IDENTIFICATION AND PERFORMANCE EVALUATION OF CHRISTOPHER ALEXANDER'S PATTERN 60 IN THE CONTEXT OF URBAN DHAKA TO INVESTIGATE LIVABILITY

SARAH BASHNEEN SUCHANA

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Identification and Performance Evaluation of Christopher Alexander's PATTERN 60 in the context of Urban Dhaka to investigate Livability

by

Sarah Bashneen Suchana

Roll No: 040401025 [P]

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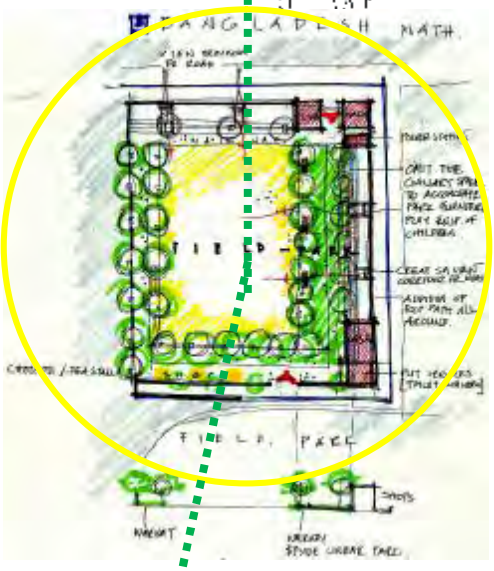
Accessible green



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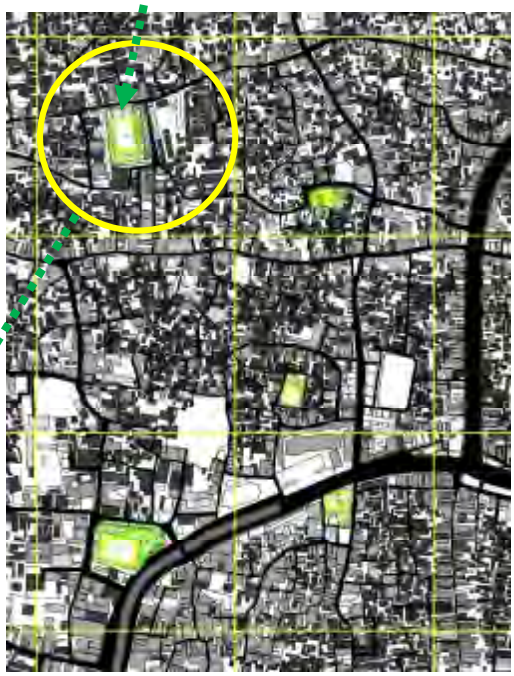

Pattern 60(Accessible green) Unplanned & Planned Area Distance Accessibility Connectivity Sociability Use & Activities Frequency of Uses Comfort & Security Amenities ……

CANDIDATE'S DECELERATION

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

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Sarah Bashneen Suchana

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Thesis title: **Identification and performance evaluation of Christopher Alexander's PATTERN 60 in the context of urban Dhaka to investigate Livability**

Abstract

Good-quality, accessible greens play a vital role in revitalize communities; encourage inward investment and urban livability. Dhaka's citizens' like to see such accessible vibrant green spaces in their close proximity. But unplanned urbanization and an avalanche of greed and manipulation by both private and public interventions has gradually tilted the ratio of open space and habitation, narrowing the access of the residents to such green spaces over the years**.** So a new language for this problem has been created with the help of Christopher Alexander's book "A Pattern Language: Towns, Buildings, Construction" (1977). Among 253 patterns of this book, **PATTERN 60: ACCESSIBLE GREEN** emphasize that people use green urban places most when they are in close proximity to their residences or work places. There by the objectives of this thesis is to identify and list the selected existing accessible greens in the planned and unplanned neighborhoods of Dhaka for evaluation of their performances in the light of yardstick set by Christopher Alexander' **PATTERN 60 : ACCESSIBLE GREEN** as well as by documenting the problems and prospects of such accessible green spaces of urban Dhaka and delineating a hierarchy or network of green spaces resulting in out door living room effect, which will foster social interaction as well as comfort by creating a language comparable to the Pattern language of Christopher Alexander but applicable for urban Dhaka. The findings are synthesized with people's behavior and motivation pattern (distance) to use existing accessible green areas. The multifunctional urban green in the case of Dhaka with an area of 2.0 acres and distributed nearly 3-5 minutes walking distance from each other is considered similar to **PATTERN 60** and taken here as case studies. It is found that the distance of accessible green in Dhaka should not exceed 1000-1250 feet (4-5minutes walk) from the users place. For existing accessible greens of Old and New Dhaka this concept of **"MULTIFUNCTIONAL PARK-FIELD"** will portray the characteristics and qualities of parks and playfields in the same ground that will meet the preferences and need of the users. To make Dhaka a city, not a great, nor a beautiful one, just a city with a sense of commonality and liveability, with a sense of civility, and mostly with a sense of equitability, the designers and citizens have to participate with the idea of creating a accessible greens for future generation of Dhaka and that should be the pattern language for any future urban design endeavor for Dhaka.

PATTERN 60
Accessible green

CHAPTER 01: INTRODUCTION

CHAPTER 02: RESEARCH METHOD

CHAPTER 03: LITERATURE REVIEW ON URBAN GREEN

Accessibility	Accessibility is the degree to which a product, device, service, or environment is available to as many people as possible. Accessibility can be viewed as the "ability to access" and benefit from some system or entity.
Accessible Green	Nature Nearby, places those are available for the general public to use free of charge and without time restrictions, an accessible green space will also be known to the target users, including potential users who live within the site catchment area.
Amenities	Attribute of a site or feature that is perceived as pleasant and provides tangible advantages to passers-by, residents, commerce, tourists, wildlife, or other important interests in appropriate circumstances.
Climate	Broad meteorological condition which include temperature, humidity, precipitation and wind that prevail in a particular region
Comfort	Comfort is a sense of physical or psychological/ pleasurable ease, condition or feeling of ease, well-being, and contentment.
Connectivity	Property of being connected or the degree to which something has connections
Foot-path	A footpath (also pedestrian way, walking trail, nature trail) is a type of thoroughfare that is intended for use by pedestrians but not other forms of traffic, such as motorized vehicles. They can be paths within an urban area that offer more expedient or safer routes
Green Network	The system of green spaces within the urban area and links between them, from the inner city through the suburbs and out into the open countryside.
Green space quality	A recognized standard of excellence that meets the expectations of both the staff and users of a site and the wider community and neighborhood.
Liveability	Well-being of a community and represents the characteristics that make a place where people want to live now and in the future, it infers the force or capacity of a public space to shelter and support people lives, sociability and its development
Needs	a condition or situation in which something is required or wanted in order to achieve its satisfaction or fulfillment
Neighborhood	Neighbourhood refers the physical setting, activities, and boundaries and also contains the communal life with the norms, values and common beliefs of a group of people
Park	A park is an area of open space provided for recreational use. It can be in its natural or semi-natural state, or planted, and set aside for human enjoyment, or - in addition- for the protection of wildlife or natural habitats.

Pattern 60	A pattern from Christopher Alexander's "A Pattern Language: Towns, Buildings, Construction" (1977) among 253 patterns People need accessible green open places (Pattern 60) to go to; when they are close they use them. But if the greens are more than three minutes away, the distance overwhelms the need.
Pattern language	A set of patterns (Solution to a problem in a Context) used to solve closely related problems
Performance	Accomplishment of a given task measured against preset known standards of accuracy, success level of urban green space,
Play field	A play field is a field used for playing sports, may provide seating stands for watching the sports
Planned area	Area with grid plan, grid street plan or gridiron plan, type of city plan in which streets run at right angles to each other, forming a grid
Preference	Right or chance to choose
Sociability	Physical and functional qualities of a space that influence people inbeing sociable that support human contact, social interaction and information exchange
Unplanned area	Area with organic or informal patterns,
Urban green spaces	Public and private open spaces in urban areas, primarily covered by vegetation, which are directly (e.g. active or passive recreation) or indirectly (e.g. positive influence on the urban environment) available for the users
Ward	District into which a city or town is divided for the purpose of administration and election

Social-cultural Terms used in this research

Bazaar	A market consisting of a street lined with shops and stalls
Bihari	The group of dialects of Hindi spoken in Bihar
Chawk	Public place named as Chawk or town square or market place or a road junction is an open public spaces commonly found in the heart of traditional town like Old Dhaka
Chini-tikri	Mosaic work of broken China porcelain pieces, a decorative style that was popular during the 1930s
Juba Sangha	Community of youth
Krira chakra	Sports club
Maath	Means play ground in Bengali.
Mahalla	The residential neighbourhoods of old Dhaka, locally known as 'Mahallas', which were the enclaves of caste or craft groups are considered by many to be a morphological archetype of this historic city
Maidan	An open space in or near a town, often used as a marketplace or parade ground, meetings, sports,
Para	Similar as 'Mahalla', in Bengali
Panchayet	One of the oldest and most active community bodies in Old Dhaka
Thana	Means police station in Bengali

ADB	Asian Development Bank
AG	Accessible Green
AGP	Accessible Green Performance
AGS	Accessible Green Spaces
AIA	American Institute of Architects
ANGSt	Accessible Natural Green space Standards
BAPA	Bangladesh Poribesh Andolon
CABE	Commission for Architecture and the Built Environment
CBD	Central Business District
CDA	Capital Development Authority
CDC	Centers for Disease Control
DAP	Detailed Area Plan
DCC	Dhaka City Corporation
DDA	Disability Discrimination Act
DIT	Dhaka Improvement Trust
DMA	Dhaka Metropolitan Area
DMDP	Dhaka Metropolitan Development Plan
DNCC	Dhaka North City Corporation
DSCC	Dhaka South City Corporation
EEA	European Environment Agency
EN	English Nature (UK)
FAO	Food & Agriculture Organization (UN)
GIS	Geographic Information System
GLC	Greater London Council
HC	High Court
JICA	Japan International Cooperation Agency
LGC	Local Government Commission
LPAC	London Planning Advisory Committee
AED	Krishi Somprosaron Odhidoptor (Agricultural Extension Department)
NHA	National Housing Authority
NPFA	National Playing Field Association
ODPM	Office of the Deputy Prime Minister
PIL	Public Interest Litigation
POBA	Save the Environment Movement
PPG	Planning Policy Guidance
PWD	Public Works Department
RAJUK	Rajdhani Unnayan Kartripakkha
SANGS	Suitable Accessible Natural Green Space
SDNPBD	Sustainable Development Networking Programme, Bangladesh
SPA	Special Protection Area
SPM	Suspended Particulate Matter
SPP	Scottish Planning Policy
TI	Town Improvement
UAP	Urban Area Plan
UGS	Urban Green Spaces
WASA	Water Supply and Sewerage Authority
WHO	World Health Organization

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PATTERN 60
Accessible green

CHAPTER 01: INTRODUCTION

1.1 Problem statement
1.2 Background of the problem
1.3 Research questions
1.4 Delimitations
1.5 Objectives of the study
1.6 Organization of the study

This chapter introduces the research topic and presents the problem statement, the background of the problem, objectives of the study with research questions and rationale. Findings from various secondary sources ,articles, news on different aspects of accessible green spaces, which are important gathering and community spaces in Dhaka, is also discussed here with the purpose of exploring the physical, functional, social, comfort and security needs within the consideration of accessibility to the urban green .

1.1 Problem statement

Christopher Alexander's "A Pattern Language: Towns, Buildings, Construction" published in 1977, is a substantive, illustrated discussion of a pattern language derived from traditional architecture, with 253 unitary patterns in which "**PATTERN 60: ACCESSIBLE GREEN"** states that urban green must be placed about 1500 feet apart in an identifiable neighborhood having a working community within a 3 minutes walking distance which will accelerate the rate of peoples uses of such green spaces. But the public life experiences hardship in most of the areas of the Dhaka caused by imbalance between people and accessibility to green spaces for livability throughout the city. The image of Dhaka is not derived from its concrete parts like building, roads etc. It is much deeper and more fluid, that is, its people, pattern of spaces and activities therein, the relationship between the living and nonliving part of its environment, time, space and the people. Experts suggested that an ideal city needs to keep its 40%-50% of land open or free. However Dhaka structure plan urges to have 20% of open spaces for its future generation (Mowla 2005). In Dhaka designated urban greenery, park greenery or tree-covered spaces constitutes less than 15% of the city landscape (Mowla 1999, Nilufar 1999). According to the DMDP 95, old Dhaka (organically developed neighborhood) has only 5% and new Dhaka (planned neighbourhood) has about 12% open space.

In Dhaka, the green spaces are vanishing one by one in an avalanche of greed and manipulation by private interests often in partnership with the authorities. A series of opinion poll on Dhaka's citizens (Prothom Alo 'Dhakai Thaki' issues, 1st June 08, 12th October 08, 26th October 08, 14th December 08, 4th January 09, 18th January 09, 25th January 09, 1st February 09, 8th February 09, 8th March 09, 15th March 09, 3rd May 09, 10th May 09, 21st June 09, 21st June 09, 5th July 09, 12th July 09, 2nd August, 9th August 09) like to see vibrant green spaces in their close proximity. Unplanned urbanization has tilted the ratio of open space and habitation and other settlements for worse in the capital city Dhaka over the years, narrowing the access of the residents to such places of recreation (Zaman Mahtabi, 2006**).** According to the poll and Christopher Alexander's (1977) **PATTERN 60: ACCESSIBLE**

GREEN, people use green urban places when they are in close proximity. But if the urban greens are more then three minutes away, the distances overwhelms the need.

During the last twenty years of urban development, Dhaka has experienced rapid population growth and uncontrolled urban expansion which has a negative effect in the environmental quality of urban spaces. Based on the existing situation it is logical to assume that architects, urban designers or planners, even the municipal governments have not made efforts to ameliorate such conditions and are giving little consideration to users and there needs for accessible green (Monica & Montero, 2001).

Accessibility is a complex issue and relies on both physical factors and socio-cultural factors. These social factors are generally less obvious but often very significant in determining the quality of users experience **(**Stoneham 2001**).** It is essential that the green spaces are accessible. Good-quality, accessible green space can help revitalize communities, encourages inward investment and urban livability **(**Mowla 2003**)**. Kaplan and Kaplan (1990) and Godbey et al. (1992) found that good accessibility is one of the most important attributes of urban open space. Assuming that Christopher Alexander's Pattern Language holds good for Dhaka, the spaces similar to **PATTERN 60: ACCESSIBLE GREEN** in Dhaka's context are identified and their performance evaluated in this study.

Accessible green spaces, which are important gathering and community spaces in Dhaka, is studied in this study with the purpose of exploring the physical, functional, social, comfort and security within the consideration of accessibility. It is anticipated that by investigating these problems some important information would be obtained and those would be used to develop a pattern for green spaces in Dhaka. The study involves conducting user interview and observing the spatial behavior pattern in the areas selected from among many existing green spaces in Dhaka. This research focuses on the users of urban green in order to identify their needs and understand what attract people to urban green in terms of accessibility. The study undertaken here examines social factors in public green spaces as a way to enhance users' satisfaction and to improve the relationship between people; built environment and the natural environment for better livability.

1.2 Background of the problem

Urban green spaces are especially important to Dhaka for softening densely developed neighborhoods, creating a soothing environment within the city and providing small areas of refuge from the urban chaos. Dhaka needs a huge amount of urban open green spaces for urban services as well as for amusement. For a healthy city we need a proportional balance

between open and built up areas. Open green spaces acts like lungs besides being used as active recreational and leisure areas for its citizens. So city people must realize that green spaces have a direct impact on the urban environment and general physical, mental and social health of the urban dwellers. Instead of protecting the open green spaces for the sake of a balanced urban environment there were insidious attempts to destroy the greenery since independence. Many such spaces in the city were gradually encroached upon in the last 30 years. Designated and planned urban greens in Dhaka are often that popular and accessible, that also motivates their conversion to other use.

There is a need for awareness and sensitivity among the relevant officials regarding environmental issues or ecosystem. in late eighties open spaces managed by DCC was estimated to be about 250 acres but recent stock taking reveal that the amount has gone down to below 200 acres. Problem of private encroachment on to public land, for instance influential real state interest being allowed to site new development on public land, including parks and green corridors along water body is quite common in Dhaka (Mowla, 2006).The crowded situation reduce green spaces in the city and proliferation of high rise without leaving ground area open and green for public uses is evident. This process results in a city where the young have no safe playground to play; mother and old people have no spaces to enjoy their leisure time. The ultimate result would be destroying healthy, livable environment and scenic beauty of the urban landscape, fade out the sense of recreation and culture and to close down breathing spaces with in the city. This problem needs to be addressed immediately. Right amount of urban green in right places needs to be determined, that is expected to discourage encroachments.

1.3 Research questions

The purpose of this research is neither to focus on the study of all the problems that affect urban green nor to address all the green spaces in Dhaka. Instead the study examines and explores Christopher Alexander's "PATTERN 60: Accesible Green" in the context of Dhaka in a systematic way and ascertain its validity in Dhaka. By the study it will be easier to determine right amount of urban green in the right place in an urban neighborhood of Dhaka. Several urban green spaces as described in PATTERN 60 have been carefully selected to evaluate the performances of users that influence the livability of the surrounding neighbourhoods in Dhaka. The selected areas are located in two contrasting urban conditions. In order to have a precise idea of the problem to be addressed in these study areas, the following questions were raised:

Main question:

How Christopher Alexander's "PATTERN 60: ACCESSIBLE GREEN" works in the context of Dhaka to enhance livability?

Accessible urban greens

- What is the pattern of spatial distribution of urban greens?
- What is the average size of urban greens verses catering population?
- What is the spatial setting of successful and unsuccessful urban greens?
- What types of urban green spaces are needed in a compact city like Dhaka?

Users' accessibility

- Who are the users of these green spaces?
- How are people able to access the greens?
- How frequently are the greens used by the residents of those areas and others?

Liveability

- How urban green spaces can contribute on urban liveability?
- What are the measures of performance evaluation of such accessible green?
- What set of urban physical, functional and social attributes attract people the most to the green and influences their enjoyment, use, sociability, satisfaction and comfort to those areas?
- What uses and activities occur in those areas?
- How do security and climatic factors affect people's comfort in greens?

1.4 Delimitations

Christopher Alexander's **PATTERN 60 (ACCESSIBLE GREEN)** was originally developed for western context. But in this research the context of Dhaka has been chosen to execute the pattern. In terms of the various categories of accessible greens that are there in Dhaka, the study was delimited to neighbourhood level accessible greens like play fields and parks. Different accessible greens of southern part of Dhaka have been considered only as survey area.

1.5 Objectives of the study

Christopher Alexander's pattern language (**PATTERN 60: ACCESSIBLE GREEN**) would be tested in the Dhaka context and adapted with necessary modifications. In other words The objective of the study is to ensure accessibility to urban green in the context of urban Dhaka

and to develop a hierarchy of open space planning resulting in out door living room effect, which will foster social interaction as well as comfort by creating a language through the Patterns of Christopher Alexander for urban Dhaka.

The specific objectives of the study are:

- To identify **PATTERN 60 (ACCESSIBLE GREEN)** spaces in the planned and unplanned neighborhoods of Dhaka for evaluation of their performances in the light of yardstick set by Christopher Alexander.
- To document the problems and prospects of **PATTERN 60(ACCESSIBLE GREEN)** of urban Dhaka and identifying the interventions to make them available to people without destroying their spatial qualities.
- To delineate a hierarchy and network of open spaces resulting in out door living room effect, which will foster social interaction as well as comfort by creating a language similar to the Pattern language of Christopher Alexander but applicable for urban Dhaka.

Possible outcome

- Evolve a checklist in order to provide an integrated approach to plan, design and manage the green open spaces for improving the quality of social life and livability in the contemporary urban Dhaka neighborhoods.

1.6 Organization of the study

The study is organized in eight chapters.

Chapters 01 on **Introduction** introduces the research topic and presents the problem statement, the background of the problem, objectives of the study with research questions and rationale. Findings from various secondary sources, articles, news on different aspects of accessible green spaces, which are important gathering and community spaces in Dhaka, is also discussed here with the purpose of exploring the physical, functional, social, comfort and security needs within the consideration of accessibility to the urban green .

Chapter 02 on **Research Method**, designs the study process in order to make it logical, result oriented and suitable within the available of time frame.

Chapter 03 on Literature Review on Urban Green, presents the literature review regarding theories related to accessible green (**PATTERN 60** of Christopher Alexander), benefits of green, measures to evaluation the performances of such green and urban livability globally and locally according to different authors.

Chapter 04 on **Accessible Urban Green-a Framework for analysis in the Dhaka Context**, provides the historical background of green spaces of Dhaka presents the socio cultural profile of city dwellers and describes the urban conditions of these green spaces in order to study the problems stated above and develop an understanding of the current research. A yardstick would be developed for performance evaluation.

After the context analysis in **Chapter 05** on **Case Studies**, it illustrates the physical and functional characteristics of areas, there transformations and scenario of urban life, climatic condition and spot problem and prospects to measure the performance to boost urban livability of Dhaka on the basis of the yardstick.

Chapter 06 on **Analysis and Synthesis of data** gathered in the field .It includes the research analysis and briefly describes the observational characteristics of accessible green spaces of planned and unplanned areas and residents responses towards accessible green areas. Analysis and synthesis of the case studies includes various attributes under which different measures are taken to investigate liveability.

Chapter 07 on **Recommendations and Conclusion** critically evaluates Dhaka context on accessible urban green vis-a-vis Christopher Alexander's **PATTERN 60 (ACCESSIBLE GREEN)** and summarizes overall fact that is observed and standards that has been evolved and puts forward some guidelines for suceesful accessible urban green foe Dhaka in this study with a conclusion note.

CHAPTER 02: RESEARCH METHOD

This chapter designs the study process in order to make it logical, result oriented and suitable within the available time frame.

2.1 Research Characteristics

It is a phenomenological research to reinterpret and evaluate an existing concept in a new context. This research consisted of a social study to address the problems and prospects of **PATTERN 60** in Dhaka. In particular, the attitudes toward nature and green in the selected areas were studied and composed of two main dimensions of evaluative orientation of performances of those green spaces. The first dimension is based on “Appreciation and Depreciation of urban green in accessibility perspective" and the second, “livability of urban green in a performance perspective”.

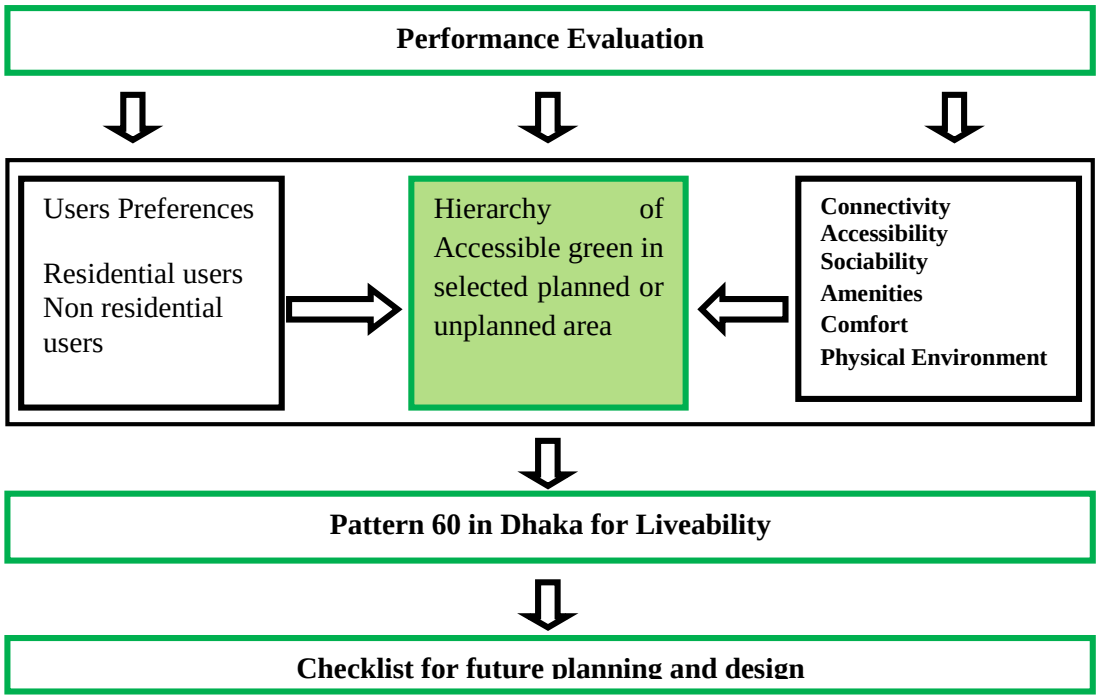

Figure 2.1: Flow diagram of Liveability of urban green in a performance perspective

The physical and social environments of open spaces in a city influence people's behavior as well as their perception of the city. Performance evaluation means to evaluate need, development and impact of an area on users of that area. It is a flexible technique which involves preparing a detailed analysis of existing conditions in the area, and estimates the impacts of development on community facilities, the environment, local economic conditions, and other norms practiced by the community. Performance evaluation requires in-depth analyses. Based on this evaluation of the spaces, a development guideline for each space can be provided responding to the users needs. This evaluation will help to identify of needs open space resources and set priorities for different types of open spaces.

2.1.1 Criteria for choosing areas for the research

· Different types of accessible greens have different benefits as well as impact and role in community life. So the needs and demands of users in terms of accessibility (according to function and distance) and livability are the two main issues on this respect.

· Both the areas: Old Dhaka and Mohammadpur (figure2.2) are on southern part of Dhaka and have different types of urban fabric, social life structure, economics status and physical dimension. Northern part has not been considered in the survey as the green part of southern area is more liveable and user friendly. The Mohammadpur residential area is planned and old Dhaka is an organically developed. Accessible green of these areas are used differently .The residents of mohammadpur use greens in specific time of the day because people of surrounding localities come to enjoy these green as they do not have green areas near their dwellings and has several parks as accessible green distributed different location of the area. In contrast the residents of old Dhaka use their green in different time of the day.

· Similarities and differences allow making comparisons among different factors that influences their accessibility and livability. Factors such as locations, distribution and distances of greens, climatic comfort, surrounding activities, contextual settings and density and pressure of users in those areas are all factors that need to be explored in order to understand the positive and negative factors that affect the livability of these spaces.

· This will also facilitate to categorize, analyze and evaluate suitable sample from the selected **PATTERN 60** in Dhaka with a checklist as well as to delineate a Pattern Language of accessible green for urban Dhaka similar to Christopher Alexander's **PATTERN 60** and based on that formulate recommendations and suggestions to plan sustainable accessible green spaces in Dhaka.

Yardsticks for the selection of the sample site

01. Residential areas
    - Urban fabric (planned and unplanned)
    - Surrounding activities and density
02. Typology of accessible green
    - Park / Play ground
03. Accessibility
    - Distance and frequency of uses
04. Sociability

Figure 2.2: Unplanned and planned urban fabric of Dhaka as study areas with distribution of accessible green (park and play ground)

2.2 Survey method

The following flow chart explains the process used and the criteria for selecting participants for the study.

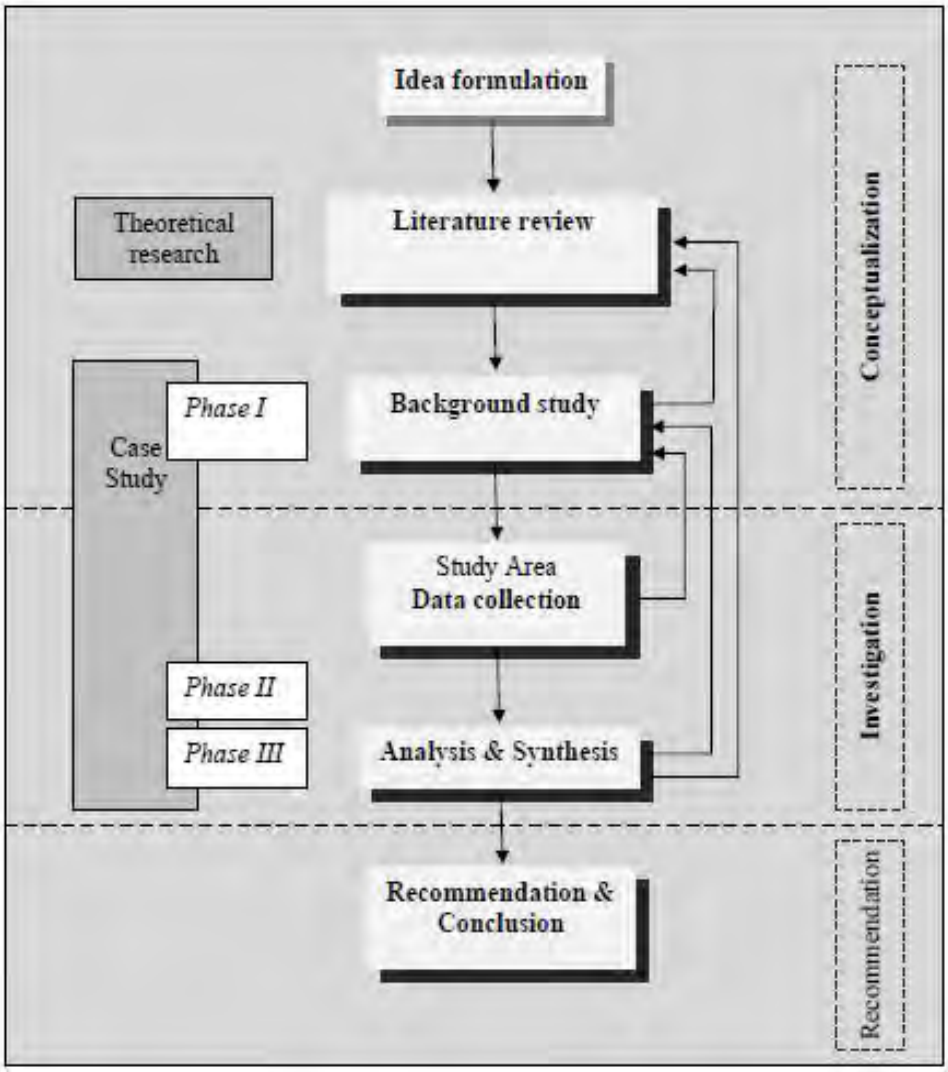

Figure 2.3: Diagram of research design

2.2.1 Literature survey and Background study

An extensive literature review on **'PATTERN 60: ACCESSIBLE GREEN'**, needs of such accessible green, benefits, problem and prospects of these green areas in cities and how they contribute in the livability of a area has been done. The sources of these literatures are secondary such as the books from libraries, publications or research papers, thesis, print media and magazines. Background study holds the scenario of accessible green space in Dhaka, the problems and challenges.

2.2.2 Data collection

Primary data collections through interview and participants observations allow for insight into contexts, relationships, behavior and provide information previously unknown to researchers. The case studies are crucial for research design, data collection, and interpretation of other data. Pilot study has been done to understand the views of the users and non users of the green spaces regarding the research.

Pilot study: to fine tune the sampling, a total of four interviews and casual observation were done before applying survey methods. Consistent with the importance attached to access, the basic analysis that underlies the functions of accessibility of green spaces is one of the lengths of route that follows the network of roads or paths. Several options were provided for assessing the proximity of green spaces from any given location, including a comparison of the distance to each green space that was identified as the first, second or third most visited site for individual respondents to the survey. Three interview formats were developed for different parks and play fields of following three areas.

During the pilot study users of parks and playfields were asked several questions in terms of distance from their residences and degree of social interaction in those spaces. In order to study Christopher Alexander's **PATTERN 60: ACCESSIBLE GREEN**, besides environment behaviour study (EBS), 50 samples were enquired on the spot regarding, how often they came there, and how far they had walked to the park or playfield etc. Especially each person (samples) was asked three questions:

Table 2.1: Sample Questions for users	
Question for the residential users:	
A.	Which is the nearest green area from your apartment and do you go there?
B.	What are the characteristics of that green space [park, lake side green or play field/size of the space] that attract you to go there?
C.	Do you think distance and size is the factor to use the green space?
Question for non residential users [on spot]:	
A.	Did you walk or drive?
B.	How many blocks have you come [150 feet, 250 feet, 500 feet, 750 feet or 1000 feet]?
C.	Why you prefer [satisfaction/dissatisfaction] this green space?

Two survey subjects were used, one was an interview with parks/play fields' users and another was with concerned authority. Interview with authorities provided information related to parks. Users' interviews were recorded according to the questionnaire. This will be

discussed further in the following section; the other EBS method was by making observation (supported with some map tracing note taking, and photographs).

2.2.2.1 Interviews

Observation and interviews conducted during the pilot study were oriented in different sessions and a number of visits were required during a day for conducting interviews in different parks. The interviews are developed in very informal way at random, but generally at a regular frequency i.e. made every Sunday, Tuesday and Friday as representative days of the week. The interviews were made through multiple visits to the parks and developed through four sessions of the day, morning, noon, afternoon and night. Residence participants' were interviewed on Friday as Friday is the holiday. It was believed that people's behavior and attitudes were also different as a result of different context, climatic, social, activities and security conditions at different hours. This allowed gathering of information about why they visit, from what distance they come and why use the parks at certain hours.

Interview sessions for the different periods of the day in various parks of same location or area were developed simultaneously. After interviewing the participants in one park, the other park was immediately surveyed; this was possible because all seven chosen parks plus play fields of Mohammadpur (planned) area were within 4 to 5 minutes apart depending on the traffic. Same sequence was followed in the case of unplanned old Dhaka. Interviews were tape recorded which allowed having people's explanation and opinions obtained in faster way and therefore helped obtaining the most information from the participants in a shorter period of time and allowing listening again and again for interpretation. This represented a fast way to obtain a higher number of interviews with less effort and demand from users. Also the time allowed to conduct interviews was limited (one month) in planned and unplanned context of Dhaka.

2.2.2.2 Criteria for selecting interview participants

- Users of different ages and socio-economic status were interviewed in order to assure a representative cross section of the accessible green users. Children, young and elder people were also interviewed so as to understand their impressions, likes and dislikes and their needs in the green areas.
- Some times groups of two or three peoples were interviewed (residents, couples, groups of friends and families), which allowed capturing different impressions and information from users at the same time and shortened the interview session in both areas (planned and unplanned).

2.2.2.3 Observation

The observations complimented the interview result. The combination of observation and interviews was a key methodical approach for this study because it allowed perceiving peoples attitudes, needs towards accessible green, understanding how people socialize and observing how the existing conditions of parks influenced people's behavior in and use and livability of the parks. Observations were initially done every Monday and Wednesday which were different days than those used to conduct interviews. The only day that pattern of use were different were during weekends or when special events occurred in those parks. Observations were based on a chart, which contained a list of items and conditions to take into account. A combination of tape-recorded interviews, observations, casual note taking, photographs taking and map tracing were methods of this study.

2.2.3 Participant study

The green spaces users were the main subjects of this study. Knowing about their views regarding need of accessible green, their experiences, impression, opinions and feelings in relationship to the parks were very valuable way to ascertain their performance on using those parks, there preferences, activities and enjoyment. This was particularly important for understanding that living in close proximity to a green follow a high intensity use function or not and is it very sensitive to increasing distances. In order to obtain information regarding distance and livability a structured interview with both open and close ended questions were necessary for this study. The number of participants surveyed for this study was 30 users in each green space. Users were approached while doing their regular activities in the parks. People that were generally sitting, watching or conversing and even resting were approached for interview in cordial way. When approached, the academic purposes of the interview was explained ,it was mentioned that the interviews were being develop for Master's thesis, that their impression and information would be helpful for the development of research and were completely anonymous. Most people that were interviewed were receptive.

2.2.4 The interview script

An interview script was developed in order to guide the interview sessions in the selected green spaces as well as selected apartments which were located in different distances from the selected green space of the planned or unplanned wards. The types of questions were selected according to the research objectives and to identify the factors like accessibility, uses and activities, sociability that influenced the livability of urban green spaces. The interviews were

face to face which helped the researcher to observe peoples attitudes towards green spaces and their locality. The interviews were of both open and closed questions. Closed questions were made according to the pre established selection of possible answers. Open questions on the other hands allowed users to express their reasons and impressions according to their attitudes and personal beliefs. Tape recording the answers given by the respondents was another strategy which is very practical for obtaining the information of open ended questions made through the interviews and which was only recorded in selected green spaces, not in the apartments due to privacy concern.

Table 2.2: Investigation Matrix (Variables and factors to be explored through the interviews and observation)

	Variables	**Category**	**Queries**	**Survey method**
Liveability Measures	**Spatial distribution** • Visual & physical connectivity • Hierarchy of green spaces • Size of green spaces	Physical Social	• Visibility and accessibility to assure Connectivity • Types of green space in selected area • Most usable green spaces • Which types of green used by whom • What is the average size of urban greens verses catering population	Observation
	• **Accessibility** (Distance from living area and activities in the green space with no limitation)	Functional Physical	• How far away user lives from the green space • How user arrived at the green • Is distance act as a barrier to use the green	Interview Observation Description of green space
	• **Frequency of use** (Number of times a person visits the green space)	Functional	• Frequency of visit • Time spent in the green space • Time of day green spaces is visited	Interview Observation
	• **Uses and activities** (Functions that encourages people to visit and remain in the green space)	Functional	• What people do in the green space • Activity location in the green space • User's favorite spots in the green space	Interview Observation Description of green space
	• **Sociability** (Degree of social interaction)	Social	• Number of people engaged in groups • How interaction takes place in the green space • Known people and unknown people interaction	Interview Observation
	• **Amenities** **(**feature that provides comfort, convenience or pleasure)	Functional	What types of amenities are available in the greens? • Whether these amenities are free, easily accessible, enjoyable, unnecessary, or desirable?	Observation
	• **Users' profile** (Personal data of users)	Social	• User's Age, gender, occupation • User's perceived attitudes and	Interview

			behavior	
	• **User's preferences and needs** (Needs, demands, preferences and satisfaction are inter-related)	Social Psychological	• What attract users to use green space • Users preferences; both residential and others users • Users favorite spots in the green space	Interview
	• **Comfort** (Degree of acclimatization and adaptation of the individual)	Physical Psychological	• Comfortable in which time of the day • Which spots are visited mostly: Spots with tree or without trees	Interview Observation
	• **Physical Environment**	Physical	• What is the condition of the accessible green? • Which spots are visited mostly: Spots with tree or without trees	Observation

The interview script (see Appendix 01: The Observation chart and interview script) consisted of questions that were sometimes extended by follow up questions in order to explore additional information. The research variables were obtained based on both literature reviews and because they represented significant factors capable of influencing the accessibility and livability through using the green spaces. The variables were also obtained according to the research questions and the objectives of the study. Variables are categorized as physical, functional, social and psychological. These variables are: hierarchy of green spaces, accessibility, frequency of use, uses and activities, sociability, users' profile, user's preferences and needs, comfort.

2.3 Data analysis tools

Since the interviews were based on open ended questions the results were transcribed, tabulated and codified in order to develop the data analysis. The information was classified into answers categories and expressed as percentage frequencies. The method for analyzing the information was content analysis. Through content analysis which is based on data codification, the key elements contained in information given by the green spaces users are transformed into units that facilitated their description and analysis. It is important to state that the results that are presented are based on the number of answers given by the users. Therefore percentages given to each answer category are based on the number of answers given by the users, not the total number of interviews for each accessible green space. Sometimes the user had more than one answer to an open ended question and therefore percentage for answers categories were calculated upon the frequency in which they were mentioned. The methodology used in this study was based on the research questions, the problems to be addressed and also based on the theoretical base (**PATTERN 60**). The survey

methods used were interviews, observation and some note taking which were considered to be useful methods with the data collected from this research, information is expected to be obtained that could provide directions for developing design implication for green space design and redesign. The methods used in this study are also expected to provide many lessons for this study based on the study of people.

PATTERN 60
Accessible green


. . . at the heart of neighborhoods, and near all work communities, there need to be small greens - identifiable neighborhood (14), work community (41) Of course it makes the most sense to locate these greens in such a way that they help form the boundaries and neighborhoods and backs - subculture boundary (13), neighborhood boundary (15), quiet backs (59).

CHAPTER 03: LITERATURE REVIEW

This chapter presents the literature review regarding theories related to accessible green (**PATTERN 60** of Christopher Alexander), benefits of green, measures to evaluation the performances of such green and urban livability globally and locally according to different authors.

3.1 Pattern Language and Christopher Alexander

"A pattern is a solution to a problem in a context"

Every individual in a society has a unique language, shared in part but which as a totality is unique to the mind of the person who has it, in this sense in a healthy society there will be many pattern language as there are people-even though these languages are shared and similar. But the language people have today are so brutal and so fragmented that most of people no longer have any language to speak of at all and what they do have is not based on human or natural consideration. So we have to try to formulate a living language in the hope that people can understand and use it. Christopher Alexander (1977) presented a set of rules that are invoked by circumstances. According to Christopher Alexander, (1979) the great architectures:

- Not made from rigorous, planned designs
- Made of pieces custom fit to each-other and to their environment
- Aesthetics is attuned to human needs and comfort
- All involve recurring themes (he called **PATTERNS**)

Patterns emphasize the role of relationship between the parts in determining the nature of the whole. Alexander's patterns have two components: utilitarian and aesthetic. According to Alexander, design pattern is a piece of literature that describes a design problem and a general solution for the problem in a particular context.

3.1.1 PATTERN 60: ACCESSIBLE GREEN

Christopher Alexander's Pattern Language describes an entirely new attitude to architecture, urban design and planning. It describes a detailed pattern for towns and neighborhoods. No pattern is an isolated entity. Each pattern can exist in the world, only to the extent that is supported by others patterns: the larger patterns in which it is embedded, the patterns of the same size that surround it and the smaller patterns which are embedded in it. Among the 253 patterns ranging from the scale of interior design to regional scale, **PATTERN 60** deals with the 'accessible green' placed about 1500 feet apart in an identifiable neighborhood (pattern 14) having a working community (pattern 41) within certain boundaries (pattern 13 & 15) etc.

PATTERN 60 being sensitive to the socio-spatial context of the place, explains the livability parameters**.**

The book "A Pattern Language" by Christopher Alexander is the archetypal cores of all possible pattern language, which can make people, feel alive and human. In the context of Dhaka this pattern has its transformation changes according to the population, planning, need and demands of such green metro nature to enhance the quality of life of its people which is diminishing day by day to accommodate excessive urban people. People need accessible green open places (**PATTERN 60**) to go to; when they are close they use them. But if the greens are more than three minutes away, the distance overwhelms the need. Parks are meant to satisfy the need. But parks as they are usually understood are rather large and widely spread through the city. Very few live within three minutes of a park. The research done by Christopher Alexander suggest that the need for parks is very important and even though it is vital for people to be able to nourish themselves by going to walk and run, and play on open green, this need is very delicate. The people in a city, who live more than three minutes away, do not need the parks less. But distance discourages use and so they are unable to nourish themselves as they need to do. This problem can only be solved if hundreds of small parks or greens and scattered so widely and so profusely that every house and work place in the city is within three minutes walk of the nearest one. In a citizen's survey on open spaces conducted by Berkeley city planning department showed that the great majority of people living in apartments want two kinds of outdoor space above all others: (a) a pleasant, usable private balcony and (b) a quite public park within walking distance. It is as if those people with ready access to a green displays a full, free responsiveness to it, while people far away have lost their awareness of it and have suffered a reduced sensitivity to the pleasures of the green-for these people the green has ceased to be a vital element in their neighborhood life.

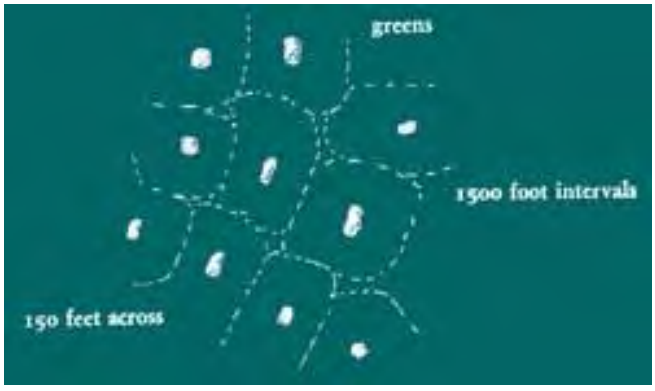

Figure 3.1: PATTERN 60: ACCESSIBLE GREEN and distribution of accessible green

According to the research, a green should be as much as 60,000 square feet in area and at least 150 feet wide in the narrowest direction in order to meet the need to be with nature, green within about 750 feet of every house and workplace. This means that the green need to be uniformly scattered at 1500 feet intervals throughout the city. "….pay special attention to old trees, look after them –tree places(pattern171])shape the green so that it forms one or more positive room like spaces and surround it with tree, or walls, or buildings, but not roads or cars, positive outdoor space (pattern 106) and perhaps set aside some part of the green for special community functions-holy grounds(pattern 66),gravesites(pattern70),local sports(pattern72), sleeping in public(pattern94)…."

3.1.2 Accessible green and other Researchers

We need to be concerned about each part of the city as a livable place, all of the residential places should be provided with accessible and attractive green spaces. Distance or walking time from the home has appeared to be the single most important precondition for use of green spaces (e.g. Deconinck, 1982; Grahn, 1994; Bussey, 1996; Holm, 1998). People who live in close proximity to a green space use it frequently; those who live further away do so less frequently in direct proportion to the increase in distance. For example, according to most authors neighborhood parks should be situated within a 5 minutes walk, corresponding to maximum 400m from home, if they are to be perceived as accessible. Grahn & Stigsdotter (2003) in their study, found users are extremely sensitive to distance to urban open green spaces. The farther the park is from the home or the office the fewer and shorter are park visits. After a only 50 meters distance we see a decrease in visits frequency and an increase in number of occasions of perceived stress. If a person has access to a green areas within 50 meter of his/her home, the visit frequency is three to four times a week [ibid].the numbers of visits decreases with increased distance to a green area. If the distance is 1000 meters, the visit is postponed until the weekend.

In Europe, the European Environment Agency (EEA) recommends that people should have access to green space within 15 minutes walking distance. A Europe-wide assessment of access to green space reported that all citizens in Brussels, Copenhagen, Glasgow, Gothenburg, Madrid, Milan and Paris live within 15 minutes walk of urban green space, as well as the residents of many smaller cities (Stanners and Bourdeau, 1995). English Nature (EN), a UK government agency, recommends that "people living in towns and cities should have an accessible natural green space less than 300 meters from home" (English Nature,2005; Harrison et al., 1995; Barker, 1997; Handley etal., 2003; Wray et al., 2005). A recent analysis of green space availability in the Netherlands found that 67% and 83% of

neighborhoods had ready access to recreational opportunities for walking and cycling, respectively (De Vries and Van Zoest, 2004). The study of a wide variety of public spaces in Cardiff, Preston and Swindon (Mean and Tims 2005) suggested that **"access and availability"**-good physical access is important in creating shared social spaces. For example, 64% of Sheffield households fail to meet the recommendation of the regulatory agency English Nature (EN), that people should live no further than 300 meters from their nearest green space (Jamie A.2007).

In Bangladesh according to DMDP public 'open space' is that which 'is accessible to the public all times, not including required yards. It adjoins a public street or public way for at least 20% of its perimeter at an elevation not more than three feet above the adjoining foot path (DMDP, 1995-2015: Vol-I, II, Planning definitions, Appendix 1, p.11. no.107). A number of studies suggest that the distance criteria used to identify children's use of natural places are especially sensitive to the kind of physical barriers and to social constraints imposed by parental anxieties about children's safety (Harrison et al., 1995). Studies on children's activity range (e.g. Hart, 1979; Matthews, 1987; Hillman et al., 1990) make it likely that the recommended maximum distance of 400 meters to neighborhood parks is not a sufficient criterion of a site's real accessibility to many children of primary school age (Van Herzele Ann & Wiedemann Torsten 2003). In order to handle physical distance as an effective criterion for identifying accessible green spaces, contemporary constraints on mobility and behavior need to be examined.

3.1.3 The Term Accessibility

Accessibility is an important concept for urban designer and planners because it reflects the possibilities for activities, such as working or shopping, available green spaces to residents of a neighborhood, a city, or a metropolitan area. Accessibility is determined by attributes of both the activity patterns and the transportation system in the area. The spatial distribution of activities as determined by land development patterns and their qualities and attributes are important components of accessibility, as are the qualities and attributes of the transportation system that links these activities, such as travel time and monetary costs by mode (Mowla, 2005). Most measures accessibility can be classified as one of three basic types (Handy and Niemeier 1997). Cumulative opportunities measures are the simplest type. These measures count the number of opportunities reached within a given distance or travel time and give an indication of the range of choices available to residents (Handy Susan & Clifton Kelly, 2001). From the planning perspective**,** a network of high quality green spaces linking residential areas with business, retail and leisure developments can help to improve the accessibility and

attractiveness of local facilities and employment centers. Well designed networks of green spaces help to encourage people to travel safely by foot or by bicycle for recreation or commuting (Leeuwen, 2002). Accessibility refers to the ease to arrive to facilities, activities or goals, which could be appointed in general as opportunities. In addition accessibility could be defined as "the intensity of the possibility of interaction" (Hansen, 1959) and interchange (Engwicht, 1993) where as connectivity related to spatial configuration (system of spaces) and city scale. According to Lynch (1960) accessibility is a time issue but also depends on the "attractiveness" and the identity of the itineraries. In this sense, the accessibility is related to pedestrian. The pedestrian movement is the mobility model that has the capacity of maintaining the most direct relationship and interaction with the city, e.g. through the senses, in the interaction with other pedestrians, in the possibility of participating in the trading activity and cultural one along the streets (Venturi, 1998) and enjoying the natural, architectonic environment (Jacobs, 1996). A key element of the public realm is accessibility. While by definition the public realm should accessible for all. Carr et al (1992, p: 138) identify three forms of access:

01. Visual Access (visibility): if people can see into a space before they enter it, they can judge whether they would feel comfortable, welcome and safe there.

02. Symbolic Access: symbol can be animate or inanimate. For example individuals and groups perceived either as threatening or as comforting or inviting, may affect entry into a public space

03. **Physical Access**: concerns whether the space is physically available to the public .Physical exclusion is the ability to get into or to use the environment, regardless of whether or not it can be seen into.

In conducting accessibility check, there are a number of issues that need to be resolved to establish conditions on the ground and then to assess the level of accessibility that is possible. For this purpose access can be divided into five categories (following Table 3.1 & Figure 3.3):

Table 3.1: Purpose of Access

Category	**Definition**
Full Access	Entry to the site is possible without restriction
Conditional Access	A right of entry exists which is subject to or affected by one or more restrictions or conditions that may affect the quality of the natural experience enjoyed by the visitor.
Proximate Access	There is no physical right of access but the site can be experienced from its boundary, where a close-up visual and aural experience of nature may be available.
Remote Access	No physical right of access exists and the proximate

	experience is limited, but the site provides a valuable visual green resource to the community along a number of distinct sightlines and at distance.
No Access	No physical right of access exists and views of the site are largely obstructed.

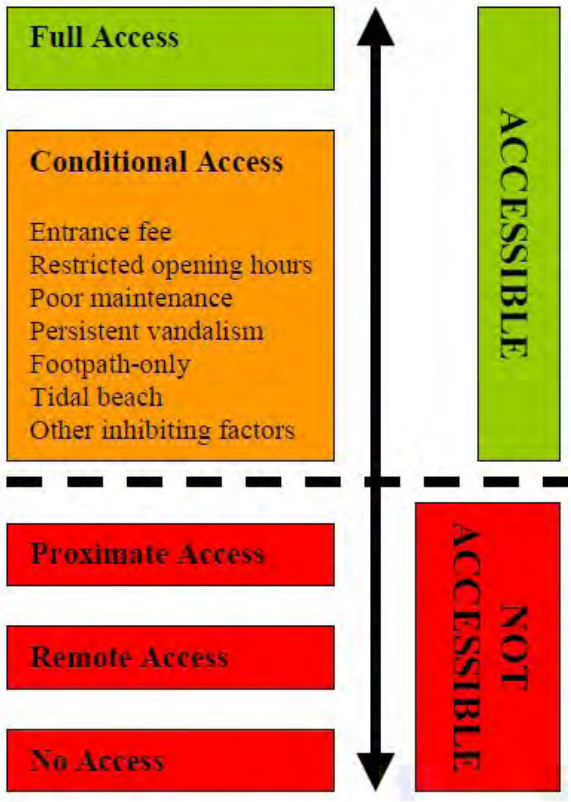

Figure 3.2: Providing Accessible Natural Green space in Towns and Cities, A Practical Guide to Assessing the Resource and Implementing Local Standards for Provision in Wales, Centre for Urban and Regional Ecology, School of Planning and Landscape, University of Manchester, pg 24

3.2 Accessible Urban green spaces

3.2.1 Definitions of urban green spaces

Urban green space is an indispensable element of urban quality of life. Green areas are environmental – and sometimes historic-ecological assets of great importance for any city. The importance of 'urban green' has been clearly recognized in urban architecture (MacHarg 1971), by, for instance, Ebenezer Howard with his Garden Cities, Charles Fourier with his Phalansteries, and Ernest Calleback with his Ecotopia.(Leeuwen, E,2009)

According to Mace (2007), where the populations are falling, there are opportunities to redesign the built and external environments in order to improve livability and sustainability. urban green space is seen as an integral part of cities providing a range of services to both the people and the wildlife living in urban areas (James P, 2009). Swanwick et al. (2003)

suggested that urban areas are made up of the built environment and the external environment between buildings. The external environment, in their model, is composed of two distinct spaces: ‘grey space’ and ‘green space’. Grey space is land that consists of predominantly sealed, impermeable, ‘hard’ surfaces such as concrete or tarmac. Green space land, whether publicly or privately owned, consists of predominantly unsealed, permeable, ‘soft’ surfaces such as soil, grass, shrubs, trees and water. By urban green spaces we understand public and private open spaces in urban areas, primarily covered by vegetation, which are directly (e.g. active or passive recreation) or indirectly (e.g. positive influence on the urban environment) available for the users.

Barnett, et.al (2008) defines the term “urban green space” broadly as the range of urban vegetation including not only parks and open space, but street trees, residential gardens, and in fact any vegetation found in the urban environment. Much less attention is being paid to that type of nature close to where people live and work, to small-scale green areas in cities and to their benefits to people. Increasing empirical evidence, however, indicates that the presence of natural areas contributes to the quality of life in many ways. Besides many environmental and ecological services, urban nature provides important social and psychological benefits to human societies, which enrich human life with meanings and emotions (Anna 2004). According to DMDP (1995)-open space means any portion zoning plot essentially free of structures that serves the purpose of visual relief and buffering from building and structural mass. These areas may be privately or publicly owned and may not accessible to the general public.

3.2.1.1 Accessible green space

Accessibility is affected (amongst other things) by: how far the place is from home; whether there are barriers in the way such as busy roads; and how far different groupings of adults or children are able to - or are allowed to - walk by themselves. Accessibility is a complex issue and relies on both physical factors (such as distance from home) and socio-cultural factors (such as people wanting to go somewhere and feeling comfortable there). These social factors are generally less obvious but often very significant (Mowla, 2002). “Accessible places are those that can be used by everyone, regardless of age, gender or disability. They celebrate people's diversity and remove unnecessary barriers and exclusions to benefit us all” (ODPM 2003). For sociologists: public space is a place accessible to anybody and reflects a notion of basic equality, social freedom of circulation and anonymity (Stephane, 2008). Accessible green spaces are places that are available for the general public to use free of charge and without time restrictions (although some sites may be closed to the public overnight and there

may be fees for parking a vehicle). The places are available to all, meaning that every reasonable effort is made to comply with the requirements under the Disability Discrimination Act (DDA 1995). An accessible place will also be known to the target users, including potential users who live within the site catchment area (“Nature nearby, Accessible Natural Green space Guidance”, Natural England 2010, Pg: 08).

Within the statutory planning system, Planning Policy Guidance (PPG) 17 suggested a form of categorization commonly used in assessing supply and demand of accessible green spaces, and is a good starting point for mapping what might considered to be natural green space. Natural England expects that, “People will have places to access and enjoy a high quality natural environment”. This is often more achievable in urban communities than in rural communities, particularly in lowland agricultural England where there is often poor access to quality green space. There are many factors that contribute to the accessibility of a green space, and they can act together in complex ways. Accessibility encompasses a spectrum from the purely visual to the right to enter a green space, move about freely and experience it without disturbance (Mowla, 2005). Accessibility is also affected by social and cultural matters, including how safe people feel travelling to and wandering over the place concerned If people cannot reach a place, are afraid of it, or Just feel uncomfortable visiting it then it is not accessible to them. What a healthy man finds easy to use may be out of the question for a mother with toddlers, a lone woman, old people or people feeling threatened by racial abuse. The needs of the whole community must be considered. People must feel at ease before a natural space is called accessible (EN 1996). There is therefore a gradation of accessibility but for a site to be included as ‘accessible’ it must be possible to enter it.

3.2.1.2 Quality green space

Quality green space is defined as green space which is ‘fit for purpose’ - meaning it is in the right place, readily accessible, safe, inclusive, welcoming, well maintained, well managed and performing an identified function. ‘Fitness for purpose’, by definition, requires the assessment of green space quality to reflect the intended purpose or need. Green space is often multi-functional in nature, which is one of its great strengths and quality attributes. Quality green space requires to be considered against defined needs, whether these are local (e.g. providing play for local communities); regional (e.g. offering connected networked spaces providing corridors of movement); or national (e.g. contributing to biodiversity and mitigating the impacts of climate change). (Green space Scotland**,** Glasgow & Clyde Valley Green Network Partnership, Green space Quality - a guide to assessment, planning and strategic development)**.** Quality means different things to different people. Different user groups use

green space in different ways and seek differing qualities, facilities, functions, standards and experiences. Green space quality standards need to reflect local circumstances and to be based on the status of existing green space assets, an understanding of the needs of communities, the roles and contributions of key stakeholders and the resources available to plan and secure improvements.

3.2.1.3 Green space Network

A Green space Network seeks to understand green space in a wider, more strategic context, addressing green space as part of a system of connected spaces - recognizing the spatial component but equally mindful of the connection within other networks. These include physical elements such as hydrological, ecological and transport; social elements such as community infrastructure, accessibility and quality of life; and economic issues related to regeneration, place making and image.“In urban areas, networks of linked, good quality green space are important for their positive visual impact, as well as their role in nature conservation, biodiversity, recreation, education, and outdoor access. Regional networks of open space may form an integral part of city regions’ settlement strategies. Open spaces can be important components of habitat networks” (SPP 11). Urban green space network is defined broadly to include physically and/or functionally interconnected formally designated green spaces as well as informal natural areas irrespective of their size, composition or use (Tzoulas & James 2009).

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Figure 3.3: Urban green as a network system (Tzoulas & James 2009)

Urban green consists of different elements of green space of which each fulfils special functions in the urban green concept as a whole: Punctiform elements (nature parks/urban forests, neighborhood parks, cultural landscape parks, solitary green elements) should be

connected through linear elements which sew the urban green system together to improve the environmental effect. Those linear elements (like trails, greenways, waterways, green corridors) can serve as linkages between urban parks and also link the city centre and the outskirts. Unlike parks, green corridors, which can come along with development axes, have a more environmental function.

3.2.2 Types of accessible urban green

According to western standard all the open spaces in urban areas falls under four types:

01. Utility open spaces
02. Green open space
03. Corridor open spaces
04. Multi use classification

Each of these major types has a number of categories according to functional land use. (Koppelmen and Chiara, 1975).Among these the type of open spaces which are the concern of this fall under the category Green open spaces. This category of green open spaces is based on open spaces where natural site or condition lend itself most advantageously to use for recreation, parks, building sites, non extractive uses and to shape urban development. The use may be limited or extensive, active or passive, large or small (Nilufar Farida, 1999).

Table 3.2: Scale of facilities in various green

Types of green open spaces	Scale of facilities
Wilderness areas	Areas in natural state for scenic, geological and ecological values
Protected areas	Protected special areas of scenic and other natural values
Natural parks	Available for public but maintained in natural state
Urban park areas	More related to local urban metropolitan development ,e.g. zoo, botanical garden
Urban recreation areas	Spaces for organized out door recreational facilities for local community or metropolitan area use, e.g. golf courses, play field
Urban developmental open space	Spaces that shape, control and site urban development, e.g. planned green belts, plaza

Source: Koppelman and Chiara, 1975

However first two categories of green open spaces can not be located inside cities because they need large scale space. Last four categories are essentially located within the cities. Another open space hierarchy was suggested by Greater London Council, GLC (Roberts, 1974:340). All four types of GLC slandered fall under the category of urban recreational areas of the former group.

Table 3.3: Scale of facilities in various green with size and distance			
Hierarchy of open spaces	facilities	Size[minimum]	Distance from home[optimum]
Metropolitan park	General amenity area or woodlands with facilities	150 acres+	2-3 mile
District park	Children's play areas, court games, some special facilities	50-75 acres	3/4 mile
Local park	Children's play areas, informal games, quite areas	5-10 acre	1/4 mile
Mini park	Sitting areas, flower garden, and children's play areas.	Under 2 acres	Less than1/4 mile
Source: Greater London Council, GLC [Roberts, 1974]			

Open spaces in neighborhoods are defined as any unbuilt land within the boundary or designated envelop of a neighborhood which provide or has the potential to provide environmental, social and economic benefits to communities whether direct or indirect (Campbell 2001).

Table 3.4: Scale of facilities in green and grey spaces		
Types	**More detailed classification of open spaces**	**Functions**
Green space: Consisting of any vegetated and or structure, water or geological feature within urban areas.		
Parks and gardens  	Urban parks Country parks Formal gardens	Areas of land normally enclosed, designed, constructed, managed and maintained as a public park or garden. They can be urban park or country park depending on their location. They often incorporate other types of green spaces such as Children's play space and sports facilities. Primary function is for informal activity or relaxation, social and community purposes and horticultural or arboricultural displays. Some parks and gardens may also be designed landscapes of historical importance, where they are of national significance.
Amenity green space 	Informal recreation spaces Housing green space Domestic garden	Managed and maintained landscaped areas with no designated specific use by people, but providing visual amenity or separating different buildings or land uses for environmental, visual or safety reasons.

Children's play space 	Play areas Hanging out areas Out door basket ball courts	Designated and maintained areas providing safe and accessible opportunities for children's play usually linked to housing areas and therefore normally set within a wider green environment of amenity open spaces.
		Primary function is to provide safe facilities for children to play, usually close to home and under informal supervision from nearby houses.
Sports facilities 	Tennis court Bowling greens Sports pitches School playing fields Other institutional playing fields	Designed, constructed, managed and maintained large and generally flat areas of grass land or specially designed artificial surfaces, use primarily for designated sports.
		Primary function is to accommodate practice, training and competition for recognized outdoor sports.
Green corridors 	River and canal bank Roads and rail corridors Cycling routes within towns and cities Pedestrian paths within towns and cities Rights of way and permissive paths	Routes linking different areas within city as part of a designated and managed network and use for walking, cycling or linking cities to their surroundings country parks.
		Primary function is to allow safe, environment-friendly movement within urban areas. moreover they support wildlife colonization and therefore habitat creation
Natural/Semi natural space 	Wood land Grass land Wet land Open and running water	Undeveloped land with little or only limited maintenance which have been planted with wild flowers or colonized by vegetation and wild life.
		Primary function is to promote bio diversity and nature conservation.
Other functional green spaces	Allotments, city farms, Community garden	Essentially allotments, the yards of religious buildings and cemeteries.
Grey space: Consisting of urban squares, market places and other paved or hard landscaped areas with civic functions.		
	Civic square and plazas	Often containing statues or fountains and primarily paved, sometimes providing a setting for important public buildings.
	Market places	Usually with historic connotations
	Pedestrian streets	Usually former roads which have been paved over and provided with seats and planters.
	Promenades and sea fronts	Usually used for recreational activities.thy have special value when located at historical areas.
Source: Campbell 2001		

None of the western slandered are comparable to the case of Dhaka. However considering the nature of the land and the type of open space use all the public open spaces within Dhaka can be ordered under the following four. Open spaces can be classified into three broad groups according to the spatial scales, extent of utility and services rendered by them (Islam, Kawsar and Ahmed, 2002).

Table 3.5: Spatial scale of facilities in green and grey spaces
Significance & Characteristics
Regional or national open space: Regional green spaces or facilities often serve to define and separate urban areas, link the urban area within or outside the cities and often provide for recreational needs region wide or national wide. A high proportion of users are likely to travel to them by car or public transport. Example: regional or national parks, zoological and botanical gardens.
City open space: City green spaces provide facilities for city wide recreation. These facilities tend to attract a significant proportion of city people, several neighborhoods can use those open spaces. They may attract the highest number of users, mainly from throughout the local authority area but possibly wider afield and therefore have a large effective catchment and high distance threshold. Example: city parks, park ways, green belts, stadium, sports centers, athletic fields, golf course, water bodies.
Neighborhood Open space: Neighborhood facilities will tend to attract a significant proportion of their users from particular parts of the local authority area e.g. at least two neighborhoods. They will provide a range of play, recreational or sporting facilities that will draw users from a wider catchment. Depending on their location, people will travel by foot if they live close to the green space or by car or public transport if they live further away. Example: play grounds, Play fields, medium sized parks,
Local open space: Local green spaces are often smaller in size, with fewer facilities, but are greater in number, spread throughout a local area and with well used footpaths linking key community facilities. These green spaces will tend to attract almost all of their users from a localized area. Many users of these facilities will walk to them. Example: Small parks, small green pockets, play lots, incidental open space
Source: Islam, Kawsar and Ahmed, 2002

3.2.3 Size of green open spaces

Most people live in dense aggregations, and policy directives emphasize green areas within cities to ameliorate some of the problems of urban living. Urbanization is accelerating and the consequences for green space are unclear. Fuller and Gaston have shown that green space coverage increases more rapidly than city area, yet declines only weakly as human population density increases. Thus, green space provision within a city is primarily related to city area rather than the number of inhabitants that it serves, or a simple space-filling effect. However, at high levels of urbanicity, the green space network is robust to further city compaction. As cities grow, interactions between people and nature depend increasingly on landscape quality outside formal green space networks, such as street plantings, or the size, composition and

management of backyards and gardens.The size of open spaces in a locality greatly depends on population density, social and environmental requirements, natural conditions of landscape, technical consideration and economic feasibility.

Table 3.6: Space requirement and size of open spaces

Open spaces	Areas	Area/1000 pop.	Size (standard)	Size(max)	Size)min]
Play lot	50 sq ft/child	0.5 acre	5000 sq ft	----------	2500 sq ft
Play ground	100 sq ft/child(6-14 yrs)	1.5 acre	3 acre	5 acre	2 acre
Play field	600 sq ft/person(15+)	1.5 acre	20 acre	50 acre	10 acre
Local park	300 sq ft/person	2.0 acre	----------	50 acre	5 acre
City park		0.5 acre	100 acre	----------	30 acre

Source: Islam, Kawsar and Ahmed, 2002

Table 3.7: Open Space Planning in London

Open spaces	Areas	Characteristics
Regional park	400 ha	Catchment up to 3.2 - 8km, contain natural areas of, e.g., heath land, for informal recreation.
Metropolitan park	60 ha	Catchment 3.2kms or more, have natural areas or formal parks for active and passive recreation.
District park	20 ha	Catchment 1.2km, have a variety of natural features, playing fields and children's play areas.
Local park	02 ha	Catchment about 0.4km, provide court games, children's play areas and sitting out areas..
Small local park	Up to 2 ha	Catchment about 0.4km, have gardens, children's playgrounds, sitting out areas and specialist areas.
Linear open space	variable	Include canal towpaths, disused railway lines, footpaths, provide for informal recreation, including nature conservation.

Source: LPAC 1992

The American National Recreation and Parks Association set a national standard of 10 acres of open space per 1,000 people. There should be a hierarchy of parks available to residents, ranging from small "pocket parks"—which could be only large enough to accommodate benches and secondary seating (low walls, statues, and anything else that is part of the park design but also amenable for sitting) for about ten people—to large community-wide parks. Ideally, all residents would live within 400 meters of a "pocket park" and within 800 meters of a neighbourhood park complete with (but not limited to) a sports field. Recreation facilities and community wide parks should be located on transit routes to ease congestion and improve access.

Proposed standards for accessible green according to Box and Harrison in 1993:

a) An urban resident should be able to enter an urban green space of at least 2 hector within 0.5 kilometers of their home.

b) Provision should be made for Local Nature Reserves in every urban area at a minimum level of 1 hector per 1,000 populations.

In **Accessible Natural Green spaces in Towns and Cities**, author Harrison, C. (1995) suggested that the minimum distance criteria should be 280 meters (about five minutes walk) rather than 500 meters. Distance is often mentioned as the main environmental factor influencing the use of green space (e.g. Coles and Bussey, 2000; Van Herzele and Wiedemann, 2003; Giles-Corti et al., 2005), and a distance of 300–400 meters is seen as a typical threshold value after which the use frequency starts to decline (Grahn and Stigsdotter, 2003; Nielsen and Hansen, 2007). Other environmental factors such as size of the green space, presence of facilities and possibility for activities are also thought to have an influence on the use of urban green space (Van Herzele and Wiedemann, 2003; Bedimo-Rung et al., 2005; Giles-Corti et al., 2005, Jasper & Stigsdotter,2010). The references given in the following Table are general standards, which should be used with caution in specific situations.

Table 3.8: Minimum standards for urban green spaces

Functional level	Maximum distance from home (meters)	Minimum surface (hector)
Residential green	150 m	----------
Neighborhood green	400 m	1
Quarter green	800 m	10 (park: 5 ha)
District green	1600 m	30 (park: 10 ha)
City green	3200 m	60
Urban forest	5000 m	>200 (smaller towns)/>300 (big cities)

Source: Van Herzele Ann & Wiedemann Torsten ,2003/ MIRA-S 2000

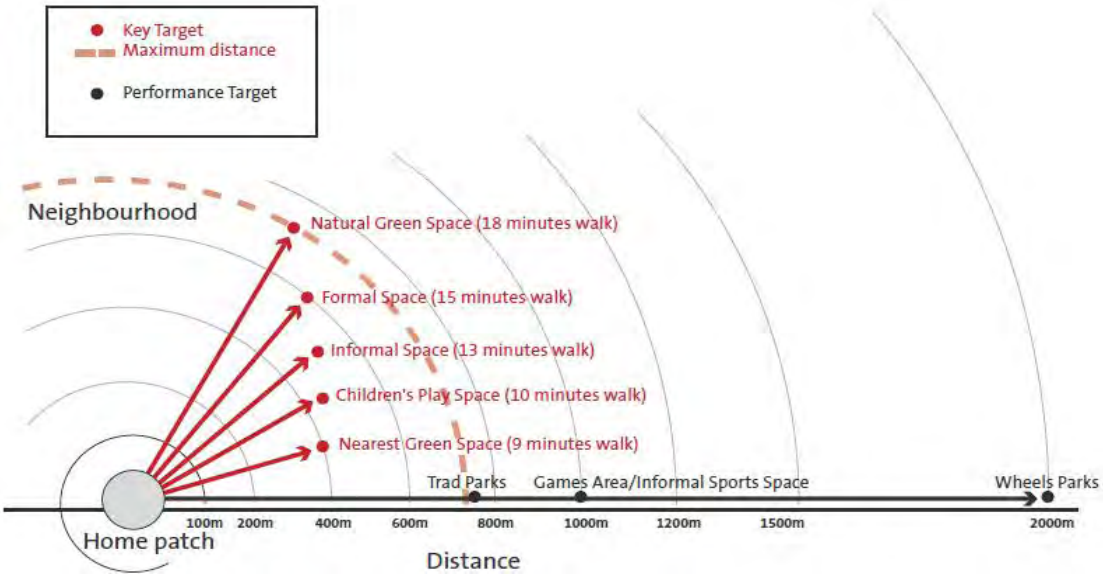


Figure 3.4: Time and distance matrix

According to Bristol's Parks and Green Space Strategy (2008) the aim of distance standards is to protect and promote an accessible network of green space. The distance standards are based on research as to how far Bristol residents feel it's reasonable to walk to get to the different types of space, and on analysis of Bristol's layout to ensure the standards are credible.

Accessible Natural Green space Standards (ANGSt):

The Countryside Council for Wales recommends that provision should be made of at least 2ha of accessible natural green space per 1000 population according to a system of tiers into which sites of different sizes fit:

- No person should live more than 300m from their nearest area of natural green space;
- There should be at least one accessible 20ha site within 2km from home;
- There should be one accessible 100ha site within 5km;
- There should be one accessible 500ha site within 10km.
- A minimum of one hectare of statutory Local Nature Reserves per thousand populations.

RAJUK has prepared two master plans for the city — one in 1959 and the other, Dhaka Metropolitan Development Plan, in 1995, which was approved in 1997.

1959 Master Plan: The 1959 Master Plan was prepared taking into consideration four acres of land as open spaces for an area inhabited by a 1000 people, following a model used in Singapore. When the 1959 plan was worked out, it based its open space ratio on the open spaces available at the time.

Table 3.9: Size of green spaces of Dhaka

Type of Open Space	Area (hectare)	Population
Playground	0.08 acre	2,500
Park	0.12 acres	1,000
Source: housing policy gazette in March 2004		
Old Dhaka	unplanned neighborhood	5%
new Dhaka	planned neighborhood	12%
Source: Mowla,Q.A, Eco-design Concept in the Design and Management of Dhaka's Urban Open spaces, in XXII World Congress of Architecture, uia2005istanbul, Cities: Grand Bazaar of Architecture *S*, 3-7 July 2005 [sub-theme: Urban Ecology]		

1995 master plan: The present guideline, worked out in 1995 earmarks four acres of land as open spaces for an area of 25,000 people. Currently the total amount of accessible green space varies significantly between wards, from about 3 ha per 1000 people up to 12 ha per 1000. And all of these open spaces are concentrated to only 38 of the 90 city wards, most of them unusable because of unlawful occupation. In the old part of city there is only 5% open space

while in New Dhaka 12 % of land is green and open. The total amount of open spaces in greater Dhaka is about 17% to 18% and the total stock of public open spaces is hardly over 5000 acres (Mowla, 2011).

DAP: The severe shortage of parks and open space in the main Dhaka area (study area C: main Dhaka city) and its impacts on public health, environment, ecology and social integration are well known. However DAP has failed to provide anywhere near a sufficient amount of space for parks and open space within both brown field and green field areas despite the fact that sufficient space is available in restricted areas of the brown field and proposed infill developments of the green field areas. In the main Dhaka City area (Study area C) there are only a few parks and open spaces, comprising 1.62% of the area, providing 0.06 acres of land per 1,000 persons. In order to improve the critical shortage of parks and open space, DAP proposed to increase the share of parks and open space to 5.07% of the area, allocating 0.13 acres of land per 1,000 people, with provisions for an additional 916 parks and open spaces by the year 2015. The main problem with the DAP proposal is not that the proposed allocation is still far below the recommended standard for a modern city, but the ambiguity of the proposal. DAP arbitrarily estimated the requirements for parks and open space without allocating the requisite land space for them. The DAP proposal is hypothetical in nature and represents a serious weakness of the ongoing initiative for providing a detailed area plan for the city. There is no scope for any ambiguity in the detailed area planning, which represents the lowest tier of the planning hierarchy and should provide not only the future requirements but also specific land-use guidance on how to meet those needs. The proposed allocation of only 0.13 acres/1,000 persons in the main Dhaka City is far below any international standard. For example, even in the infamously polluted and unlivable city of Los Angeles, rich white neighbourhoods enjoy 31.8 acres of park space for every 1,000 people, while low income areas like African-American and Latino neighbourhoods provide 1.7 acres and 0.60 acres per 1,000 persons, respectively. Meanwhile Hong Kong, the most crowded city on earth, provides on average 0.71 acres/1,000 persons, or more than five times the amount proposed by DAP.

Table 3.10: Existing and Proposed Allocation of Lands for Parks & Open Space in DMDP Area (After DAP, 2008)

Study Area C: Main Dhaka City	Area (Acres)	Acres %	Acres/1000 Persons	Additional Number
Existing Park & Open Space (2007)	0429.44	1.62%	0.06	
Requirement for Park & Open Space (2015)	1345.44	5.07%	0.13	416

3.2.4 Function and use of accessible green spaces

Use of urban green space is defined broadly as any sort of visit to an urban green space, without looking at the duration of the stay, the reason for visiting or the activity done while visiting; e.g. passing through on the way to a destination is also counted as use. There is a growing recognition of the multi-functional values of open spaces in urban areas. Barker (1997) identified that green networks have a range of uses "beyond the early ideas that they are important simply for recreation (from sport to picnics) and for beauty. They also address the needs of wildlife, flood control, improved water quality, outdoor education, local transport and many other urban infrastructure needs (Searns 1995). Their multiple functions – and multiple problems – demand attention from people having a wide range of skills. These green networks comprise a wide variety of formal and informal open spaces that include parks and designated public open space. The widest meaning to describe open green spaces is probably as the unbuilt volume of spaces within a given built fabric (Roy, 2001).The functions can be grouped into three categories.

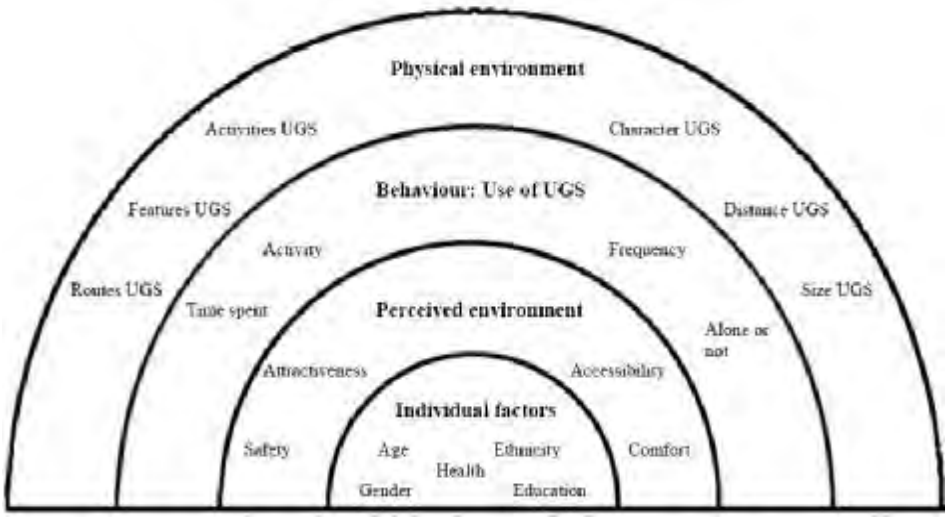


Figure 3.5: Model for the use of urban green space. Schipperijn J., 2010

01. **Utilitarian functions:** These include environmental aspects like light and ventilation inside the built spaces, the provision of access to use areas and the passive functions.
02. **Social functions:** These include functions, which usually involve direct and active participation of human beings in these spaces, such as social interaction, recreation like going for a walk; taking children to play areas; sitting to relax and enjoy nature; playing informal or formal games; walking; cycling; taking exercise; and taking part in social activities and events. A common finding amongst surveys of the recreational use of urban green spaces is that sports users are the minority of all users of parks and that informal activity is more common than formal activity (Dunnett et al., 2002;

Moore, 2003; Bell et al., 2004; Mulder et al., 2005; Ward-Thompson, 2005; Green Space, 2007).

03. **Perceptual functions:** These include aspects like aesthetic satisfaction, creating a distinct identity of a given residential area. Evidence suggests that urban scenes that feature natural elements are preferred over scenes that do not (Ulrich, 1981; O¨ zguner and Kendle, 2006). Furthermore, there is evidence to suggest that although people may like to visit wild areas they do not like to live in very close proximity to them, preferring well-kept landscapes near their homes instead (Nassauer 1995). Various individual factors such as age, education and having small children, are associated with the use of green space. Distance, size, the number of features, and the number of experiences are four environmental factors that seem to affect use, and decay parameters for each of the four factors were used to construct a model for the attractiveness of urban green space. (Schipperijn J., 2010)

3.2.5 Problem and prospects of green spaces in cities

The primary function of urban parks and green areas is to ensure satisfactory surroundings for recreational and social activities (Nilsson & Randrup 1997).The enormous rate of population growth along with the growth of urban development, leads to drastic exploitation of the nature resulting to an unhealthy and unhealthy ecology, which is alarming to the urban dwellers. Cities in many developing countries are experiencing the problems like deterioration of air quality, higher air temperature, increased noise levels, greater psychological stress and decreased sense of community. These facts increasingly recognized the need for urban green spaces. With lack of green space, the exponential population increase in the twentieth century will make physical, social, psychological and environmental hazards in the third world countries (Ahmed & Hassan, 2003). Householders moving away from the city of Leuven, Belgium, cited the lack of accessible public green space as the main reason for leaving (Tratsaert, 1998, cited in Van Herzele & Wiedemann, 2003). With growing and increasingly urbanized populations (Stanners and Bourdeau, 1995; ODPM, 2002), the demand for more land to be released for development can be intense. Changing patterns of social life left parks empty, whilst neglect, decay, and anti-social behavior from a small minority reinforced the impression that parks should be avoided rather than visited. Many familiar features were lost (Handley, 1986). Beside positive effects, parks may play a negative role on people's perceptions. Some surveys have reported residents' feelings of insecurity associated with vandalism, and fear of crime in deserted places (Melbourne Parks, 1983; Grahn, 1985; Bixler & Floyd, 1997). However, far larger is the empirical evidence of the positive functions of green areas; a study by Kuo and Sullivan (2001) even shows that residents living in "greener"

surroundings report lower level of fear, fewer incivilities, and less aggressive and violent behavior.

Public perception and expectation of the quality of urban park and green spaces are low in Dhaka. Whilst other forms of recreation from indoor sports and leisure to computer games are aggressively marketed to urban populations, a visit to local parks can seem a less exciting option. Two “leisure cultures” now co-exist, one is represented by the recreational culture of regular park users, parents with young children, teenagers hanging out, joggers, the other is the fitness cultures based on fitness centers, aerobics, swimming pools etc. while the majority of people walk to parks, the majority of users of indoor leisure facilities drive to them. Fewer and fewer adults and children are walking and cycling and over time this has contributed to the climate of empty green space, empty streets. Some of the common perceptions are:

- Children and young people’s use of the outdoors has become increasingly restricted and consequently has declined in the last fifteen years. Many children and adult have better access to commercial and house hold entertainments. They are often encouraged to use these facilities because of parental restriction and fears.
- Poor quality and badly maintained spaces: Lack or poor condition and inadequate provision of facilities, especially seats, toilets and play opportunities for children.
- The incidence of anti social behavior. There are increasing concerns over the presence of drug and alcohol users, undesirable characters and stranger danger. Older people may feel threatened.
- Unsafe and unwelcoming: Safety and other psychological issues including feeling of fear and vulnerability. This applies not only to people’s own personal fears but also fears for their children.
- Environmental quality issues such as litter, graffiti and vandalism.
- Loss of variety
- Inaccessibility: traffic and badly located green spaces mean they are often too far or difficult to reach safely. As a result parents often do not let children go on their own.
- Some sectors of society are using green spaces less than others, people over 65, people with disabilities, women, minor communities.

Poor quality green spaces can appear depressing dirty, dangerous place. At present these factors are major obstacle to the use and enjoyment of parks and green space and to their role in improving the quality of life in towns and neighborhoods. They conspires the value of green space assets at a time when urban land is under greater development pressure, and the

value of green space and play spaces should be rising. (Green paces, better places, London, 2002)

3.2.6 Benefits of accessible green

Accessible green spaces provide opportunities for outdoor play and recreation. They make places more pleasant to live in, provide a space for wildlife, and promote health and wellbeing. Involvement in green-space projects supports community learning and development, helping people to understand and improve their local environment.

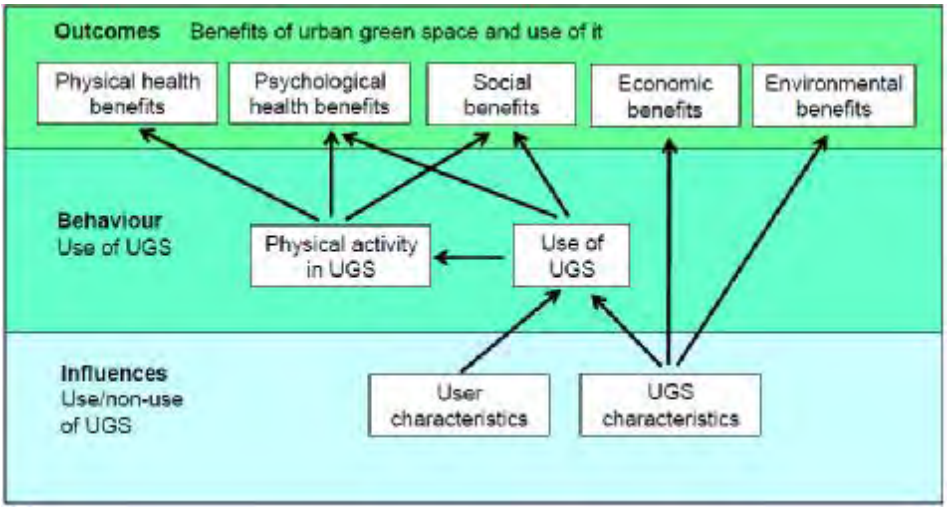


Figure 3.6: Model for the benefits of urban green space. Adopted from Bedimo-Rung et.al (2005)

The open and green spaces close to where they live are a high priority for investment and improvement. Good-quality, accessible green space also improves poor landscapes, and can help revitalize communities and encourage inward investment. Besides important environmental services such as air and water purification, wind and noise filtering, or microclimate stabilization, natural areas provide social and psychological services, which are of crucial significance for the livability of modern cities and the well being of urban dwellers. Furthermore, aesthetic, historical and recreational values of urban parks increase the attractiveness of the city and promote it as tourist destination, thus generating employment and revenues.

3.2.6.1 Social benefits

Reducing Crime: Access to public parks and recreational facilities must be strongly linked to reductions in crime and in particular to reduced juvenile delinquency. In Dhaka Lack of recreational green spaces push youngsters to be involved in vandalism, delinquency other anti social activities. A study has observed that average age of drug of city is 18 years (Siddiqui, 1990). Due to lack of outdoor recreational facilities people engage themselves in home bound and less active and less diversionary recreation activities (Huq, Saleheen & Sharif, 1989).

Recreation Opportunities: The Importance of Play:

Table 3.12: Studies of various researchers

Researchers & their Studies
Jacobs, 1961: Urban green spaces provide safe play space for children
Hart, 1997: Green spaces contribute to children's physical, mental and social development and play an important role in the basic education of schoolchildren with regard to the environment and nature
Moore, 2003 : Parks are places for all to play
Isenberg J.P, & Quisenberry N., 2002: Research on the brain demonstrates that play is a scaffold for development, a vehicle for increasing neural structures, and a means by which all children practice skills they will need in later life
CAPABLE : Children who were allowed out to play without adult supervision were found to have more chance to be active and sociable
Tzoulas et al., 2007; Maas et al., 2008: The recreational activities that take place in urban green spaces are particularly important because they could be linked to both physical health and psychological well- being benefits for people

Only 21.6% of the poor in the city go to parks, zoos and museums for recreation (Hossain, 2005). More than 50% of children—irrespective of age or socio economic background—wanted to have a playground within their community and about 85% children wanted to have an amusement park within 3.2 km of their house (A. Ahmed & M. Sohail, 2008).According to Huq, (1989), 39% of the respondents of his study has the attitude of being conservative and introvert because of lack of local green spaces and as they have to be at home with indoor activities. Nasreen (1990) in a study on recreation and leisure pattern of urban woman observes that a significant number of woman prefer to spend their time at home. Only 25.5% of urban woman are involved in outdoor recreation activities.

Creating Stable Neighborhoods with Strong Community:

Table 3.13: Studies of various researchers

Researchers & their Studies
Germann-Chiari and Seeland, 2004; Martin, 2004: public green space, can offer broader social benefits as meeting places that give a shared focus to diverse communities and neighborhoods
Lofland, 1973; Sennett, 1990: Green areas may provide opportunities par excellence for exchange between ethnic communities, as members of these communities can visit them, meet other people and enjoy the area, while remaining anonymous in the world of strangers
Maloutas & Pantelidou, 2004: Inspired by prior literature on social cohesion and the relation with the spatial characteristics of places, our overall focus was on three key concepts, namely social cohesion, social interaction and place attachment. It is generally claimed that both social interaction and place attachment can contribute to social cohesion
Coleyet al., 1997: Nature can encourage the use of outdoor spaces, increases social integration and interaction among neighbors
Kuo et al., 1998: The presence of trees and grass in outdoors common spaces may promote the development of social ties, greenery helps people to relax and renew, reducing

aggression.
Fraser & Cox,2007: the contributions that green space makes towards the cohesiveness of communities, including youth development, social capital, improvement in health and cognitive function, reduced symptoms of attention deficit disorder, a greater ability to overcome depression and stress as well as reduced blood pressure and anxiety levels

3.2.6.2 Health benefits

Green space is related to health.The amount of green space close to where people live has a significant relation with their perceived health (Maas et al., 2006). Green space is contributing to restoring mental fatigue, serving as a resource for physical activity, reducing mortality and reducing the level of stress. When these spaces are referred to as the ‘‘green lungs’’ of a city a highly appropriate evaluation is being expressed as these spaces really do generate both physical and psychological health and well-being, first of all for those who use them but also for the entire urban population (Beato, 2002; Grahn and Stigsdotter, 2003).

Table 3.14: Studies of various researchers

Research topics	**Researchers & their Studies**
Physical activity makes people healthier	
Bjork et al., 2008: Green spaces serving as a resource for physical activities	
Morris, 1994: Increased physical activity is recognised as one of the best ways to improve people’s physical and mental health, thus interest in the relationship between the natural environment and physical activity evolved.	
Humpel, Owen & Leslie, 2002: physical activity and the natural environment initially focused on exploring the direction and magnitude of relationships between characteristics of the natural environment and physical activity, for example between the presence of and perceptions of safety in parks, access and proximity to parks, and size of parks	
Giles-Corti, 2005: there has been a focus on new aspects of measuring these micro and macro characteristics such as proximity, attractiveness, size and design and their relationship to physical activity	
Takano T, Nakamura K, & Watanabe M.(2002): Survival of older people increased with more space for walking near their residence, with nearby parks and tree lined streets near the residence.	
Access to parks increases frequency of exercises	
Giles-Corti B and Donovan R. 2003,Owen N, Leslie E, 2002: Accessibility to nearby attractive public green space and footpaths are more likely to increase levels of walking	
CDC, “Increasing Physical Activity,” p. 11: Strong evidence shows that when people have access to parks, they exercise more. In a study published by the CDC, creation of or enhanced access to places for physical activity led to a 25.6 percent increase in the percentage of people exercising on three or more days per week.	
Frank Lawrence,(2003): When people have nowhere to walk, they gain weight. Obesity is more likely in unwalkable neighborhoods, but goes down when measures of walkability go up: dense housing, well-connected streets, and mixed land uses reduce the probability that residents will be obese	

Exposure to nature and greenery reduces stress
Mitchell & Popham 2008: Access to green space is associated with better health for the poorer half of the population
Kaplan, 2001: Green space is suggested to promote health by restoring from mental fatigue
Allender et al, 2006: Adults who are physically active have a 20-30% reduced mortality risk compared to inactive adults
Ferrini, 2003: green therapy is becoming increasingly common as a paramedical activity in the treatment of some psychological and physical diseases
Kaplan, 1995; Hartig et al., 2003; Maller et al., 2006: Contact with nature, which can be part of the experience of walking, has been shown to have a positive influence on health, referred to as the restorative effects of nature.
Kuchelmeister & Braatz 1993: Trees contribute significantly to the aesthetic appeal of the cities, thereby help to maintain the psychological health of their inhabitants
Wenger 1984: Urban green spaces serve several primary functions like maintenance and sustenance of natural process such as water, gaseous nutrient cycles, support of flora and fauna, and maintenance of psychological health through beautification and enhancement of the appearance of a particular area

3.2.6.3 Environmental benefits

Accessible urban green space is an aggregate indicator of environmental services provision and its utility can be seen as an indicator of the general environmental quality of a city (Arlt Günter,2008).From the ecological perspective, urban green spaces moderate the impact of human activities by, for example, absorbing pollutants and releasing oxygen (Hough, 1984), contribute to the maintenance of a healthy urban environment by providing clean air, water and soil (De Groot, 1994), improve the urban climate and maintain the balance of the city's natural urban environment (Stanners et al., 1995).We can get the following environmental benefits from accessible green spaces:

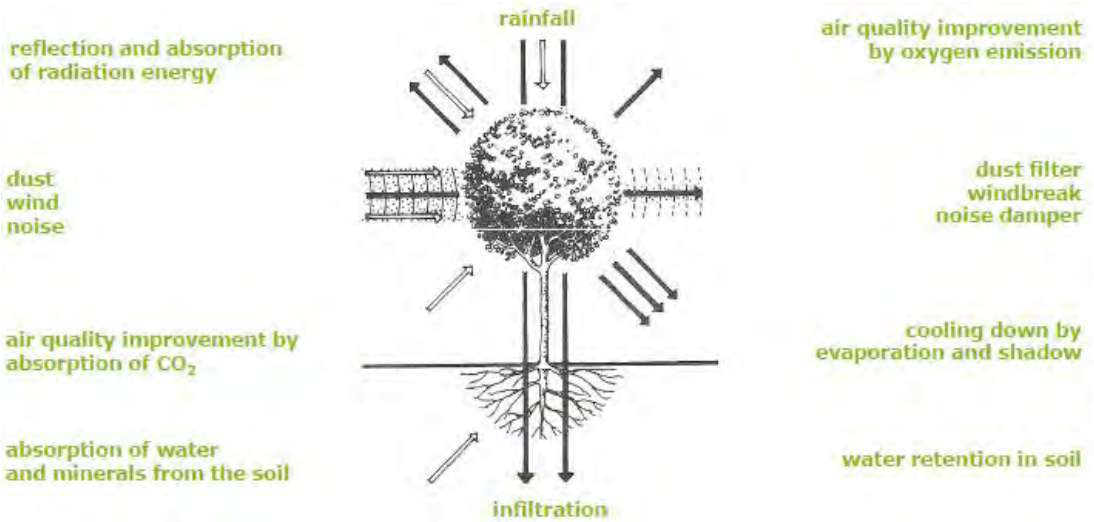


Figure 3.7: Baseler, 1974

- Supporting biodiversity
- Reducing surface water run off
- Pollution amelioration
- Air cooling
- Land reclamation

3.2.6.4 Economic benefits

According Fraser & Cox (2007) easy access to parks and open space and connecting these green lungs has become a new measure of city wealth - an important way to attract businesses and residents by guaranteeing both quality of life and economic health .The larger (smaller) the size of the park, the larger (smaller) the Sales Price of near by houses.

Table 3.15: Studies of various researchers

Researchers & their Studies
Tyrvainen, 1997; Tyrvainen & Miettinen, 2000; Thorsnes, 2002: The price of a house increases with its proximity to nearby parks.
Jim & Chen (2009) : The location, size, shape, orientation or alignment of land parcels zoned for residential use could take into account the view or nature preferences.
Poudyal (2009): Evaluates how residents value variety, spatial configuration, and patterns of open space in their neighborhood.
Salazar & Menendez (2007): Estimated the willingness to pay for proximity to planned urban parks in Spain.
Bolitzer & Netusil (2000): Considered the size of different natural areas on property values in Portland, Oregon.
Tuzin & Nijkamp (2002): Green space might deliver products such as wood or fruits and also compost and energy as a result of urban green production. Their presence can create an increase in the economic value of an area and provides new jobs.
Paschalis A. Arvanitidis (2009): Have a role to play for economic development in terms of improving the quality of urban life, building a desirable 'city image' and advancing the position of the city in respect to its competitiveness

Urban Open Spaces in the Residential Neighborhood of Dhaka city has been reached to a point which exceeds the potential of those spaces to offer recreational and amenity benefit. Using Economic value of open spaces would help to protect them against over development and co modification of adjacent land use. Rental fee of apartments [Dhanmondi, Gulshan] near lakefront or green corridors, parks have shown the economic benefits of nearer green space can cause to the owners of those apartments.

3.3 Livability (The quality of human life in city)

3.3.1 Definition

Livability means that we experience ourselves as real persons in the city (A.Casellati. 1997). ‘Livability’ is a word increasingly used to refer to quality-of-life issues important to the long-term well-being of people and communities. The term encompasses issues such as

environmental quality, safety, affordability, neighborliness, convenience, and the presence of neighborhood amenities such as parks, open space, sidewalks, restaurants, and neighborhood-serving stores. Together these assets help make places pleasant and easy to live in. The lack of such assets can make life much harder.

Although there is little consensus about what 'Livability' entails, the definition used is based on the Victorian Competition and Efficiency Council's definition, which states: The achievement of livability requires conditions which enhance social, environmental, economic, cultural, governance goals and outcomes (Sue West & Cait Jones, 2009).Allan Jacobs and Donald Appleyard (1987) in their paper "Towards an Urban design manifesto" suggested seven goals that were essential for the future of a good environment. Among them the first one is LIVEABILITY which means a city should be a place where everyone can live in relative comfort. The degree of Liveability' of a place as experienced on a personal level is the product of two main factors:

• The degree to which that place meets a person's positive needs.
• The degree to which stress is absent from the person in that place.

3.3.2 Concept of livable community

Livability [of a city] is generally understood to encompass those elements of home, neighborhood, and metropolitan area that contribute to safety, economic opportunities and welfare, health, convenience, mobility, and recreation of a community. City people must value it immensely and want it preserved and enhanced. Many factors come together to create a truly livable city. Livability results from forward-thinking policies and practices. Dhaka's livability is threatened. Government should focus on improving livability for all. According to urban design theorist Kevin Lynch preferred to think of it in terms of a number of values or performance dimensions, including "vitality," "sense," "fit," "access," "control,""efficiency," and "justice" (Lynch, 1981). These concepts have been influential with urban designers in the 1980s and 1990s. In California, the Sacramento-based Local Government Commission (LGC) has been a leader in developing livability concepts. In1992, LGC published a report entitled "Land Use Strategies for More Livable Places" and, more recently, established a Center for Livable Communities. The Center defines its livability agenda as helping local communities to "increase transportation alternatives, reduce infrastructure costs, create more affordable housing, improve air quality, preserve natural resources, and restore local economic and social vitality. According to Brian Scott, President of Livable Oregon, "A livable community has engaged people and businesses, efficient and memorable places, and community-

reinforcing activities" (Scott, 1998).For the purposes of the report, livability can be defined as "the quality of being pleasant, safe, affordable, and supportive of human community." Important elements contributing to livability in urban areas, condensed from the sources include the following:

· An attractive, pedestrian-oriented public realm
· Low traffic speed, volume, and congestion
· Decent, affordable, well-located housing
· Convenient schools, shops, and services
· **Accessible parks and open space**
· A clean natural environment
· Diverse, legible, and educative built landscapes
· Places those feel safe and accepting to all users
· Places that emphasize local culture, history, and ecology
· Environments that nurture human community and interaction

3.3.3 Indicators of livability

Livability addresses human need and impacts on the environment only to a small degree, and issues of carrying capacity hardly at all. Instead, it focuses on the good life, and while it is about the environment is not explicitly for the environment. Key principles that give substance to this theme are equity, dignity, accessibility, conviviality, participation and empowerment (Cities PLUS, 2003. A Sustainable Urban System: The Long-term Plan for Greater Vancouver).As the project for Public Space (PPS, 1999, p-51) advice: "when you observe a space you learn about how it is actually used, rather than how you think it is used". It is an urgent requirement for city to have some meaningful and responsive green spaces to serve the needs of their users. People frequently use greens which are in walking distance, which are comfortable and secured and engage them actively or passively with the space. Literature review has concentrated on identifying the different dimensions of place-specific livability, in order to establish a set of desirable indicators which would help to shed light on what exactly 'Livability' might mean, and which could form a basis for monitoring changes to livability over the longer term (State of the English Cities, Liveability in English Cities, Department for Communities and Local Government, Eland House, Bressenden Place, London, November 2006, www.communities.gov.uk). A series of desirable indicators, as shown following, has been identified and grouped under four headline themes. The four themes covered concentrate exclusively on livability as it refers to place quality, in line with the Government's perspective on livability. These themes are further broken down into thirteen sub-categories which represent our preferred range of indicators, to provide the

potential basis for a comprehensive assessment of livability in our towns and cities. Perceptions are, we believe, especially important in relation to livability. It is people's perceptions, more than any 'objective' assessments, which tend to govern individuals' locational decisions. Key Livability themes and desirable indicators are:

A. Environmental Quality (Psychological)

B. Place Quality (Physical)

C. Place Quality (Functional)

D. Safer Places (Social)

3.3.4 Quality of life, urban accessible green and livability

The adjective livable for a city connotes a desirable quality of life for its citizens –

Including social activities,

Attractive public places and green spaces,

Provision of a certain level of privacy,

As well as a sense of community

Quality of life has been defined as a combination of life conditions and satisfaction (Felce and Perry, 1995). Green spaces, is a key element to create sustainable development, environmental quality, quality of life, and citizen health. The availability of quality green space is an integral part of quality of life of urban citizen. The availability of accessible, safe and attractive green spaces is an integral part of urban quality of life (Van Herzele & Wiedemann 2003). Jim and Chen (2006) argue that 'green space provision is probably as old as settlements' . Human desire for open space is often articulated as appreciation of quality of life and connection with nature (Miller 1997, Chiesura 2004)).

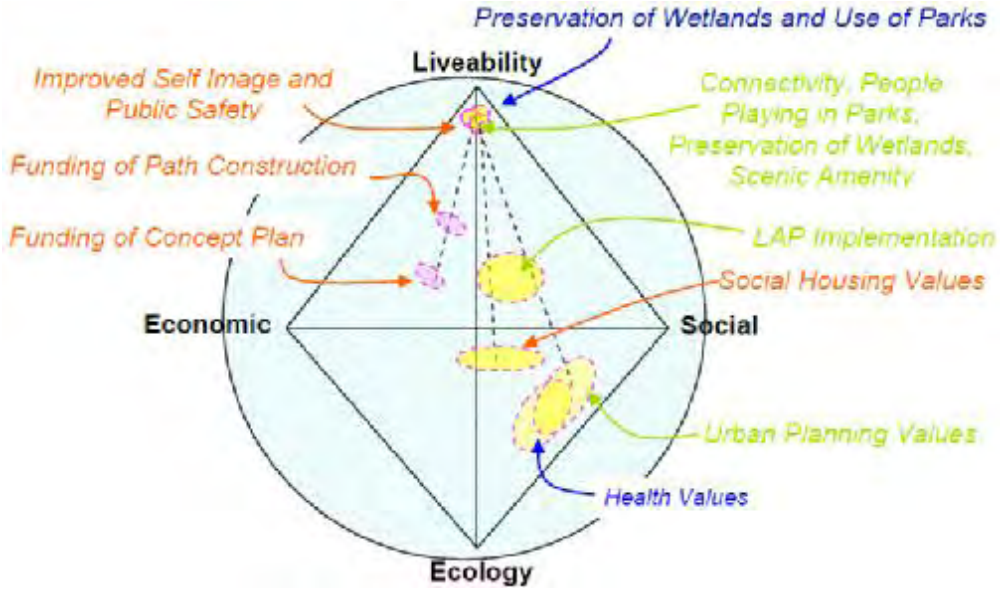


Figure 3.8: Grounding Values in the Axiology of Liveability (Baharuddin 2010)

Urban growth has contributed to high competition in land use. As a result, the limitation in access to land is identified as contributing factors facing the urban green spaces in modern cities. For example, the city of Kuala Lumpur is currently seeking alternative approach to urban planning and design in order to increase its urban green spaces that will improve quality of life with a liveable Kuala Lumpur (Baharuddin 2010). Again, research shows that the major elements crucial for a satisfactory quality of life are low crime, safe streets and access to greenery and open space. By facilitating this mixing, such accessible green spaces can contribute to the cohesion of communities and to improve livability. The provision, design, management and protection of urban green spaces are at the top of the agenda of sustainability and livability. Green Space refers to a tangential, but important, aspect of livable communities: the promotion, conservation, restoration and appreciation of open lands and public parks. It has a significant role in all of the diverse initiatives to make our communities and surrounding areas more livable, more functional and more beautiful. Green space in cities makes them more livable. Dhaka needs parks with green space along Lakefront, "forever open, clear, and free." Having these parks throughout the city will mean that green space does not belong to one ethnic group or social class; everyone has access to the "lungs of the city." Many of these parks can also be boasted architectural gems. Having green space throughout the city makes the city "greener" in another sense; we do not have to drive for miles to get to green space. Many of these spaces should be walkable or accessible by public transit.

3.4 Summarize Livability of Accessible Green

City residents express a deep appreciation for parks and open spaces, believing that access to these places within the city contributes immeasurably to Dhaka’s livability. People appreciate the variety of recreational opportunities available at parks, including opportunities to play sports, take classes and experience wildlife within the city boundaries. Easily accessible parks and open spaces are needed. City people would like to see accessibility improved, especially for people with disabilities, children and residents of low-income communities. Therefore urban livability consistently emerges as one of the most prized attributes for Dhaka .But green areas of Dhaka are dwindling in an unprecedented rate. For accommodating the incoming people, pressures on the land is escalating day by day. In such a situation the remnant green spaces of Dhaka city are at stake. People of Dhaka are concerned with equity in regards to parks and open spaces, calling for more parks and better-maintained parks in low-income neighborhoods. Looking to the future, they want current open spaces preserved and more

open spaces created as the city's population grows and becomes denser. Certain key features are required to make Dhaka a livable city:

- A clean and beautiful built and natural environment;
- Vibrant, well-served neighborhoods with accessible green spaces to contribute urban livability and to help build strong communities as well
- The ability to get around town easily (lack of traffic, accessible public transportation, ability to bike and use alternate modes, relatively short commute times);
- Human scale and human-oriented buildings and streetscapes
- Big city amenities with a small town feel;
- Friendly and open-minded people who care about the environment, education and a host of social issues;
- A thriving local economy that provides access to fresh local food, local beer, coffee, clothing design, local musicians and art and so much more;
- Being able to afford to live in and enjoy the city; and
- A strong sense of community, fostered by public spaces, neighborhoods, walking and using transit, outdoor events and the local economy.
- Dhaka needs to invest in parks and open spaces for the future.

"Nature pervades the city, forging bonds between the city and the earth, air, water and living organism within and around it. In themselves, the focuses of nature are neither benign nor hostile towards humankind. Acknowledged and harnessed, they represent a powerful resource for shaping a beneficial urban habitat."----Ann Whiston Spirn, the Granite Garden[open space protection plan, city of Burlington, VT,2000]

CHAPTER 04: ACCESSIBLE URBAN GREEN SAPCES IN DHAKA- SCENARIO AND FRAMEWORK FOR ANALYSIS

This chapter provides the historical background of green spaces of Dhaka presents the socio cultural profile of city dwellers and describes the urban conditions of these green spaces in order to study the problems stated above and develop an understanding of the current research.

4.1 Scenario of Accessible urban green space in Dhaka

Moving in search of a better life, people across the globe have abandoned traditional socio-economic systems, broken ecological bonds with nature, and flocked to urban centers. Originally, merely considered a decorative element in towns and cities, green space has now taken on a new value and function, the importance of which is widely acclaimed within the parameters of sustainable development. The presence of green spaces represents a fundamental asset above all when considering contemporary urban reality, with its traffic congestion, pollution and lack of space for socialization.

4.1.1. Historical background of green spaces in Dhaka

Megacity Dhaka, one of the major cities of South Asia with a population of over 14million, which carries a very long history dating back to more than 500 years to present times, was once known for its serenity, beautiful parks, clean roads and lush greenery. James Taylor who visited Dhaka in 1824, called it “the Venice of the orient” because of it water bodies. The modern city, however, was developed chiefly under British rule in the 19th century, and became the second-largest city in Bengal after Calcutta (presently Kolkata). After the partition of Bengal in 1905, Dhaka became the capital of the new province of Eastern Bengal and Assam but lost its status as a provincial capital again after the partition was annulled in 1911. But the present city started to develop in a more planned way after 1947 when it gained regional and political importance (Chowdhury, J.U., 1998).

Figure 4.1: Open Public Spaces with respect to the expansion of Dhaka City Source: Dani 1962, British Library London, Dhaka City Map 2002, Google Image2010

As late as the 1950s, with its ample green spaces, majestic trees, crisscrossing canals, and boats plying through the heart of the city, Dhaka promised to be a true garden-city on the water. At that time commercial and residential areas were situated side by side, mostly concentrated beside the narrow roads, old Dhaka still presents this situation with mixture commercial, residential and small industries. In 1971, Dhaka became the capital of an independent Bangladesh where the large open spaces with the lushness of nature surrounding the habitation, the lake flowing across the city-all these natural features made the city beautiful. During British period Dhaka experienced an expansion on north with Ramna Park and Sohrawardy Uddayan with lake and huge plantation.

After preparation of the Master Plan of the city in 1958, the commercial centers of the city was moved to Motijheel and a high class residential area was developed at Dhanmondi. Housing colonies for government employees, universities, parks, commercial and industrial zones, lakes and other public facilities were developed gradually to meet the demands of the expanding city. With the development of the city, wide roads and other paved areas replaced the unpaved areas, natural depressions, and agricultural land. In many cases, natural drainage canals and open water bodies were filled up for development works. However the present status of Dhaka city demonstrates that the development of the city did not succeed to fully meet the requirements of a mega city. Absence of parks, open water bodies, and drainage system has degraded the quality of living in the city in many ways (Tawhid, 2004).

4.1.2 Present state of green spaces

“A common problem of with park and recreation lands has been scattered fragments they were neither well suited to their use nor well related to the people who would use them”- Simonds (1993) has portrayed the common problem that has been in existence in Dhaka. Unawareness of authority (DCC, RAJUK), illegal establishments of market, club and water pump under political influences has interrupted open spaces of Mohammadpur and Lalmatia which are allocated in the master plan. Recent media reports have indicated major contradictions in the production and transformation of urban space in Dhaka. The ways in which public authorities, RAJUK in particular, develops assigns and then sells land creates conflicts of interest. On the other hand, when the authority assigns and approves non-designated use to existing land it comes in contradiction with its own roles; for example, an area specific to residential use is not a residential area anymore. The Bangladesh Environment Lawyers’ Association conducted a study on 30 city parks in May 2005 and it found none of them were usable for children. Eight of the parks disappeared. The association found 17 parks

were faced with problems and they were not usable for the children. Kitchen markets, restaurants, car parks, clubhouse, community centers and auditoriums have been set at the places.

Figure 4.2: News concerning green areas of Dhaka. (Source: News paper "Prothom Alo" 10th May.2009/ "Dhakai Thaki" 21st June 2009)

Many of such places were occupied in 2004 for the installation of public toilets (Source: New Age Metro—Dhaka Sunday, April 23, 2006). At present it is imperative to identify the requirement and the potential green spaces for the future generation as well as form green open spaces and protection of natural areas which must be the highest priorities in order to preserve the livability of city people.

4.1.2.1 Types of accessible green spaces in Dhaka: An overview

Development decisions in the Dhaka city frequently fail to consider the values of environmental amenities, such as Open Spaces. So called development occurs without considering the value of the Open Spaces with negative environmental, economic, and social consequences on the neighborhood properties.

Table 4.1: Distribution of Open Spaces in DCC (Source: Bhadra and Shammin, 2001 and Peoples Report on Bangladesh Environment 2002-2003, MoEF – US)

Type of accessible green Space	**Area (acres)**	**Area (acre) Per 1000 people**	**Percent of total Area**
Agricultural	4871.00	1.15	12.120
Garden	362.00	0.086	0.901
Grave yard	14.50	0.003	0.036
Lake	60.71	0.014	0.151
Vacant space	2004.63	0.470	4.991

Park	**358.46**	**0.082**	**0.892**
Play ground	**156.46**	**0.037**	**0.390**
Pond	101.12	0.024	0.252
Swamp	731.00	0.173	1.820
Urban forest	8.00	0.002	0.020
Total	**8668.23**	**2.040**	**21.573**

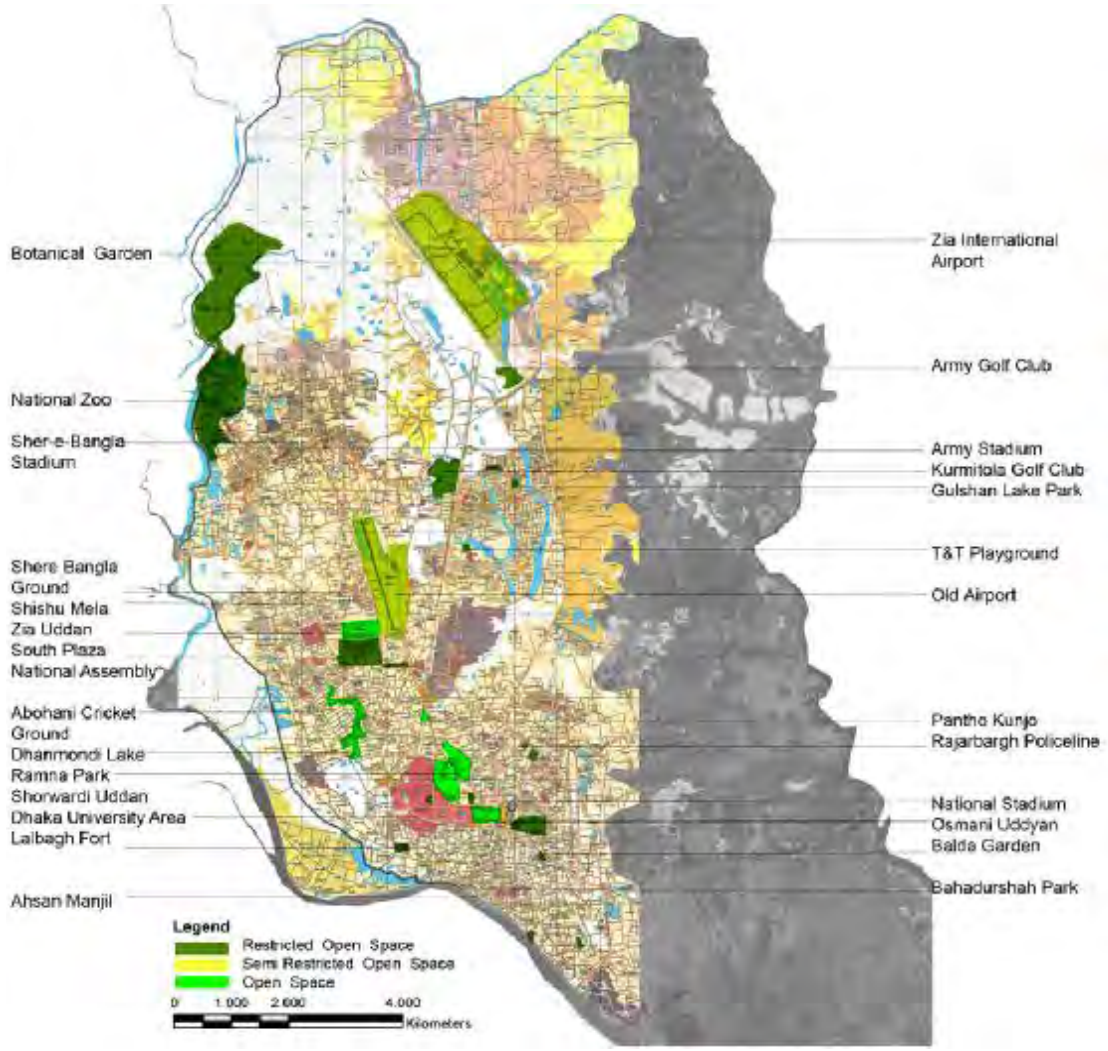


Figure 4.3: The existing public spaces of Dhaka. Source: Dhaka city map 2002, Google

Figure 4.4: Accessible Greens spaces of Dhaka

From the above table 4.1 it can be assume that one person can get only approximately 8 Sq. meter open space in Dhaka city which is really inadequate for living in a city. Moreover the distribution of open spaces of the city per 1000 people is considered as only official statistics. Probably if we count the people living in illegally in the slum areas and floating people around the city then the distribution of open spaces will be less than this amount. According to the statistics of SDNPBD (2005), the open space in Dhaka city is accounted only 21.573 % of its total area. As agriculture is most dominant activities in Bangladesh; it comprises the highest proportion of open spaces that was about 12.12%. Thus, accessible green resources in Dhaka city comprise:

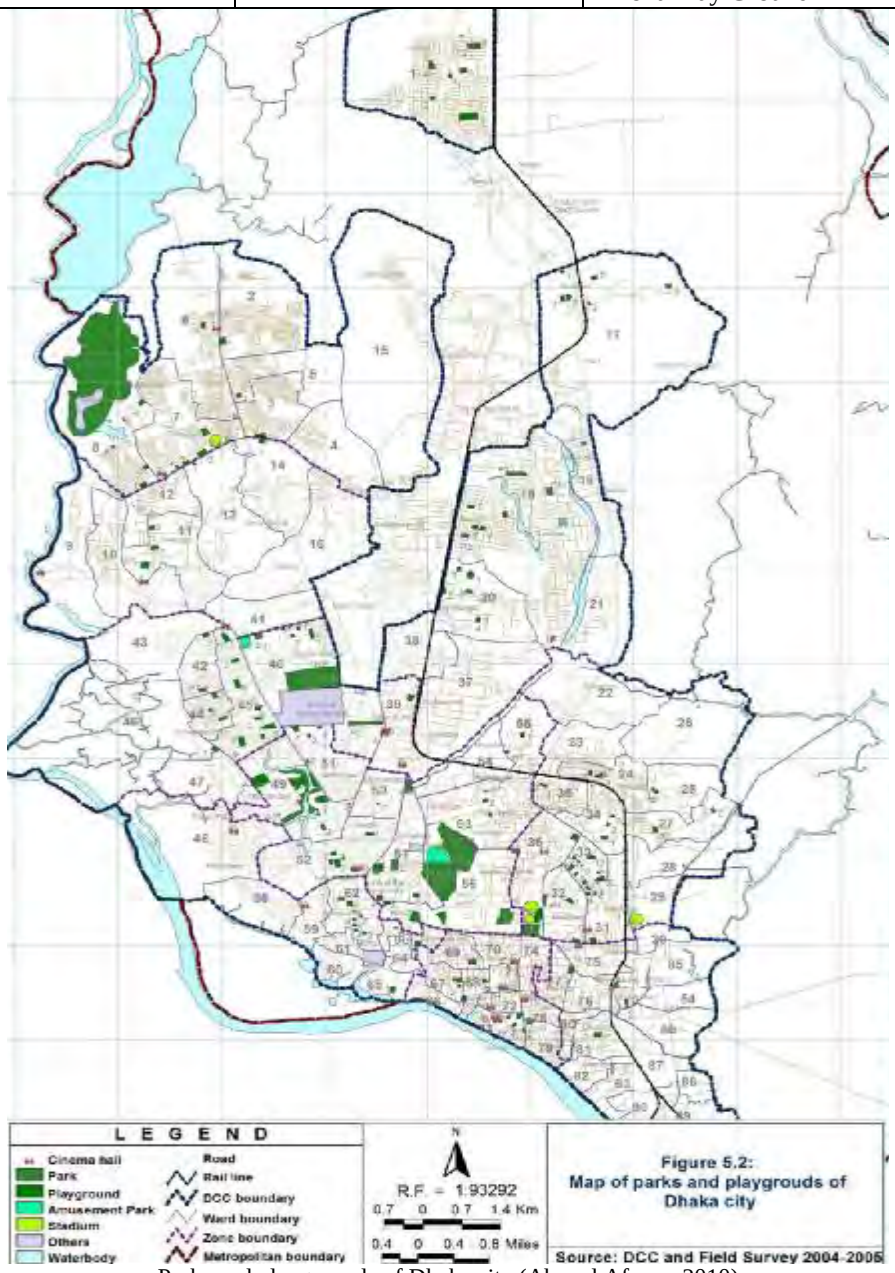
- Parks inside the city used for recreational purposes and generally consisting of different areas. For example: Ramna park. Chandrima uddayan, Osmani uddayan, Sohrawardy Uddayanand in side neighbourhoods like Tajmahal Park, Sirajuddowla park.
- Public and private Garden, children's park (ex: Kalabagan children's park and nursery), graveyard, nursery, zoo, play fields like Armanitola playfield, Bangladesh Math, Udoyjol play field etc.
- Multifunctional green areas along lake side in residential areas. For example, Dhanmondi lake
- Larger green areas or National Parks outside the city but within the periphery, with some recreational use, mainly visited during holidays and weekends.
- Trees along the streets, paved paths in commercial and residential areas, car parks etc.

Besides the above mentioned parks, DCC has developed 53 parks within its jurisdiction boundary; those are situated in different parts of the city. Playgrounds can be considered as green space because at least for certain part of the year these lands remain covered by grasses and plantation of some common tree species such as rain tree and Mahogany occur surrounding these. Many playgrounds are encroached upon in the city and used for different purposes such as slum or market. The list of the DCC developed parks and play fields is shown below (Source: DCC annual Report, 2006):

Table 4.2: List of the DCC developed parks & play fields

Park	**Park**	**Play field**
Banani Sishu Park	Baridhara Nursery Park	Bangladesh Field
Banani Park	Gulshan Park	GolapBagh
Banani Sishu Park	Gulshan Central Park	Basabo Field
Banani Sishu Park	Gulshan Taltola Park	Lalbagh Soshanghat Play Ground
Banani Lake Park	Jatrabari chourasta Park	Killar Mor Play Ground
Kamal Ataturk Avenue Park	Bahadur Sah Park	Dhanmondi Play Ground
Baridhara Park	Saidabad Park	Kolabagan Play Ground
Samibagh Park	Gulisthan Park	Banani Play Ground

Siraj ud Doula Park	Najirabazar Park	Gulshan Central Park
Jogonnath Sah Road Park	Malitola Park	Freedom fighter Sadek Hossain Khoka Play Ground



Parks and playgrounds of Dhaka city (Ahmed Afroza, 2010)

Hazaribagh Park	Bongshal Triangle Park	Dhupkhola Play Ground
Nababgonj Park	Pallabi Sishu Park	
Shyamoli Park	Tree Uddayan	
Sahid Makil Park	Narinda Sishu Park	
Shia Mosque Park	Bashir Uddin Sardar Park	
Iqbal Road Field Park	Khilgaon Sishu Park	
Shyamoli Sishu Park	Outfall Staff quarter Sishu Park	
Kawran Bazar Park	Mirpur 1 no Park	
Firm gate Trikon Park	Motijheel Park	
Pantho Kunja Park	Wonderland Park	
kolabagan Lake Circus Park	Ser sahsuri Lane Park	
Udoyjol Field	Hazaribagh Kasaitola Park	

Tajmohol Road Park	Phulbaria Park	
Dhanmondi Park	Bokshibazar Park	
Lalmatia D Block Park	Nimtola Park	
Dhanmondi 3 no gate park	Central Sishu Park --	

In the city environment graveyards also have very important ecological role as green space. The land occupied by the graveyards is not negligible and the amount is on an increase. Graveyards support very sound and undisturbed ecosystem. Most prominent and large graveyards are Azimpur Graveyard, Mirpur Graveyard, Banani Graveyard and Iraqi Graveyard. Vegetation around the government offices are sometimes in almost natural condition. The vegetation in western part of the Sangsad Bhaban and some vegetation in the park near Bangabhaban are examples. Such prime sites are: Prime Minister's Office, Prime Minister's Residence, Saangsad Bhaban, Bangabhaban, Old airport, Bangladesh Betar, Meteorological Department which are non accessible. In a survey done in 1999 listed 92 open spaces spanning an area of 196.82 acres under the jurisdiction of the Dhaka City Corporation. The city corporation authorities said the corporation has 41 parks and no play ground. The total area of parkland is 68.18 acres. The estimated population within the corporation area in 2005 was 12 million, which means 1.6 acres of land for one lakh people. In Dhaka Metropolitan City, it is found that there are 148 play grounds (excluding stadiums), 27 parks and three amusement parks and they cover about 1,266 acres of land area and there is no uniformity in open space standard throughout Dhaka city (Siddiqui, 1990).The ratio of these outdoor play and recreation areas to the total area of Dhaka City is only 1:0.04. According to the survey, parks and playgrounds ranging from 0.5 to 1.0 acre make up only 4% of the Dhaka’s total area, parks and Playgrounds of more than 1 acre of land make up 3.8% of the Dhaka’s total area, parks and playgrounds of more than 6 hectares make up 2.8% of total land (Ahmed Afroza, 2010).

4.1.2.2 Physical and functional Qualities of green spaces

The increasing population creates an enormous pressure on the physical condition of the available green spaces. It is identified by JICA (1991) that Dhaka has failed to provide appropriate lands for park, playfields for different use group through out the city. As we can see every residential area has different territorial limits and populations as well as economic status but when we are planning we are just aware of to accommodate huge population on the limits. The need of accessible green spaces are not at all is in the concern of the planning authority. From various studies it has been observed that most of the existing green spaces users stated an indispensable need for more well maintained and secured multifunctional green spaces at their own areas as well as city levels. Play fields and parks are stripped of

green grass and full of dirt and dust. Green space provides a number of broad functional qualities to a community. It is not just scenic land to view and enjoy as recreational space but also act as “natural and green infrastructure” that provides a number of important functions and benefits for Dhaka (Mowla, 2005a).Different types of green spaces in and around Dhaka provide functions and benefits depending on the nature of the green space, location and other factors. Key functions and benefits include:

- Community Identity and Character
- Biodiversity and Habitat
- Health Wellness and
- Vital Urban Resource Protection
- Access and Linkage to Nature
- Economic Value

According to Dhaka city structure plan 1995-2015 policy 10 &11 demands the augmenting of city open space and securing the future open space although there have no specific policy which can support sustainable livelihood. Well-planned and well managed green areas are essential for environmental and high quality of life for Dhaka city dwellers. So it is very much for RAJUK and DCC to rethink about these issues and necessary actions need to be taken. But DCC and various other government organizations ignored responsibility to look out for the public interest by authorizing commercial use of numbers of city parks and playgrounds by different private organizations. It is an irony that when the DCC spends public money to "maintain these breathing spaces" on behalf of the residents of the city, the organizations with exclusive permission from the DCC bar the public from accessing these places.

When the Dhanmondi Lake development project was underway, the consultation firm involved with the project had suggested developing a children's park on the northern portion of the ground, a lakeside walkway along the filed as part of the lake development project and bridging the playground with the nearby island in the lake. But Kalabagan Krirachakra later raised a boundary wall around the playground and occupied the entire children's park. General Secretary of Kalabagan Krirachakra, admitted that they have no lease for the northern portion of the ground where they run a plant sales outlet and no approval for the two buildings constructed on the playground and he also admitted that the use of the playground is restricted to all without prior permission from the club (Tawfique, 2007). Another popular playground on Dhanmondi Road 8, known as Dhanmondi playground, is occupied by Dhanmondi Club and permission from the club is required to use it. According to a recent survey conducted by the DCC in June 2007, Dhanmondi Club built office structures, five cricket pitches a couple

of football posts on the Dhanmondi playground and made the playground restricted to public. Dhanmondi children's park, adjacent to roads 3, 4 and 5, is occupied by Dhanmondi Cricket Academy, a limited company.

The largest playground in Dhanmondi, known as Abahani playground, was leased out dubiously to Abahani Limited on a long-term basis by PWD. The Public Park behind Bangladesh Biman office at Motijheel was handed over to Dhaka Bank for 'beautification'. Former captain of national cricket team Gazi Ashraf Hossain Lipu, convenor of Parks and Grounds Programme Committee of BAPA and Architect Salma Shafi, said the public use of a playground gets restricted once it is designated to a certain club or organization. According to sources, anti-social activities such as gambling take place regularly at many of these so-called sports clubs.

From a DCC survey, it is seen that many public parks are being used for various commercial purposes. Shahid Makil Park in Mohammadpur is one such park. Shyamoli Shishu Mela (children's park) is being used as a commercial amusement park; the general public has no access to Farmgate Triangular Park, which is entrusted with a private company for 'beautification'. Narinda Shishu Park has been divided into a number of portions. Narinda Lions Club occupies a portion; a two-story building rented out for community programmes occupies another portion while several tin-roofed houses, known as WASA quarters, occupy the rest. A small portion of the parkland is being used by a nearby mosque. A club occupies Outfall Staff Quarter Shishu Park in DCC ward 86. Hazaribagh Kasaitola Park is in possession of a club. Presently, BDR runs a kitchen market on the park.

Dhupkhola playground in DCC ward 81 has been split into three portions. East End Club is one of the occupiers of the ground. There is also a Shahid Minar, office and parking of a rent-a-car business, a public toilet and a restaurant on different parts of the playground. There are also two shops, a rickshaw garage and a construction material shop on the same ground. Parks and Grounds Programme Committee of BAPA found that Haji Alim Eidgah Maath in Bakshibazar is under exclusive possession of Orient Cricket Academy. The sponsor of the academy, a private firm, uses the playground for loading and unloading goods, said Sharif Jamil, member secretary the Committee quoting locals. A kitchen market has been allowed on the playground to justify the commercial use of the field, locals alleged.

The eviction drive launched by DCC has freed the capital's playgrounds illegally occupied by the influential quarters. The eviction drive came after an instruction of Prime Minister Sheikh Hasina practicing sports and games of the children. DCC Estate Officer Md Golum Rahman

Mia told that the illegal occupants as well as illegal structures have been removed from all the 11 playgrounds of Dhaka city in a drive (The daily Star, 2011b). DAP covers 1,528 square kilometers of Dhaka Metropolitan City. The proposed allocation in DAP is only 0.13 acres of parks and open space for 1,000 persons in the main Dhaka City, far below the WHO recommendation of 4.23 Acres/1,000 persons for parks and open space. Meanwhile Hong Kong, the most crowded city on earth, provides on average 0.71 acres/1,000 persons, or more than five times the amount proposed by DAP (Bari ,2005). The necessity of open recreational space can easily be understood when we see the pressure of population in Ramna Park and Dhanmondi Lake area. The plan proposed only one third of the land as open space after proposed relocation of Central Jail. We feel that this is inadequate and would be grabbed by vested quarter as the rest of it demarcated as residential and commercial use. The vacant area must be designated as city scale open space to meet the critical demand of residents of old Dhaka. DAP fails to frame pro-people plan to make Dhaka livable. The provision of general public services, social institutions and green spaces within walking distance of residences is vital for the development of a lively city. It is already recognized that Dhaka has lack of open space which has negative impact on public health, ecology and society.

4.1.3 Livability and sociability of Dhaka

Dhaka Metropolitan City is the 16th largest city in the world. At the same time, it is consistently ranked as one of the world's least livable cities. Thus livability in Dhaka City is at stake- a complaint often raised by all Dhaka City dwellers. Stressed by environmental pollution, traffic congestion, increasing incidence of crime, critical housing situation and over crowding, the primate city Dhaka is said to be gradually losing its ground as livable place in many respects. As Peñalosa (2002) says, a good city is a place where people can walk or ride bicycles and feel safe doing it. Not just safe, but find pleasure in the activity. In case of Dhaka, city dwellers thus feeling we are spending or wasting time getting around the city, we can get our exercise and our recreation while transporting ourselves. Instead of sitting in traffic, movement by foot, cycle or rickshaw could be pleasurable .But Dhaka do not contain such images. In pleasant, livable cities, cities for people, housing is designed for people, not cars; the entrance to buildings is through doors, not parking lots, and the ground floor is used for people (via shops, cafés, and housing), not parked cars. Dhaka holds the opposite scenario. The use of green spaces by the urban people of Dhaka is diversified. Most of the festivals, seasonal or occasional, appear to be an integral part of many urban dwellers for day to day recreational purposes. To get relief of their exhausted life and congested living environments, the people come to enjoy the green spaces from every part of the city. It has been observed

that people from a distance bearing the communication cost only to get relief from the exhaustion of busy urban life as distribution of multifunctional green spaces are not evenly done in planned and unplanned area. So some residential areas have to be accessible for people from various locations, which may benefits the outsiders but cause residential people sufferings in terms of privacy .But the active recreation like exhibition, cultural programs increases the social interaction as well as livability of the area. Different income group use the same spaces for different purposes. The following diagram shows the basic nature of the use of the various green spaces.

Table 4.3: Use criteria according to income group

Income group	**Use criteria**
Upper income group	Personal care: daily use 
Middle income group	Recreation: occasional use Create a platform for social interaction between people from a wide variety of backgrounds. These are the places of mutual involvement beyond the immediate family circle; offer a platform for cultural and political events. 
Low income group	Income generating opportunities :earning & living: daily use Offer employment and shelter to those who do not have access to private facilities. A woman in her later fifties, working as servant in a household in Dhaka, cuts grass on a public park sports facility to feed a cow kept at home. She will fill five sacks to make an additional 50 Taka or less than 1 USD. When her photo was taken she asked what benefit she would get from this. 

(Source: Nilufar 1999, urban life and public open space in Dhaka, pg-27)

Every morning, a sea of people leave their residential area, and every evening, they return in mass, while during the day, women and children are abandoned there, often trapped in their homes due to the lack of pleasant , accessible and safe outdoor environments. This situation mostly is taken place in unplanned residential areas of Dhaka and in some planned areas as they do not have green outdoors areas within walking distance from their door steps. The focus must be on access. As green spaces are intended to support urban populations' quality of life, they have to be considered in connection with the places where people live and in a way that reflect their point of view. Green spaces inside and outside the city are no substitutes for each other and both are perceived in different ways. Urban greening should be evaluated in relation to the relevant functional scales, ranging from street to city level. The preconditions for use (proximity, accessibility, surface, safety, etc.) should first be considered. If these are not fulfilled, people won't be attracted to green spaces. A variety of qualities ensures an array of activities and experiences related to urban green within close proximity to homes and workplaces. Variety is a general aim, if not within one green space separately, at least for the total supply on the different functional levels. People use open landscapes, such as parks, playing fields, other green spaces in and around the cities freely and often without regard to their original purposes. Urban green spaces are seen in a wide scope and include all the open areas, which can be perceived by citizens as contributors to their quality of life. The neighbourhood people experience green spaces such as neighbourhood park and play fields that are unwelcoming, unkempt and difficult to access or even dangerous to use.

The distance criteria do affect children's use of neighbourhood green spaces are especially sensitive to the kind of physical barriers and to social constraints imposed by parental anxieties about children's safety in Dhaka. In order to handle physical distance as an effective criterion for identifying accessible green spaces, contemporary constraints on mobility and behaviour need to be examined. It has been seen that each study site of planned and unplanned Dhaka has some physical features and uses .but there is no uniqueness in the interrelationships between physical features and perceived qualities of the need of the users. These study sites are of different sizes and shapes. Some are near the major roads while some

are in the core of the neighbourhoods. This makes it is necessary to evaluate green spaces separately and partly in a subjective way in the field as well as making standard for whole Dhaka which will accelerate the liveability. The main liveability indicators for the sustainable development of Dhaka are: the Green Areas, the Proximity of Green Space, the Accessibility/Public Access to Green Space, the Orientation and connectivity, Sociability and Users needs and Preferences. Accessible green spaces are widely celebrated as public spaces which help in socializing and improving livability. Establish connectivity among green spaces and continuity of green tree belt boost the rate of livability of Dhaka.

4.2 Framework for analysis the accessible green spaces of Dhaka

In the context of Dhaka, the availability of small green spaces on the doorstep are of crucial importance, especially for less mobile people (old, disabled) and young children. A main reason is that small-scaled greening is difficult to assess against spatial criteria. For a large part such small scaled greens are experienced from the outside, integrated within its surrounding area. Linear green spaces should be assessed in a more appropriate way within the framework of a green structure concept. The sections 4.2.1 and 4.2.2 will help to review the context of Dhaka and baseline information by identifying the issues and problems related to the accessible greens and to construct a framework to analyze accessibility and investigate liveability.

4.2.1 Need analysis

The need of green spaces which act as lungs of city is massive because aesthetically pleasing accessible green spaces rejuvenate the soul and provide a sense of calm in a hectic world. For creating livability in any urban centre, is the scope of enhancing quality of life through proper utilization of lands. Dhaka has been experiencing the continuous destruction of its parks, vacant lands and green areas in response to rapid urban expansion ever since the independence of Bangladesh (Chowdhury and Faruqui 1989; Islam 1996). Historical records reveal that the city was well planned and superbly furnished with many parks and gardens during the Mughal period (DCC 2008). Dhaka's urban growth is primarily attributed to the rapid increase in the human population driven by rural to urban migration (SDNPBD 2005; Islam 1996, 2005). Among the world's major cities, Greater Dhaka probably has the lowest number of playgrounds, parks, open spaces and swimming pools per capita (Hossain 2006). A recent study estimated that almost 80% of the land in Greater Dhaka was non-urban in the 1960s) but this figure had been reduced to about 40% by 2005 (Dewan and Yamaguchi 2008; BCAS 2006). Figure 4.7 portrays the types of benefits Dhaka city can receive from accessible

greeneries and the need of such accessible green spaces all around the city whereas figure 4.8 clearly depicts how green spaces are disappearing in Dhaka over the course of time.

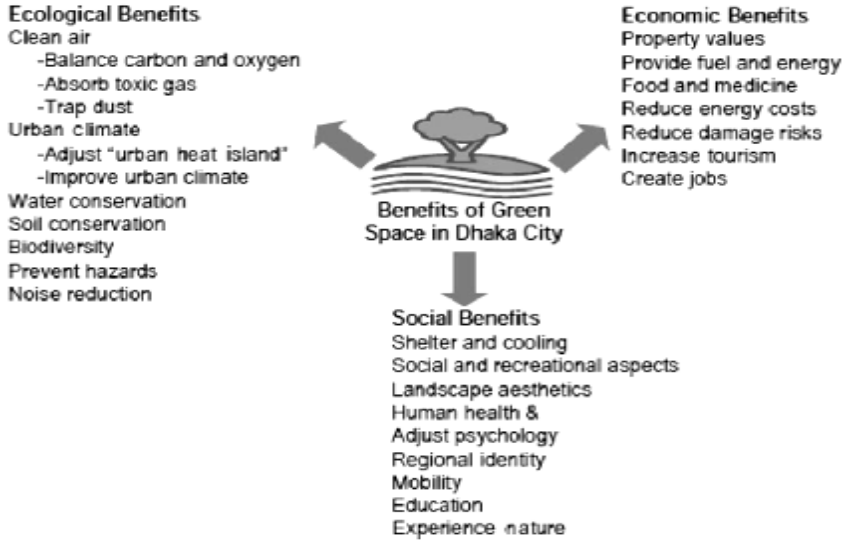


Figure 4.5: Conceptualization of the benefits of green spaces (Byomkesh & Dewan, 2010)

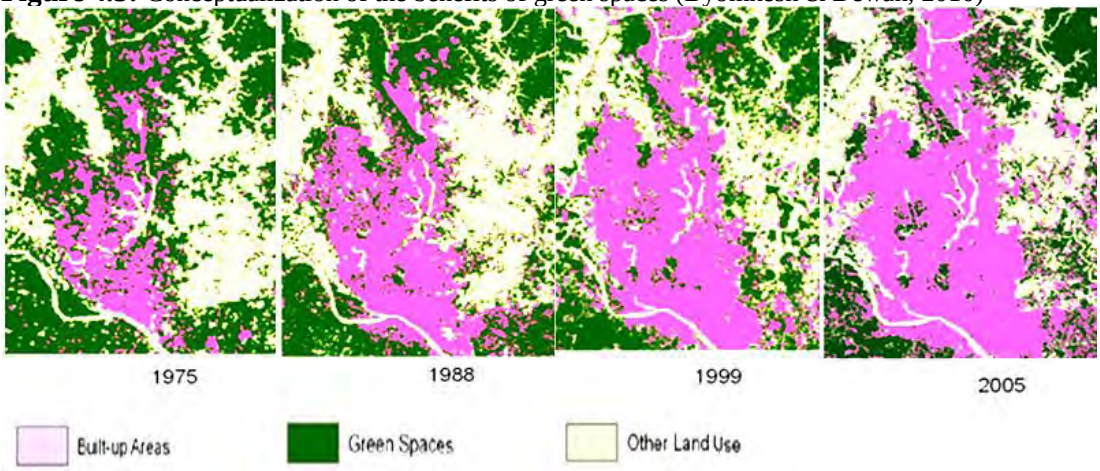


Figure 4.6: Spatiotemporal changes in green spaces in Greater Dhaka (Byomkesh & Dewan, 2010)

In 1975, green spaces occupied 44.8% of the total study area, which dropped to 35.7%, 31.2% and 24.1% in 1988, 1999 and 2005, respectively. On the other hand, the built-up area expanded from 13.4% (5550 ha) to 49.4% (20,549 ha) from 1975 to 2005. In other words, the net increase in urban area was 14,999 ha over the study period (1975–2005), suggesting a huge growth in the human landscape and a subsequent reduction in the natural landscape, which obviously indicates the magnitude of the anthropogenic activities that occurred during that period. Interestingly, green spaces also witnessed spectacular changes during 1988–1999, amounting to a net loss of 1852. To accommodate the 4636 ha of growth in built-up areas during this time, a great deal of vegetative cover was converted to urban land (Fig. 4.8 Byomkesh & Dewan, 2010). According to the Chief Town Planner of Dhaka City Corporation (2003), an ideal city needs 20% area covered by trees but there is only 8%

vegetation in the city. Currently, almost 15 million dwellers of Dhaka city enjoy limited ecological services from Ramna Udyan, Sohrawardy Udyan, Dhaka University campus, National Parliament Bhaban complex, Usmani Udyan, Botanical Garden and National Zoo etc (The Daily Star,2012b).

Most of playgrounds and parks in the Dhaka Metropolitan area, about half of these are maintained by Dhaka city Corporation. Capital Development Authority (RAJUK), private and government organizations and others are responsible for the maintenance of the rest of the parks. The two most common physical facilities in parks are seating arrangements and walkways. Swings and slides are the two play facilities can be seen (Ahmed A, 2010).Informal play is observed in the streets of colonies (public housing areas), at the entrance of access roads in the planned residential areas and in the alleys of the unplanned residential areas. In most cases children are found to play on the paved roads, narrow streets and on uneven ground close to their houses. Children, irrespective of their age and socioeconomic background, want to have a playground within their community. Although the adolescent boys prefer large size playgrounds rather than ones close to their home which can be outside the community if there is a space problem within community. Older people and woman want to take their grand children and children within close proximity green areas whether it is a park or playfield having proper amenities those can fulfill their needs.

4.2.1.1 Vulnerability of green spaces in Dhaka

Most of the parks are occupied by floating people. Due to their presence the condition of many parks is not good enough to be visited by the city dwellers. As architect and writer Himanshu Burte (2003) argues, “In recent times, new citizens' groups from the middle and upper classes of society have emerged in the city, effectively laying claim to public space as their space, and insisting on the removal of all those who would occupy it for functions which urban traditions have sanctioned but the law has not.” The so-called-encroachment of public spaces by hawkers, beggars, street vendors or the homeless is often criticized by the middle and upper classes, who believe there should be strict regulations limiting or restricting their access to these places. This has resulted in the exclusion of the underprivileged from these places and in their exploitation by other powerful actors (like the police who collect a bribe of 200 taka from each vendor in Sharwardi).

Figure 4.7: BAPA organized the rally protesting the construction of a clinic at the Khilji playground, the present situation of Naya Bazar Children's Park & Azimpur play ground, structures being built on Road-8 Dhanmondi playground ,Sayedabad Park, Chairman Bari playground at Banani, Jatrabari Park, Narinda Park

Development of township in the metropolitan capital is regulated by the Town Improvement Act (TI Act) of 1953. Under the Act, the RAJUK has been empowered to prepare a master plan for the city that should guide all future developments. There are two master plans for the city which were drawn up at two different periods but never adequately followed. It is incredible that although the master plans were formulated as long ago as 1959 and 1995 respectively, these never acquired the shape of functional detailed plans for green areas. Last plan (UAP for Dhaka city 1995-2015) has kept some provision for creating open spaces but this plan exists in paper only. Though RAJUK) and DCC, none of these organizations feel that hey are the responsible agency to ensure children's play and recreation facilities. These two government organizations blamed each other for the misappropriation of playgrounds and parks. The RAJUK representative stressed the fact of the inclusion of the playgrounds and parks in the DAPs of Dhaka city. It is important to include all the existing maps in the respective DAPs to protect the existing playgrounds and parks in Dhaka city from further encroachment and misuse.

The City Corporation focused on the lack of political will and budget constraints for the problems related to maintenance of parks and playgrounds of Dhaka city. Different

stakeholders ranging from the government's own utility agencies to private developers felt no compulsion to adhere to guidelines stated in the master plans because these lacked the force of implementation or enforcement. Environmentalists demanded immediate steps to stop all sorts of construction works in capital’s Dhanmondi playground and eviction of all illegal establishments from it. They also urged the government to ensure proper maintenance of all parks and playgrounds in the country (the Daily Star, 2012c). Since being designated as a children's park in the early nineties, this strip of land at Naya Bazar in Old Dhaka has been anything but a place for the kids to play. Truckers used it as a parking lot till newspaper reports in 1996 forced Dhaka City Corporation to reclaim it and install slides, seesaws, swings and other playground equipment. But because of the same DCC's neglect, the amusement tools soon rusted and vanished, and the park became a dumping ground for construction rubbish and sewer sludge. The prime minister's recent order to recover the capital's playgrounds highlights how the little ones in this densely-populated city grow up without much access to outdoor play (The Daily Star, 2010a).

When playground for children are fast becoming scarce, the Dhaka City Corporation has designated this ground in Azimpur as children's playground and the local venue for Eid prayers but transport traders in the area are using it for parking their trucks (The Daily Star, 2011a). Chairman Bari and Banani playgrounds are two of the three remaining open spaces in Banani residential area. A political party and a forum of businessmen have occupied two playgrounds at the capital's Banani to arrange a ten-day iftar party and a trade fair throughout the rest of the Ramadan. On the Banani playground, Jamdani and Handicrafts Development Society erected around a hundred makeshift shops for the fair. After few days later a team of RAJUK demolished around 50 makeshift shops erected at Banani playground following a report carried in this daily on August 22 (The Daily Star, 2010b). Residents of the neighbourhood of Narinda in Old Dhaka feel nostalgic when they look at this community centre set up by DCC on the only park there 15 years ago. A mosque has also been established on the park, which now remains only in paper.

Structures being built on Dhanmondi playground on Road-8 violating a court order that instructed everything not related to sports or park should be removed. The Sayedabad (0.7-acre)park was used as a spot for waste disposal and as a parking lot and now has two public toilets, constructed in the 90s. Bus owners of Sayedabad bus terminal used a third of the park to keep their vehicles while waste was dumped on the rest, led by negligence on the part of DCC. Some shops and another toilet were also erected on the park adjacent to Jatrabari-Tikatuli Road but were demolished during the last interim government. The park, for the last

three months, is being used to house laborers constructing Gulistan-Jatrabari flyover. Over 50,000 residents of Uttar Sayedabad, Dakkhin Sayedabad used to benefit from the park, having benches and playground equipment for children, (The Daily Star, 2011). Jatrabari Park, once situated on around four bighas of land, shrunk to less than one bigha as, over the years, different organisations including DCC occupied it for different purposes.DCC, the authority to maintain the park, constructed a road linked with Demra and a public toilet on nearly two bighas of the grounds around five years back.

4.2.1.2 Public opinion

An informal survey was conducted through questioning on need for green spaces. The city people cited several concerns, including the importance of access to green spaces as well as the importance of monitoring and managing those spaces, pointed the diverse values that green spaces have for them to recreation, to visual aesthetic, the need of more green spaces. Most respondents are in the opinion there has been deterioration in the social environment of Dhaka city.

Opinion 01:"Where have all the open spaces gone?" laments Zeba Khondker. "This city doesn't give us a space to breathe, to interact with people outside of our own confined lives, to escape the madness of the bustling city," she says. She feels suffocated by the concrete walls that surround her and her grandchildren in their cramped apartment in Mohammadpur. "I know it sounds ridiculous, but I actually walk in the house. We have rearranged the furniture in such a way that I can make rounds around the house every day. It's not really possible to walk on the busy streets of Dhaka," she explains.

Opinion 02: Domestic workers, Nilufar and Rima, who work in a house in Lalmatia, say they have no place to go on their off-days. "We get a half day-leave on Friday, but where will we go? We can't afford to go to markets or coffee shops like our madams," says Rima.

Opinion 03: Shabnam Rahman, for instance, is furious that the playground near her house has been taken over by local boys. "We can no longer use what used to be common public space; the local boys insist it's a cricket ground, and we cannot send our kids to play or conduct evening walks there," she says.

Opinion 04: "Look what they've done to the Kalabagan field. Now it's become a market instead of a sports field," says Shiraj, who plays cricket every afternoon in the field.

Opinion 05: "I live in Dhanmondi for last 10 years. Crowding in the lake side and other green areas is an impediment to use those areas according to my wish as residents of Dhanmondi…"

Opinion 06: According to Efty Khan of Kayettoli of old Dhaka (May25, 2012) Bangladesh Maath used to be one of the few remaining playgrounds in Old Dhaka. But last week, when a

couple of my friends and I went to play some outdoor games in the afternoon, we found that the place was not suitable for playing anymore. There was no sign of soft earth as the field was filled with sand. Feeling a little disconcerted, we started to play on our roof. There is virtually no playground in this part of the town. The remaining fields are in terrible shape or become overcrowded in the evening. We ask ourselves, should we stop playing outdoor games only because we live in Old Town?

Opinion 07: Mohammad Alam, a resident of New Colony, said over 100 children of different ages used to play on the playground every day, even at night, around five years back. “For the last five years, the playground has been used for anything but sports,” Alam said. (The Daily Star, September 15, 2012)

4.2.1.3 Spatial distribution and comfortable size of accessible green

Gilbert (1989) said that factors such as the size, shape, accessibility, diversity, history, and distribution of green spaces within a city play a decisive role in defining the liveability functions. The scale of spatial planning is essential to how people experience their city. The balanced spatial distribution of accessible greens with respect to population has become a public concern that involves many factors. For example, in Dhaka there has been an overall decrease in green areas and this has had a negative effect as environmental pollution is on the increase.

Figure 4.8: Changing spatial pattern of Old Dhaka (Chawk bazaar in 1904 and Today) and density of new Dhaka

Most of the accessible green spaces (parks & garden/amenity green spaces/playfields/natural, semi natural greens) in Dhaka are spatially connected by streets, sometimes by major roads (Figure 4.4). Though it is seen that spatial distribution of parks and playfields is scattered but these provide access for the public. Some however are only open to the public at limited times during the day, and many of the parks are closed after dusk. Most of the parks and playfields are busiest around midday, particularly in the summer, when they are used frequently by users to relax. But existing active green spaces do not make a sufficient contribution to urban life due to their small areas and disproportionate distributions across the urban fabric of Dhaka.

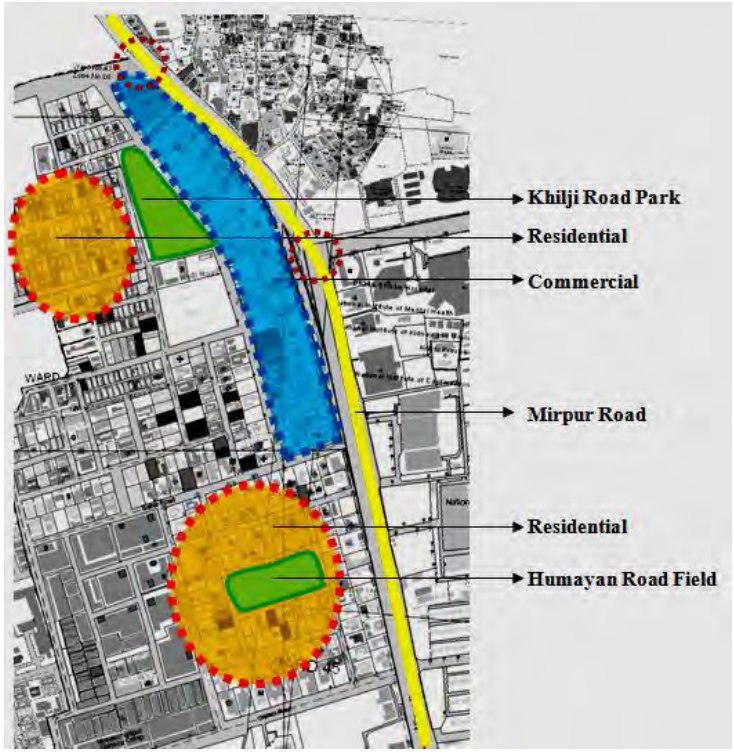


Figure 4.9: accessibility differs according to spatial planning (planned area)

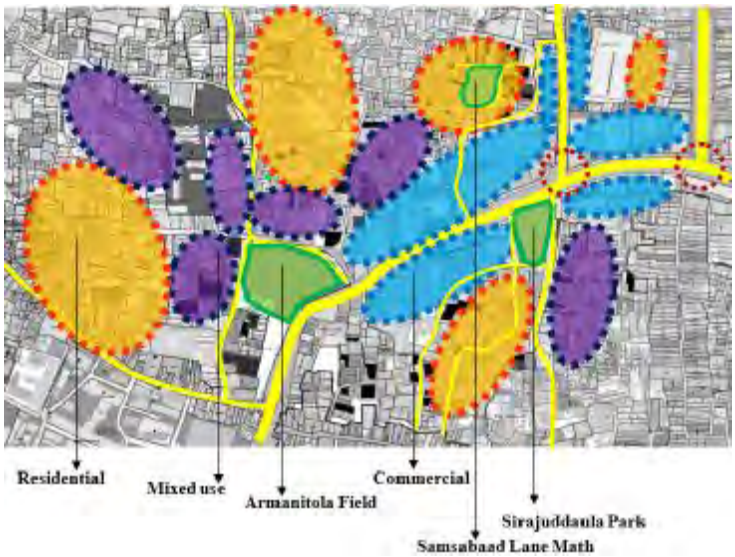


Figure 4.10: accessibility differs according to spatial planning (unplanned area)

For the irregular or organic urban fabric it is difficult to address the green and excessive traffic reduces the option to use the green as well to the city people. If we study the spatial organization of Old Dhaka we can identify that most of the accessible green has only one or two road or a continuous street that connect the green with its surroundings. However most of the accessible greens of planned area surround by roads which some times create opportunity to access from all side as well decrease the chance to use the green for old people or children if they have to cross a major road. Neighbourhood Park which are allocated to be used by

residents and neighbour sometimes lost its privacy as it may very near or adjacent to major road and accessible to the passersby. For example Khilji road park of Mohammadpur is adjacent Mirpur road and Shaymoli node. So people of various ages, professionals are using the park differently at different hours of the day (figure 4.10). Whereas Humayan Road Park of same area are used by neighbors mostly as it is located in the middle of residential atmosphere. Both of these Parks are in planned area. Sizes of accessible greens in planned area are approximately near to each other (0.80-2.00acres).

The quantified and spatially explicit urban green areas in unplanned area are bit different as the land use pattern mostly commercial in periphery of the area as well as in core. The residential atmosphere is not as in planned area. Both Armanitola field and Sirajuddaula Park are beside major road with mostly commercial and mixed use (rentable space +apartment). There is a positive relationship between the planned area ratio and the unit park area ratio as it is expected that as the planned area ratio increases, unit park area ratio increases also. There is actually a negative relationship between the population and the unit park area ratio of the areas which means that as the population increases the unit park area ratio decreases as it is expected due to higher construction pressure in the more populated areas. Also, there is a negative relationship between the unit park ratio and distance to the CBD for as the distance increases, the unit park area ratio decreases. Despite all of its positive attributes, Dhaka's tremendous population growth has negatively affected its socio-economic and cultural life as well as its physical structure and green areas. Following Table 4.5 conveys the area/size of green spaces according to various authorities of Dhaka.

Table 4.4: Area/Size of green spaces according to various authorities

<table>
<tr><td colspan="3">Space requirement and size of open spaces (Islam, Kawsar and Ahmed,2002)</td><td>1995 master plan
The present guideline, worked out in 1995 earmarks four acres of land as open spaces for an area of 25,000 people (0.16 acres for 1000 people).</td></tr>
<tr><td>Open spaces</td><td>Areas</td><td>Area/1000 pop.</td><td rowspan="2">DCC Annual Report, 2006(list of parks)
Size of Neighbour hood or Local park ranging from 0.030acres to 8.700 acres. Most of the parks have an area of 1.5 acres -2.0acres.</td></tr>
<tr><td>Play ground</td><td>100 sq ft/child[6-14 yrs]</td><td>1.5 acre</td></tr>
<tr><td>Play field</td><td>600 sq ft/person[15+]</td><td>1.5 acre</td><td rowspan="2">Detailed Area Plan (DAP)
Proposes that only 0.13 acres of parks and open space for 1,000 persons in the main Dhaka City, which is significantly lower than the World Health Organization's recommendation of 4.23 acres /1,000 persons for, parks and open space.</td></tr>
<tr><td>Neighbour hood or Local park</td><td>300 sq ft/person</td><td>2.0 acre</td></tr>
</table>

4.2.2 Mapping and evaluation of accessible green spaces

Dhaka has two distinct urban fabrics: planned and unplanned areas which are constructed with several neighbourhoods. Each neighbourhood contains its own distribution pattern of land for various functions. Mapping of accessible green spaces are done through Google Earth maps and GIS ward maps. Ward based GIS mapping of Dhaka contains base map, road network map, holding distribution map, land use map (various networking of the roads, foot path , drainage , traffic town planning, land and estate, holding with land use, no of floors electricity line, water supply lines, telecom lines, slum Solid waste management facilities etc. with the associate attribute information on the length and width, area as will as various spatial and non-spatial data analysis of them) and from those GIS based maps accessible greens (parks, playfields, garden) as well as open spaces can be sited and there connectivity with major roads, streets with the surroundings can be identified. These GIS ward maps also help to find out the distance of the accessible greens from different holdings and size of the greens. Ward Based GIS Mapping through observation show the uneven scattered distribution of accessible green spaces, which have different degree of connectivity, functionality and standard. In case of unplanned area of old Dhaka Christopher Alexander's **"PATTERN 60: ACCESSIBLE GREEN"** is complicated than the case of planned area of new Dhaka.

Figure 4.11: Google earth map, GIS ward map (ward 45), Arc view Map

Connectivity as well as accessibility to green spaces is difficult in old Dhaka where as in new Dhaka connecting feature like green corridor with the capacity to incorporate a pedestrian and cycle route is easy to incorporate with planned distribution of circulation. The complexity of green space attractivity and accessibility is measured not only by the surface area (m2) and metric distance (m) but also with the use values (number of) and axial distance (steps).So functionality is another precondition for liveability of green spaces which means maximise

the range of environmental, social and cultural functions and features within the sites appropriate to their scale and location. In relation to public opinion and need analysis of green spaces in Dhaka it has been realized that uncertainty exists regarding the relationship between green space access and the frequency of green space uses. The framework will be constructed based on three principles:

Figure 4.12: Combined GIS based ward maps of planned (ward 41, 42, 44 and 45) and unplanned (ward 67, 68, 71 and 72) study areas

a) Improving access: Improving access and the distance thresholds with in the standard which will is based on Christopher Alexander's **PATTERN 60** to ensure that the majority of people do have a accessible green space near their home, which they are able to use freely and that green spaces are planned to accommodate all potential users.

b) Improving naturalness: Many locally accessible spaces, through their nature, layout and the way that they are managed, may not offer a very wide range of biodiversity. There are ways in which habitat improvement can be achieved in green space areas that are not rich in biodiversity.

c) Improving connectivity: Providing a welcoming atmosphere to all visitors to accessible green space, from a range of ethnic and cultural backgrounds, will provide opportunities for individuals and communities to engage and connect with their local environment. It can provide a focus for educational activity, community events and social activities. Engaging

with the environment can be at a variety of levels. Opportunities will depend on how spaces are designed and managed and on a range of active interventions.

4.3 Summary

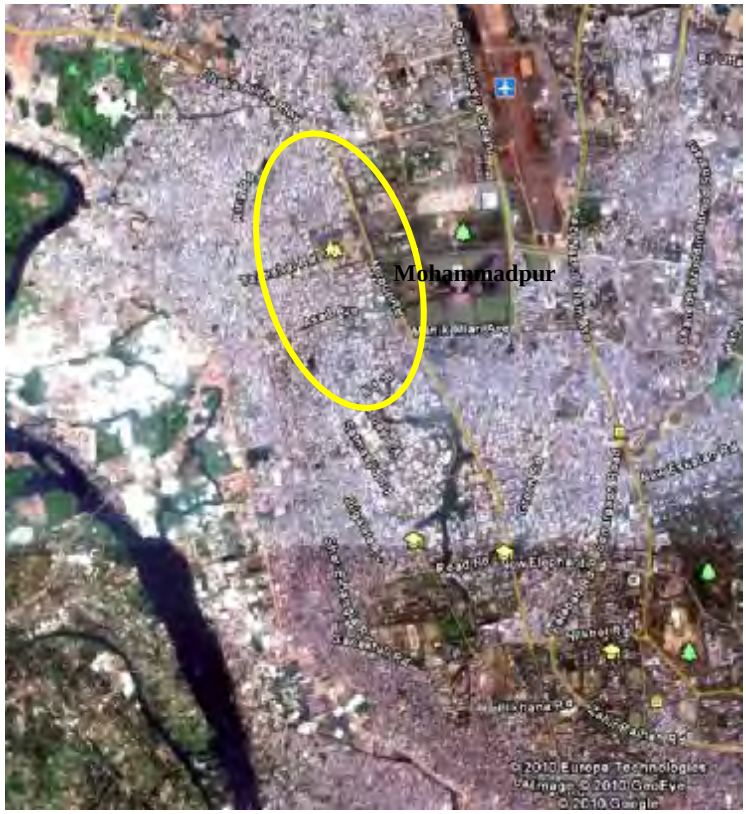
As from the above discussion it is been clear a proper framework is needed to overcome the problem of not have enough accessible green spaces in Dhaka and to support the framework and highlight the **PATTERN 60** in a contextual intervention with a checklist of different dimensions is to be established. As Christopher Alexander set out each pattern as a sketched minimum framework of essentials with few basic instructions to associate the relationships between peoples' activity and space, not as a form without context, so **Social dimensions** and **Functional dimensions** are given importance to measure the performance to boost urban livability of Dhaka as well as describe the **Morphological dimensions** and **Environmental Dimensions** to give an idea about the contrasting settings.

Table 4.5: Checklist for analysis

Dimensions	**CONTEXT**	
	Unplanned/Planned	
 Humayan road field,Mohammadpur	 Bangladesh Math,Old Dhaka	
Morphological Dimension layout and configuration of urban form, local pattern of development, process of change		
	Land uses	Relatively temporary, changes through time and with incoming uses
	Plot pattern	Organic or orthogonal(rectilinear pattern)
	Street pattern	Regular or ideal grids(monotonous)/organic or deformed grids(picturesque character)
	Public space network	Chawk/node
	Urban block pattern	Fine urban grain with small sized streets blocks(Collective ownership) or coarse urban grain with larger blocks (individual property)
	Building structure	Buildings of similar height in small plot(one unit/floor) or high-rise with different height(multiple units/floor)
	Connectivity	Orientation/Integration and connection
Social Dimensions Understanding of the relationship between people (society) and their environment (space),human activity and social life(public realm)		
	Public realm	Physical(space) Socio cultural(activity)

	Neighbourhoods	Size/ Boundaries Social mix and balanced communities
	Safety & security	Control of space/ Surveillance/ Activity
	Accessibility	Visual Access/ Physical Access /Mobility/ Distance and frequency of uses (PATTERN 60)
	Sociability	Uses and activities Sense of attachment and adjacent uses
	Amenities	External and internal walkways Integrated Parking facilities Benches, Playing equipments, Cricket practice nets Pools/fountains, Sculpture/Landmarks Shade and Shelter, Club House Food or tea stalls, Restrooms & drinking fountain Waste Receptacle, Lighting Fixtures Ramps for disable ,Treed areas, Signage
Functional Dimensions Social usage and visual traditions with functionalist perspective, functioning of environment in terms of how people using it		
	Comfort & Relaxation	Climatic comfort Social and physical protection Cooling/warming Effect Maintenance /Services
	Users' perception and satisfaction	Passive engagement Active Engagement Discovery
Environmental Dimensions Physical Environment of accessible greens & weather parameters		
	Physical factors	Floorscape(Hard pavement/soft area) Rainfall/water clogging retention Tree coverage /other vegetation Boundary wall or Fencing Lighting
	Climatic Factors	Sunlight and shade(orientation) Temperature Humidity

So according to the checklist (Table 4.5) the next chapter is aimed to look in depth at two contrasting environments in planned and unplanned settings, to explore and understand the issues related to **PATTERN 60** in the context of urban Dhaka as well as social and functional attitudes of the users.



CHAPTER 05: CASE STUDY

This chapter explains the rationale for selecting the study location, and the particular accessibility of green spaces observed. Of course, no area is exactly the same as another, but many share similarities. This study aimed to look in depth at two contrasting environments, to explore and understand the issues related to **PATTERN 60** in the context of urban Dhaka to portray the **Morphological dimensions** (physical and functional characteristics of areas like land uses, plot patterns as well as street pattern, connectivity ,there transformations), **Social dimensions** (scenario of urban life, neighbourhood size and accessibility, Distance & frequency of uses) and **Functional dimensions** (climatic condition, passive active engagement with users needs and satisfaction) to give an idea about the contrasting settings and hope to measure the performance to boost urban livability of Dhaka.

5.1 Contrasting nature of study areas

The city of Dhaka is centrally located in the country. In its stages of development, the city of Dhaka has developed without any robust planning guideline and shows no comprehensive urban design. Within its framework, two distinct spatial patterns are dominant in Dhaka; they are the planned and unplanned (i.e. organic or informal) patterns. Major part of Dhaka is planned though in a fragmented way. Dhaka has two distinct parts - old and new Dhaka.

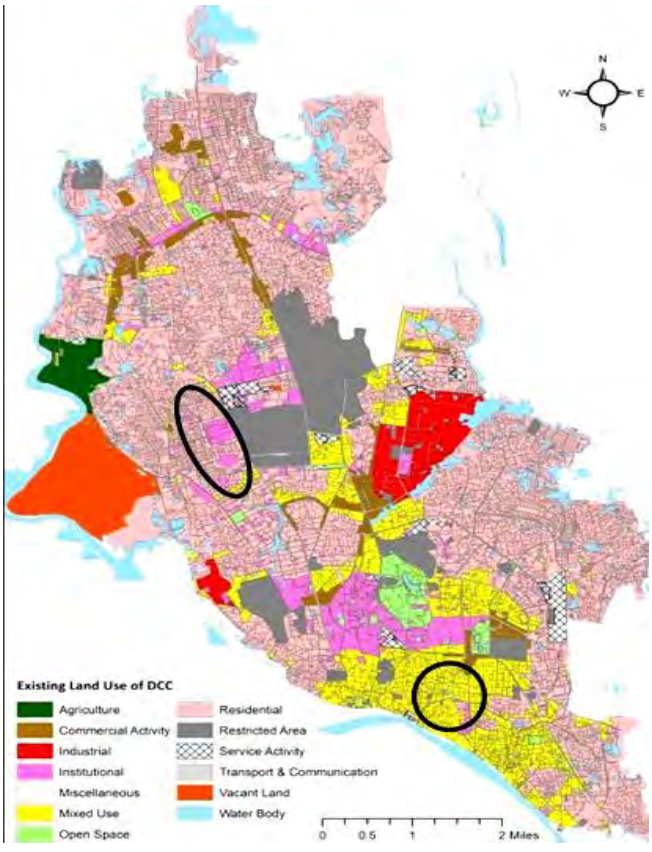


Figure 5.1: Existing Land use of Contrasting study areas

The historic part, the old Dhaka, has an organic settlements and it retains many traditional features. In the newer extensions of Dhaka, outside the historic core, grid iron patterns are prevalent which have been spontaneously developed with rigid planning proposal. In the present study selected areas possess different characteristics in terms of background of establishment, physical layout of built up[covered] and natural green spaces[open], residential pattern that enhances social interaction among neighbours and outsiders, their capacity to accommodate new functions with flexibility; their location and accessibility; their layout and size and their function .

Study area 01: Unplanned area (Ward 68/69/70/71)

The pattern that exists in the old historic city is the winding and intricate street network, continuously twisted in and out, and were tortuous to an extreme degree in some places. Like many organic cities, the urban pattern of old Dhaka reflects the community spirit and the aspiration of its inhabitants. The organic character of the old part of Dhaka is particularly distinctive because of the density of its built-up areas.

Selected park and play field of Unplanned Area

Ward 68/69/70/71[Kotwali, Bangshal, Naya Bazzar area] (Figure 5.2):

01. Bangladesh Maath [1.48 acres, use: play field]
02. Sikkatuli Khalek Shardar Park [0.290 acres, use: Park]
03. Samsabaad Lane Maath [0.35 acres, use: play field]
04. Sirajuddaula Park [0.50 acres, use: Park]
05. Armanitola Field [1.85 acres, use: play field]

Study area 02: Planned (Ward 44/45)

Planned parts of Dhaka mainly followed a grid iron pattern with a land use as prescribed in the master plans. The grid pattern of roads was introduced in the city for the first time in Wari and Gandaria in 1885. Latter in 1905, Ramna was planned as government residential district however not in a grid pattern. The first evidence of planned residential areas under the planning authority was found in 1948 when the East Bengal government created a planning division under which a physical plan for Dhaka city for its future growth was made.

According to this master plan, some residential area were developed which include Azimpur and Motijheel residential colony for public employee and Dhanmondi residential area for upper class people. Comprehensively planned residential areas of Gulshan, Banani, etc. are

the successors of this type which were developed by the city authority DIT (presently RAJUK).

Figure 5.2: Site surroundings with landmarks and connectivity through major road network of unplanned area

Another major planned residential project was the Uttara Model town (1360 hectare), which was planned by DIT and located about 20 km from the centre of the city. In the later period, Baridhara was developed in 1972 as high-class residential area acquiring 150-hectare land. Their street layout follows a rigid gridiron pattern with some semicircular arcs. Mohammadpur is a District in the Division of Dhaka, Bangladesh. Though initially Mohammadpur has grown as a residential area, nowadays many commercial places can be found here. The area has become more crowded than it was before. Massive urbanization has turned Mohammadpur into a miniature city and has resulted in the loss of natural environment including green areas, wetlands. Unlike some parts of Dhaka city, most parts of

Mohammadpur was planned in the 1950s, and therefore, it have relatively broad streets and avenues.

Figure 5.3: Site surroundings with landmarks and connectivity through major road network of Planned Area

Selected park and play field of Planned Areas

Ward 42/44/45[Lalmatia, East Mohammadpur, Shaymoli Area] (Figure 5.4)

01. Lalmatia D Block Play Field [1.00 acre, use: Eidgah, play field, park]
02. Lalmatia New Colony Children's Park [2.30 acres, use: Eidgah, play field, park]
03. Iqbal Field Park [1.70 acres, use: park]
04. Udoyjol Club Maath, Iqbal Road [1.20 acres, use: play field]
05. Tajmahal Park/field [1.46 acres, use: play field, park]
06. Humayan Road Block B Play Field [1.37 acres, use: park]
07. Khilji Road Children's Park, PC Culture, Shaymoli [2.0 acres, use: park]

5.2 Morphological dimensions

Morphological dimension refers to the layout and configuration of urban form and space with as a traditional or modernist system. It includes local pattern of development, process of changes of land uses, spatial planning of urban green spaces, building structures, plot pattern and street pattern as well .Within the successive stages of growth, two dominant urban patterns are conspicuous in Dhaka; they are the historical core or 'old Dhaka' and the later development towards the north, known as 'new Dhaka' (Nilufar, 2010).

5.2.1 Physical and functional characteristics of study areas

The unplanned study area is placed under Kotwali thana which is considered as old Dhaka. Kotwali Thana with an area of 1.93 sq km, is bounded by Ramna and Motijheel thana on the north, Buriganga river and Keraniganj upazila on the south, Sutrapur thana on the east, Lalbag thana on the west. It consists of seven wards (ward no.67, 68, 69,70,71,72 &73) and ninety seven mahallas, five playgrounds and two Parks. It has 52,292 units of house hold and total area 1.93 km². Old Dhaka is a continuously-lived bustling place with rich cultural heritage. Despite several attempts in the past, the development in Old Dhaka has been mostly unplanned. As a consequence, and with the passage of time, Old Dhaka lost many of its valuable urban spaces due to encroachment. Ruplal House and Ahsan Manjil are two of the most prominent structures from this period that exit today. Ahsan Manzil (1872) and Tara Mosque are archaeological heritage and relics of this thana. Armenian Church and Bangshal pond are landmarks of the study areas (unplanned).

Figure 5.4: Organic growth of old Dhaka (Nazira bazaar) and urban grid of new Dhaka (Mohammadpur) showing the plot pattern and building structures

Kotwali areas contain a population of 284,991 with a density of 148,000/km^2. Land use of Kotwali Thana under which include the unplanned study area is urbanisation 100%; residential 32%, commercial 19%, offices 6%, business centre 38%, common facilities 3.3%, low marshy land 0.5%, fallow land 0.5%, and others 0.7%. Mixed land-uses are a pre-requisite for compact cities, where other than heavy industrial and hazardous uses, the other uses are located within close proximity to each other. The traditional fabric of the city has either been damaged, remodeled or has disappeared entirely. Architecturally significant buildings that are fifty to hundred years old, representing their time, and located in the older part of the city, have now become obsolete primarily because of economics (Ahmed, 2004).
Old buildings in dilapidated conditions and very bad state of repair are still in use. New extensions of up to four / five stories over old foundations of one to two stories are frequent. Most of the structures stand shoulder to shoulder without the minimum of open space necessary for light and air. The area seems very dense in terms of population and buildings but it is more apparent than real. The average FAR in Chawk was found to be only 0.9. Old Dhaka lacks in open spaces and parks. There are less than 17 acres of open space for over 10 lac people. These too are being impinged upon by hawkers and unscrupulous group or individuals (Mowla, 2008).

The grid pattern of roads was introduced in the city for the first time in Wari and Gandaria in 1885. The state sponsored planned extensions for the upper classes were contrasted with the unsanctioned, spontaneous, tawdry development in the old city. Comprehensively planned residential areas of Dhanmondi, Gulshan, Banani, Baridhara and Uttara etc. are the successors of this type. Dhaka has grown in size, scale and extent, and the distribution of urban functions has evolved and changed according to the dictates of political and commercial considerations.

Mohammadpur is a small prototype of such planned geometric development. Mohammadpur is one of the most prominent residential areas of the capital, Dhaka. The Dhaka City Corporation allots six wards (ward no 41, 42, 43, 44, 45, 46, & 47) and 45 mouzas under this area. It has 112,666 units of house hold and total area 12.14 km².Everything is available here and the communication system is very good. It is smoothly connected to both Sadar Ghat and Gabtali by the City Protection Dam. The Geneva Camp of ‘Bihari’ is in Mohammadpur. The Biharis have been living there since the end of the 1971 War of Liberation. ‘Asad Gate’ is the symbol of the Great Boys of the country who has contributed themselves for the country. As of 2006 Bangladesh census, Mohammadpur has a population of 528,402. Density is 44,000/km^2. Though initially Mohammadpur has grown as a residential area, nowadays many commercial places can be found here. The area has become more crowded than it was before.

Massive urbanization has turned Mohammadpur into a miniature city and has resulted in the loss of natural environment including swamps, wetlands. The concept of living in multi-storied apartments is something that is ordinarily not ingrained in the cultural experience of most people of Dhaka. It is a new experience for many people to live in apartments and maintain their life style, thus changing the urban and social fabric from the classic single storied independent house, to sharing smaller units of space side by side with numerous other families. The dwelling culture including plot pattern and building structures has also changed gradually over a short span of time. The traditional dwelling custom has changed in different orders from the native origin. Old Dhaka's buildings are of similar height in small plot (one unit/floor) whereas mohammadpur contain mid-rise to high-rise with different height (multiple units/floor).

5.2.2. Typology of accessible green space in study areas

According to the DMDP 1995**,** old Dhaka has only 5% and new Dhaka has about 12% open space. There is also no uniformity in open space standards between old and new Dhaka and even within two ends of the same area. Both of the study areas (unplanned and planned) have park and play fields which are used as public green spaces. From Table 5.1 it is evident that all the parks and play field of the unplanned study area except Armanitola Govt School play ground are accessible. Among these accessible greens of Old Dhaka, Bangladesh Maath near Aga Sadek lane and Sikkatuli Park Also known as Nazira Bazaar Park on Majed sardar Road are under ward 69, zone 02.Before 1971 Bangladesh Maath is known as Pakistan maath. Samsabaad Lane field is very neighbourhood oriented field of Ward 68, whereas Armanitola field is in ward 67. In the 18th and 19th century, Armenian Diasporas, consisting mostly of merchants, lived in the area. The area has the Armenian Church, established circa 1781. Sirajuddaula Park was established in memory of Nawab Sirajuddaula, the Nawab of Bengal who was defeated in the battle of Palashi in 1757. Nawab Salimullah contributed to the establishment of the park. These accessible green spaces are structured by adjacent buildings, streets layouts and defined by City Blocks.

Typology of accessible green spaces in Unplanned Study Areas:

Table 5.1: Accessible green spaces in Unplanned Study Areas

Typology	Name and Location	Total area (acres)
Parks	**Sirajuddaula Park**	0.500 acre
	Sikkatuli Khalek Sardar Park	0.290 acre
Sports facilities	**Armanitola Field**	1.850 acre
	Bangladesh Maath	1.480 acre
	Samsabaad Lane Maath	0.350 acre
	Armanitola Govt School Play Ground	Not accessible for all.

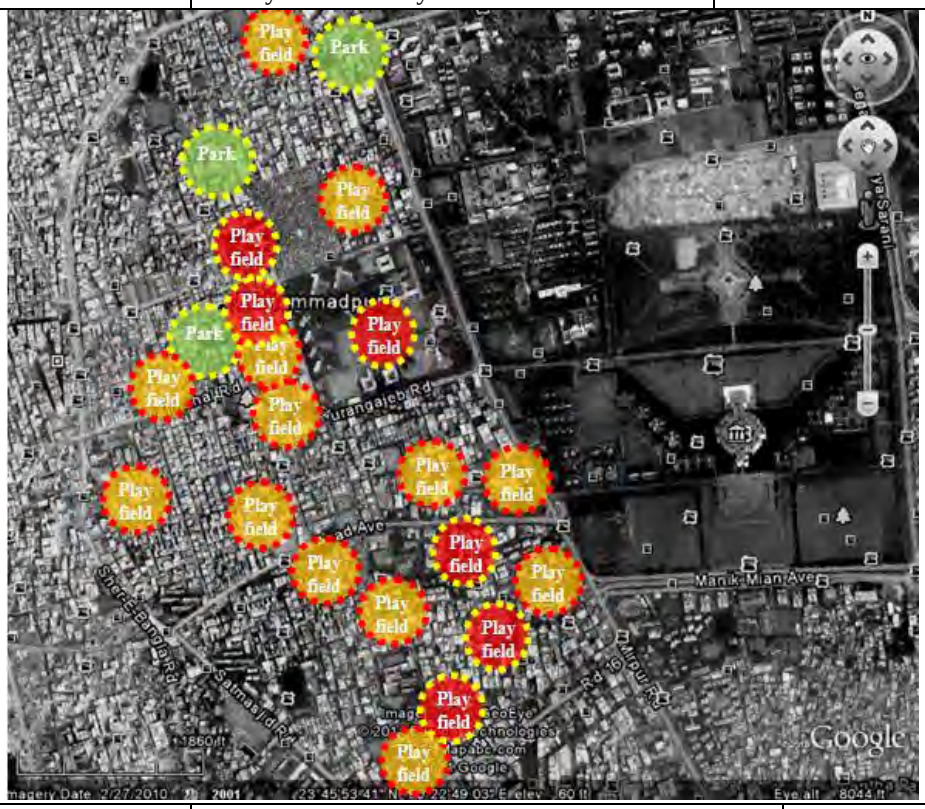
Typology of green spaces in Planned Study Areas:

There are 16 big play grounds and several important parks situated in Mohammadpur under ward 42, 44 and 45, where people can exercise their entertainment rights in fresh nature. Not all of them are accessible as few of them are under schools and other institutions. Lalmatia D Block Field, near Road 16 Dhanmondi is also known as Lalmatia D Block Park is under ward 45, zone 06. Under the same ward Lalmatia New Colony Field near Aarong and Lalmatia water tank. It serves the people of new colony Lalmatia, Lalmatia block A, B and also known as Asad Gate New Colony Boro Maath.

Table 5.2: Accessible green spaces in planned Study Areas

Typology	Name and Location	Total area (acres)
Parks and Children's play areas 	**Lalmatia D Block Park**	1.000 acre
	Tajmahal Road Children's Park	0.460 acre
	Shaymoli Khilji Road, Children's Park	2.000 acre
Sports facilities 	**Lalmatia New Colony Field**	2.300 acre
	Tajmahal Play Field Adjacent Tajmahal Park	1.460 acre
	Udoyjol Play Ground, Iqbal Road	1.200 acre
	Iqbal Road Field Park	1.700 acre
	Humayan Road Block B Play Field	1.370 acre
	Shaymoli Club Play Field	2.100 acre
	Zakir Hossain Road Play Ground	1.000 acre

	Sher Shah Suri Road Play Ground	1.870 acre
	Sonali Play Ground Near Shia Mosque	1.250 acre
	Mohammadpur Shahid Park Play Ground	1.980 acre
	Mohammadpur Eidgah Maath	2.680 care
	Salimullah Road Panir Tank Maath	1.000 acre
	Johury Moholla Play Ground	0.860 acre



Play field	St Joseph School play ground	Not accessible for all.
	Kakoli school play ground	
	Residential Model School & college play fields	
	Mohammadpur Govt High school play field	
	Lalmatia housing society boy's school play field	
	Lalmatia girls school & college play field	

Another play field under ward 45, Zone 6 is Udoyjol Play ground which is near the Iqbal Road. Iqbal Road Field Park is under same ward. Humayan Road Block B Play Field with green on north-east side of Ward 45.Tajmahal field and park is On Tajmahal Road under Ward-42, Zone-6 and on west side of Residential Model school and college. Khilji road Children's Park Also known as Shaymoli Park is another accessible green of planned study area. Besides these play grounds there some green garden in this area. Of these, two are at Asad Avenue and one is at Lalmatia C Block. At Asad Gate you will find a beautiful horticulture center which is being controlled by the Krishi Somprosaron Odhidoptor.

5.2.3. Spatial organizations with street layouts of study areas

The streets of organic city designed for palanquins, horse carriage, elephants and foot traffic are now being used by push carts, rickshaws, cars, trucks and pedestrians. Public transport is underdeveloped and mal administered. Traffic jam in old Dhaka is a way of life. The narrow, torturous roads and alleys are further constricted by public stand pipes, hawkers and spillover of business on to the streets. Pavements are literary absent. To be a pedestrian in these parts is a precarious experience (Mowla, 2008).

Figure 5.5: Galis of Old Dhaka and Street of new Dhaka

In the organic development streets gives a strong sense of enclosure by narrowing down at ends, which together with activities and events on its two sides make it a place to stay. The spaces in-between and in front of the buildings are vibrant and provide many closed and short vistas, which make streets, galis and other public spaces comfortable, satisfying and secure for assorted activities and to walk through (Mowla,2000). The general street layout of the accessible green areas is irregular though admired for being picturesque, can be confusing for visitors but rarely for the original inhabitants. In case of the mohammadpur green, the layout of street is reticular. Parks and play fields under this area are surrounded by roads, but in old Dhaka the scenario is different. Parks and play fields are not separated by roads from all sides. The corridors of old Dhaka's accessible green are characterized by commercial activities with lack of vegetation, lack of definition of parking spaces and foot paths. These characteristics make these corridors highly uncomfortable for pedestrian use. The streets of old Dhaka are very busy and the physical conditions are not so attractive. But the perception of space and a sense of enclosure are very strong in Old Dhaka due to the intimate scale of road network and closely-knit urban spaces. These closely-knit spaces accelerate the movement of cultural activity mostly at the outdoor urban environment. Mohammadpur Residential Area is dedicated residential areas with individual plots subdivided by gridiron road networks. There seems to be a preference among the residents to live in planned areas in order to have a better physical environment for healthy living. But people who live in both planned and organic areas show a 91 percent preference for indigenous social and spatial

environments (Mowla, 2003). livable streets, which was conducted in neighbourhoods with a grid, social networking and street playing degraded as traffic increased on a street, which has been found in mohammadpur areas.In most of the study spots of unplanned areas have internal walkway that is continuous .On the other hand in planned area such spatial organization is missing except few accessible greens. Following figures (Figure: 5.6-5.32) illustrate physical, visual and psychological connectivity with surrounding areas and highlights landscape structure, spatial organization and functional characteristics with special features of unplanned and planned study areas.

Bangladesh Math

Figure 5.6: Surrounding areas and spatial organization of Bangladesh Math

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics** [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Ward commissioner office
Circulation	Entry internal walkway	Residential area
Special features Gallery Seating	Water pump Club BLDG Mazar Tea Stall Chotpoti/food stand	
Area: 2.64 acres	Local sporting club since 1973 maintains the field. Condition of the	

Coordinates: 23°43'8"N 90°24'11"E	field is good .But authority concerned intentionally neglecting to do any development works on the field. WASA pump was set up at the south-eastern side of the field.	
Shape: Trapezoidal	**Major Activity**	Playing, walking, resting
	Most Active hour	Evening/weekend

Table 5.4: Functional and physical Characteristic of Bangladesh Math

Figure 5.7: Main entry, gallery for sitting, internal activities of Bangladesh Math

Shamshabaad Eidgah Maath

Figure 5.8: Surrounding areas and spatial organization of Samsabaad Lane Maath

Shamshabaad Eidgah Maath is in the high density traditional neighborhood (Kosaituli) which has some important architectural heritage like the Kosaituli mosque, famous for its intricate Chini-Tikri work, comparable only to the Star mosque of Armanitola. Kosaituli also has one of the most active Panchayet (1974) of Old Dhaka, with its distinct Panchayet house. Most of the neighborhood is mainly residential with some traditional factories with shop fronts. This Panchayet maintain this playfield of Old Dhaka (Ahmed I, 2012).

<table>
<tr><td>Street layout</td><td colspan="2">Landscape structure & Spatial organization</td><td>Functional characteristics [land use around green space]</td></tr>
<tr><td>Internal Street layout</td><td colspan="2">Green space</td><td>Commercial uses</td></tr>
<tr><td>Major Road</td><td colspan="2">Tree cover</td><td rowspan="2">Residential area</td></tr>
<tr><td>Circulation</td><td colspan="2">Entry
Internal walkway</td></tr>
<tr><td>Special features</td><td colspan="3">Pond Mosque</td></tr>
<tr><td>Area: 0.640 acre
Coordinates:23°42'55"N 90°24'21"E</td><td colspan="3">This field is in very compact neighborhood which is composed of single unit apartment of 5-6 stories.Bangshal pond is near to this playfield.</td></tr>
<tr><td rowspan="2">Shape: Trapezoidal</td><td>Major Activity</td><td colspan="2">Playing, walking</td></tr>
<tr><td>Most Active hour</td><td colspan="2">Morning and evening</td></tr>
</table>

Table 5.5: Functional and physical Characteristic of Samsabaad Lane Math

Figure 5.9: Main entry, sitting, internal activities of Shamshabaad Lane Math

Armanitola Play Field

Figure 5.10: Surrounding areas and spatial organization of Armanitola Field

Figure 5.11: Armanitola Field from above

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics [**land use around green space**]**
Internal Street layout	Green space	Commercial uses
Major Road Fly over	Tree cover	Institutional uses Old structures
Circulation	Entry	Residential area
Special features	Church Club BLDG Tea Stall Chotpoti/food stand	
Area: 3.229 acres **Coordinates:** 23°42'55"N 90°24'8"E	One hundred-year old historic Armanitola Maidan, a pride of the citizens of old Dhaka. This large ground which was created long before partition in 1947. The south west corner of Armanitola ground is the Armenian church situated as landmark. This ground has been surrounded by trucks, pickup vans and other vehicles. This unauthorized parking of transports have not only caused acute traffic jam but also marred the beauty of the ground making it difficult for local people to use it. The illegal parking of trucks and vans on the road there continues for a long time under the very nose of the law forcing agency. Taking advantage of the situation, drug addicts and muggers remain active almost round the clock. This age-old vacant lot has therefore lost its charm and utility.	
Shape: Trapezoidal	**Major Activity**	Playing
	Most Active hour	Evening

Table 5.6: Functional and physical Characteristic of Armanitola Field

Not only had the sprawling ground known as 'Armanitola Maath' provided the much-required space for the young men and children of the locality to play and do exercise in the past years, the ground has also seen many turns and twist in the history of Bengal in its heyday. History shows that stalwarts like Netaji Subhash Basu, Sher-e-Bangla AK Fazlul Haque, Hossain Shahid Suhrawardi, Bangabandhu Sheikh Mujibur Rahman, Mowlana Bhasani et al have addressed crowds at many important and critical moments of the nation. Many authors, writers and poets did find the field a place where they could ponder in private and do their work. The Armanitola filed, the Armanitola School and the Armenian Church of the area actually testify to a pluralist and rich culture of the yester years. (Source: The Independent, Bangladesh, Nov 30 2003.Though DSCC earned money from leasing the field but they did not maintain the field for the local people for rest of the year.

Figure 5.12: Surrounding roads, internal activities of Armanitola Field

Sikkatuli Shahid Khalek Sardar Park

Sikkatuli Shahid Khalek Sardar Park is a very small Park of old Dhaka. Though is small in size, the park serves the old Dhaka community as a breathing space, a place for interaction for all ages people (children/teenage/adult/old/woman). This park is being looked after by Sikkatuli Muslim Juba Sangha which is a local non profitable organization.

Figure 5.13: Surrounding areas and spatial organization of Sikkatuli Park

Figure 5.14: Surrounding road, main entry, internal activities of Sikkatuli Park

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics [**land use around green space**]**
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	
Circulation	Entry Internal walkway	Residential area
Special features	Pond Police Fari Waste Dumping Ground Tea Stall Chotpoti/food stand	
Area: 0.5 acres **Coordinates:** 23°43'5"N 90°24'22"E	Sikkatuli Children's Park also known as Nazira Bazar Park, Opposite to this park there is Sikkatuli pocha Pukur.	
Shape: Trapezoidal	**Major Activity**	Relaxing, walking, waiting, playing
	Most Active hour	All the day/weekend

Table 5.7: Functional and physical Characteristic of Sikkatuli Park

Sirajuddaula Park

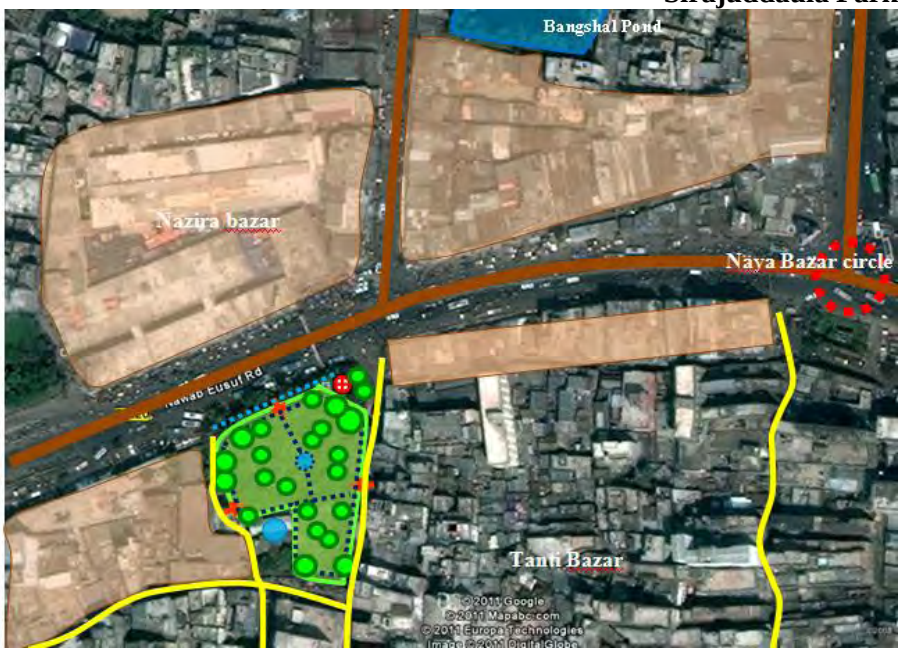


Figure 5.15: Surrounding areas and spatial organization of Sirajuddaula Park

Sirajuddaula Park looks comparatively good in the morning, but the atmosphere starts getting worse from afternoon when the park becomes crowded with floating people. They spend time or do physical exercise and boys often play badminton there. The park has five of its sitting benches specially arranged for women visitors only. But the recreational place becomes a heaven for drug addicts at night, polluting its ambience and environment, Sirajuddaula Park has lost its beauty now. Poor maintenance by the authorities concerned is blamed for the loss. The park remains open from 6am-9am and from 3pm-9pm

Figure 5.16: Footpath, inner environment, activities, sitting, internal walkway of Sirajuddaula Park

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics** [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Residential area
Circulation	Entry Internal walkway External walkway	
Special features	Pond Minar Water pump	
Area: 0.85 acre	Generally residents of Koshaituli, Jindabahar, Tantibazar, Bashabari Lane, and Syed Awlad Hossain Lane in the city come to the park everyday. People coming to do physical exercise everyday, formed an organisation named Bhorer Otithi, of which Haji Mohammad Yousuf is the vice-president.	
Shape: Trapezoidal	**Major Activity**	Waiting, walking(physical exercise),resting
	Most Active hour	Morning, afternoon, evening

Table 5.8: Functional and physical Characteristic of Sirajuddaula Park

Lalmatia D Block Park

Figure 5.17: Surrounding areas and spatial organization of Lalmatia D block Park

Figure 5.18: Internal environment, activities, main entry, surrounding road of Lalmatia D block Park

This accessible green is under DNCC and many tournaments take place in this field.the student of nearby madrasa use to play here daily as well as children from surrounding apartments also come here to play. It has been seen that at the afternoon school returning children of nearby locality come with their mothers to play.

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics [**land use around green space**]**
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses
Circulation	Entry	Residential area
Special features	Mosque Tea Stall Chotpoti/food stand	
Area: 1.00 acres **Coordinates:** 23°45'14"N 90°22'3"E	Football tournament	
Shape: Rectangular	**Major Activity**	Playing football or cricket
	Most Active hour	Afternoon

Table 5.9: Functional and physical Characteristic of Lalmatia D block Park

Lalmatia New Colony Field

Figure 5.19: Surrounding areas and spatial organization of Lalmatia New Colony Field

The playground in the capital's New Colony neighbourhood of Lalmatia, which was supposed to be swarming with children and people for recreational and leisure activities, is instead filled with cars on sale. Local ruling party men have long been renting out the field for display of cars every Friday, depriving the residents of recreational facilities and damaging its surface. Every Friday 150 to 200 cars are displayed on the playground between 9:00am and 8:00pm. The fair authorities do not allow sports during the fair. Local people said a section of local Awami League leaders who are running a club called "New Colony Krirachakra" is regularly renting out the playground for a car fair every Friday.

Figure 5.20: average tree coverage,dirt on the field,bus parking in Lalmatia new colony Math

Some officials of NHA, owner of the playground, are also getting benefit from the rental. These political leaders have also set up a makeshift kitchen market of around 200 stalls on the western side of the playground. In the time of survey and interviewing it has been said by the traders that the club authorities take Taka 30 to Taka 50 a day from each of the shops. The same club authorities also allowed Aarong to set up a car park during the entire period of Ramadan as the superstore does not have a parking space. SAM Fazlul Kabir, superintending engineer of Dhaka circle of NHA, said they had not given any permission to anybody for using the playground. “Everything is going on illegally. The field level officials did not take any action against the illegal users."

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics [**land use around green space**]**
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses
Circulation	Entry External walkway	Residential area
Special features	Water tank Mosque ire brigade Tea Stall Chotpoti/food stand Waste Dumping Ground Shahid Minar	
Area: 1.65 acres **Coordinates:** 23°45'30"N 90°22'19"E	Local sporting club "New Colony Krira Chakra" since 1973 maintains the field. Condition of the field is very bad .Authority concerned intentionally neglecting to do any development works on the field. It is Under NHA.	
Shape: Trapezoidal	**Major Activity**	Playing(active),waiting/resting
	Most Active hour	Afternoon/weekend

Table 5.10: Functional and physical Characteristic of Lalmatia New colony Field

Udoyjol Field, Iqbal Road

Figure 5.21: Surrounding areas and spatial organization of Udoyjol Field

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics [**land use around green space**]**
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses
Circulation	Entry	Residential area

	External walkway	
Special features	Water tank Mosque BLDG Tea Stall Chotpoti/food stand	
Area: 1.229 acres **Coordinates:** 23°45'42"N 90°22'5"E	It is besides Prepeitory school and Bangladesh University of Iqbal road.	
Shape: Trapezoidal	**Major Activity**	Playing, gossiping
	Most Active hour	Afternoon

Table 5.11: Functional and physical Characteristic of Udoyjol Club Field, Iqbal road

Figure 5.22: Entry from south west corner, Udoyjol Club house, students gathering in Tea stalls on North West side

Iqbal Road Field Park

Figure 5.25: Iqbal road Field Park From Above

Figure 5.23: Surrounding areas and spatial organization of Iqbal road Field Park

Figure 5.24: External and internal walkway with various tree coverage, sitting arrangement

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics** [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses Nursery uses

Circulation	Entry External walkway Internal walkway	Residential area
Special features	Water Pump Mosque Tea Stall Chotpoti/food stand	
Area: 1.607 acres **Coordinates:** 23°45'40"N 90°22'13"E	Maintenance by **Iqbal Road Club Limited** keeps the playground in a good condition excepting its poor drainage. Club authority uses the park as a means of earning. Portion of the field has remained occupied by the Water and Sewerage Authority for long. WASA pump was set up at the eastern side of the field about 10 to 12 years back. Also known as Strikers Math.	
Shape: Trapezoidal	**Major Activity**	Playing, Walking
	Most Active hour	Morning, Afternoon

Table 5.12: Functional and physical Characteristic of Iqbal road Club Field

Humayan Road Block B Play Field

Figure 5.26: Surrounding areas and spatial organization of Humayan road Playfield

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics** [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses
Circulation	Entry	Residential area

Special features	Water pump Mosque Seheva Camp Shahid Minar Tea Stall Hotpoti/food stand	
Area: 1.52 acres **Coordinates:** 23°46'8"N 90°22'2"E	Also known as Nabin Sangha Field. It is maintained by a club named Nabin Sangha. Field is under Dhaka North City Corporation (DNCC).	
Shape: Rectangular	**Major Activity**	Playing, cricket practicing as the field contain cricket net
	Most Active hour	Evening

Table 5.13: Functional and physical Characteristic of Humayan road B block field

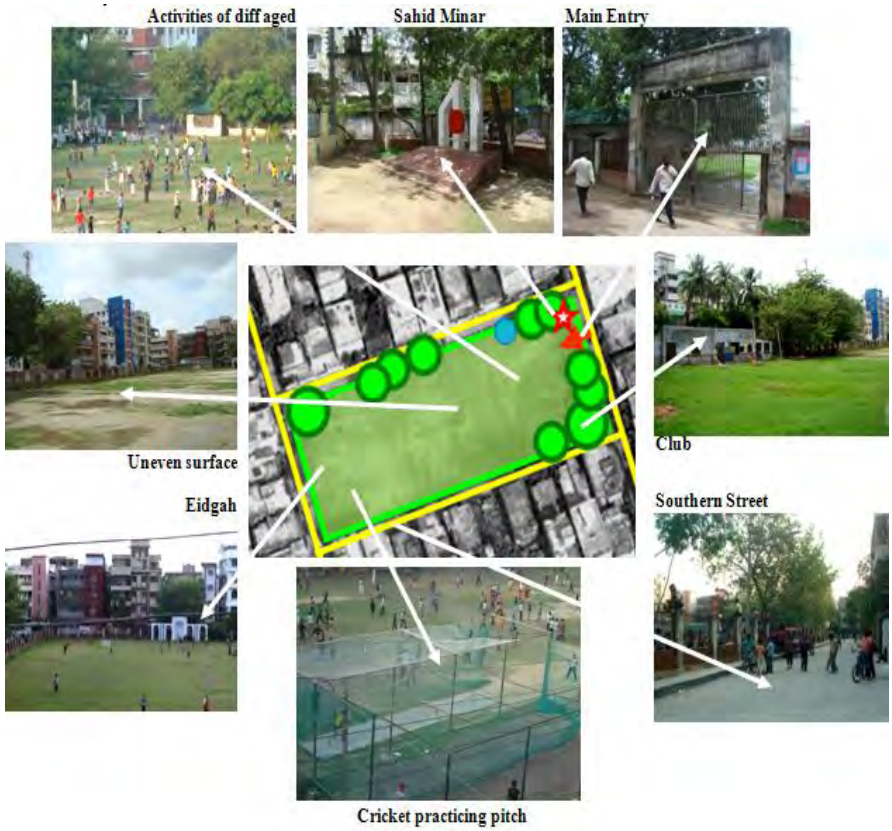


Figure 5.27: Activities and road networking of Humayan road Field

Tajmahal Park & field

Figure 5.28: Surrounding areas and spatial organization of Tajmahal Park- Field

Figure 5.29: Surrounding road, sitting, fountain of Tajmahal Park/Field

Street layout	**Landscape structure & Spatial organization**	**Functional characteristics**
Internal Street layout	Green space	
Major Road	Tree cover	Institutional uses
Circulation	Entry	Residential area
Special features	Madrasa, Tea Stall, Chotpoti/food stand	
Area: 2.06 acres **Coordinates:** 23°45'57"N 90°21'46"E	The park and field both are now under occupation by DNCC.the park is located on West side Block-C of Tajmahal Road.	

Shape: Trapezoidal	**Major Activity**	Playing,relaxing,walking
	Most Active hour	Evening

Table 5.14: Functional and physical Characteristic of Tajmahal Park/Field

Shaymoli Children's Park, Khilji Road [PC Culture Shaymoli]

Figure 5.30: Surrounding areas and spatial organization of Shaymoli Children's Park, Khilji Road

Figure 5.31: Commercial belt on east side, poor play equipment, continuous walkway with variety of activity: sleeping, waiting, playing, footpath, visual access from road

Table 5.15: Functional and physical Characteristic of Khilji road Park/Field

<table>
<tr><th>Street layout</th><th>Landscape structure
& Spatial organization</th><th>Functional characteristics</th></tr>
<tr><td>Internal Street layout</td><td>Green space</td><td>Commercial uses</td></tr>
<tr><td>Major Road</td><td>Tree cover</td><td>Institutional uses</td></tr>
<tr><td>Circulation</td><td>Entry
External walkway
Internal walkway</td><td>Residential area</td></tr>
<tr><td>Special features</td><td>Water pump Mosque Cinema Hall
Tea Stall Chotpoti/food stand</td><td></td></tr>
<tr><td>Area: 2.86 acres
Coordinates:
23°46'25"N 90°21'48"E</td><td colspan="2">In Khilji road at Mohammadpur, open space kept reserved for children's park is now under occupation by the DNCC for construction of its multi-storey health complex. Despite best efforts by the local people to prevent DCC from occupying the open space, the Corporation has already started construction.</td></tr>
<tr><td rowspan="2">Shape: Trapezoidal</td><td>Major Activity</td><td>Playing, walking</td></tr>
<tr><td>Most Active hour</td><td>Afternoon</td></tr>
</table>

5.2.4 Transformation of the areas

In traditional old Dhaka houses, the courtyard facilitates all household and socio-cultural activities as the focus of the spatial arrangement. The courtyard of Old Dhaka house form, traditionally central to social and cultural activities, often employed to provide climatic solutions has long vanished in new Dhaka. The concept of front (public: formal receiving of guests) and back (private: family and service) in rural archetype house form was thus reshaped to form an urban archetype (Khan, 1982). Usually, one court yard represents one family; multiple court yards characterize a number of families (extended or joint) residing in one house. An expanding family is reflected in the addition of courtyards surrounded by similar activities and rooms. It manifests various aspects of life style, values, social customs, culture, climate, location, economy etc. Changes in the socio-cultural context of the majority of urbanites from that of the compactness of Old Dhaka ,the New Dhaka urban dwellers with the increasing availability of developed means and materials, changes are brought in various fields like living patterns(single house to apartment), mentality, family structure(joint family to nuclear family), job satisfaction, education etc. These lead towards further transformation of the form of the spatial pattern in both areas. Nevertheless today the same spaces are used far differently in everyday life by the city dwellers. Dhaka that had lush green fields, infinite horizons where the blue sky met the greenery of the earth but today struggles to provide the children with small playgrounds. Urban lifestyle and house form experiences a series of alteration and adjustment in its planning, organization and hierarchy of space, and façade treatment, that correspond to the changing habits and activities as opposed to traditional behavior. Recent functional changes tend to result in commercial developments. The

functions of many buildings along the major streets are changing from residential to commercial, institutional and manufacturing activities in Mohammadpur. Quaint independent houses have been turned to high rise apartments. Multi-storied apartments are presently used in different functions.

5.2.5 Connectivity through axial representation (space syntax)

Connectivity is a measure of how connected a space is to other spaces. The value is arrived at by a simple count of the number of spaces that are directly connected to that space. Connectivity is related to spatial configuration .Spatial configuration affects users when they have to take the decision about what route they select for their trips to meet the destination.

Connectivity is shown from Google earth maps and through using space syntax (Space Syntax was initially developed in 70's to give an answer to the urban renewal processes that took place in London and as a result of the observation of the space in the city as a place for physical, social activities) that include axial representation (Figure 5.32 & 5.35).The axial map of a urban grid accounts for the description of movement-related aspects of urban form.
It is defined by Hillier et al. (1993, p.34) as the set of longest and fewest straight lines that can be drawn through the spaces of the grid so that the grid is covered. The graph allows a number of measures that can be used to describe configurational properties of the grid, related to connectivity, depth, accessibility and control. The most integrated lines are those which tend to be more accessible in the urban grid, and usually correspond to main paths or shopping areas. Segregated lines, on the other hand, are generally related to more quiet residential areas that tend to be deeper structures in the overall urban grid. Integration measures how many turns one has to make from a street segment to reach all other street segments in the network, using shortest paths. If the amount of turns required for reaching all segments in the graph is analyzed, then the analysis is said to measure integration at radius 'n'. The first intersecting segment requires only one turn, the second two turns and so on. The street segments that require the least amount of turns to reach all other streets are called 'most integrate' and are usually represented with hotter colors, such as red or yellow.

In this part of this research, the syntactic analysis of local and global integration was carried out as an independent system excluding the greater spatial system of Dhaka city. It is important to note that for local integration this research analyses at R= 4 as Dhaka (newer part) represents a strong intensified local area effect at the radius 4 whereas the historic part characterized its localities at the radius- 3 (Nilufar 1997) .For the space syntax analysis two maps of unplanned and planned areas were modeled in CAD. Regarding the accessible greens

(parks/playfield) selected it could be observed which park has axes with high connectivity values that surround it and which one has low connectivity axes with the measures of global and local integration. Axes with highest integration values of spatial configuration will be most accessible. The most integrated lines are automatically colored red, then through orange, yellow, green, to blue and deep blue for the least integrated. Both in planned and unplanned areas segregated lines are generally related to more quiet residential areas which surround accessible greens of the neighbourhood. So the study areas are mainly focused on neighbourhood level of greens.

The Neighbourhood Units of old Dhaka appear to be structurally segregated lumps in the urban fabric rather than well-structured parts of the whole. It is no continuity within the grid and many streets end in unconnected dead ends. From the following figure connectivity of streets with the selected accessible greens of Old Dhaka are shown. Each street connect with maximum number of streets denotes the degree of connectivity.

Figure 5.32: Axial connectivity of Old Dhaka study areas

Figure 5.33: Global integration pattern of Mohammadpur study area showing Integration [HH] R=n

Figure 5.34: Local integration pattern of Old Dhaka study area showing Integration [HH] R=3

According to the local integration values of Old Dhaka , they show how the axis of accessible green has the highest value of local integration (Table 5.17) and some streets that intersect with it have high values of integration too. These values mean that pedestrian "natural movement" move along these avenues in a local scale. From the above integration maps and following table it is evident that the connectivity of the roads in neighborhood of Old Dhaka is good in terms of local integration (3.3354) than global (1.3756). Table 5.17 portrays a comparative integration value of the streets of each accessible green of Old Dhaka which convey that the surrounding streets are locally integrated.

Table 5.16: Attribute Summary

Attribute Summary			
Attribute	Minimum	Average	Maximum
Connectivity	1	4.14386	21
Harmonic Mean Depth	3.36293	11.0761	25.6945
Harmonic Mean Depth R3	1.33333	9.05291	49.8883
Integration [HH]	0.46354	0.81664	1.3756
Integration [HH] R3	0.33333	1.64447	3.3354
Mean Depth	6.5101	10.6783	17.3521
Mean Depth R3	1.75	2.35923	2.73333
Node Count	1140	1140	1140
Node Count R3	4	30.8596	176

Table 5.17: Integration values of surrounding roads of the accessible greens (unplanned)

Accessible Greens of Planned area		North Side	East Side	South Side	West Side	North-west	South-east
Bangladesh Maath	Local Integration (R3)	2.369	2.009	1.698	2.239	--------	1.624
	Global Integration (Rn)	0.861	0.846	0.870	0.816	--------	0.805
Shamshabaad Lane Maath	Local Integration (R3)	2.364	1.785	2.243	2.835	--------	--------
	Global Integration (Rn)	0.921	0.885	0.963	0.896	--------	--------
Armanitola Field	Local Integration (R3)	2.542	2.734	2.542	2.275	--------	3.062
	Global Integration (Rn)	1.198	1.272	1.248	1.135	--------	1.345
Sikkatuli Park	Local Integration (R3)	2.200	2.934	--------	1.000	1.149	--------
	Global Integration (Rn)	1.092	1.232	--------	0.633	0.661	--------
Sirajuddaula Park	Local Integration (R3)	3.173	3.284	2.610	----------	--------	--------
	Global Integration (Rn)	1.318	1.276	1.135	----------	--------	--------

The axial maps of Mohammadpur study consist of a number of parallel lines, both long and short lines, passing through each other area. The most connected road is Mirpur Road in case of this part of New Dhaka. The result from axial integration maps highlights that most of the accessible green constitutes of a fragmented and segregated spatial system. From the following figure connectivity of streets with the selected accessible greens are shown. Each street connect with maximum number of streets denotes the degree of connectivity. Figure 5.34 shows the axial connectivity with integration value of each street through a color coding.

The maximum integration value is found 2.8354. The syntactic analysis of small-scale urban grids show that the primary and secondary roads of the planned areas gain the maximum local (R4) and global (Rn) integration value which constituted the local as well as global integration cores of those independent systems.

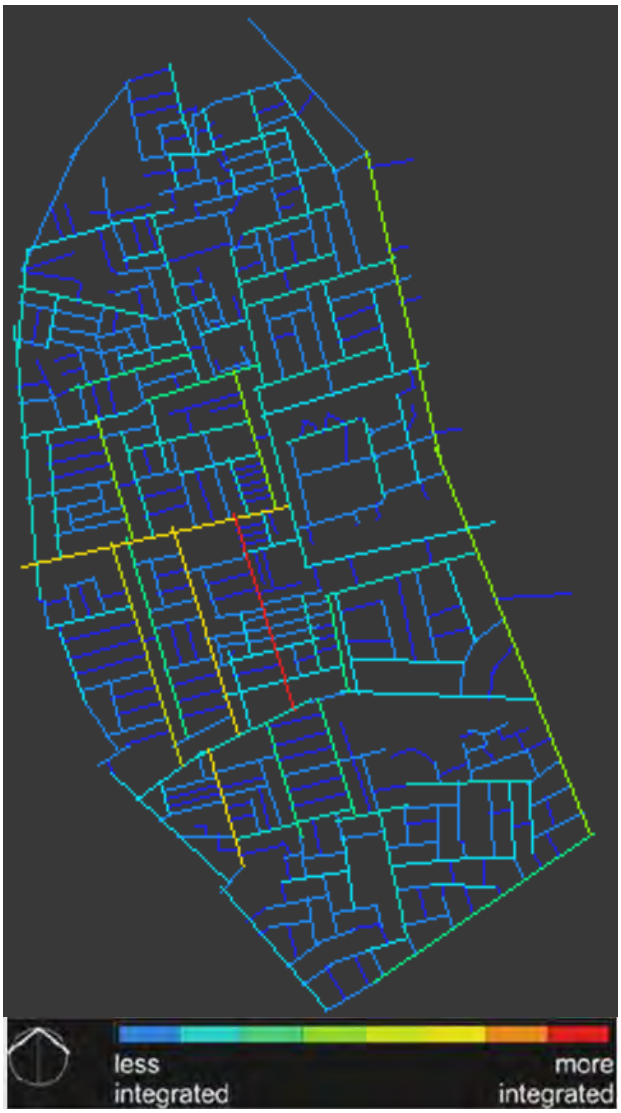


Figure 5.35: Axial connectivity of New Dhaka study area (Mohammadpur)

Table 5.18: Attribute Summary

Attribute Summary			
Attribute	Minimum	Average	Maximum
Connectivity	1	3.40803	20
Harmonic Mean Depth	2.79234	9.47807	22.9351
Harmonic Mean Depth R4	1.25	9.93481	48.7704
Integration [HH]	0.598861	1.08319	1.8031
Integration [HH] R4	0.351994	1.56151	2.8354
Mean Depth	4.50636	7.05319	11.5572
Mean Depth R4	2.5	3.26309	3.65789
Node Count	473	473	473
Node Count R4	5	77.5708	243

Such a character implies that those roads are more easily accessible from and with the planned areas. It is well understood that the planned residential areas being a small independent systems represent a localized system in which the locally important roads always coincide with the global integration core (i.e. Rn of independent systems) and get importance to the local inhabitants as well as to outsiders (figure 5.35). The table of the analysis (table 5.19) shows that most integrated streets surround the accessible greens of New Dhaka.

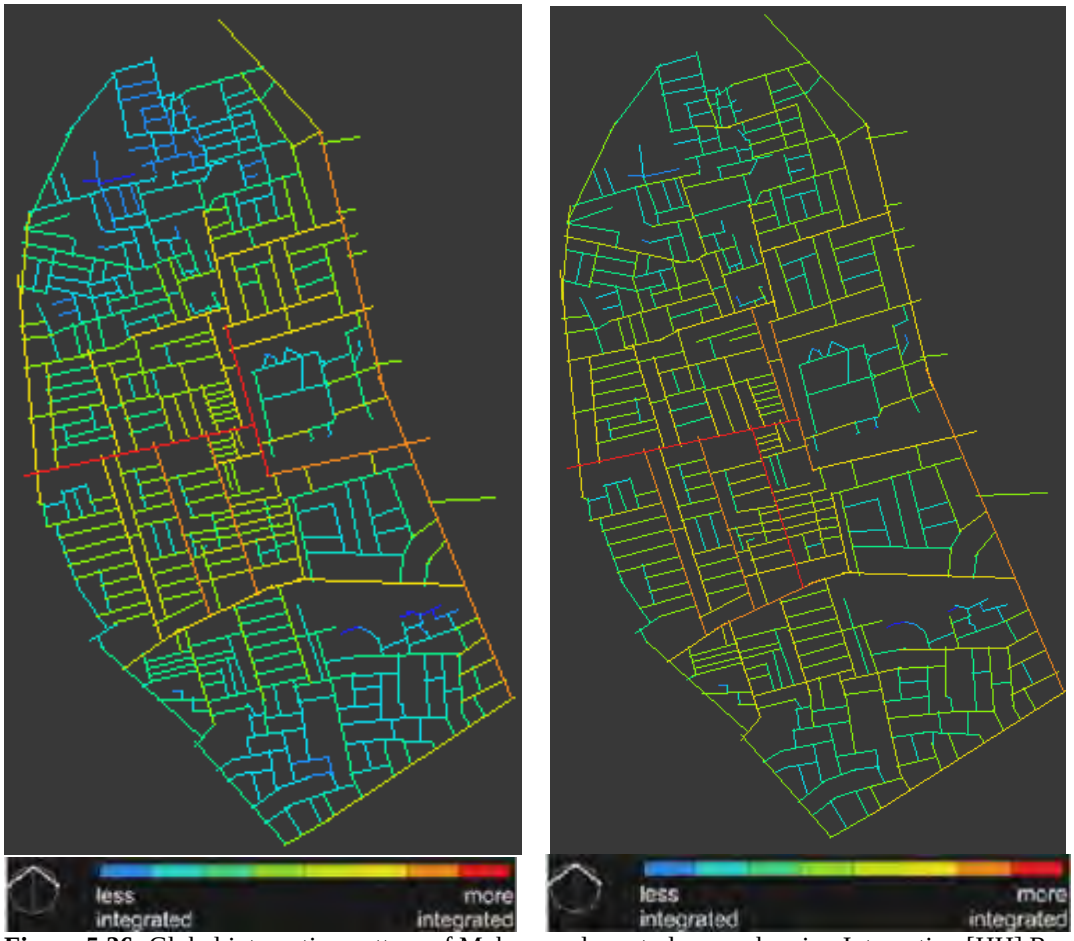


Figure 5.36: Global integration pattern of Mohammadpur study area showing Integration [HH] R=n & Local integration pattern of Mohammadpur study area showing Integration [HH] R=4

Table 5.19: Integration values of surrounding roads of the accessible greens (planned)

Accessible Greens of Planned area		North Side	East Side	South Side	West Side	North -west	South-east
Tajmahal Field	Local Integration (R4)	1.859	2.138	1.798	1.494	-------	--------
	Global Integration (Rn)	1.253	1.412	1.247	1.050	-------	--------
Iqbal Road Field	Local Integration (R4)	1.195	1.649	1.474	1.510	-------	1.570
	Global Integration (Rn)	0.980	1.158	1.012	1.013	-------	1.138
Udoyjol Club Field	Local Integration (R4)	1.226	1.191	1.226	-------	-------	--------
	Global Integration (Rn)	1.007	0.874	1.007	-------	-------	--------
Khilji road Children's Park	Local Integration (R4)	1.439	1.758	1.682	1.837	-------	--------
	Global Integration (Rn)	1.030	1.202	1.061	0.963	-------	--------

Humayan Road Play field	Local Integration (R4)	1.249	1.669	1.249	1.714	-------	--------
	Global Integration (Rn)	1.106	1.314	1.106	1.336	-------	--------
Lalmatia New Colony Field	Local Integration (R4)	1.367	--------	1.537	-------	-------	--------
	Global Integration (Rn)	0.864	--------	1.042	-------	-------	--------
Lalmatia Block D Field	Local Integration (R4)	1.401	1.534	1.887	1.648	-------	1.989
	Global Integration (Rn)	0.975	1.124	1.167	0.995	-------	1.352

The connectivity analysis of the unplanned and planned accessible green areas show that streets of theses areas are locally more integrated, some of them are concentrated in very high values and the rest of them in very low values of connectivity.

5.3 Social Dimensions

It is difficult to conceive of space without social content and equally to conceive of society with out of spatial component. The built environment influence patterns of human activity and social life. Human behaviour therefore inherently situational, it is embedded in physical and also in social, cultural and perceptual contexts and settings. Social dimensions include the urban life of public (public realm), neighbourhoods, safety and security, accessibility etc.

5.3.1 Scenario of urban life in study areas

The urban public life provides the communal identity and essential characteristics, such as, the presence of local institutions, official recognition, the type of housing they contain, the pattern of social interaction and organization that they exhibit, the ethnic, socio-economic, and demographic makeup of residents. The socio cultural dynamics resulted in the formation of spontaneous neighbourhood, known as para or mahallas that act as the basic spatial unit to form the organic pattern in the urban web of Old Dhaka. The basic pattern evolved a hierarchy of spaces that manifested the socio-cultural quality of urban life (Mowla, 1997). Recently the issue of globalization also becomes an important factor for more job opportunities, which further accelerates the physical changes to accommodate the incoming population. As a result of this phenomenon, communal life and identity are gradually diminishing (Mahmud, 2001) which is seen in the context of New Dhaka. Physical setting is gradually transforming and social spaces are diminishing, neighbours are now visiting shopping malls and restaurants. Their interaction with people from the same neighbourhood is now replaced by interaction with other people. These days opportunities to socialize are rare, especially for those of children, disabled, or elderly people; outdoor recreation is limited and often unpleasant. People living in the same building rarely know their neighbors; social isolation leads to unhappiness. But the excitement and life found in old Dhaka are to a great extent to the cheerful chaos randomly built into it. The fact that old Dhaka still serves vital

social and economic functions, tells of the vitality and strength of the culture that produced it (Mowla, 2006). New Dhaka has become a conglomeration of innumerable self-alienating private spaces of various sizes and scales. Everything is about that interior space within the bounded plot; no consideration is given to the streets and public spaces. The culture of constructing multi-storied apartment blocks in Dhanmondi, Mohammadpur, Gulshan, Uttara has ironically become a visual trope for the essentially estranged nature of Dhaka's urban life. General attitude of both the patron and the designer of a multi-storied apartment complex is one of creating for a few families a "safe" private haven - an interior refuge from a perceived harsh exterior, marked by environmental hazards, social anxiety and street violence. All their efforts and energies are spent in embellishing only that interior world; conscious attempts are made to alienate it from the very urban milieu of which it is a part. Dhaka's recent urbanisation and city life not only fail to evoke any kind of image or to inspire the construction of an identity in which people can take pride, but also ensconce a culture of isolation, estrangement and apathy. Controlled, monitored, regulation and irritations of everyday urban life make impossibility for the un-expectation and the spontaneous activity to take place and ultimately leads to the exclusion of certain groups and behavior (Habib. K. 2010). Present urban planning and design in Dhaka inhibit urban residents to form any meaningful relationship with their present urban outdoor settings and lifestyles are increasingly becoming introverted.

5.3.2 Neighbourhood characteristics of the study areas

Neighbourhood not only refers the physical setting, activities, and boundaries, but also contain the communal life with the norms, values and common beliefs of a group of people. Neighbourhood today serves many of the functions of the urban communal life in many neighbourhoods. The English term ‘neighbourhood’ is similar as 'Mahalla' (in Urdu) or 'Para' (in Bengali) in Dhaka society. It is referred in the literature that historically both the Hindus and Muslims of Old Dhaka used to live in compact groups forming a remarkable system of neighbourhood organisation locally known as “mahallas”. Local mahallas has a spatial dimension and physical connectivity and it is not strictly dependent on area or population size. However both must be comprehendible. Old Dhaka neighbourhoods were the enclaves of caste or craft groups (ethnic or occupational groups) (Sub cultural boundary) with high level of mutual help and sharing with geographically defined territories (neighbourhood boundary). The historically renowned occupational and ethnic neighbourhoods, like Shnakhari Bazaar and Kasaitoli, are still remembered and their existence has certainly been agreed by the local people. In Old Dhaka, the local features and local foci influence people many times to place the boundary along the local wavy organic lanes which are sometimes

not physically distinct on maps. The local landmarks act as reference points. Another public place named as Chawk or town square is an open public spaces commonly found in the heart of traditional town like Old Dhaka.

The concept of social neighbourhood, commonly known as ‘para’ in the newer parts of the City, like Segun Bagicha, Dhanmondi, Mohammadpur is present here. The paras in Dhaka actually denote a set of people having regular social interaction (primary or face-to-face) on the basis of close co-residence in a physical area (Nilufar 2004). In new Dhaka, people agree that the physical parts of the locality are neighborhoods with a named identity and Dhaka as local areas appear rather big in size; therefore, familiarity with local feature is unlikely. Some areas show a significant difference where arterial and local roads are mainly referred to as a boundary. Boundaries defining a distinct territory enhance the development of functional and social interaction, a sense of community and identification with the area .Though Jacobs (1961) argued that neighborhoods that worked best had no beginning or ends-a major part of their success depended on their overlapping and interweaving. Old Dhaka neighbourhoods have sub cultural boundary (Shankhari Bazaar etc) sharing with geographically defined territories which are overlapping and interweaving whereas in new Dhaka the streets define the boundary of an area. As a planned area Mohammadpur is divided by commercial streets. In the case of Dhaka boundaries are mental rather than physical.

5.3.3 Psychological profile of the areas [human psychological and attitude]

The organic cities reflect the ‘community spirit. The socio cultural background of Dhaka will provide the urban scenario and the general cultural context including the psychological profile of Dhaka in order to understand the nature of people’s attitudes among others and in public green spaces. This becomes particularly important to know the livability of city people. Knowing about users social and psychological background can supports the study’s findings and orient further recommendations for making the accessible green spaces more liveable.

5.3.4 Accessibility analysis in terms of visibility, movement and mobility pattern

The traditionally evolved built environments may have some problems in terms of physical parameters such as accessibility, maintenance level, hygiene etc.; but they seem to be in harmony with the users. This harmony is getting lost in the emerging urban environments of developing cities, though these urban environments satisfy most of the physical parameters. This is because of the lack of understanding of user preferences, while planning and designing the urban built environments. User preferences in terms of space proxemics vary due to the

cultural differences, accessibility and connectivity as well. Spatial configuration affects users when they have to take the decision about what route they select for their trips to meet the destination.

The dynamic elements of movement, hierarchy of spaces, activities, culture and life styles are as integral to the composition of the city as are the physical elements (Mowla, 2008). Those spaces become more user-friendly as well as vibrant when accessibility is possible. Public realm should be accessible and open (freely chosen and spontaneous actions of people) to all. Accessibility reflects both mobility (people's ability to travel) and land use patterns (the location of activities).Movements are linked to specific urban activities and their land use and people decide modes of travel (walking, biking and transit) based on their destinations and use of activities that they want to perform, as well as the order in which the activities are performed. "Mobility" refers to the movement of people and goods. This recognizes both automobile and transit modes. Pedestrian mobility pattern means walking facilities, such as sidewalks and underground passages. Interaction among pedestrians affects the rate and the duration of contact opportunities in such places if the visual and physical accessibility is achievable. From figure 5.2 the walking area and activity area inside the accessible greens (unplanned area) can be identified. A user can be in one of the following three states: walking (user is moving in a walking area), visiting (user is visiting an activity area), or waiting.

In old Dhaka people use rickshaws, push carts, van, cars, and trucks as means of transport. Though the movement pattern of this area is mainly pedestrian where pavements are absent and these spaces are surrounded by hawkers and small business. Both the parks (Sikkatuli and Sirajuddaula) of the unplanned study areas have the visual access as well as physical access with a comfortable environment as enclose by tree canopies. Sirajuddaula Park is beside major busy road with dense scenarios pedestrian crowds and used as waiting place for the passersby all day long where as Sikkatuli contain a continuous street at only one side which experiences traffic jam most of the times (Figure 5.38).There is no visual accessibility in case of Armanitola field and Bangladesh math of Old Dhaka except the entry gates .Pedestrian walkways is absent as well. Samsabaad math has visual accessibility but mobility pattern vary according to different streets width at the way to reach there. Though the street width of Armanitola field is larger than that of Bangladesh math but the pedestrian movement experience is better around Bangladesh Math rather than Armanitola Field.

Figure 5.37: presence and absence of visual accessibility of unplanned study areas

At the neighborhood level, accessibility is affected by the quality of sidewalks and cycling facilities, street connectivity, geographic density and mix which can be seen in planned study areas. Network connectivity (more roads or paths that connect one geographic area with another) of Mohammadpur allows more direct travel but motorized conditions sometimes discourage people (mostly old aged people and children) to cross the streets and use the neighborhoods' social spaces. All the parks and play fields are visually and physically accessible to all type of users. Most of the accessible greens have walkways adjacent to the street which welcome the users and enhance the rate of pedestrian movement. Designed open spaces within a residential environment need to be integrated with visual and physical approaches to ensure accessibility, movement, security both based on their size and access pattern. Spaces for children require safety from strangers. Moreover, open spaces within walkable distance are also essential for elderly people and women for ease of movement. Frequently used accessible public spaces are less vulnerable to illegal encroachment and other transformations hampering the residential living environment (Siddiqua A, 2011).

Figure 5.38: visual and physical accessibility of greens of Mohammadpur (Humayan road field, Lalmatia new colony field, Khilji Road Park)

5.4 Functional Dimensions

Functional dimensions focus on social activities: how people use spaces, how spaces can facilitate activities and how the relationship between spaces and activities are structured. Most of the parks of the study areas (old and new Dhaka) can be distinguished according to their publicness. For example Sirajuddaula Park of the old Dhaka and Khilji road children's Park of Mohammadpur are mostly used semi public where as Samsabaad Lane Math, Bangladesh Math, Humayan road Field, Tajmahal park field ,Lalmatia D Block Field are more semi private. Though these accessible greens provide physical comfort (tree canopies, sufficient seating) and passive engagement but there are a lack of 'soft edges' and smooth transitions between the private and public.

Passive engagement leads to a sense of relaxation, people watching, waiting, sleeping etc. After evening and at night the social and psychological comfort level of users is low because of the absent of adequate light and security and stay closed after eight o clock. Though most of these parks are actively (walking, exercising) used at morning before eight o clock.

Figure 5.39: people relaxing under tree canopies, waiting, and walking in Sikkatuli Park, sleeping under trees, gossiping, Old Dhaka

It has been seen while surveying women use to come for walk at late afternoon between 3-5pm (Figure 5.40). Sirajuddaula Park has five of its sitting benches specially arranged for women visitors only. Sirajuddaula Park is also adorned with a fountain inside. Six palm trees and two Chambal trees have been in the park for over 100 years.

Figure 5.40: people relaxing, waiting, play equipments in Khilji road Park, social circles (different ages, activities) in Humayan Road Field.

Same scenario is seen in the parks of Mohammadpur (Tajmahal Park, Khilji road Children's park).Part of Khilji road Park is being used actively as well as passively. Active engagement involves a more direct experience with a place and the people within it with varied transitional forms between being alone and being together. Another form of accessible green the play fields provide varying degree of engagement and also disengagement from contacts. The arrangement of internal walkways, benches, play equipments for children, fountains, chotpoti, jhalmuri stand, tea stalls sometimes more or less conducive to social interaction.

5.5 Environmental Dimensions

Environmental dimension for this study is comprised of two factors: physical factors and climatic factors. Physical environment enhance or distract the users according to its condition. Vibrant and successful contrast among the elements of physical environment improves the liveability of the local people as well. These elements are: floorscape (Hard pavement or soft landscape area), tree coverage (various types of tress or spots), water or rainfall retention, the boundary (solid/open/visually accessible or non accessible), lighting. On the other hand the climatic factors contain levels of sunlight, shade, temperature, humidity, wind environment, air quality and noise. The greening of towns and cities represents a key sustainability objective. Tress and other vegetation express the changing seasons, enhancing temporal legibility of these accessible greens. Trees provide a contrast with and a foil to, hard pavement and add a sense of human scale, a sense of enclose and continuity The ideal condition of a boundary wall or fence is to give an identity and enclosure of the accessible green and also has a strong visual connection with the surroundings. An essential part of these accessible greens are the need to provide climatically comfortable conditions; if such places are not comfortable they are unlikely to be used. Levels of sunlight, shade, temperature, humidity, rain, wind and noise have an impact upon our experiences and use of accessible greens. Landscape, planting, fountains enhance natural cooling. Sunlight penetration into the greens helps to make them more pleasant, encourages out door activities and plant growth, and improves health by providing the body with vitamin E. Figure 5.42 displays the physical condition of accessible greens of planned and unplanned area.

5.6 Problem analysis

Lack of policy, low political motivation, and poor management are the causes for the drastic reduction of green spaces in greater Dhaka as well as using the green by city people. It is found that distribution and distance of green from house hold also creating an impact of using

the greens by the residents. Most areas, old or new, of Dhaka city, have little scope for creating any green space or enhancing the existing ones, if any still worthy to be called so. But the importance and necessity of green space is simply great and we cannot do without it in too crowded a city like Dhaka. Despite the importance of parks, many of us do not have adequate access to parks and open spaces. In addition to provide recreation, open spaces provide visual breaks between and within residential areas and it can contribute to the development of walking and cycling space. Ideally, all households should have access to open space at a reasonable distance. It can create improved opportunities for social interaction which is favourable to the development of communities.

5.7 Attributes and Measures of performance evaluation of the study areas

It is evident from the above problem analysis part (chapter 5, 5.5) proper measures should be taken to uplift the performances of the accessible greens (parks and playfield) of study areas as well as of whole Dhaka city in terms of spatial connectivity with existing urban fabric, accessibility according to Christopher Alexander's PATTERN 60 in context of study areas and liveability through the evaluation from users'(local people) perception, their need and satisfaction (passive & active engagement/discovery) as we know these greens are an essential constituent of urban liveability of life. The aim of this section is to get a measure of how important access to green space is when compared with these other important factors in the neighbourhood environment .

Table 5.20: Attributes of performance evaluation of the study areas to investigate Liveability

A T T R I B U T E S	**C O N T E X T**	
Morphological Dimensions	**Unplanned area**	**Planned area**
01.Connectivity	**Play Fields/Maths as accessible greens**	
Orientation and connectivity		
Social Dimensions	01.Armanitola field 02.Bangladesh math 03.Samsabaad lane math	01.Lalmatia D block Field 02.Lalmatia New Colony Field 03.Udoyjol Play ground, Iqbal Road 04.Iqbal Road Field Park 05.Humayan Road Block B Play Field
02.Accessibility		
Visual accessibility Physical accessibility Distance and frequency of uses(PATTERN 60)		
03.Sociability(social life)		
Varity of events and activities/diversity Sense of attachment and adjacent uses	**LIVEABILITY**	

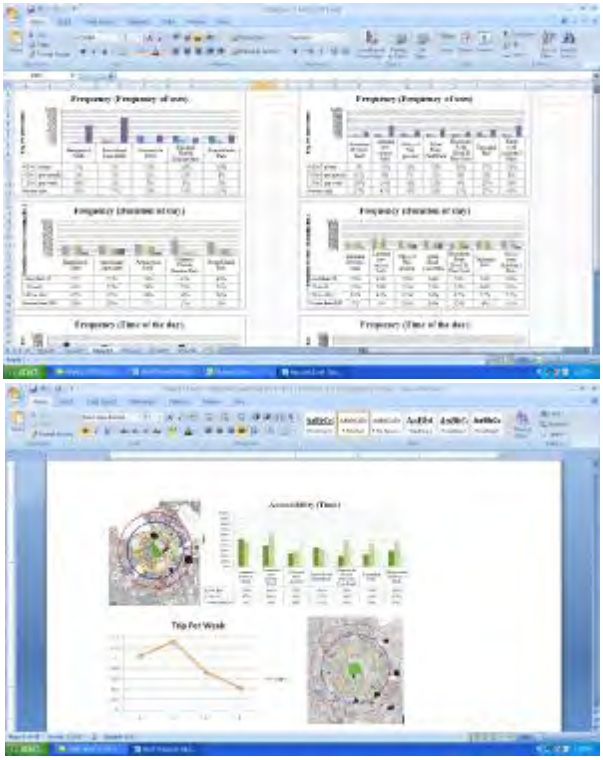
04.Amenities		
Functional Dimensions		
05.Comfort	**Park as accessible greens**	
Climatic comfort Social and physical protection Cooling/warming Effect Maintenance /services	01.Sikkatuli Khalek Shardar Park 02.Sirajuddaula Park  Old Dhaka :Organic pattern	01.Tajmahal Park 02.Khilji road children's Park  New Dhaka: Grid pattern
06.Users preferences and needs		
Users' profile Users' perception and satisfaction (passive & active engagement/discovery)		
Environmental Dimensions		
07.Environmental Impact & weather parameters		
Physical Environment Climate		
Performance Evaluation of AGP		

'Accessible green performance' (AGP) of Dhaka in terms accessibility, in terms of connectivity with city, distance between house cluster to accessible green, frequency of uses, sociability or liveability through sense of place, diversity of activities, comfort by giving physical and social security, arranging furniture, accommodating services and tree coverage, priorities in users preferences and needs, and their success level will be evaluated. 'Level of performance' from the viewpoint of stated attributes on the basis of a comparison of twelve selected spots of Dhaka will be defined in five categories: (1) very successful, (2) successful, (3) moderately successful, (4) marginally successful. Performance measures used in this analysis reflects the perceived performance of the accessible greens from the users' evaluation perspectives.

5.8 Lesson Learned and Summary

From above discussion it is evident that no area is exactly the same as another, but many share similarities. Though the two environments are opposite to each other in terms of land uses, plot and street patterns, public space networks but the need of accessible green is utmost priority to the local people as well as to the users. The land uses old Dhaka are changing through time and with incoming uses. The peripheral building structure gives us the glimpse of new Dhaka in some places of unplanned study area. Old Dhaka streets show the picturesque character because of the organic or deformed grid where as rectilinear plot pattern

with regular grid of Mohammadpur portrays monotony in nature. Public space network are livelier to Old Dhaka than new Dhaka. People of new Dhaka are more vehicles oriented. But on the other hand people of Old Dhaka love to walk though Old Dhaka do not have foot path as new Dhaka. Day by day fine urban grain with small sized streets blocks (collective ownership) of Old Dhaka is disappearing and coarse urban grains with larger blocks (individual property) of new Dhaka are creating pressure on the land, services as well as open spaces. It has been observed that people from a distance bearing the communication cost only to get relief from the exhaustion of busy urban life as distribution of multifunctional green spaces are not evenly done in planned and unplanned area. As this study aimed to look in depth at two contrasting environments, to explore and understand the issues related to **PATTERN 60 (ACCESSIBLE GREEN)** of Christopher Alexander in the context of urban Dhaka to portray livability and that can be only done by creating more accessible green within few minutes walking distance through out Dhaka as well as study areas, making more liveable and maintaining the existing green areas in the study areas by introducing hierarchy of activities as per need of the users.



CHAPTER 06: ANALYSIS AND SYNTHESIS

This chapter briefly describes the observational characteristics of accessible green spaces of planned and unplanned areas and residents responses towards accessible green areas. Analysis and synthesis of the case studies includes various attributes under which different measures are taken to investigate liveability. The results provided in this chapter allowed identifying factors in twelve selected neighborhood greens that influenced the connectivity, accessibility, frequency of uses, uses and activities, sociability, amenities, satisfaction of users needs and thermal comfort. This study has particularly identified **PATTERN 60: ACCESSIBLE GREEN** in context of the study areas (Figure 6.1) and also the problems that will helpful for orienting design implication and improving liveability of the greens. This chapter will also present the observation findings with comparative analysis of the unplanned and planned study areas.

6.1 Interview result and discussion

One most important section of the study is the presentation and discussion of the answers from spot survey through observation and provided by the users of the accessible greens of unplanned and planned areas of the research. The results are important because they add validity to the research questions made and the methodology used in this study. The research results are structured and discussed according to the different attributes that were covered in the interviews. They are as follows: **connectivity** which is subdivided by orientation and connectivity, **accessibility** by physical and visual accessibility, distance and frequency of uses, **sociability** which is subdivided by uses and activities, sense of attachment and adjacent uses, **amenities** (provision of internal walkway ,outdoor furniture, landmarks, parking, waste receptacle etc), **comfort** by climatic comfort, social and physical protection, maintenance /services and tree coverage, **users preferences and need** which convey users' perception and satisfaction (passive & active engagement/discovery)and finally **environmental impact & weather parameters** that express thermal performance**.** Theses variables were selected based on the problem addressed to enhance accessibility and liveability of accessible greens.

According to Christopher Alexander's **PATTERN 60 (ACCESSIBLE GREEN)** should be within three minutes walk that cover about 750 feet. Therefore figure 6.1 and figure 6.2 are the location maps of the interview participants with the radius of 250 feet, 500 feet, 750 feet and 1000 feet which will cover one to four minutes walk from the accessible greens of unplanned and planned areas. The interviewed persons' locations are colour coded according to the diameters rings colour. The mustered color ring denotes 500 feet diameter (250 feet radius distance), the yellow one 1000 feet (500 feet radius distance), blue ring marks 1500

feet (750feet radius distance) and the red one 2000feet which contain 1000 feet radius distance. The black colour indicate landmark or important structures those give an identity of that place to the city people.

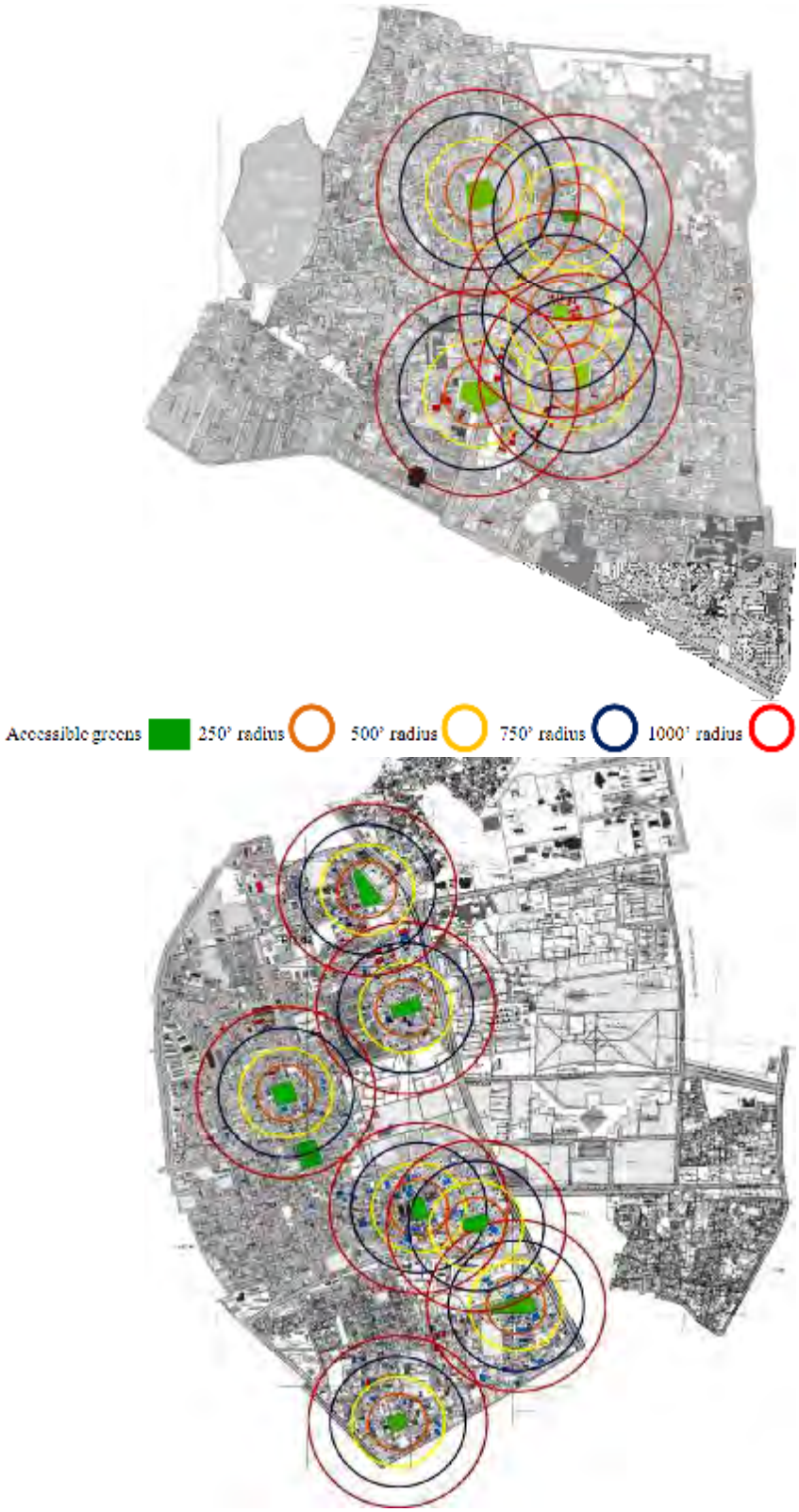


Figure 6.1: Location maps of the interview participants of unplanned areas & planned areas

6.2 Performance evaluative criteria for analysis of Case studies

There are twelve study areas of unplanned and planned. Each study area has been evaluated by interviewing 30 people who were present on the area as well as on different distance from the study site. Total 360 people are interviewed .These people are of different ages ((children up to 10, young people from 11-15 and 16-19, adults from 20-25, 26-45 and 46- 55 and older people from 56-65, 66-75 and over 75) with different professions like service holder, businessman, students, house wives or others. Case studies of unplanned area include three play fields (Bangladesh Maath, Samsabaad Lane Maath and Armanitola Field) and two Parks (Sikkatuli Khalek Sardar Park and Sirajuddaula Park). Case studies of planned area include five play fields (Lalmatia D Block Field, Lalmatia New Colony Field, Udoyjol Play Ground, Iqbal Road Field Park, Humayan Road Block B Play Field) and two Parks (Tajmahal Park and Khilji Road Children's Park).

Young adults and middle aged people constituted more than 50 per cent of accessible green users. Teenagers and children were also identified as significant users of parks. It is clear that there does not appear to be any consistency in the characteristics of urban green space users according to age, which almost certainly reflects the great variety both of spaces and of people in different locations. People aged 25-59 have been identified as the dominant user group in Sirajuddaula Park. In Udoyjol Play ground and Iqbal Road Field Park the dominant age for use is revealed to be younger (25 to 45 years) is because this is the age group with children to take to such spaces particularly at evening and weekends. In terms of the gender of those who use urban green spaces, dominant users are mostly male. The Study also indicated that there were slightly less female users in planned study areas than female users of unplanned areas. Graphs 1A, 1B & 1C of Annex03 describe participants profile with their profession with perception (Annex 3: Graphs 2A, 2B & 2C) towards the existing greens (study areas) which emphasize the need of adequate amount of green and the types of greens they are deprived of.

Perception of the Users' in terms of having adequate amount of accessible greens in both areas is same. It has been evident that users perceive that they do not have adequate amount of green spaces in their locality. Need more green spaces. Users' perception in cases of Bangladesh Math, Samsabaad Lane Math and Armanitola filed that they needs green spaces like park or garden in their areas. Whereas Sikkatuli and Sirajuddaula park users think they need more green spaces for sports. On the other cases of planned areas like Lalmatia D block field, Iqbal road field park and Khilji road Children's Park the users needs such green space

that will act as multifunctional green space providing play areas for children, sports zone as well as park for all type of users. It is seen from graphs (Annex 3: Graphs 2A, 2B & 2C) users want diversity and wilder environments in their green spaces with option for sports, walk and for enjoyment. Green spaces have an important role in the social life of cities .It is obvious that environments that satisfy many human needs (such as easy accessibility, security, comfort, attachment) are highly visited by people, and therefore more livable, with a greater frequency of use, and more meaning and attachment to those spaces. People preferred to be in spaces where others congregated and socialize. Recovering the use and livability of green spaces can promote a sense of ownership and territoriality of neighbourhood green spaces and established, attachment to those greens. This attachment could also promote sociability in green spaces and subsequently social tolerance among strangers. Therefore these twelve spots are evaluated and described under four broad categories. These categories are connectivity, accessibility, sociability, amenities, comfort and user's preferences and need and thermal performances.

6.2.1 Connectivity

Connectivity enhances proximity by emphasising directness to the accessible greens. Accessibility depends on the connectivity pattern and orientation of those accessible greens with the city fabric. From the city to the part of the city to the study sites the different level of connectivity of roads, streets and pedestrian movement can be seen.

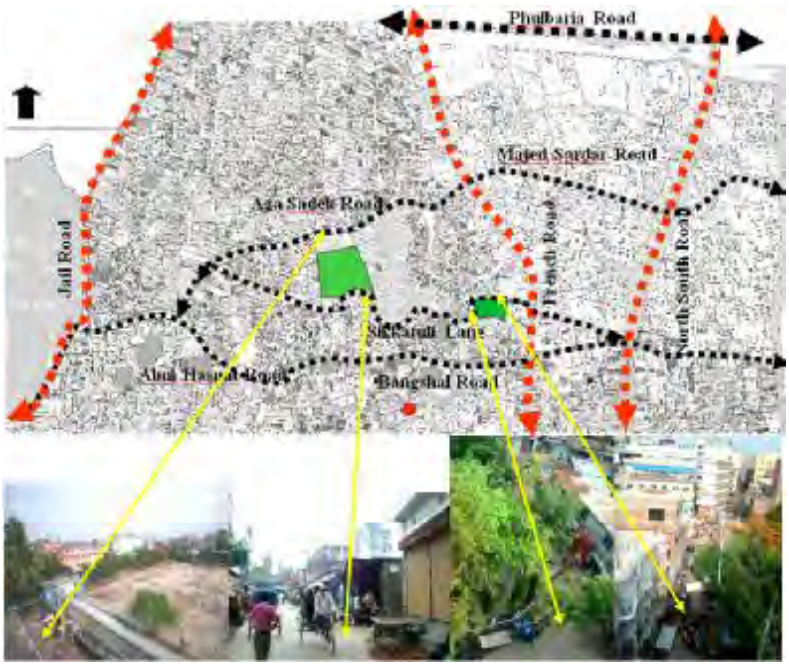


Figure 6.2: Aga Sadek Road near Bangladesh Math & Sikkatuli Lane near Sikkatuli Park

Study spots in unplanned area are not well connected to the city's main road network though Sirajuddaula Park and Armanitola Field are besides major artery of the old Dhaka. But the interface between visual coherence and movement of the local people make a good spatial

connection with the accessible green. Then again most of the accessible greens of planned area are direct connect with the Mirpur road which enhances accessibility of the city people as well as local residents.

Table 6.1: Findings on Connectivity attribute in unplanned areas

Morphological Dimensions

01

Unplanned area
Attribute: Connectivity

Orientation and Connectivity

Bangladesh Maath

Bangladesh Math is placed along Aga Sadek Road which is connected with Norh south road of Old Dhaka.The playground is visually non accesible from north,east and west as several types of shops surround the field.The main entry is from north side of the field with club BLdg at left and maza on right side. Low to moderate income residential neighborhood.Saat rawza is near the field.There is another entry on south side which is along Sikkatuli Lane.(Figure 6.2)



Main entry Connecting road

Samsabaad Lane Maath


Main entry gate Connecting road

This neighbourhood oriented field of old Dhaka is surrounded by Habibullah road on north side, K.P Ghosh lane on west and Samsabaad lane on south. It is connected with French road from east side.On North West corner Kasaituli Mosque and on south west corner Panchayet club. (Figure 6.2)

Armanitola Field

Well connected with the city. Armenian streets towards west and south. Bounded on the east and north by Nawab Eusuf road and P.K Ghosh streets (Figure 6.4).Mixed use (commercial & residential) buildings are around the Field. The Field is middle of a moderate income Neighbourhood.



Main entry gate Connecting road

Sikkatuli Khalek Shardar Park

Main entry gate Connecting road

Also known as Nazira bazaar Park on Sikkatuli lane (Figure 6.4) through which anyone can reach Bangladesh Math. The traffic on the Sikkatuli lane is relatively high as it is a two way 10'street.this small park is located in a racially mixed neighborhood.

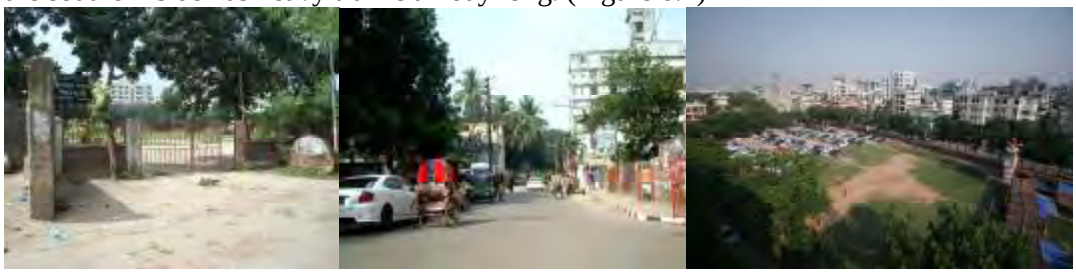
Sirajuddaula Park

Main entry Connecting road

This long-established park is accessed from busy Nawab Eusuf road, near Zindabahar, Nayabazar under ward-68, zone-2 with an area of 0.50 acres (Figure 6.4).Too much traffic on the Nawab Eusuf road invite passersby who are not the local user through out the day. It is surrounded by a mixture of uses ranging from commercial to residential. Most of the structures around the park are four to six storey hotel and apartment building.

Figure 6.3: Connectivity of Armanitola Field, Sirajuddaula Park & Samsabaad Lane Math

Table 6.2: Findings on connectivity attribute in planned areas

Morphological Dimensions
01 **Planned area** **Attribute: Connectivity**
Orientation and Connectivity
Lalmatia D Block Field  Main entry Connecting road Well connected with the city through Satmosjid road on west side and road 27 Dhanmondi on south. Most of the structures around the park are four to six storey apartment Buildings with a mixture of uses ranging from institutional to residential. (Figure 6.4)
Lalmatia New Colony Field Well connected with the city and has good visibility. Satmasjid road towards west and Road 16 Dhanmondi on south, Mirpur road towards east and Asad Avenue towards north. This field is surrounded by low traffic road on three sides: north, east and west. The road of the southern side has heavy traffic all day long. (Figure 6.4)  Main entry Connecting road
Udoyjol Play Ground  Main entry Connecting road Udoyjol Play ground is near the Iqbal Road.Bounded by Sir Sayed road towards north, Mirpur road towards east and Asad Avenue towards south.The play field is surrounded by a mixture of uses ranging from institutional to residential. Bangladesh University is besides this play field. (Figure 6.5)
Iqbal Road Field Park It is well connected and very close to Asad Avenue from south and Mirpur road from east. (Figure 6.5)The play field is surrounded by a mixture of uses ranging from institutional to residential as like as Udoyjol play field. The neighbourhood residents are mainly employed and retired middle to upper middle income people.



Main entry Connecting road

Humayan Road Block B Play Field



Main entry Connecting road

It is well connected and very close to Mirpur road from east. North side is connected with Babor road. Geneva camp is on the west side of the field (Figure 6.7).Mostly residential oriented structures are evident around the field holding a mix of families, retired people, professionals and students with medium to upper medium incomes. The streets all around the field are have moderately quite atmosphere.

Tajmahal Park and Field



Entry of field Connecting road

This small park is bounded by Tajmahal road on south, Shahjahan road on east, Humayan road on north with Tajmahal playfield besides the park. (Figure 6.6)

Khilji Road Children's Park



Main entry Connecting road

Also known as Shaymoli Park (2.86 acres) near Mohammadpur Ring Road, under ward-45, Zone-6.Well connected with Mirpur road on east side. Too much traffic on the Mirpur road invites passersby who are not the local user through out the day. This children park is opposite ASA building. (Figure 6.7)

Figure 6.4: Location of Lalmatia D block & Lalmatia New Colony Field with connectivity

Figure 6.5: Connection & orientation of Udoyjol club field & Iqbal road field

Figure 6.6: Location of Tajmahal Park- field with connectivity

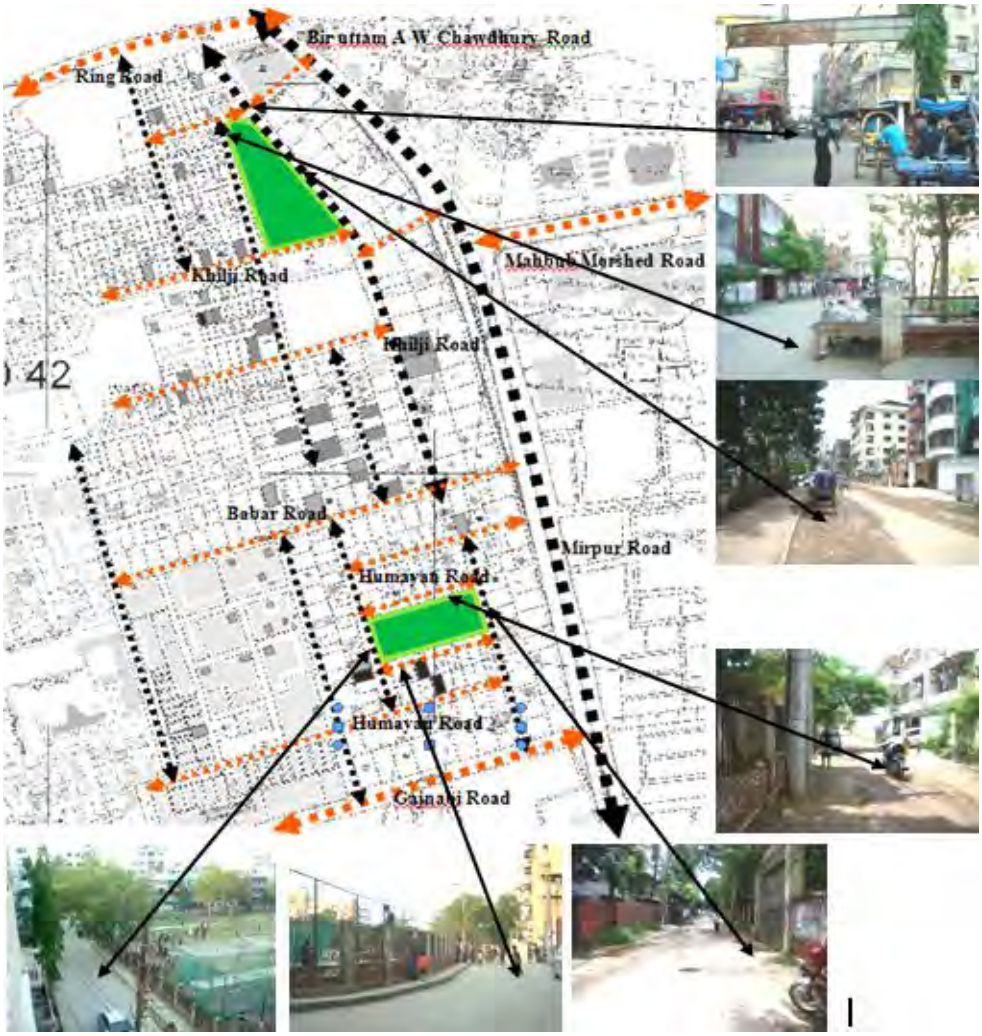


Figure 6.7: Connection & orientation of Humayan road field & Khilji Children's Park

6.2.2 Accessibility

Accessibility is the way users can locate or identify as well as arrive at the green and the distance necessary for access to it. This information is necessary to know if distance creates an impact on using the green or not and to explore if this influences people's intensity of uses and visits and to determine if problem in accessibility reduces the frequency of visit to the green. Frequency of uses was asked in order to know the number of times (on a weekly basis) a person visits the green and to know the time spent there. This information is significant to understanding people's pattern of uses and determining if green spaces are highly visited or not. Table 6.4 and Table 6.5 cover the findings on accessibility of unplanned and planned areas.

Table 6.3: Accessibility parameters

Accessibility parameters
Distance affects users visit to existing open and green space
[ ] yes **[ ]** no
Users preference for green space near to your home
[ ] yes **[ ]** no **[ ]** if so, why?
Time needed for normal journey to the green
[ ] less than 1 minutes **[ ]** 1-2 minutes **[ ]** 3 minutes**[ ]** 3-5 minutes **[ ]** more than 5 minutes
Distance of users living from this open and green space
[ ] very far **[ ]** far - more than 5 blocks **[ ]** Relatively close 2 -3 blocks radius **[ ]** very close- less than 1 blocks radius
Arrival of the users to this open and green space
[ ] public transport **[ ]** own vehicle **[ ]** walk **[ ]** other

Table 6.4: Findings on accessibility attribute in unplanned areas

Social Dimensions	
02	**Unplanned area** **Attribute: Accessibility**
Distance and Frequency of use	**Measures**
	Bangladesh Maath
	• Study area cover 2000 ft dia. This green is more neighbourhoods oriented. Therefore most users are surrounding neighbours that who live in close residential areas around Bangladesh Math. • 43% users think this accessible green is relatively close (2 to 3 blocks radius) to their residence and most of them sense that it takes 3-5 minutes to reach the green. • 90% of the interviewed participants accessed the green by foot when visiting the green for exercising. • 55% users think that distance act as a barrier to use the green. 53% users use the Bangladesh Math everyday where as 14% go there 2-3 times per week. • Bangladesh math experienced 30% users who use of half an hour to an hour. 27% of users were able to remain more than one and half hour in the green space. • In regards to the time of the day users visited the green showed that 73% people visit the

green in the afternoon and 27% in the morning hours.

Samsabaad Lane Maath

- Samsabaad Lane Math is more neighbourhood-oriented as Bangladesh Math.
- 49% users consider the green very close (less than 1 block radius) whereas 27% is relatively close (2 to 3 blocks radius) to their residence.
- 97% of users accessed the green by foot and to 70% people it gets less than 1 minute and to 23% users find 3 minutes to get in touch with the green.
- 93% users think that distance work as an obstacle to use the green. 77% users use the Samsabaad Lane Math everyday where as 10% go there 2-3 times per week.
- 33% users hang about half an hour to an hours in Samsabaad Lane Math while17% of users were able to remain more than one and half hour.
- 57% people visit the green in the afternoon and 23% in the morning hours. At evening and night 27% residents stay in their nearby green.

Armanitola Field

- As it is adjacent to Nawab Eusuf road that lead to Buriganga Bridge 2 it is not neighbourhood-oriented as like Bangladesh Math or Samsabaad Lane Math. Heavy traffic and solid boundary make this huge land un attractive to the local people.
- 37% users think this accessible green is relatively close (2 to 3 blocks radius) to their residence and 29% of them sense that it takes 3-5 minutes to reach the green. To 36.5% people it gets 1minute or less than 1minute to access the green.
- 93.5% accessed the green by foot while 3.5% use own vehicle and publics transport to reach this green.
- Most of the users think that distance matter to use the green. 23.5% users make use of the field everyday and 27% use 2-3 times per week.
- 23.5% users hang about half an hour to an hours in the field at the same time 33.5% of users were able to remain more than one and half hour.
- 50% of the interviewed participants carry on staying to the field in the afternoon and 20% in the morning hours.

Sikkatuli Khalek Shardar Park

- It is a small park (0.29 acres) with huge green in the middle of Nazira bazaar residential area.
- 63% users consider the green is relatively close (2 to 3 blocks radius) to their residence.14% think far that is more than 5 blocks radius.
- 97% of users accessed the green by foot and to 13% people it gets 1minute or less than 1minute and to 57% users find 3-5 minutes to enter the green.
- Distance matter to access the green to 77% users of Sikkatuli Khalek Shardar Park.13%users go to the park everyday whereas 7.5% use 2-3 times per week.
- 27% users stay half an hour to an hour in the park and 10% of more than one and half hour.47% remains there less than 30 minutes as the Pocha pond and waste damping area affect on staying there.
- 63% people visit the green in the afternoon and 13% in the morning hours. At evening 10% and at night 13% residents prefer to use green. Woman are prohibited to stay there after 8pm.

Sirajuddaula Park

- As it is adjacent and on the south of Nawab Eusuf road that lead to Buriganga bridge 2, it

is not neighbourhood-oriented as like Sikkatuli Khalek Shardar Park. The area of the park is 0.61acre.

- 53% users think this accessible green is relatively close (2 to 3 blocks radius) to their residence and 17% users consider the green very close (less than 1 block radius).
- 13% users think it takes 1-2minutes to access the green and 67% of them sense that it takes 3-5 minutes to reach the green.
- 87% of the interviewed participants accessed the green by foot when visiting the green and 30% by public transport like cycle or rickshaw (local people).
- 80% users think that distance act as a barrier to use the green.23% users use the park everyday where as 6% go there 2-3 times per week. Residents of Koshaituli (butchers' area), Jindabahar, Tantibazar (the market place for weavers of the famous muslin, afterwards turned into the largest market of gold jewelry), Bashabari Lane and Syed Awlad Hossain Lane come to the park everyday.
- Sirajuddaula Park experienced 23.5% users who use of half an hour to an hours.20% of users were able to remain more than one and half hour in the green space. 46% remains there less than 30 minutes as unwanted and unknown people hold down the park in noon, afternoon and also in the evening.

In regards to the time of the day users visited the green showed that 25% people visit the green in the afternoon and 43% in the morning hours. Sirajuddaula Park still looks comparatively good in the morning. It is not safe to use the park at evening and night as starts getting worse from afternoon when the park becomes crowded with floating people. The recreational place becomes a heaven for drug addicts at night, polluting its ambience and environment.

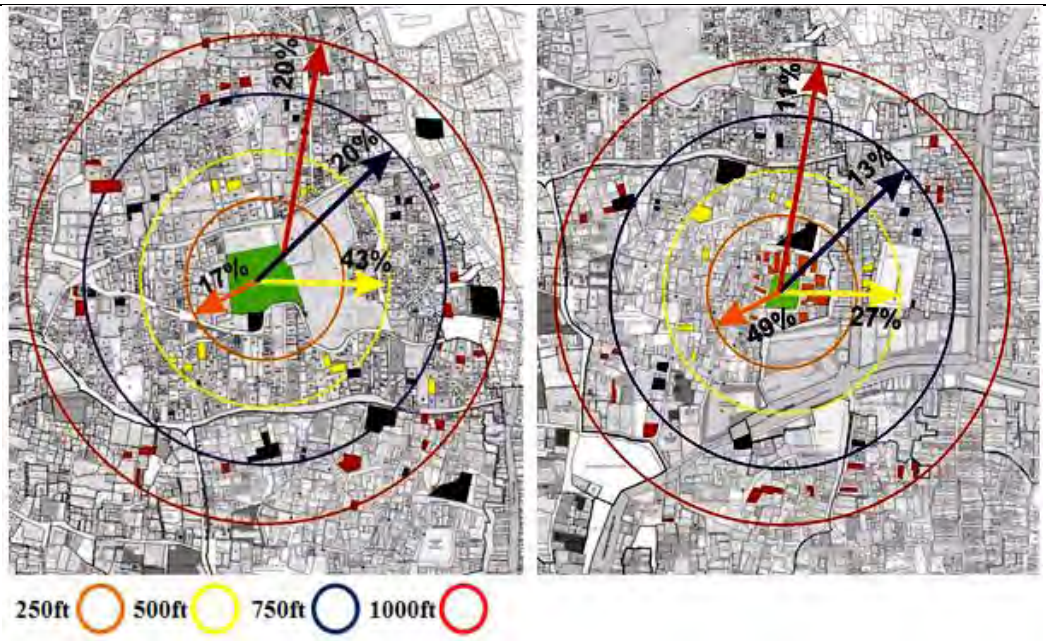


Figure 6.8: Distance & frequency diagrams of Bangladesh Maath & Samsabaad Lane Maath

Most of the users of both unplanned and planned study areas feel that distance affect on their visit to the green spaces. In relation to the table 6.4, 76% of the users think that distance affects their visit to the existing greens and 90% prefer to have green space near their residence.

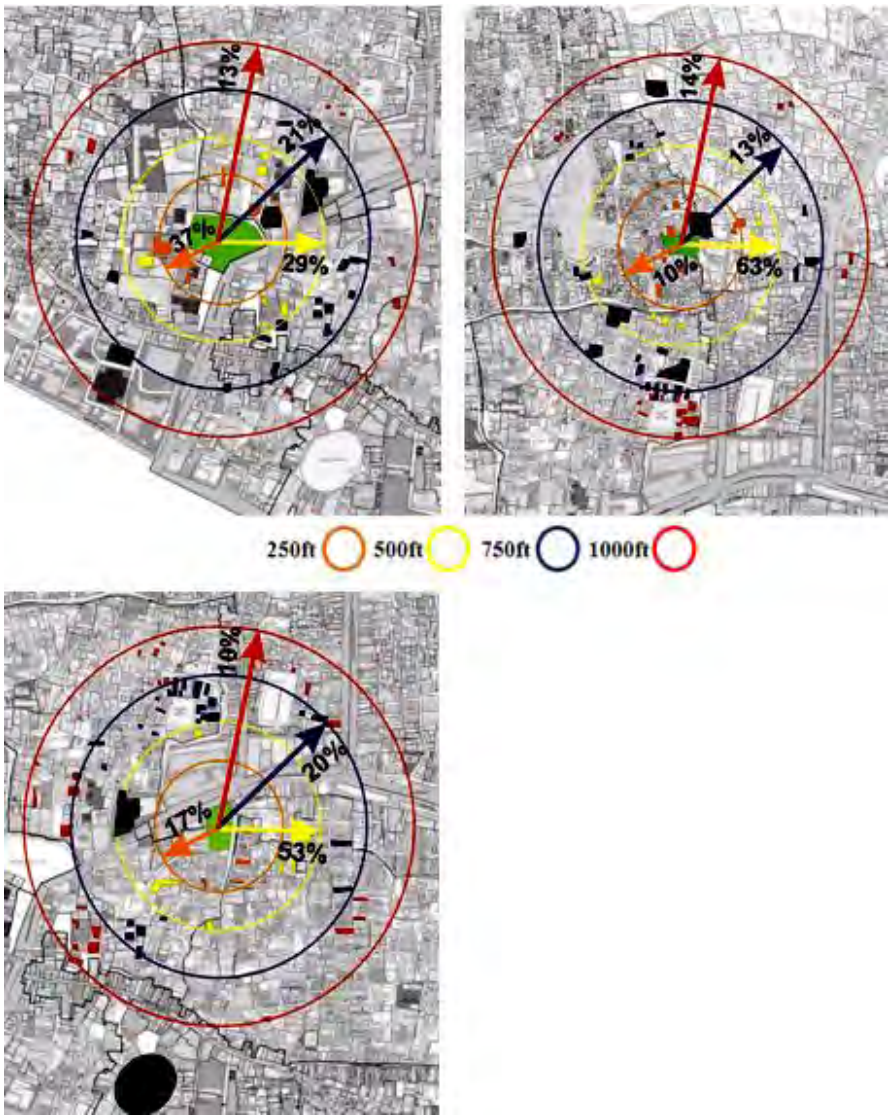


Figure 6.9: Distance & frequency diagrams of Armanitola Field, Sikkatuli Park & Sirajuddaula Park

The Graphs (3A-3F) of Annex 3 are the graphical representation of unplanned areas of the feedbacks that were found from table 6.4. Regarding to accessibility condition, Samsabaad Lane Math is a neighbourhood- oriented green and most users are surrounding neighbors.70% of the users reached there within 1 minutes time and do not attract outsider due to the residential nature. The presences of accessible conditions invite many more people to the green. It is evident from the Graph 3A that 43%users take 3min or less time to go to the nearby green where as 46% users go by 3-5 minutes. 41% users who live 250 feet or less then that distance from the nearer accessible green and 53% of the users come to the green spaces from 250 feet to 500 feet distance. The way people accesed these greens was some what different and depend on the users chareacteristics and the availability of transportation (public or Private).From the graph 3C it has been seen that 97% users come to the green on foot.

Frequency of use was asked in order to know the number of times a person visits the nearby accessible green and to know the time spent there. The graphs (Annex 3: 3D, 3E, 3F) are derived by asking the users about frequency of use, time spent in the greens and times of the day the user visited the greens. In Bangladesh math 53% and Samsabaad lane Math 77% of the interviewed participants used to go to theses fields everyday. This frequency of uses reflects an almost constant or routine visit of these accessible greens by these individuals which is the result of regular exercising activities taking place in these greens during morning and afternoon hours. In relationship to the time spent in all the unplanned study areas, most users stated that 25 minutes to 60 minutes (graph 3F) were spent .The constant people presence during most hours of the day (between morning,noon,afternoon and evening) in Bangladesh Math may be atrributed to the presence of more amenities in this green then others.In regards to the time of the day users visited the greens, graph 3F of Annex 3 showed that people visit these greens mostly in morning and afternoon.another important issue was that not much use was experienced during noonhours.

Table 6.5: Findings on accessibility attribute in planned areas

Social Dimensions
02 **Planned area** **Attribute: Accessibility**
Distance and Frequency of use
Lalmatia D Block Field
• This green is neighbourhoods oriented. Therefore most users are surrounding neighbours that who live in close residential areas around the field. • 40% users think this accessible green is relatively close (2 to 3 blocks radius) to their residence, 24% users consider the green very close (less than 1 block radius) and 46.5% of them sense that it takes 2-3 minutes to reach the green. • 77% of the interviewed participants accessed the green by foot when visiting the green for exercising. • 33% users think that distance act as a barrier to use the green.17% users use the field everyday where as 16% go there 2-3 times per week. • Bangladesh math experienced 23% users who use of half an hour to an hours.23% of users were able to remain more than one and half hour in the green space. • In regards to the time of the day users visited the green showed that 30% people visit the green in the afternoon and in the morning hours.
Lalmatia New Colony Field
• 43% users consider the green is relatively close (2 to 3 blocks radius) to their residence.33% think very close (less than 1 block radius). • 93% of users accessed the green by foot and to 40% people it gets 3minutes or less than 3minutes and to 60% users find 5-10 minutes to enter the green. • Distance matter to access the green to 63% users of Lalmatia new colony field.43%users go to the field everyday whereas 14% use 2-3 times per week. • 20% users stay half an hour to an hour in the park and 43% of more than one and half

hour.43% remains there less than 30 minutes.

- 57% people visit the green in the afternoon and 13% in the morning hours. At evening 20% and at night 17% residents prefer to use green.

Udoyjol Play Ground

- Both Udoyjol Play ground and Iqbal Road Field Park are neighbourhood-oriented green spaces.
- 21% users think this accessible green is relatively close (2 to 3 blocks radius) whereas 35% think very close (less than 1 block radius) to their residence and 29% of them sense that it takes 2-3 minutes to reach the green. To 25% people it gets 3minutes or less than 3minutes to access the green.
- 83% accessed the green by foot while 2% uses own vehicle to reach this green.
- 62.5% of the users think that distance matter to use the green. 25% users make use of the field everyday and 10% use 2-3 times per week.
- 29% people users hang about 3minutes or less than 3minutes, 14.5% half an hour to an hours in the field and 20% of users were able to remain more than one and half hour.
- 58% of the interviewed participants carry on staying to the field in the afternoon, 19% in the morning hours and 12.5% at evening.

Iqbal Road Field Park

- 26% users think this accessible green is relatively close (2 to 3 blocks radius) whereas 19% think very close (less than 1 block radius) to their residence and 33% of them sense that it takes 2-3 minutes to reach the green. To 35% people it gets 3minutes or less than 3minutes to access the green.
- 75% accessed the green by foot while 2% uses own vehicle to reach this green.
- 73% of the users think that distance matter to use the green. 30% users make use of the field everyday and 15% use 2-3 times per week.
- 34% people users hang about 3minutes or less than 3minutes, 13% half an hour to an hours in the field and 21% of users were able to remain more than one and half hour.
- 63% of the interviewed participants carry on staying to the field in the afternoon, 25% in the morning hours and 15% at evening.

Humayan Road Play Field

- 47% users consider the green is relatively close (2 to 3 blocks radius) to their residence whereas 23% think very close (less than 1 blocks).10% thinks far that is more than 20 blocks.
- 70% of users accessed the green by foot.
- Distance matter to access the green to 50% users of Humayan Road Block B Play Field.17%users go to the park everyday whereas 9% use 2-3 times per week.
- 13% users stay half an hour to an hour in the park and 27% of more than one and half hour.20% remains there less than 30 minutes as the Pocha pond and waste damping area affect on staying there.
- 47% people visit the green in the afternoon and 30% in the morning hours.

Tajmahal Park & Field

- 47% users think this accessible green is relatively close (2 to 3 blocks radius) to their residence and 43% of them sense that it takes 2-3 minutes to reach the green. To 23% people it gets 3minutes or less than 3minutes to access the green.
- 93% accessed the green by foot.
- 73% of the users think that distance matter to use the green. 27% users make use of the

field everyday and 11% use 2-3 times per week.

- 40% users hang about half an hour to an hours in the field at the same time 27% of users were able to remain more than one and half hour.
- 73% of the interviewed participants carry on staying to the field in the afternoon and 27% in the morning hours. At evening 20% residents prefer to use green.

Khilji Road Children's Park

- 47% users consider the green is relatively close (2 to 3 blocks radius) to their residence.23% think very close (less than 1 block radius).
- 84% of users accessed the green by foot and to 30% people it gets 3minutes or less than 3minutes and to 47% users find 2-3 minutes to enter the green.
- Distance matter to access the green to 80% users of Khilji road children's Park.43%users go to the field everyday whereas 20% use 2-3 times per week.
- 33% users stay half an hour to an hour in the park and 17% of more than one and half hour.30% remains there less than 30 minutes.
- 67% people visit the green in the afternoon and 23% in the morning hours. At evening 10% and at night 7% residents prefer to use green.

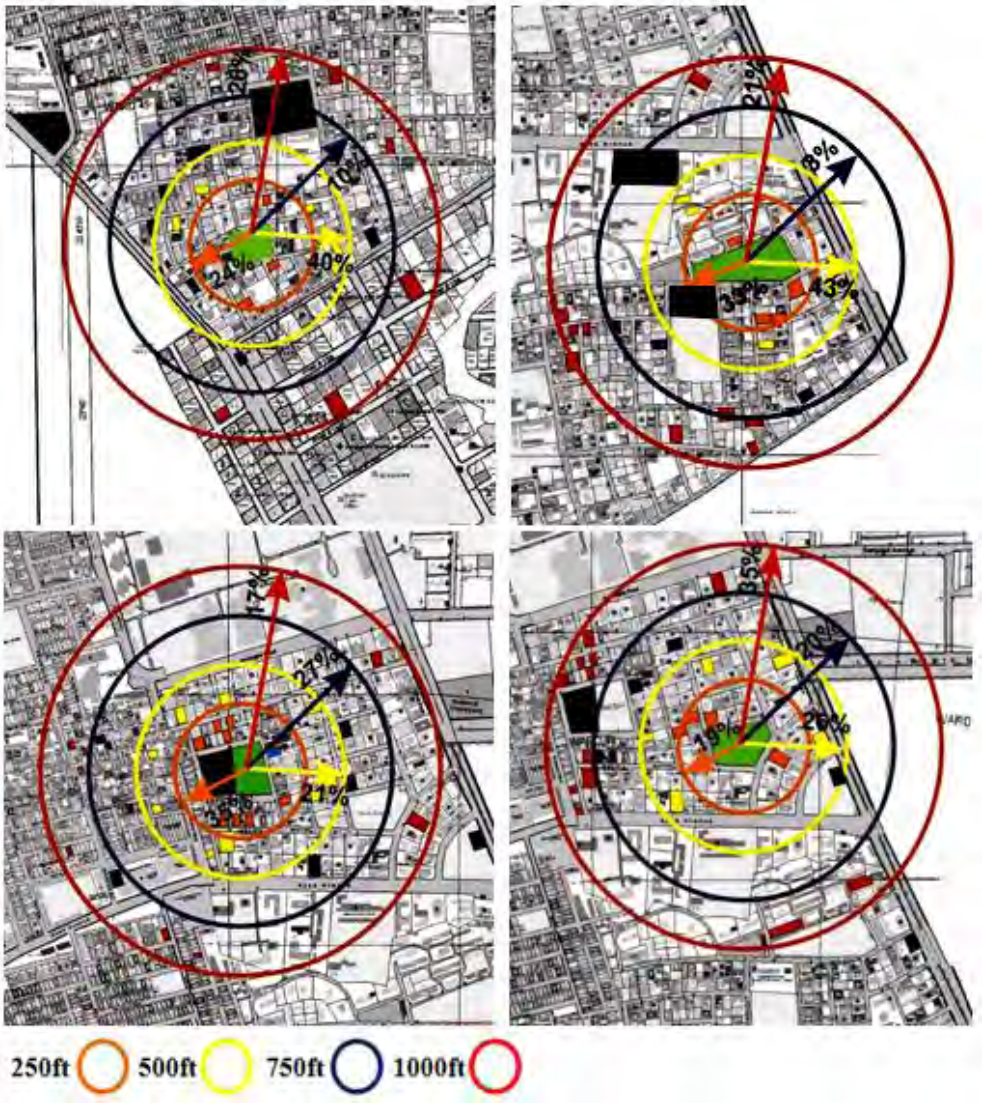


Figure 6.10: Distance & frequency diagrams of Lalmatia D block field,Lalmatia New Colony Math,Udoyjol Club Math & Iqbal road Field

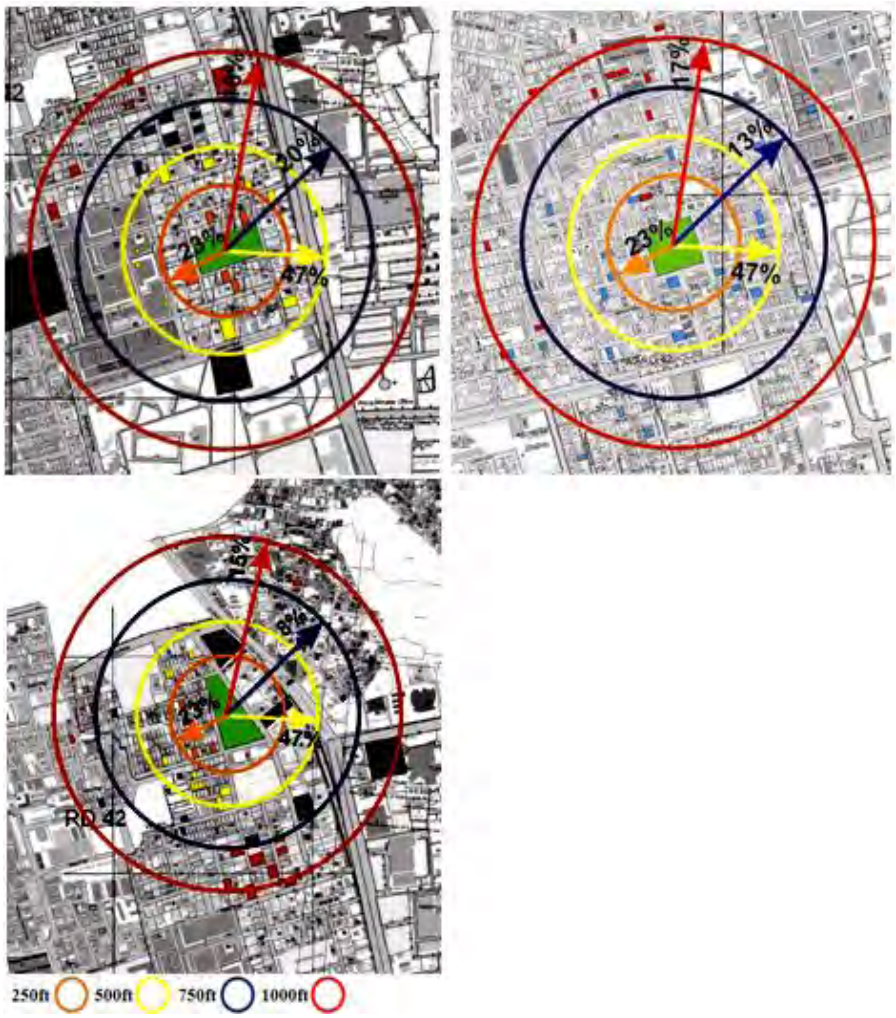


Figure 6.11: Distance & frequency diagrams of Humayan road Field, Tajmahal Park-Field & Khilji road Children's Park

From graph 3G (Annex 3) it is evident that 32%users take 1min or less time to go to the nearby green where as 44% users go by 2-3 minutes. 26% users who live 250 feet or less then that distance from the nearer accessible green and 42% of the users come to the green spaces from 500 feet to 750 feet distance(graph 3H).From the graph 3I it has been seen that 82% users come to the green on foot. In planned study areas 40% of the interviewed participants used to go to their nearby green everyday and 19% users use to come 2 to 3 times per week. This frequency of uses reflects an almost constant or routine visit of these accessible greens by these individuals which is the result of regular exercising activities taking place in these greens during morning and afternoon hours. In relationship to the time spent in all the planned study areas, most users (40%) stated that 25minutes to 60minutes (graph 3K) were spent. In regards to the time of the day users visited the greens, graph 3L showed that people visit these greens mostly in morning(34%) and afternoon (79%).Another important issue was that not much use was experienced during noonhours.

Finding:
For study areas unplanned it takes 3-5 minutes of majority users come from 3-4 blocks radius distances (750ft-1000ft) and for planned areas takes 2-3 minutes to come from 2-3 blocks radius distance(500ft -750ft) on foot to their accessible green spaces. The constant presences of the users (aged 8yrs-18yrs) are seen in the morning and afternoon for ½ hour to 1 hour.

6.2.3 Sociability

Sociability deals with the different functions that occurs in side the green and in the surrounding areas and perception of the users towards other users of the green. This attribute contain uses and activities pattern (Passive, Sociable &active) with the objective of understanding what activities and uses that most attract people to the field and exploring how social interaction took place in the green and how comfortable people felt with the other users. The following tables cover the findings on sociability of unplanned and planned areas.

Table 6.6: sociability through uses and activities in unplanned areas

Sociability through Uses, activities and interaction		
Use Patterns		
[ ] Passive **[ ]** Sociable **[ ]** Active		
Passive **[ ]** Enjoy flowers/trees **[ ]** Get some fresh air **[ ]** Enjoy the beauty of the surroundings **[ ]** See birds and wildlife **[ ]** To relax **[ ]** For peace and quiet **[ ]** To think	**Sociable** **[ ]** Children/family outing **[ ]** Meet friends **[ ]** Visit the children's playing area **[ ]** Enjoy entertainment/events **[ ]** Watch sports or games **[ ]** Picnic/ barbeque **[ ]** To eat/drink	**Active** **[ ]** For a walk **[ ]** Play sports or games **[ ]** Take a shortcut **[ ]** To keep fit **[ ]** Organized educational visits **[ ]** Guided walks and talks **[ ]** Ride a bike
Interaction with others		
[ ] yes **[ ]** no [ ] if so, with whom and in what way?		

Table 6.7: Findings on sociability attribute in unplanned areas

Social Dimensions	
03	**Unplanned area** **Attribute: Sociability**
Uses and activities	
Bangladesh Math	

The reasons for people visiting the green were determined by the climatic conditions and the activities taking place in the surrounding context. Main users of this open and green space are the residents.53% users go there for passive activities like to get some fresh air or to relax.60% for active recreation like for a walk and 33% for sociable reason to meet friends or enjoy play. Activity location in the green space is on the field, internal walkway and on the gallery sitting. User's favorite spot in the green space gallery sitting and tree covered walkway whereas children love to play on the field. The interviewed participants were asked if they interacted with others in the green.53.5% felt that users were mostly neighbours and people seen regularly.

Shamshabaad Lane Math

The main users of this open and green space are the residents. 50% people visit the green for passive purposes, for example to have fresh air (13.5%), to relax and for peace (23.5%). 70% for active recreation like for a walk (60%), to play sports or games (23.5%),whereas 57% for sociable reason to meet friends(40%), for Children/family outing(20%) or watch sports or games (3.5%) or to watch the children's play(23%). 80% felt that users were mostly neighbours and people seen regularly.



Armanitola Field

16% users make use of the park for passive activities like to get some fresh air(10%) or to relax for peace(3.5%) and quiteness.40% for active recreation like for a walk(20%) and 27% for sociable reason to meet friends(23%), for Children/family outing(6.5%) or watch sports or games (13.5%) or enjoy entertainment/events(10%). If we compare these percentages with other fields and parks we will find that the ranking will be poor. Because the huge area is enclosed with solid boundary without any tree coverage or amenities that will attract people to use this field. 20% experienced that users were mostly neighbours and people seen regularly where as 63.5% did not interact with others.


Sikkatuli Khalek Shardar Park

Main users of this park are the residents but sometimes person walking by also stay here. 47% users make use of the field for passive activities like to get some fresh air (47%) or to relax for peace (20%) and quietness. 50% for active recreation like for a walk (47%) and 47% for sociable reason to meet friends (37%), for Children/family outing (13%) or visit the children's playing area (3%). Activity location under the adult trees which provide shading to the users. 47% felt that users were mostly neighbours and people seen regularly where as 30% do not interact with others here.

Sirajuddaula Park

• 36.5% users use the park for passive activities like to get some fresh air (10%) or to relax for peace and quietness. 60% for active recreation like for a walk (46.5%) and 36% for sociable reason to meet friends (30%), for Children/family outing (10%) or enjoy play. There is a notice; if anyone walks 11 times around the park they will have walked a distance of one mile. Activity location under the adult trees which provide shading to the users. The interviewed participants were asked if they interacted with others in the green.30% felt that users were mostly neighbours and people seen regularly where as 63% do not interact with others here.

From Graph 4A(Annex 3) it is seen that 41% users of old Dhaka come to the accessible green for passive reasons like to enjoy nature, to have some fresh air as well as enjoy the beauty of the surroundings, to wildlife or to relax, for peace and quiet ,or to think. Around 53.5% interviewed participants of Bangladesh math felt that users were mostly neighbors and interact regularly. This percentage for Samsabaad Lane math and Sikkatuli Park is 80% and 47%. As Armanitola Filed and Sirajuddaula Park are beside the main road the percentages of using these greens by local people is 20% and 30%.40 % old Dhaka users use green for sociable reasons for example to meet friends, to watch sports or for family outing and 56% for active purposes like for a walk or to play. Basically the parks (Sikkatuli and Sirajuddaula), Samsabaad Lane math and Bangladesh Math are used for morning walk as well as for playing in the afternoon time whereas Armanitola Field is used for playing, for various events like annual fair, cow hut at the time of Eid-ul-Azha and for meeting of political parties.80% users of Samsabaad Lane math felt that they knew almost every one as they meet regularly and all of them are neighbour. Whereas 53% of Bangladesh math users and 47% of Sikkatuli park users interact with others people of different sector as these greens are surrounded by commercial activities. On the other hand 47% of Sirajuddaula Park users and 20% of

Armanitola field users felt they met diversity of users most of the time as they are beside busy traffic congested road of old Dhaka.

Table 6.8: Findings on sociability attribute in planned areas

Social Dimensions
03 **Planned area** **Attribute: Sociability**
Uses and activities
Lalmatia D block field
Main users of this open and green space are the residents.17% users go there for passive activities like to get some fresh air or to relax. 50% for active recreation like for a walk (26%), to play sports or games (26%) and 46% for sociable reason to meet friends (20%) or enjoy play (13%). Activity location in the green space is on the field. The interviewed participants were asked if they interacted with others in the green.30% felt that users were mostly neighbours and people seen regularly. 
Lalmatia new colony field
The main users of this green space are the residents. 30% people visit the green for passive purposes, for example to have fresh air (30%), to relax and for peace (23%). 63% for active recreation like for a walk (37%), to play sports or games (40%), whereas 67% for sociable reason to meet friends (33%), for Children/family outing (13%), Enjoy entertainment/events (17%) or watch sports or games (20%). 40% felt that users were mostly neighbours and people seen regularly.
Udoyjol Play ground
 The main users of this green space are the residents. 19% people visit the green for passive purposes, for example to have fresh air (15%), to relax and for peace (23.5%). 60% for active recreation like for a walk (30%), to play sports or games (30%),whereas 40% for sociable reason to meet friends(40%), for Children/family outing(5%) or watch sports or games (25%) . 60% felt that users were mostly neighbours and people seen regularly.
Iqbal Road Field Park
Users are mainly the resident people. 30% people visit the green for passive purposes, for example to have fresh air (23%), to relax and for peace (30%). 45% for active recreation like for a walk (55%), to play sports or games (20%),whereas 30% for sociable reason to meet friends(40%), for Children/family outing(10%) or watch sports or games (3.5%) .

48% felt that users were mostly neighbours and people seen regularly.

Humayan Road Block B Play Field

Main users of this park are the residents and Biharies of Geneva Camp. 17% users make use of the field for passive activities like to get some fresh air (13%) or to relax for peace(10%) and quiteness.63% for active recreation like for a walk (20%), Play sports or games(50%), and 50% for sociable reason to meet friends (23%), for Children/family outing(13%) or visit the children's playing area (13%). Activity location near the cricket practice area on west of the field. 47% felt that users were mostly neighbours and people seen regularly where as 30% do not interact with others here.

Tajmahal Park

67% users use the park for passive activities like to get some fresh air (30%) , enjoy flowers/trees (33%) or to relax for peace and quietness (20%). 60% for active recreation like for a walk (40%) and 67% for sociable reason to meet friends (53%), for Children/family outing (17%) or enjoy play or to watch the children's play (16%). Activity location under the trees which provide shading to the users. The interviewed participants were asked if they interacted with others in the green.53% felt that users were mostly neighbours and people seen regularly.

Khilji road children's Park

The main users of this park are the residents. But at the evening hour people of others locality, office people of surrounding office area, commercial area come to pass some relaxing time with others. 23% people visit the green for passive purposes, for example to have fresh air (23%), to relax and for peace (10%). 73% for active recreation like for a walk (60%), to play sports or games (27%), for guided walks and talks (10%), whereas 47% for sociable reason to meet friends (33%), or watch sports or games (7%) or to watch

the children's play (10%). 47% felt that users were mostly neighbours and people seen regularly in the morning at the time of walking. Activity location under the trees which provide shading to the users at noon hours. But at evening people sit on the ground of the field.

It is evident that 41% users of planned area Mohammadpur come to the accessible green for passive reasons like to enjoy nature, to have some fresh air as well as enjoy the beauty of the surroundings, to wildlife or to relax, for peace and quiet, or to think. Interviewed participants of planned areas felt that users were mostly neighbors and interact regularly. This percentage is low in case of Lalmatia D block field as it is surrounded by offices, NGOs. School children come to play after they finishes the school hours. 70 % users use green for sociable reasons for example to meet friends, to watch sports or for family outing and 74% for active purposes like for a walk or to play. Basically the parks (Tajmahal Park and Khilji road Park) and Iqbal road Field are suitable for morning walk as these accessible greens have prominent walkway. Lalmatia New colony field act as a place for car hut on every Friday, weekly vegetable market as well as is used for playing. All the fields are used as Eidgah during Eid-ul-fitar and Eid-ul-Azha.

Finding:
For both study areas (unplanned and planned) users come to their accessible green spaces for sociable reasons that means these greens act as a place for interaction which can influence the liveability.

6.2.4 Amenities

Amenities are the features that provide comfort, convenience or pleasure to the users of a particular area. Amenity values and special attractions play an increasingly important role for the attractiveness of greens. Features or provision of facilities in the accessible green which are seen in the study areas for this research are :External and internal walking path, Integrated Parking facilities, Benches, Playing equipments, Cricket practice nets, Pools/fountains, Sculpture/Landmarks, Shade and Shelter, Club House, Food or tea stalls, Restrooms &

drinking fountain, Waste Receptacle, Lighting Fixtures, Ramps for disable, Treed areas, Signage.

Figure 6.12: Amenities in planned & unplanned study areas

Table 6.9: Provision of various amenities in the study areas

Social Dimensions													
Accessible greens Parks/ playfields	**Amenities/Facilities in nearest green space**												
	External Walkway	Internal Walkway	Seating	Pools/ Fountain	Play equipment	Cricket practice nets	Sculpture/Landmark	Club House	Food or tea stalls	Restrooms & drinking fountain	Waste Receptacle	Lighting Fixtures	Shaded Canopy
Unplanned Areas													
Sirajuddaula Park	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Y	N
Sikkatuli Park	No	Yes	Yes	No	Yes	No	Yes	No	Yes	No	No	Y	Y
Armanitola Field	Yes	No	No	No	No	No	No	No	No	No	No	No	N
Bangladesh Math	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Y	N
Samsabaad Lane Field	No	Yes	Yes	No	No	No	No	No	Yes	No	No	Y	N
Planned Areas													
Lalmatia D block Math	No	No	Yes	No	No	No	No	No	Yes	No	No	Y	Y
Lalmatia New colony field	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	Y	N

Iqbal road Club math	Yes	Yes	No	No	No	No	No	No	No	No	No	Y	N
Udoyjol Club Math	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	No	Y	N
Humayan road field	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Y	N
Tajmahal park Field	No	No	Yes	Yes	No	No	No	No	Yes	No	No	Y	N
Khilji Road children's Park	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Y	N

6.2.5 Comfort

A public setting that is comfortable will allow the fulfillment of a broader range of peoples needs and enhance enjoyment, sociability and passive and active engagement in the accessible green spaces. Comfort in this particular study will be related to climatic conditions and security factors of the green. So this attribute is subdivided into climatical, security comfort within access to the outdoor furniture and services as well as shading effect of tree coverage. Table 6.10 and 6.11 cover the findings on comfort ability of unplanned and planned areas.

Table 6.10: Findings on comfortability attribute in unplanned areas

Functional Dimensions
04 **Unplanned area** **Attribute: Comfort**
Climatic comfort
• Users in the Bangladesh Math mentioned with more frequency that their experience was very comfortable (64%).Morning, afternoon and evening hours were comfortable for the local people. • 47% Samsabaad Lane Math's users feel very comfortable, 13% comfortable and 3% not comfortable. • In the case of Armanitola Field, 30% think the atmosphere is very comfortable,20% comfortable and 13% not comfortable. • 65% of the users of the Sikkatuli Park stated their experience was very comfortable. To 13% the environment is comfortable and to 3% is not at all comfortable. • Users in the park mentioned with more frequency that their experience was very comfortable (43%).20% users feel the environment comfortable.
Social and physical protection(security comfort)
• When asked about security while visiting the green, 58% users of Bangladesh Maath mentioned that they feel secure being in the green space. Users visit the green in group. The reasons given for feeling safe are people presence and lack of evidence of any crime in the green. Night hours of the day are perceived as insecure in the accessible green. • 75% users of Samsabaad Lane Maath mentioned that they feel secure being in the green space. Night hours of the day are perceived secure in the accessible green. • Armanitola ground has been surrounded by trucks, pickup vans and other vehicles. This unauthorized parking of transports have not only caused acute traffic jam but also

marred the beauty of the ground making it difficult for local people to use it. Taking advantage of the situation, drug addicts and muggers remain active almost round the clock. This age-old vacant lot has therefore lost its charm and utility. When asked about security while visiting the green, only 20% users mentioned that they feel secure being in the green space.60% users said they feel insecure to go to the field at night hours. The area is almost barren and poorly lit at night.

- 60% users of Sikkatuli Khalek Shardar Park mentioned that they feel secure being in the green space and 17% users said they feel insecure.
- 25% users of Sirajuddaula park mentioned that they feel secure being in the green space.40% users said they feel insecure to go to the field at night hours.
- This recreational place becomes a heaven for drug addicts at night, polluting its ambience and environment, said Mohammad Delowar Hossain of Bangshal area (the Daily Star, April 4, 2011). Five of electric poles out of eight are out of order for long. So the park is poorly lighted at night.

Maintenance/services

- Bangladesh Math is under Dhaka South City Corporation (DSCC).
- Samsabad Lane Math is maintained by Shamshabaad panchayet committee
- Armanitola Field Discovery poor condition, no maintenance
- Sikkatuli Muslim Jubo Shangha look after Sikkatuli Shahid Khalek Shardar Park
- Sirajuddaula Park is Under DSCC, but Vorer Othiti patronize the park.

Tree coverage (Shading effect)

- Most of the users of Bangladesh Math mentioned that they would not visit accessible green be if it has no tree. Spots with trees are visited mostly. Most of the users were located in shady spots of the field under trees. Bangladesh Math has sufficient adult medium sized trees on eastern and southern part which provide favourable microclimatic condition in the field. Taller trees of eastern part of the Bangladesh Math provide more shelter from the sun intense incidence especially in the afternoon. The users of the field also think that street trees as well as trees in side the field can make great communities. Coconut ,Krishnachura,Neem trees are found here.
- A good number of coconut trees all around the Samsabad Lane Math. Though the residents plant more new trees will produce the most ecological benefits —impact the quality of life of tomorrow's generation.
- In residential areas, barren, treeless spaces often become "no man's lands," which discourage resident interaction and invite crime. In case of Armanitola field same situation occurs.The area is almost barren and without tree coverage. People are observed to stay under trees of other plots for shading.
- Cool environment because of lots of tree are in the Sikkatuli park. Children play games in the field in the noon.
- Most of the users of Sirajuddaula park were located in shady spots of the field under trees. Six palm trees and two Chambal trees have been in the park for over 100 years.
- Delower of Bangshal area said just 15 years ago the park was full of greenery and flower. But lack of proper maintenance damages the ground's earlier look.

50% of users feel very comfortable to be in the accessible greens and 13% feel comfortable.most of the users mentioned that they would not visit the field if it has no

trees.From Graph 5A it is clear that Armanitola field has low comfortable level as it has no The users of Armanitola Field feel insecure as the field is surrounded with solid boundary,poorly lit at night and has no visual connection with the street.In contrast Bangladesh Math's users feel comfortable and secured as it contain gallary type of sitting on north and east with medium sized trees on eastern and southern part of the field .Though they think it should be maintained properly.

Table 6.11: Findings on comfortability attribute in planned areas

Functional Dimensions
04 **Planned area** **Attribute: Comfort**
Climatic comfort
• 30% of the users of the Lalmatia D block field stated their experience was very comfortable and 20% the environment is comfortable. • In the case of new colony field of Lalmatia, 13% think the atmosphere is very comfortable and 17% comfortable. • 37.5% of the users of field stated their experience was very comfortable and 12.5% comfortable. • 45% of the users of Iqbal road club field verified their experience was very comfortable and 23.5% comfortable. • 23% users of Play Field of Humayan Road Block B feel very comfortable and 37% comfortable. • To 46.5% of the park users feel very comfortable and 13% feel comfortable. • 57% users of the park feel very comfortable and 17% comfortable.
Social and physical protection(security comfort)
• 77% users of Lalmatia D block field mentioned that they feel secure being in the green space.7% users said they feel insecure to go to the field at night hours. • When asked about security while visiting Lalmatia new colony field only 57% users mentioned that they feel secure being in the green space.7% users said they feel insecure to go to the field at night hours.Some open spaces at Lalmatia New Colony have been turned into a parking facility for buses of the ATCL Company which hampering in the security of the residents. A big pile of earth is now lying in the middle of the playground. The western side of the ground was dug up and that has left just a small patch of land on the eastern side available for games and sports and recreation of the New Colony residents. • 66% users of Udoyjol Play ground stated that they feel secure being in the green space and 8.5% feel insecure. • 76% users stated that they feel secure being in Iqbal Road Field Park • In case of Humayan Road Block B Play Field 50% users mentioned that they feel secure being in the green space.7% users said they feel insecure to go to the field at evening hours. • 50% users stated that they feel secure being in Tajmahal Park while 70% users feel secure in Khilji road children's Park

Maintenance/services
• The Lalmatia D block Field is under Dhaka North City Corporation (DNCC). • National Housing Authority (NHA) is the owner of Lalmatia New colony field. The authority plays a reluctant attitude in maintaining the field. Very recently internal walkway has been constructed. "New Colony Krirachakra" club is regularly renting out the playground for a car fair every Friday which deteriorate the field's surface condition. • Maintenance of Udoyjol Play ground is done by Udoyjol Club established in 1964. • Iqbal Road Club Limited (2006) keeps the Iqbal road playground in a good condition excepting its poor drainage • Humayan Road Field is under Dhaka North City Corporation (DNCC). Nabin Shangha club (1973) also look after the field as they provide a cricket practicing net for them who are interested in cricket. • Both the parks (Tajmahal Park & Khilji Road Children's Park) are under Dhaka North City Corporation (DNCC) though Khilji road children's park has playing equipments but those are in very poor condition.
Tree coverage (Shading effect)
• Accessible green would not be visited if it has no tree. Spots with tree are mostly visited. Need to plant more trees in Lalmatia D Block Field. • Most of the users were located in shady spots of the field under trees. The users of Lalmatia New colony field believe systematically linked trees and grass cover can include stronger ties among neighbors; give greater sense of safety and adjustment, more supervision of children in outdoor spaces, healthier patterns of children's play. • Users of Udoyjol field think green spaces with trees improve health and encourage social interaction. More tree shading enhances people to come in the noon. Spots with tree are mostly visited. Rows of trees are on the east side. • A good number of trees all around the Iqbal road field. Need to preserve those with care. • It has been observed more individuals involved in social activities in spaces with high levels of green cover than in spaces with low levels of green cover in Humayan Road Block B Play Field. Preserve existing trees as well introduce more and more trees to make the field environmentally comfortable for the users. • Proper maintenance of trees is expected in Tajmahal Park. • Khilji Park is beside a busy traffic oriented road. Rows of trees must be planted which will act as noise screening as and reduce noise pollution.

50% of users feel very comfortable to be in the accessible greens and 13% feel comfortable.most of the users mentioned that they would not visit the field if it has no trees.From table 6.13 it is clear that Armanitola field has low comfortable level as it has no tree coverage as well as outdoor furniture like sitting places ,water fountain,proper food services(tea stall ,phuchka stand).The users of this field feel insecure as the field is surrounded with solid boundary,poorly lit at night and has no visual connection with the street.In contrast Bangladesh Math's users feel comfortable and secured as it contain gallary type of sitting on north and east with medium sized trees on eastern and southern part of the field .Though they think it should be maintained properly.

Finding:
Huge tree coverage, proper arrangement of furniture, plays equipments and lighting fixtures with social and physical protection will create a comfortable setting to enhance enjoyment and sociability among users.

6.2.6 Users' preferences and needs

In order to understand the users and create a user profile participants were asked their age, gender and occupation. Asking this information also allowed knowing the users need and preferences in the public settings with what type of green they require in their area, which others open and green spaces they visit in Dhaka and what are the reasons behind that. Table 6.14 and Table 6.15 cover the findings on users' preferences and need analysis of unplanned and planned areas. Participants were asked what attract them in the greens. Most Participants were attracted to easy accessibility and the social environment. Though users of Bangladesh Math and Samsabaad lane Math are more or less happy what they have their areas but renovation and new physical characteristics particularly with the presence of wider spaces and view, new landscaping and greenery, and the maintenance must be given to all these green.

Table 6.12: Users preferences and needs parameters

Users preferences and needs parameters	
Attraction parameters to the green	
[ ] Accessibility **[ ]** social environment **[ ]** comfort	
Level of importance in attracting users to the green space	
Accessibility/distance	**[ ]** not important **[ ]** important **[ ]** very important
Proximity to public transport	**[ ]** not important **[ ]** important **[ ]** very important
Physical arrangement	**[ ]** not important **[ ]** important **[ ]** very important
Places to sit	**[ ]** not important **[ ]** important **[ ]** very important
Opportunity to walk	**[ ]** not important **[ ]** important **[ ]** very important
Landscaping/trees/vegetation	**[ ]** not important **[ ]** important **[ ]** very important
Proximity of food and retail	**[ ]** not important **[ ]** important **[ ]** very important
Social interaction	**[ ]** not important **[ ]** important **[ ]** very important
Feeling safe	**[ ]** not important **[ ]** important **[ ]** very important
Good maintenance/neatness	**[ ]** not important **[ ]** important **[ ]** very important
Special events/entertainment	**[ ]** not important **[ ]** important **[ ]** very important
Users visits others green space in Dhaka	
[ ] yes **[ ]** no [ ] if so, which one and why?	
Characteristics users like most about other green space	
[ ] Diversity **[ ]** Good place for children **[ ]** Other facilities/features **[ ]** Well maintained **[ ]** Feel safe **[ ]** Variety of trees **[ ]** Spacious	
Reason puts users off visiting other green	
[ ] Too far to walk **[ ]** Lack of public transport **[ ]** not easily accessible **[ ]** Physical barriers **[ ]** Lack of variety **[ ]** Lack of facilities like sittings, foods, toilets **[ ]** lack of personal safety **[ ]** Poor maintenance/ management **[ ]** Lack of trees **[ ]** Low awareness **[ ]** No signage **[ ]** Have no interest in going	

Table 6.13: Findings on users' preferences and need analysis of unplanned

Functional Dimensions
05 **Unplanned area** **Attribute: User's preferences and needs**
Users' perception and satisfaction
• Places to sit, Opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance are the importance attributes according to users of Bangladesh Math in attracting users to the green. 40% users' visits others open and green space in Dhaka and 60% do not go to the others green as they feel comfortable with this green because it is easily accessible from their residences. 26.5% Bangladesh Math's users also prefer to go to Ramna Park; Sharwardi uddan, Armanitola park for its spaciousness and variety of trees.36.5% users think that these places are too far to walk and can not go for lack of public transports. • Physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation and special events are the preferred attributes to the users of Samsabaad Math users'. 40% users visit Tikatuli Math, Ahsan Manjil, Lal Bag Fort, Shahid Minar, T.S.C, Ramna Park; Sharwardi uddan, Shishu park in Dhaka because for spaciousness of the green(27%),variety of trees/old trees(37%),good variety of areas /diversity (30%), good place for children(13%), for good maintenance(13%),for other facilities/features (16%) and for feeling safe(20%). 60% do not go to the others green since 30% of them think the green space is too far to walk. • 66.5% users visit others open and green space in Dhaka and 33.5% do not go to the others green. The preferred attributes by Armanitola field users include accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe ,good maintenance and special events. 36.5% of them think the green space is too far to walk. • Accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance are the preferred attributes by Sikkatuli park users.63% users visit others open and green space in Dhaka because for spaciousness of the green(50%),variety of trees/old trees(47%),good variety of areas /diversity (33%), good place for children(13%), for good maintenance(13%),for other facilities/features (17%) and for feeling safe(17%). 37% do not go to the others green since 27% of them think the green space is too far to walk. The preferred attributes by Sirajuddaula park users are same as Sikkatuli Khalek Shardar Park.60% users visit others open and green space in Dhaka and 34% do not go to the others green. 13% for spaciousness of the green, 37% because of variety of trees/old trees, 30%good variety of areas /diversity (Dhanmondi Lake), 17% good place for children, 23% for good maintenance, 7% for other facilities/features and 30% for feeling safe. 50% users think that these places are too far to walk and 20% have no interest in going.The users of Park prefer to go Sadar ghat, Victoria park, Armanitola field, Zia uddan, Sangshad Bhaban, Shishu park, Ramna Park; Sharwardi uddan , National Zoo.
Users needs
To the users of Bangladesh Maath, playground is linked to social contacts which indicate that children can play together with their friends (from the neighborhood) and parents who might supervise them can meet other parents. Encourage community events and activities. And accommodate a variety of interests and abilities to encourage friendly neighborhood

interaction and meet other citizen needs. Proper drainage system to skip water logging on the field and lighting to so that interaction can be done at night. Plantation of trees on west side of the field and play equipments for children. Duty police do not perform their duties rather take bribe from the drug taker. Restriction on unwanted contact by implementing good security system.

- Users are satisfied with this green, easily accessible, maintain by panchayet and they feel secure. Lack of soft green surface, playing equipments and food shop. Restriction on children's playing time as mothers are concerned with their education. Removal of the dustbin is necessary and plant more trees.
- Insufficient greenery in residential colony reduces the aspirations and opportunities for natural experiences of residents. Introduce huge green areas that will surround the whole field and give shade to the users of Armanitola Field. No sheltered place for resting, unsatisfactory environment. Visual connection with street people and continuous walkway Take action to avoid trucks cars that surround the field , removal of dustbin and construction materials Parents do not let the children to go to the field as they think the atmosphere is not secure enough. Provision for Children playing ground and more entry to the field. Enforce regulations to control nuisances. As few months back an unwanted incident between RAB and criminal occurred said by the few users.
- Experience of nature is important to the Sikkatuli park users. They state that needs more and more green space to their locality. Remove the dustbin and proper maintenance of the Pocha pond. Children contact with outsider should be restricted by fixing time of using the park. The size of the park is not adequate to support the need for recreation to its users. After the evening restriction on the use by teenager/youth of park so that woman can use the park without any hesitation. Enhance sitting by adding few more benches. Guard at the entrance and provision for toilet facilities also the want of the users.

Need more green spaces, each mahalla must have park and field to serve its people. Strengthen the security by introduce restriction on outsider to use the park. Though 'Bhorer Otithi' (park management committee) is doing their level best to maintain the park well. Entries from Zindabahar are encroached by the local mastans that should be solved. Food shops, provision for drinking water.

The users of Bangladesh Math gave importance on feeling safe (67%) and good maintenance (73%) of this green. In case of Samsabaad Lane Math users put importance to have places to sit (67%), opportunity to walk and sports (70%), Landscaping (70%) and Feeling safe (67%).Armanitola filed users felt importance issues to be attracted to the greens are physical arrangement (77%), feeling safe (77%) and good maintenance (80%). Places to sit (63%), opportunity to walk and sports (70%) and feeling safe (60%) are the important features to Sikkatuli Park users whereas places to sit (63%), opportunity to walk and sports (63%), Landscaping (70%), feeling safe (70%) and good maintenance (63%) are the important features to Sirajuddaula Park users. Bangladesh Math and Samsabaad Lane Math do serve well to there surrounding people. It is evident from table 6.16.Visiting other green space rate is higher among Armanitola filed, Sikkatuli Park and Sirajuddaula Park users than

Bangladesh Math and Samsabaad Lane Math users. Most of the users of the unplanned study areas think they go to others green mainly for variety of areas (diversity), for variety of trees/old trees and for there spacious quality (table 6.17). Distance is the main factor for which users do not wan to go other green spaces of Dhaka(table 6.18).

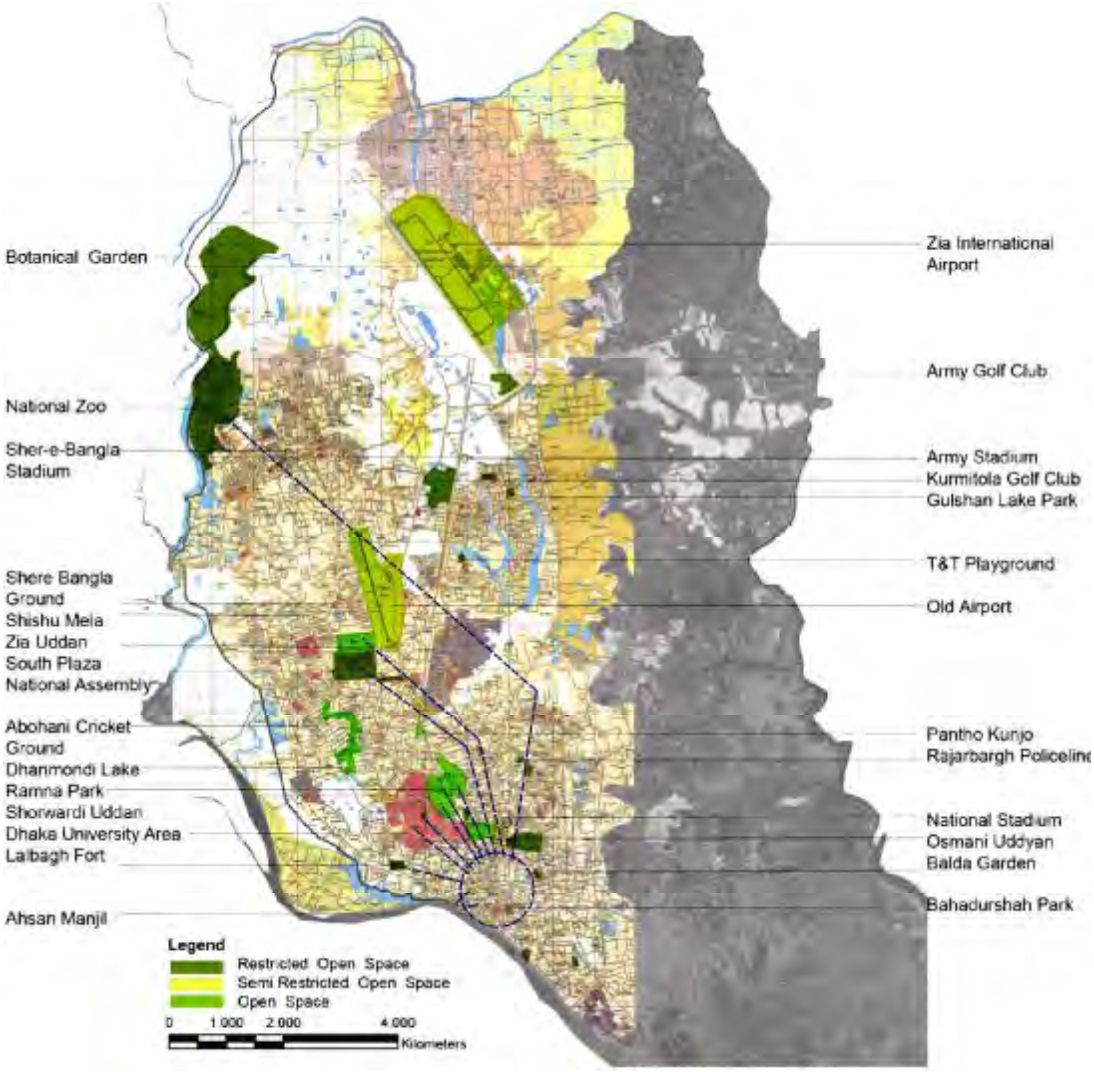


Figure 6.13: Preferred green spaces of users of unplanned areas in Dhaka city

Table 6.14: Findings on users' preferences and need analysis of planned areas.

Functional Dimensions
05 **Planned area** **Attributes :User's preferences and needs**
Users' perception and satisfaction
• Preferred attributes by users of Lalmatia D block field are accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, feeling safe and good maintenance.73% users visit others open and green space in Dhaka and 20% do not go to the others green.33% for spaciousness of the green, 27% because of variety of trees/old trees, 30%good variety of areas /diversity (Dhanmondi Lake), 17% good place for

children, 10% for good maintenance and 23% for feeling safe. 17% users think that these places are too far to walk and 3% have no interest in going.

- Accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, proximity of food and retail, social interaction and special events are the preferred attributes of the users of Lalmatia D block field. 50% users visit others open and green space in Dhaka and 33% do not go to the others green. Residents around New colony field also go to Lalmatia D block field, Lalmatia boy's school, Zakir Hossain Field, Tajmahal field, Abahani play ground, Dhanmondi Lake(lots of different activities), Zia uddan, Sangshad Bhaban (huge area with green/secured), Ramna, Nandan and Fantasy Kingdom(recreation). They use to go there for spaciousness(23%), variety of trees/old trees(17%), feeling safe(10%), good place for children (13%), variety of areas /diversity (17%) and other facilities/features (10%). 23% users think that these places are too far to walk.
- The importance attributes according to Udoyjol Play ground users are accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance. 73% users visit others open and green space in Dhaka and 27% do not go to the others green.Users go to the other accessible green areas for the same reasons that mentioned in case of Udoyjol Play ground.53% users visits others open and green space in Dhaka and 40% do not go to the others green due to there busy work schedule.
- Both the users of Iqbal Road Field Park and Udoyjol Play ground prefer to go Tajmahal Eid gagh Math ,Shahid Park math, Lalmatia new colony math ,Zia uddan, Sangshad Bhaban, Dhanmondi lake area, Dhanmondi club Math, Shishu park, Ramna Park; Sharwardi uddan , National Zoo.45% users think that these places are too far to walk whereas 10.5% have no interest in going as it is time consuming.

Accessibility/distance, proximity to public transport, physical arrangement ,place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance are the preferred attributes by Humayan Road Block B Play Field's users those attract them to go to other green spaces of Dhaka.

- The importance attributes according to Tajmahal park users in attracting them to other green are accessibility/distance, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance.47% users' visits others open and green space in Dhaka and 53% do not go to the others green as they feel comfortable with this green because it is easily accessible from their residences.The users of the park also prefer to go to Udoyjol club Math,Tajmahal eid gagh Math , Zia uddan, Sangshad Bhaban, Dhanmondi lake area, Shishu park, Shishu mela, Gulshan park, Fantasy kingdom and National memorial at Savar for spaciousness(37%), variety of trees/old trees(20%), feeling safe(23%), good place for children (16%), variety of areas /diversity (10%) and other facilities/features (16%). 27% users think that these places are too far to walk, 20% have low awareness whereas 37% have no interest in going as it is time consuming.
- Accessibility/distance, physical arrangement, place to sit, opportunity to walk and sports, landscaping/trees/vegetation, feeling safe and good maintenance are the importance attributes according to users of park in attracting users to the green.35% users' visits others open and green space in Dhaka and 55% do not go to the others green as they feel comfortable with this green because it is easily accessible from their residences.Park users

of Khilji road also prefer to go toTajmahal eid gagh Math,Shaymoli club Math,Humayan Road Field, Zia uddan, Sangshad bhaban, Dhanmondi lake area, Shishu park, T.S.C, Ramna Park; Sharwardi uddan park for various reasons.40% for spaciousness of the green,30% because of variety of trees/old trees and good variety of areas /diversity(dhanmondi lake),27% good place for children, 13% for good maintenance and 17% for feeling safe. 13% users think that these places are too far to walk, 3% lack of public transport they do not go others green whereas 13% have no interest in going as it is time consuming.

Users needs

- Average users are satisfied with the present condition of Lalmatia D block field. Though users think the whole field should be well maintained. Water logging during rainy season hamper the use of the field. So proper drainage system must be introduced as well as sitting, playing equipments for children. Restriction on entry of non residents is another concern of the field users' .If it can be done then the female users of the field feel safe and can boost belongingness with the field.Students demand to have gallery type of sitting to watch games that occurs eventually. Though there is a sheltered space on north east corner of the field. Aged person think Park like atmosphere improve the sociability and help to interact various age group.
- Most of the users of Lalmatia New Colony Math think that the boundary should be omitted as well as the waste sorting place at the entry point of the field. They need provision for all aged people, playing space for children, walkway for the joggers, sitting place for all, specific place for woman. At Friday Car hut destroy the privacy of social environment of this residential area. Specify the location for Kacha bazaar is also utmost concern to the field users. Illegal construction should be prohibited. Coffee shop and other services must be located near the entry side. As most of the service holders express that they get time to use the field at morning and night. Introduce more lighting facilities, so that people feel secure and can use the field premises at night is also necessary. Planting more trees around the field and grass (soft pave) on the ground can enhance the rate of uses of residents.
- Good quality of the physical environment of Udoyjol field which is well-maintained, clean, healthy and safe, spatially and socially vibrant to its users. Proper drainage to overcome water logging. Sitting arrangement in suitable interval. Specific places for children, adult, old people and woman are needed in Iqbal road field. Accessible to all. Waiting place with overhang, playing space with necessary play equipment must be constructed. Maintenance of the grass level and cleanliness of internal walkway is needed. More tree plantation.
- Users of Iqbal road field convey it will be good if the area of the field can be expand to welcome diversify activities though there is no such possibilities. Enhance the beauty of the field by arranging sitting, sheltered space for sunny day and rainy season, walkway and specify the playing space for children.
- Need for play equipment and sitting with proper playing place n tajmahal park. Restriction on unwanted people in the park. Toilet facility .Proper drainage system .Need to be clean
- Users of the Khilji road park think this accessible green play an important role in creating a congenial built environment for social interaction and exchange. They believe proper maintenance, drainage, provision for good lighting (at evening) and services are the

measures which should be taken as necessary call by the concerned authority.Use of rows of trees to reduce the sound pollution should be done. More parks and fields with residential privacy and security must set up in the city.

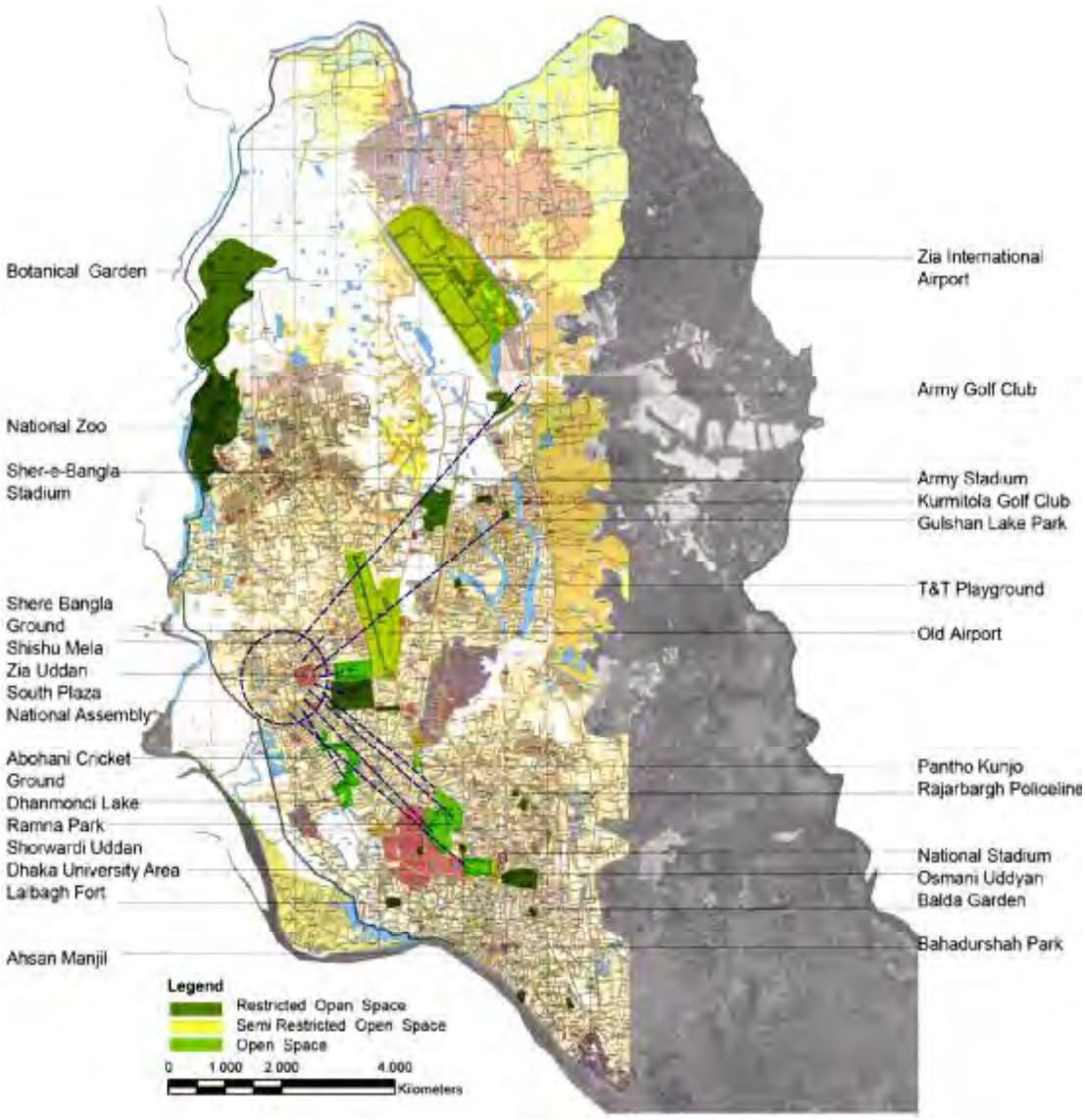


Figure 6.14: Preferred green spaces of users of planned areas in Dhaka city

Accessibility/distance (43%), places to sit (50%), physical arrangement (43%) and special events/entertainment (50%) are the important features to Lalmatia D block field users whereas opportunity to walk and sports (70%) and social interaction (50%) are the important features to Lalmatia New colony field users. The users of Tajmahal Park field gave importance on accessibility/distance (77%) ,places to sit (67%), opportunity to walk and sports (70%) and good maintenance (63%) of this green. Both in case of Iqbal road field and Udoyjol club Math, users put importance accessibility/distance (48%), on to have places to sit (50%) and on opportunity to walk and sports (52%).Humayan road field users felt that

importance issues to be attracted to the greens are places to sit (57%), opportunity to walk and sports (63%), feeling safe (77%) and good maintenance (80%) as Humayan road field has no internal walkway and sitting furniture. Accessibility/distance (70%), places to sit (63%), opportunity to walk and sports (77%), feeling safe (60%) and good maintenance (70%) are the important features to Khilji road Children's Park users.Mohammadpur do have lack of diversify green spaces. Two distinct type of accessible green are seen. One is playground or field and another one is park. The parks of this planned area are not so active like that of Sikkatuli Park or Sirajuddaula Park. Most of the users of the planned study areas think they go to others green mainly for variety of areas (diversity), for variety of trees/old trees, for safety and for there spacious quality (table 6.21). Distance is the main factor for which users do not want to go other green spaces of Dhaka(table 6.22). Table 6.23 shows importance of different attributes for example accessibility/distance, proximity to public transport, physical arrangement, places to sit, opportunity to walk, landscaping, proximity of food and retail, social interaction, feeling safe, good maintenance/neatness, special events/entertainment etc according to the users preferences (from questioner survey) which attract them to use their near by green.

Table 6.15: User's preferences/accessible green matrix

legends	User's preferences/accessible green matrix (Importance of different attributes according to users preferences in attracting users to the green)											
very important ○ / important □ / not important △ / High% Red / Medium% Blue / Low% Yellow	Study areas											
	Unplanned areas					Planned areas						
attributes	Sirajoddoula Park	Sikkatuli Khalek Sardar Park	Armanitola field	Bangladesh Math	Samsabad lane math	Lalmatia new colony	Lalmatia D block math	Iqbal road math	Udoyan club Field	Humayan road B block math	Tajmahal park	Khilji road Park
Accessibility/distance	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲B ■B ●B	▲B ■R ●B	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R
Proximity to public transport	▲R ■Y ●B	▲R ■B ●Y	▲B ■B ●Y	▲R ■B ●Y	▲R ■Y ●B	▲R ■B ●B	▲Y ■B ●B	▲Y ■B ●B	▲Y ■B ●B	▲B ■B ●R	▲B ■B ●Y	▲R ■Y ●B
Physical arrangement	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■R ●B	▲Y ■B ●R	▲Y ■R ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●B	▲Y ■B ●R
Places to sit	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲B ■B ●R
Opportunity to walk/jog/sports	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R
Landscaping/trees/vegetation	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲R ■B ●Y	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R
Proximity of food and retail	▲R ■Y ●B	▲B ■R ●Y	▲R ■B ●Y	▲R ■B ●Y	▲R ■B ●Y	▲Y ■B ●R	▲R ■Y ●B	▲Y ■R ●B	▲Y ■R ●B	▲B ■R ●Y	▲B ■R ●Y	▲B ■R ●Y
Social interaction	▲R ■B ●Y	▲B ■R ●Y	▲R ■B ●Y	▲B ■R ●Y	▲B ■R ●Y	▲B ■Y ●R	▲B ■B ●Y	▲B ■R ●Y	▲B ■R ●Y	▲B ■R ●Y	▲B ■R ●Y	▲R ■B ●Y
Feeling safe	▲Y ■B ●R	▲Y ■B ●R	▲Y ■Y ●R	▲Y ■B ●R	▲Y ■R ●B	▲Y ■R ●B	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R
Good maintenance/neatness	▲Y ■B ●R	▲Y ■B ●R	▲B ■B ●R	▲Y ■B ●R	▲Y ■R ●B	▲Y ■R ●B	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R	▲Y ■B ●R
Special events	▲R ■B ●B	▲R ■Y ●B	▲B ■Y ●R	▲R ■Y ●B	▲B ■Y ●R	▲Y ■B ●R	▲R ■B ●Y	▲B ■R ●B	▲B ■R ●B	▲B ■B ●Y	▲B ■R ●Y	▲R ■B ●Y

The shapes (circle, square, triangle) denotes importance (very important, important, not important) where as colors (red, blue, yellow) describe the percentage importance of the users. Level of performance of the study areas are done in terms of users' perception about

the accessible greens and on their preferences and need as they want their green areas to be. The above table (6.24) has shown the comparative analysis of the performance of the greens.

Table 6.16: Comparative level of performance base on users' perception, their preferences and need

categories	parameters		areas											
			Unplanned areas					Planned areas						
			Bangladesh Math	Samsabad Lane Math	Armanitola Field	Siddiqui Park	Sirajuddaula park	Lalmatia D block Park	Lalmatia New colony field	Udayan Play field	Iqbal road field Park	Humayun road H block field	Tajmahal Park field	Khilji road Children park
Users perception	Adequate amount of green	Adequate	2	3	2	2	1	2	3	2	3	2	2	2
		Not adequate	4	3	3	4	5	3	1	3	3	3	3	3
	Type of green absent	Areas for children	2	2	2	2	2	2	1	2	2	2	3	2
		Areas to play sports	2	2	2	3	4	3	1	3	2	4	3	2
		Parks /garden	2	3	3	2	3	2	3	3	2	3	2	2
	Need of green spaces for	Variety	1	1	1	1	2	1	1	2	2	1	2	1
		Wider environment	2	3	1	3	3	2	1	1	1	1	3	2
		Sports	2	1	1	1	1	1	2	1	----	1	1	1
		Openness	1	----	1	----	----	1	1	2	----	1	1	----
		Walking	1	1					1	1				1
		entertainment			1					2			2	1
	Level of Performance		19	19	17	18	21	17	15	22	15	17	22	17
Users preferences & needs	Users visits others green	Visit other green	2	2	3	4	3	4	3	3	4	3	3	2
		Do not visit	3	3	1	2	2	1	2	2	2	2	3	3
	Characteristics users like most of others green	Diversity	1	2	2	2	2	2	1	1	1	2	1	2
		Children place	1	1	1	1	1	1	1	1	1	2	1	2
		Other facilities	1	1	----	1	1	----	1	1	1	1	1	1
		Well maintained	1	1	2	1	2	1	1	1	1	1	1	1
		Feel safe	1	1	2	1	2	2	1	1	1	1	2	1
		Variety of trees	2	2	3	3	2	2	1	2	2	2	1	2
	Reason puts off visiting green	Spacious	2	2	2	3	1	2	2	2	2	3	2	2
		Too far to walk	2	2	1	2	3	1	2	3	3	1	2	1
		Not interested	2	3	2	1	1	1	1	1	1	2	2	1
	Accessibility/ distance	Not important	2	2	2	1	1	1	1	1	1	1	1	1
		Important	2	2	2	2	2	2	2	2	2	1	1	1
		Very important	2	2	3	3	3	3	3	3	3	2	4	4
	Level of Performance		24	26	26	26	26	23	22	24	25	24	25	24

Finding:

Users prefer socially interactive, diversify and secure green spaces with good physical arrangement and maintenance which are in close proximity to their home .They need accessible green that follow a high intensity use function and commence to be a vital element in their neighbourhood life.

6.2.7 Environmental impact& weather parameters

The Physical environment plays an important role in the liveability and climatic change of accessible greens. In a context of climate change, with the expected increase in temperature, dryness and intensity of heat waves, accessible green areas assume even higher importance as they can create a cooling effect that extends to the surrounding areas. The thermal performance of an accessible greens influence the surrounding atmospheric environment of a densely urbanized study areas of Dhaka. Measurements of weather parameters (sunlight &

Shade, temperature, relative humidity, wind speed) were carried out along a selected path, starting from inside the green area to surrounding streets.

Table 6.17: Analysis of physical conditions of unplanned study areas

Environmental Dimensions	
06	**Unplanned area** **Attributes :Environmental Impact**
Physical Environment	
Bangladesh Maath Physical condition of Bangladesh Maath is moderately good. Internal walkway as paved area which provides hard, dry and non slip surfaces to carry the pedestrian movement. This path creates a sense of direction and gives a feeling of repose under the tree coverage on east side of the field. Tree coverage is full of Krsihnachura, Radhachura, coconut trees, neem trees. Lighting is not at all sufficient. Solid boundary wall though create strong enclosure but decreases visual accessibility. South side wall is visually connected with the street.SS pipe and tiles are used on this side wall. Uneven soft surface with water clogging is perceived. 	
Shamshabaad Eidgah Maath Peripheral internal walkway with line of coconut trees. The walkway is made of Non slippery tiles and sitting of concrete slab. Visual accessibility is good. The boundary wall is of brick wall with iron grill in it. 	
Armanitola Play Field This large field is look like a barren land with full of waste and without any tree coverage. It is surrounded by a solid brick wall adjacent with pickup parking. Absence of proper lighting invite crimes at night. 	

Sikkatuli Shahid Khalek Sardar Park

This accessible green is a well balanced of all the physical factors among the selected study areas of Old Dhaka. The scale, tree coverage and visual accessibility are well integrated with the surroundings. The traffic calmed environment makes the park more user-friendly. Though there is waste sorting space adjacent to the entry of the park but after entering the park it will seem to any one a place of pose, relax with soothing dynamism. Boundary wall is of brick and patterned light grill which act as a visual bridge between the users and the passersby.

Sirajuddaula Park

This historical park has very rare trees all over the place. Though the park is beside heavy traffic road the peripheral trees decreases the noise at a level. Soft shaded surface create a cooling effect for the surrounding as well as for the users. Lighting condition is not good. The composite boundary walls contain a visual flow from inside to outside as well as out side to inside.

The Following table conveys the temperature and humidity data. The temperature readings are taken at morning (9am) and evening (5pm) of each study sites from center of the field, under tree coverage and from nearby busiest road.

Table 6.18: Temperatures and humidity data of unplanned areas

Time		**Morning**			**Evening**		
Accessible Greens of Planned area		Center of the Field	Under Tree	Busiest Road	Center of the Field	Under Tree	Busiest Road
Bangladesh Maath	Temperature °c	32.3°c	32.1°c	32.1°c	29.9°c	29.9°c	29.6°c
	Humidity %	24%	29%	33%	25%	23%	23%
Samsabaad Lane Maath	Temperature °c	29.9°c	30.2°c	30.4°c	30.3°c	30.3°c	30.2°c
	Humidity %	30%	27%	29%	22%	25%	25%
Armanitola Field	Temperature °c	32.0°c	31.3°c	32.2°c	30.9°c	30.7°c	31.2°c
	Humidity %	28%	27%	25%	30%	22%	25%
Sikkatuli	Temperature °c	29.3°c	29.2°c	29.9°c	28.9°c	28.9°c	30.1°c

Park	Humidity %	31%	33%	29%	34%	30%	24%
Sirajuddaula Park	Temperature °c	31.2°c	31.2°c	31.2°c	29.6°c	29.5°c	29.6°c
	Humidity %	30%	25%	27%	28%	26%	26%

Table 6.19: Analysis of physical conditions of planned study areas

Environmental Dimensions

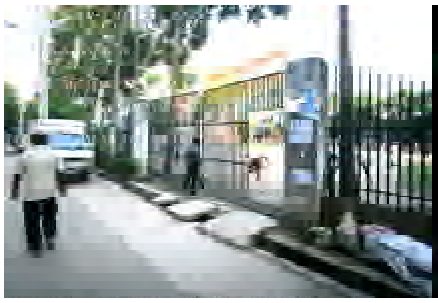
06

Planned area
Attributes :Environmental Impact

Physical Environment

Lalmatia D block field

Line of Shirish, Mehgani, coconut and Krishnachura trees all around the play field. Visual accessibility is good. The boundary wall is of brick wall with iron grill in it. Though the field have uneven surface, the traffic calmed environment makes the park more user-friendly.




Lalmatia new colony field



This multifunctional play field holds two faceted conditions. East portion is in better condition than the west part of the field in terms of surface condition. West part holds weekly vegetable market, food stall for low-income people, bus parking etc. Visual accessibility from all sides of the field. Very recently constructed internal walkway provides hard, dry and non slip surfaces to carry the pedestrian movement. People who used to go to Chandrima uddayn or Dhanmondi lake for morning walk now can continue here. Shirish , mehgani and mango trees act as shadow caster all over the field along the edge of the new colony play field.

Udoyjol Play ground

Mehgani, krishnachura, neem, akashmoni surround the play field. Boundary wall is of brick and patterned light grill which act as a visual link between the users and the passersby. The discontinuous boundary wall is also used as sitting as there is no provision of sitting. People sit on the soft surface (grass).It has been observed that water clog during rainy season. The Udoyjol club house has the wash room facility which is not seen in any other study areas.

Iqbal Road Field Park

People from the surrounding neighborhood use the internal walkway for walking which provides hard, dry and non slip surfaces to carry the pedestrian movement with tree in it. The concerned club authority keep the field close while introduce grass to create a soft floor for the users. Mehgani, coconut, krishnachura, radhachura keep the field cool during hot summer day.

Humayan Road Block B Play Field

This vibrant neighborhood playfield of Humayan road has a good balanced of physical factors. The scale, tree coverage (mango, coconut, dakhur, boroi, mehgani, krishnachura etc) and visual accessibility are well integrated with the surroundings. The traffic calmed environment makes the park more user-friendly. The streets also act as play space for children of adjacent apartments. The composite boundary walls (brick & grill) contain a visual link between insider and passersby.

Tajmahal Park-Field

These park and field adjacent to each other invite all types of users including woman with their children, old people and offer variety of activity. Though the park and field is divided physically and visually with the mehrab wall on west side of the field. Non slippery

walkways carry the pedestrian movement as well as act as bicycle path. Good treed spaces. Water clogging is observed during rainy season.

Khilji Road Children's Park

Though this is named children park, all aged persons of adjacent neighborhood or distant areas use this accessible green space. Irregular non slippery walkways not only use as pedestrian movement but also place for pause, rest, sleep ft. Grassy surface all over. Tree coverage along the periphery. Composite boundary wall has visual clarity.

Table 6.20: Temperatures and humidity data of planned areas

Time		**Morning**			**Evening**		
Accessible Greens of Planned area		Center of the Field	Under Tree	Busiest Road	Center of the Field	Under Tree	Busiest Road
Tajmahal Park & Field	Temperature °c	31.1°c	29.8°c	32.3°c	32.9°c	32.7°c	33.1°c
	Humidity %	22%	22%	23%	27%	30%	31%
Iqbal Road Field	Temperature °c	30.3°c	29.6°c	31.9°c	29.6°c	28.9°c	31.3°c
	Humidity %	26%	29%	28%	32%	29%	28%
Udoyjol Club Field	Temperature °c	29.6°c	29.2°c	29.8°c	31.3°c	31.2°c	31.7°c
	Humidity %	29%	29%	30%	31%	31%	33%
Khilji Road Children's Park	Temperature °c	27.3°c	27.3°c	27.5°c	29.6°c	29.2°c	30.1°c
	Humidity %	23%	24%	26%	29%	27%	29%
Humayan Road Play Field	Temperature °c	29.1°c	28.4°c	29.1°c	32.1°c	32.0°c	32.8°c
	Humidity %	27%	27%	28%	30%	31%	30%
Lalmatia New Colony Field	Temperature °c	27.3°c	27.1°c	29.1°c	30.1°c	30.0°c	36.4°c
	Humidity %	26%	26%	26%	31%	31%	29%
Lalmatia Block D Field	Temperature °c	31.4°c	30.1°c	31.9°c	32.2°c	31.5°c	32.6°c
	Humidity %	28%	29%	29%	30%	30%	30%

It has been found that huge tree canopy of parks (Sikkatuli Park, Sirajuddaula Park, Tajmahal Road Park, Khilji Road Children's Park) play important role in temperature control of the accessible greens.

6.3 Observation finding and Comparative analysis of Study areas

The chance to observe was very useful for obtaining additional information and to identify factors not detected through the interviews. Most of the observations were developed between

weekdays and weekend .the observations were based on a chart which had important items as a checklist which helped to structure the process. This allowed reporting events as they were occurring, allowing detection of people's behavior in more systematic way. It observed how the accessible greens are used, and spatial needs in people, because often people's action can provide more information than their words. It also detected missing links between people and the environment, and unfavourable factors for sociability. Therefore, the combination of both interviews and observation were important for obtaining information from the users and their perceived behavior. Observation also helped in comparative analysis among the twelve accessible green spots. The following are some general findings obtained through observation on study areas.

6.3.1 Accessibility

Accessibility is the way users arrive at green space and the distance necessary for access to it. This information is necessary to know how easily people are able to access twelve selected study areas, to explore if this influence people's intensity of use and visits to the greens and to determine if problem in accessibility reduce the frequency of visits the greens. Access to and within urban green spaces can be a major concern to the users. Two aspects of access – having a space nearer and being easier to get to – were clearly identified as issues that would encourage greater use of urban green spaces more. The large majority of visitors to urban green spaces travel to them on foot. In the focus groups most people similarly reported that they walk to their park, play area or green space. Rickshaw and car were the second most frequently mentioned methods of accessing to green spaces (parks, play areas).

Figure 6.15: Neighborhood oriented greens (planned and unplanned)

The following table has been constructed from the observation during the time of survey. It is clear that most of the green areas of planned areas have more visual accessibility than those of

unplanned areas. On the other hand physical access means of having number of entries to the green. A large number of the users of greens of unplanned study area reach on the spots by direct use of streets as these streets do not have any provision of footpath. Though the greens of planned study areas do have footpaths but some of them are occupied by waste, nursery, shops etc. Regarding accessibility conditions, most of the accessible greens (Samsabaad Lane Maath, Bangladesh Maath, Lalmatia D Block Field, Iqbal Road Field, Udoyjol Club, Humayan Road Field Maath, Tajmahal Park-Field) selected for the research are neighborhoods oriented. Therefore most users will be surrounding neighbor that live in close residential areas.

Table 6.21: Accessibility in terms of visual, physical access and pedestrian movement

Accessible greens (Parks/playfields)	**Accessibility**		**Pedestrian Movement** (Presence /absence of footpath)
	Visual Access	**Physical Access**	
Planned Area			
Sirajuddaula Park	**Yes**	**Yes** (from north side main entry from east and south side secondary entries)	Presence of foot paths on north and east side(narrow down by fruit shops, tea stalls ,bricks etc)
Sikkatuli Park	**Yes**	**Yes** (only from north side main entry)	**Absent**
Armanitola Field	**No** (Surround by solid wall)	**Yes** (only from west side main entry)	**Absent**
Bangladesh Math	**No** (except south side ,surround by shops and gallery)	**Yes** (from north side main entry and south side)	**Absent**
Samsabaad lane Field	**Yes**	**Yes** (from south side main entry)	**Absent**
Unplanned Area			
Lalmatia D block Math	**Yes**	**Yes** (from north and south side)	**Absent**
Lalmatia New colony field	**Yes**	**Yes** (from east side main entry and from west and south side secondary entries)	Only at south side of the field
Iqbal road Club math	**Yes**	**Yes** (from north side main entry and from south side secondary entry)	Presence of foot paths on all sides
Udoyjol Club Math	**Yes**	**Yes** (from north side main entry and from south side	Only at east side of the park but block with nursery

		secondary entry)	
Humayan road field	**Yes**	**Yes** (from east side main entry)	Presence of foot paths on all sides
Tajmahal park Field	**Yes**	**Yes** (for Park from north side main entry and south side, for field from east side main entry and south side)	Only at east side of the field
Khilji Road children's Park	**Yes**	**Yes** (from east side main entry and from west side secondary entry)	Only at east side of the park

On the other hand Armanitola Field (events), Sirajuddaula Park (transition), Lalmatia New Colony Maath (events), Khilji Road Children's Park have the broader influence over large city population as they are widely access from major road. The presence of accessible condition invites many people to these greens. These greens being highly accessible through public transportation does not attract users from other sectors due to the nature of the surrounding activities. The lack of diverse activities and uses in Armanitola Field reduces the chance of drawing many people in. Therefore the filed is physically accessible but it does not have attractive conditions for people.

6.3.2 Frequency of uses:

Parameters for frequency of uses are divided into as shown in the following table (6.27).First the users are asked the questions and then from their answers the frequency of uses from per day , per week, per month and per year have been established along with their duration of stay in the accessible green . The focus groups across twelve study locations consisted of a mixture of people who both do and do not use urban green spaces. Across all types of groups the discussions revealed that most of the participants who were users visited urban green spaces on a daily or weekly basis with less people reporting fortnightly or monthly use. Figure 6.10 and 6.11 show the frequency distribution of both unplanned and planned areas. the color coding stand for each study areas which help us to identify number of people use to go the nearby green everyday, two or three days per week or two to three days per month or one or two days in a year. In terms of a daily pattern there appears to be a peak of use in the afternoons with weekends and holiday times also being key times for use of urban green spaces. Men are confirmed as slightly higher users of urban green spaces than women. Observation detected peak hours and the frequency of use during the days of the weeks. Some people have seasonal patterns of use while others are affected by the weather. Peak hours for the greens were morning, afternoon and evening hours. During weekends and specifically at peak hours all the study spots experienced slightly higher intensity of uses than weekdays. In

case of unplanned study areas something is happening in parks or fields from morning to evening. It is because people of these areas do not have sufficient place as mohammadpur areas to go. In a mixed-use area like old Dhaka, the flow of people would be in different directions.

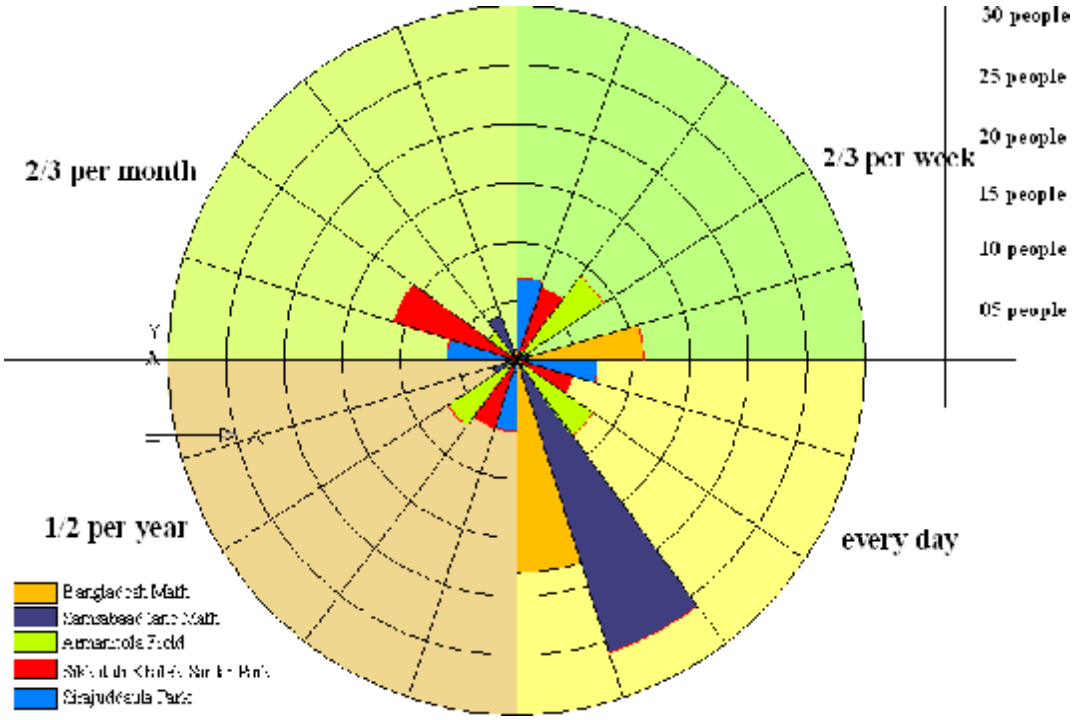


Figure 6.16: Frequency distribution of unplanned area of Dhaka

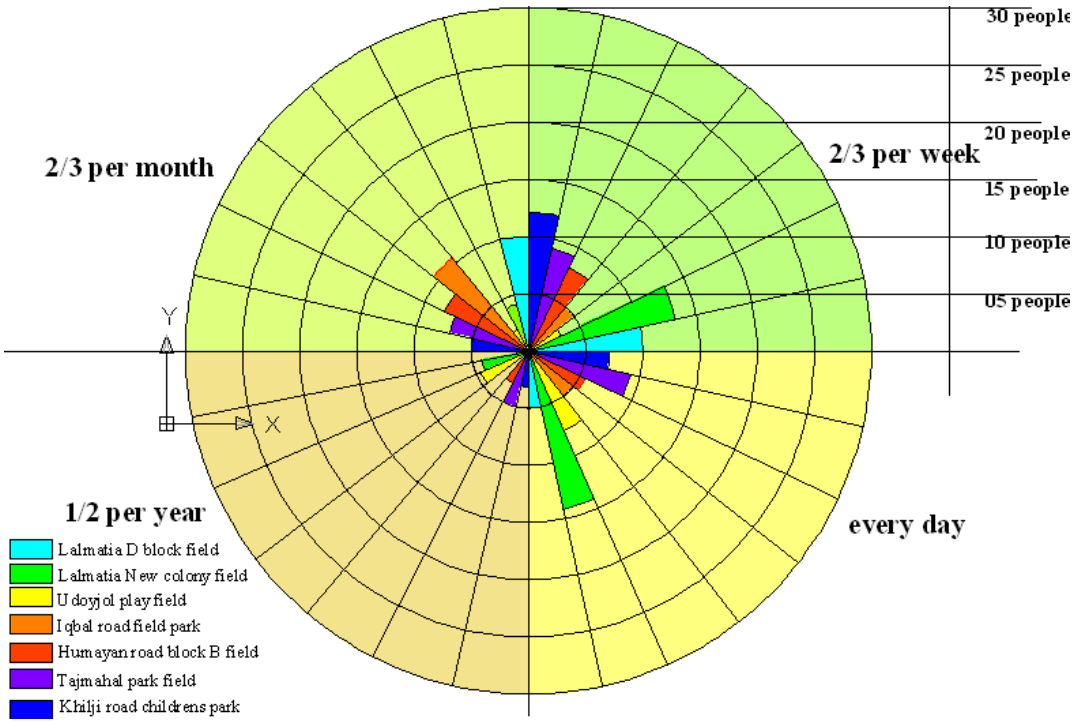


Figure 6.17: Frequency distribution of planned area of Dhaka

Sirajuddaula Park and Sikkatuli Khalek Shardar Park all day long packed with non resident people or passersby. Such Small neighborhood parks can also give the neighbors a sense of ownership by adding benches or low walls for seating, and encouraging the presence of vendors, to attract adults as well as children. At Armanitola Field children of informal sector or working children are seen as it is surrounded by whole sale markets and bazaar. Use during early morning hours is basically for exercising and jogging. Most users at this time are professionals and adult people, older people are seen after sunrise and stay in these greens until heat starts warm the park and fields. During morning hours the accessible greens are cool and breezy. Most users like to sit in benches under trees, close to the walkway. The presence of drug users (and drugs and needles) and 'undesirable characters' are the reasons that has been mentioned by Sirajuddaula Park and Armanitola Field users for non or infrequent use also. It is evident that people of planned residential areas use to go to Dhanmondi Lake for morning walk. Users of Lalmatia new colony and Lalmatia D block field felt that the natural settings of the lake area appropriate for diversify activities. Old people were seen to use the places at morning. As Iqbal road field and Tajmahal Park have the internal walkway it is used by the user for morning walk. At the afternoon of weekdays all these places experienced a good frequency of uses as children, teenagers and students were gathered for playing, gossiping, walking or share and express their views with friends or attend any events. At Friday afternoon Car hut occurred at Lalmatia New Colony Field.

Children have little or no opportunity to play outside, and few if any schools have playgrounds, meaning that children grow up with few physically active recreational opportunities and few chances to socialize with other children or with adults. It is seen that Lalmatia D Block field and Tajmahal Park field experience students played at noon. Khilji Road Children's Park serve its residential people but at the evening hours non residents and office people or people engaged with commercial uses come to the park for relax or for adda. According to the questioner survey (How far do user live from this green space?) it is evident that frequency of uses of the users increase if the green is near (2-5 blocks) to their residence. Total 360 people (150 people in unplanned area and 210 people in planned area) participate. 56% users of unplanned study areas and 58% users of planned areas think that they live relatively close to the accessible greens (2 to 5 blocks) around 500-1250 feet from their residence.

The frequency of visits to green areas does affected by significant distance decay, as distance between the dwelling and green areas increases. From figure 6.11 and table 6.29 it is evident that use frequency declines with distance.

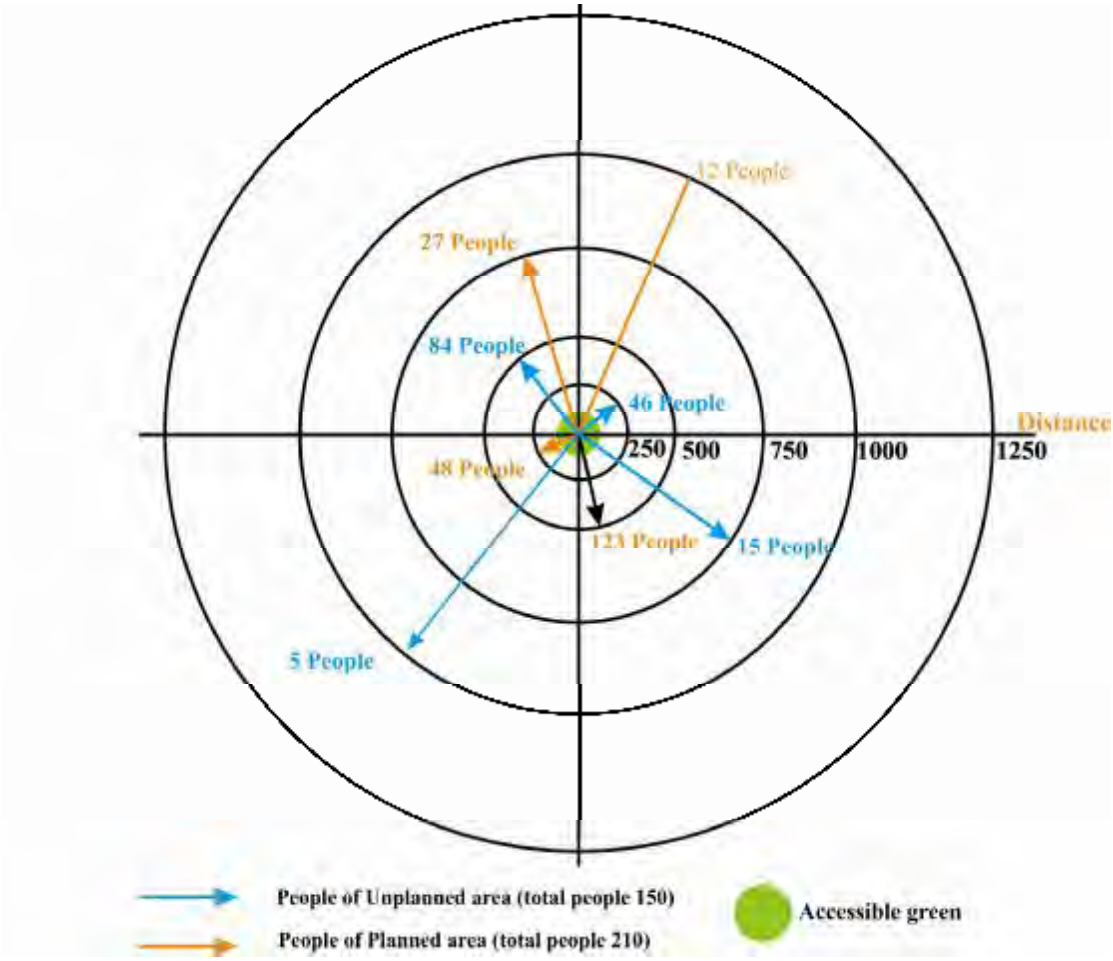


Figure 6.18: Perceived distance to nearest green space

Table 6.22: People and distance

Distance	**Unplanned area**(150)		**Planned area**(210)	
	No of People	%	No of People	%
Less than 1 blocks or 1block radius (150-250 feet)	46	31	48	23
2to 3 blocks radius (500-750 feet)	**84**	**56**	**123**	**58**
3-less than 5 blocks radius (750-1000 feet)	15	10	27	13
Far (above1250 feet)	05	03	12	06

6.3.3 Activities:

The use of urban green spaces for social interaction is also extremely important – "the field is somewhere to go, a place to talk, somewhere to sit on the grass" (young person in Lalmatia New Colony Field). Activities those are seen in these accessible greens are passive, social and active in nature for example active enjoyment, including sport and specific activities, talking/conversing ,walking or jogging, enjoying the environment; social activities ,watching people ,sleeping on bench, studying ,gathering, attending special event. The research has also

clearly confirmed that informal and passive activities are the main reasons that people visit urban green spaces. These primary uses can differ with a social typology, based on age, gender, physical and mental ability and ethnicity. It should be noted that all activities are of equal importance. Every activity is important for somebody. Sport was the most mentioned type of active enjoyment mentioned across all types of focus groups. Although football was mentioned most other sports were felt, by some, to be under-represented in their provision to play cricket was mentioned too. Attending events (fair, concerts) is a very significant reason for people mainly woman and child to use green spaces. The respondents also revealed that they visit urban green spaces for watching sport, or watching life go by, as well as for reading, smoking and photography. Surrounding activities are informal vendors; fast food or commercial shops in case of Old Dhaka and mostly residential with some informal vendors in New Dhaka. Major activity locations are under trees; internal walk way and sittings where in case of children near playing equipments and on the fields. Children were often seen playing whether it is a park or field though all the equipments are not properly maintained or insufficient to serve the users. Youngsters were seen playing footballs or crickets or hang around on internal walkway. It is evident in Bangladesh Math of old Dhaka. When these places were much crowed during afternoon and evening hours, conflict was found. Activities in old Dhaka are seen various caused by its mixed use and diverse surrounding. But in case of Samsabaad Lane Field is different as it is very much neighbor hood oriented green space.

Figure 6.19: Activities at afternoon at various study areas of Old Dhaka

Use and people permanence in these areas increased during afternoon and evening. Mostly parks use were parents bringing there children to play or beginning to exercise whereas most of the fields experienced young people to appear and congregate and interacting socially with their friends. Most of them are found leaning or standing around the walkway or sitting which beginning at 5.30 pm to 6.30 pm operates daily. The lack of visual accessibility, lighting and police monitoring and the perception of users as an unsafe area may be causing the people presence during evening and night hours. It is clear that there does not appear to be any

consistency in the characteristics of green space users according to age, which almost certainly reflects the great variety both of spaces and of people in different locations. People aged 25-59 have been identified as the dominant user group in Sirajuddaula Park and Sikkatuli Park.

Figure 6.20: Activities at afternoon at various study areas of New Dhaka.

Figure 6.21: Accessible green use by older people (walking/resting/gossiping)

Figure 6.22: Accessible green use by woman (walking/resting/gossiping)

In Udoyjol club field and Iqbal road field, on the other hand, the dominant age for use is revealed to be younger, at 25 to 40, this is because this is the age group with children to take

to such spaces. As we get older, many people increasingly rely on local public services to help continue to live active and fulfilled lives. Parks are age proof and bring opportunities for physical activity, volunteering and social interaction all of which provide a sense of achievement and purpose. Millions of older people are lonely and find themselves isolated within their own homes. Safe, high quality green spaces provide opportunities for social interaction with the local community. They can evoke memories, provide a place for people to reunite or meet new friends, allowing older people to create or sustain bonds and reinstate vitality. Walking, resting under trees, brining grand children to the green are the main activities of older people that has been identified in the study areas (Figure 6.38).

Table 6.23: Activity/accessible green matrix

Legends: High ○; Medium □; Low △

Activity/accessible green matrix													
	Study areas												
		Unplanned areas					Planned areas						
	Possible activities	Sirajuddoula Park	Sikkatuli Khalek Sardar Park	Armanitola field	Bangladesh Math	Swamibagh lane math	Lalmatia new colony	Lalmatia D block math	Iqbal road math	Udoyon club Field	Humayun road B block math	Tajmahal park	Khilji road Park
Passive	Enjoy flowers/trees	○	△	△	△	△	△	△	□	△	△	○	△
	Get some fresh air	□	○	□	○	□	○	△	□	□	○	○	○
	Enjoy the beauty of the surroundings	△	□	△	△	□	△	△	△	△	□	△	
	To relax	□	□	△	□	○	□	□	△	△	□	□	△
	For peace and quiet	□	△	△	□	□	△	△	□		□	△	△
	To think	△	△	△	△	□	△	△	△	△	△	△	△
Sociable	Children/family outing	□	□	□	△	□	□	△	△	△	□	□	□
	Meet friends	○	○	○	○	○	○	○	○	○	○	○	○
	Visit the children's playing area	△	△	□	△	□	△	△	△	△	□	□	□
	Enjoy events	△	△	□	□	△	□	△	△	△	□	□	△
	Watch sports or games	△	△	□	□	△	□	□	□	○	□	△	△
	To eat/drink	□	△	△	△	△	△	△	△	△	△	△	△
active	For a walk	○	○	□	○	○	○	○	□	○	○	○	○
	Play sports or games	△	□	○	□	□	○	○	○	○	□	□	□
	Take a shortcut	△	△	△	△	△	△	△	△	△	□	△	△
	To keep fit	□	□	△	△	△	□	□	△	△	△	□	□

Women composed most groups of two to three in the accessible green. Presence of woman was found in parks rather than play fields. They like to have seating in their nearby green where they can sit and watch their children (4-6years) to play. Also some of them come to the park at morning or afternoon hours for walk whereas some mothers use the accessible green as waiting space while their children are in schools. On the other hand these greens act as income source for low income group. They use to collect the waste or cut the grass to maintain their livelihood. Figure 6.16 shows the different uses of parks and playfield by the woman. It is found that they do not feel safe or welcome to the green as greens are mainly male dominant. These greens are means of income generating to the low income group. Informal vendors are seen in every accessible green.

6.4.4 Sociability:

Parks became 'democratic' spaces, melting pots where people from all walks of life could mingle; though there was another agenda at play too (Cranz, G. 1978). Though how we perceive a place is shaped by both individual differences and cultural values - people from diverse socio-cultural and socio-demographic backgrounds will likely perceive and use the same park space very differently. Swanwick (2009) noted that highly valued green spaces enhance the positive qualities of urban life, offer a variety of opportunities and physical settings and encourage sociability and cultural diversity. These green spaces provide a focal point for members of a community to come together and interact in a positive and enjoyable way. This kind of interaction and sharing of experiences helps to create the bonds and ties that hold a community together and create a common understanding of the nature of the community. As such green areas offer free, non-discriminatory and unlimited access, and because they can be very visible indicators of neighbourhood quality, parks appear to have a special value in galvanizing social activity. Many researches have shown that well managed parks and green spaces can encourage visitors, and enhance social inclusion and cohesion. Parks are meant to be freely shared, intentionally designed to encourage social interaction, parks help to breakdown barriers to social inclusion and allow members of different ages, communities and economic class to meet as equals. Communication, exchange and interaction between strangers can be found in the accessible green but competence and lack of empathy can also be found. Any kind of interaction can be found positive and negative. Observing people engaged in groups showed longer permanence in the greens. It was observed that most people were engaged in groups of 4 to 5 people.

Table 6.24: Comparative level of performance in terms of sociability

			areas											
			Unplanned areas				Planned areas							
categories	parameters		Bangladesh Math	Samsabad Lane Math	Armanitola Field	Sikkatuli Park	Sirajuddoula park	Lalmatia D block Park	Lalmatia New colony Field	Udoyan Play field	Iqbal road field Park	Humayun road B block field	Tajmahal Park field	Khilji road Childrens park
Sociability	Use pattern	Passive	3	3	1	3	2	1	2	1	2	1	4	2
		Sociable	2	3	2	3	2	3	4	2	2	3	4	3
		Active	3	4	3	3	3	3	4	3	2	4	3	4
	Level of Performance		8	10	6	9	7	7	10	6	6	8	11	9

Sociability as studied in this research, deals with perception of the users towards other users of the accessible greens. This research asked if people interacted with others in the green spaces and sought to know if any other users of the greens made people feel threatened or

uncomfortable. It explored how social interaction took place in the greens and how comfortable people felt with other users in the greens. Users were perceived as socially diverse and children were not observed as the dominant population. Women were generally found in groups but very rare. Mature adults were the predominant population. Young people were specially seen during afternoon and evening hours. Another important issue observed that more diverse users were found in Old Dhaka than new Dhaka.

Table 6.25: Comparative level of performance in terms of comfort

categories	parameters		areas											
			Unplanned areas					Planned areas						
			Bangladesh Math	Sansabad Lane Math	Armanitola Field	Sikkatuli Park	Sirajuddaula park	Lalmatia D Block Park	Lalmatia New colony Field	Udoyjol Play field	Iqbal road Field	Humayun road B block field	Tajmahal Park Field	Khilji road Children park
Comfort	Level of comfort	Very comfortable	4	4	1	4	4	3	1	3	4	2	4	4
		Comfortable	1	1	1	1	1	1	1	1	3	2	2	1
	Level of security	Secure	2	4	1	3	3	1	2	2	4	3	3	4
		Non secure	1	1	4	1	1	1	1	1	1	1	1	1
	Level of Performance		8	9	6	9	8	6	6	7	10	8	9	9

In Sirajuddaula Park, Sikkatuli Park and Khilji Road Children's Park most interviewed participants were diverse in age and social status. Amenities such as informal food and snake vending in the greens and in the surrounding areas create the opportunity for people to make comments between strangers, talk about their impression about various issues. Sirajuddaula Park act as a waiting place for those whom are to be going to their home to enjoy the weekend as there is a bus stand near the park. This is what Whyte defined as "triangulation" (1980), the presence of an event or amenity in the public place, which could draw strangers together. Though many of the Sirajuddaula park users feel that at the evening the accessibility of drug users makes the place unsafe for use. Because of the absence of visual accessibility and amenities the image of Armanitola Maath was not favorable than that of Sirajuddaula Park. In Tajmahal Park, people with common interest like parents bringing their children to the park, were found about their children or others commonality. It is also important to note that in Iqbal road field and Udoyjol club math a major influence of surrounding neighbors is found, therefore they are popular among the nearby residents.

The family oriented environment in the afternoon and evening favored interaction among parents while their children played with each other. Users of these fields believed that other users were socially active people as most of them are neighbor and people seen regularly specially while exercising or bringing the children to play on a daily basis.

Figure 6.23: Social Events (Car hut and Boishakhi mela) on Lalmatia New colony field

On the other hand in Lalmatia d block Math and Lalmatia New colony field the description of others mainly focused on young people and students. Events held within parks and green space, whether regular and annual, or a one off special attracting more people would make urban green spaces more interesting to be in. Many users said that an active events programme is important in green space which can uplift sociability. In the focus groups many people mentioned fair, music events and some, though far fewer, mentioned the desirability of theatre.

6.3.5 Amenities/Facilities:

Sirajuddaula Park has external walkway only on north side and Armanitola Field only at south side. Bangladesh Maath has Gallery type sitting on north and east side. North gallery is allocated only for woman. Though food stalls are not allowed inside the park or field but in case of Bangladesh math the food stalls are remain inside on southern part of the field. Lighting fixtures are seen but insufficient. Clock is added in one of the lamppost in Sikkatuli Park. Bangladesh Maath has gallery type of sitting on north and east side. Some temporary food stands are identified on southern part near the entry to the field. Samsabaad lane Math has continuous walkway inside the field with sitting in good interval. In Armanitola Field provision of sitting is absent totally. The infrastructure is very poor with low maintenance. Sometimes the field is illegally occupied by the trading goods and construction materials. Sikkatuli Khalek Sardar Park hold good possibilities of walking because there is continuous internal walkway with different type of sitting. Plantation box also use as sitting. Continuous walkway around the park for the residents is present in Sirajuddaula Park of Old Dhaka. Elderly people, including women used to visit the park for walking in the morning. The park has five of its sitting benches specially arranged for women visitors only.

Lalmatia D Block Park has sitting with covered on northeast corner. Provision for drinking water is present .The Field is in Need of internal walkway. There was No internal walkway or

provision of sitting in Lalmatia New Colony Maath. But recently internal walkway is added and the residents begin walking at morning and evening hours. Planting grass all over the field is required. No internal walkway or provision of sitting in Udoyjol Club Maath .Users use the boundary wall as their sitting. It has been observed more individuals involved in social activities in spaces with high levels of green cover than in spaces with low levels of green cover in Humayan Road Block B Play Field. Iqbal Road Field Has internal walkway but not well maintained. Sitting must be accommodated and coordinated with the walkway. Humayan Road Block B Play Field has No internal walkway or provision of sitting. Both the Humayan Road Block B Play Field and Udoyjol Club Maath have cricket practicing net. More sitting is needed. Khilji Road Children's Park contains Continuous walkway invites people. Poor maintenance of children plays equipments is evident there. The Park is poorly lit. So need pathway lighting for evening use. Integrated Parking facilities, Ramps for disable, Signage such amenities are totally absent in both of unplanned and planned study areas. People sit on benches or around walkway in order to rest and chat while children are playing which has been seen in Sirajuddaula Park, Sikkatuli Park and Samsabaad Lane Maath of Old Dhaka and Tajmahal Park-field, Khilji Road Children's Park of Mohammadpur. Sometimes people were found leaning or sitting on planter box.

Figure 6.24: Gallery type of sitting, walkway with planter boxes in Bangladesh Math of Old Dhaka, Provision of walkway, poor condition of play equipments in Khilji road children's park

People want to feel that their basic need for comfort will be met in urban green spaces and provision of suitable seating comes high up a list of things that people want to see provided. Inadequate provision of seating was briefly mentioned in some areas of study .Bangladesh Math has gallery type of sitting (Figure 6.24) .For special events or programmes these sitting acts as most important amenity. Provisions for seating were absence in Armanitola Maath, Iqbal Road Field, Udoyjol Club Filed, Lalmatia New Colony Field and Lalmatia D Block Maath (Table 6.21). Cultural gateways such as community events, art and sculpture, music and debate are all available via our green spaces. These are accessible and affordable for all, providing a platform, for skills, interest and lives to be shared; broadening knowledge and awareness and often reinforcing or reintroducing civil society which can so easily become lost

in the constant evolution of urban areas. Accessible green are the heart and soul of cities; often retelling our heritage and injecting life into the built environment. Many of our parks and green spaces have an element of historic association such as the name, a monument (Sahid Minar) or commemorative features, with most telling the stories of the local community (Figure 6.25).

Figure 6.25: Surya Vashkorjo at Sikkatuli park, Sahid minar at humayan road field, fountain in Tajmahal park-field

Figure 6.26: Young people cycling in the green

Khilji Road Playground, at Mohammadpur is used by the local children as a playground, and frequented by people for walking and exercising. But Play equipments are found without maintenance in Khilji road children's park. Engaging in moderate physical activity such as walking or bicycling can improve health outcomes. So Facilities for cycling, for leisure use by young people, were mentioned together with the desirability of a cycle track or routes. The following images depict the need of having cycle tracks in the accessible greens.

6.3.6 Spatial Behaviour:

All the fields' users have the tendency to use the central spaces for active activities such as playing, children recreation. On the other hand internal perimeters use for passive activities like exercising, social gathering. This pattern also increases during weekends. Most people bring their children to the park concentrated near sitting or playing spaces. It was observed that people jogging and walking generally located at the perimeters of the fields and parks

closer to the traffics congestion. Microclimatic conditions were one of the most important factors that influenced people's spatial behavior. It was seen that during noon hours fewer people visited and the people who were in those were all under trees or shaded areas. In the following page maps (Figure 6.27-6.31) of spatial behaviour of observed at different hours of the day will be provided for better understanding where people congregates and locate during different hours of the day. In Bangladesh Maath, at afternoon most people are seen walking, students interacting after finishing their classes. Children are seen playing at the center in groups as well as young people. Informal vendors are observed on the south side near entry .The percentage of woman is low. They use to sit near planter boxes on north side or just use the field as short cut to go from north to south or vise versa. Bangladesh math is visually detached from the road as inside the field there are galleries and outside are shops. Samsabaad Lane Math is surrounded by low traffic road.

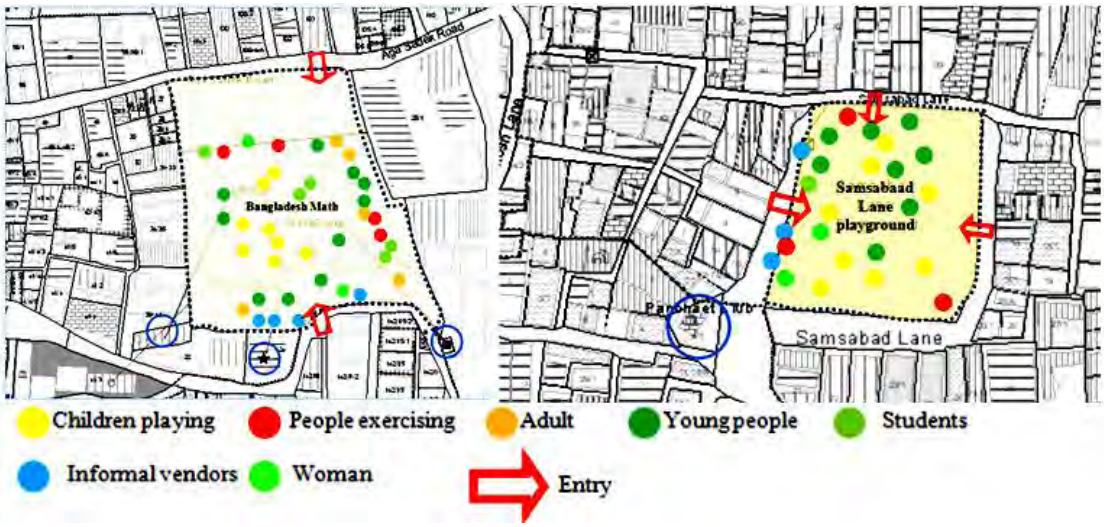


Figure 6.27: Spatial behaviour during afternoon at Bangladesh Math & Samsabaad Lane Playground

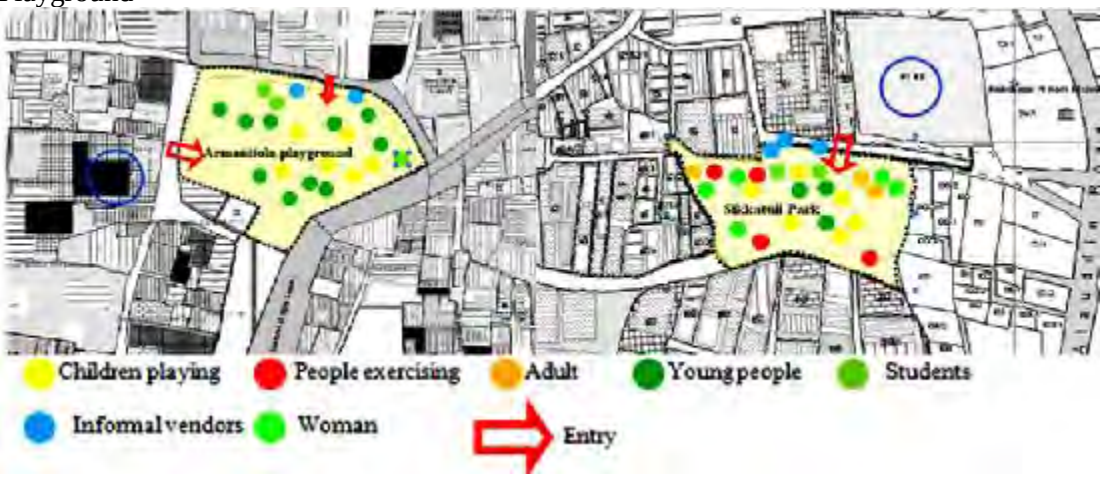


Figure 6.28: Spatial behaviour during afternoon at Armanitola Playground & Sikkatuli Khalek Sardar Park

Both Sikkatuli Park and Sirajuddaula Park are use for exercise like walking, jogging in morning and afternoon. The percentage of women users are more than that of Bangladesh math. Informal vendors are found in and around the parks. In case of Armanitola playground the dominant users are young people. Absence of visual accessibility reduces its users at morning and evening.

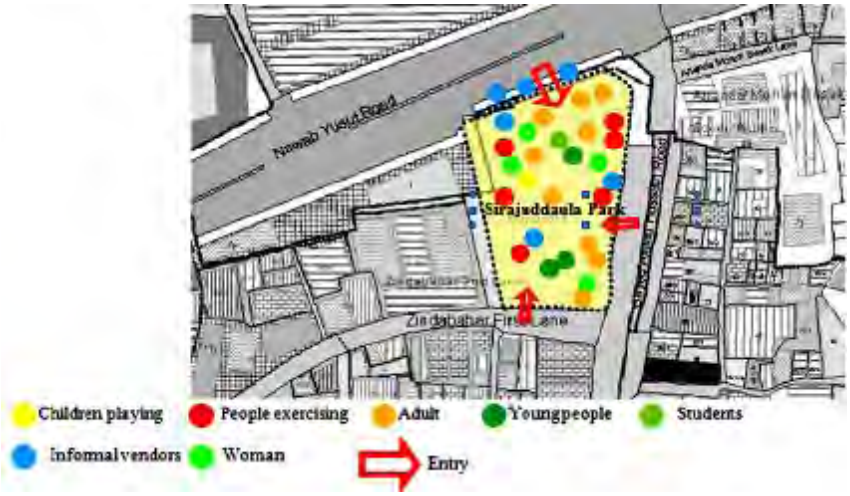


Figure 6.29: Spatial behaviour during afternoon at Sirajuddaula Park

Among planned study areas Iqbal road field, tajmahal Park and Khilji road Children Park are use for walking .It is found in both playfields (Iqbal road and Udoyjol) that parents not only bring their children but also play with them at afternoon. Users of these feel comfortable and safe as they use to come daily in these fields and most of them are neighbors. Young people as well as children can practice cricket in Lalmatia D block field, Udoyjol club Math and Humayan road play field as these greens contain practicing pitch portion at the corner of each field.

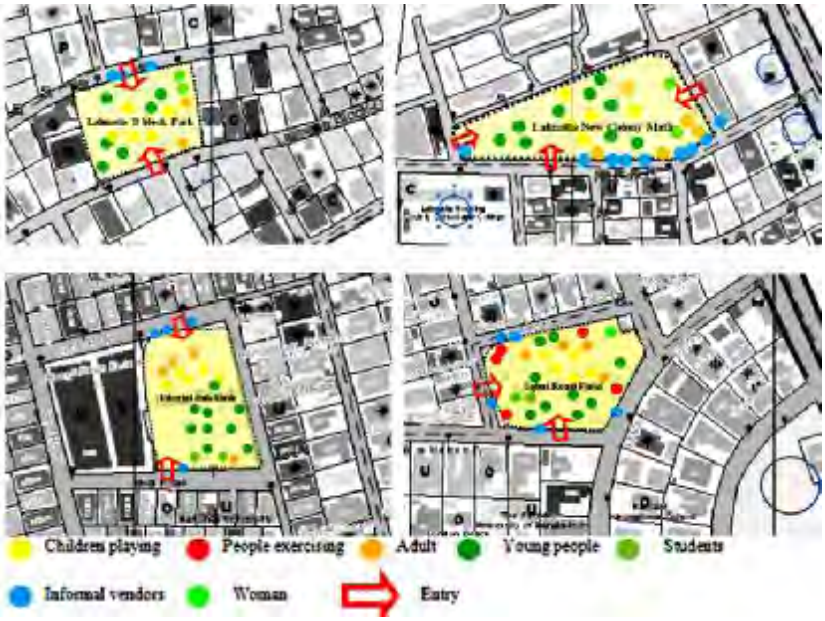


Figure 6.30: Spatial behaviour during afternoon at Lalmatia D Block Park, Lalmatia New colony Math, Udoyjol Club Field & Iqbal Road Field

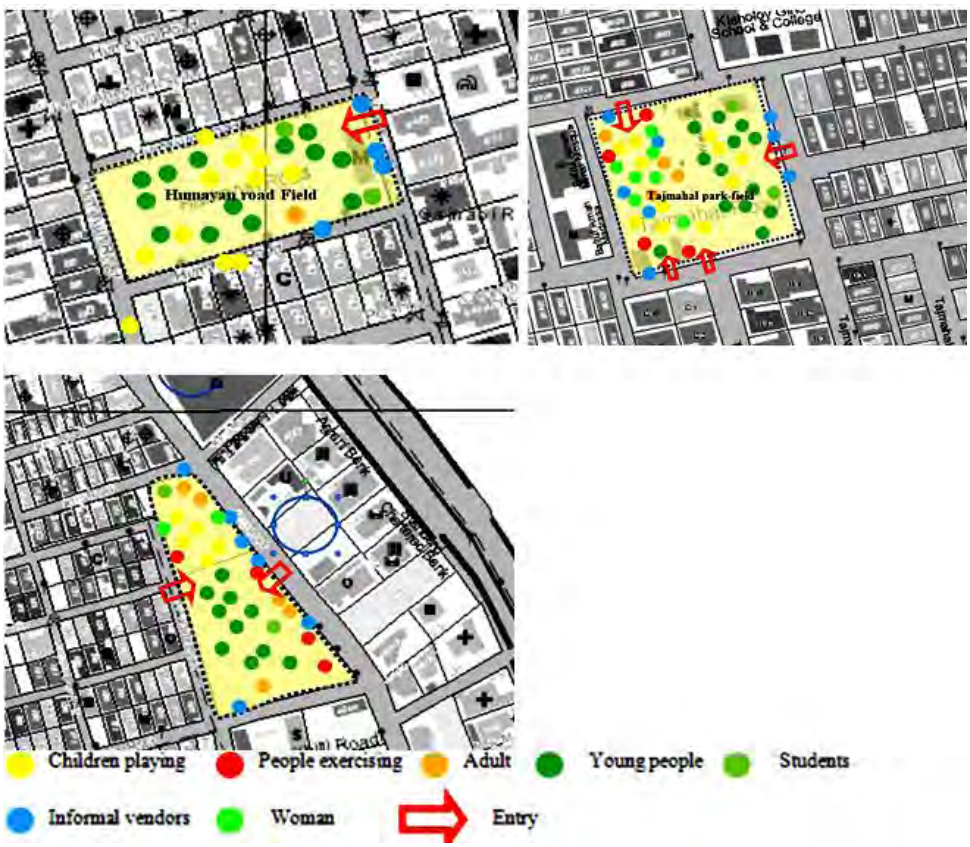


Figure 6.31: Spatial behaviour during afternoon at Humayan road field, Tajmahal Park-Field & Khilji road children's park

6.3.7 Physical conditions:

The visual appearance and attractiveness of towns and cities is strongly influenced by its green space. A high quality built environment, the buildings, roads and public spaces, cannot alone ensure that a town or city is an attractive and appealing place to live and work. The physical condition as well as landscape of parks and green space contributes as much to the quality of the urban environment as good architecture. People who do not use green spaces at all or only use them infrequently have less actual experience of using these spaces and so may have limited knowledge of how real, or otherwise, the perceived barriers may be. Main barriers have been identified that deter people from using urban green spaces. They are:

- Lack of or the poor condition of, facilities – including play for children
- Other users, including undesirable characters
- Poor lighting condition
- Safety and other 'psychological' issues
- Environmental quality issues such as litter, graffiti and vandalism.

Though the study areas contain parks and fields but with different location and site characteristics, different amenities and subsequently a different liveability, social and aesthetic experience. It is evident that all these green spaces need renovations and physical

arrangements should be aesthetically pleasing and attractive to people which will drawn more users to the greens. Those accessible greens which are under clubs or under private authority have rather good conditions than those which are under DCC. Though the maintenance is not that mush good.

Figure 6.32: Physical condition of studied areas (planned & unplanned)

Observing people pattern of use was important for detecting some problems in Sirajuddaula Park, Lalmatia New Colony Field, Khilji Road Children's Park and Iqbal Road Field. It was found that intensive traffic flux at morning and afternoon. Therefore instead of using the peripheral sidewalk to exercise they used the internal space. The gases emanated by vehicles and the proximity of the sidewalk to the street were observed as an uncomfortable conditions. Also the narrow dimension and discontinuous, fragmented sidewalks did not allow all the people pass by. Lalmatia playground is occupied by makeshift vending stalls, shops and various factories. All the greens require more surveillance in order to allow people to use the greens during more hours of the day and to create the feeling of security. It determined that more features are necessary, perhaps informal activities to more attracting uses from the surrounding areas. Climatic comfort is an important factor for drawing people to a setting. The recommendations and design implication will be discussed further. The presence of events, the use as recreational and sports facility, the presence of amenities for children and general climatic comfort are some conditions that draw people to the green. Most of the fields' uses were oriented towards sports activities, children recreation and social interaction. Bangladesh Maath was more intensely used by people than other greens of Old Dhaka and in new Dhaka Khilji road children's Park has the good sociability than other. The observation helped detecting problems, on functional features and missing amenities in the accessible greens. The information obtained will be useful and applicable in improving these spaces. In terms of changes in physical condition and addition of amenities that would encourage more frequent use of green spaces this analysis suggests that:

- Women would be encouraged significantly more than men if safety was improved;

- Disabled people would be encouraged significantly more than able bodied people if staffing levels were increased;
- 12-15 year olds would be encouraged significantly more than other age groups if there was better maintenance, better facilities, more events and a space that is easier to get to;
- 16-19 year olds would be encouraged significantly more than other age groups if there was better maintenance, provision of sports areas and events such as fairs. In addition all of this age group said that a café would make them more likely to use an urban park, play area or green space;
- 56-65 year olds would be significantly more encouraged than any other age group if there were more staff and also by provision of more seats.

Delivering quality of place does not have to be about creating new green spaces, but about improving the quality and utility of what is already there. Overall it is clear that the improvements that people want to see in their green spaces are related to good design and management, focused on meeting people's needs, overcoming barriers to use and providing a high quality and varied experience for the whole range of different groups in the community as a whole. Participants in the focus groups showed considerable awareness of the needs of others and wanted the ideal green space to be inclusive – an accessible green space for all.

6.4 Performance evaluation of study areas

The following Tables (6.24-6.26) states the comparative data analysis of unplanned and planned study areas according to the attributes (accessibility, frequency, sociability, comfort, users' perception, users' preferences and needs) after observing the accessible green spaces and interviewing the nearby people of each of the accessible green areas to evaluate and try to give a picture of their level of performance. All the data are converted to %. And so `Level of performance' twelve selected spots of Dhaka have been defined in five categories where

(1) 01%-20% =1
(2) 21%-40% =2
(3) 41%-60% =3
(4) 61%-80% =4
(5) 81%-100% =5

Tables are color coded from lighter to the darker means from lower to higher level of performance as like the following image: From table 6.31 we got the overall performance ranks of twelve selected spots of Dhaka and those have been defined in four categories: (1) Very Successful, (2) Successful (3) Moderately Successful, (4) Marginally Successful. Bangladesh Maath, Samsabaad Lane Maath and Tajmahal Park-Field perform very

successfully (101-105) where as Sikkatuli Park, Sirajuddaula Park and Khilji Road Park is successful with the range of 96-100.In other categories, Armanitola Field, Lalmatia New Colony Field and Udoyjol Play Field are moderately successful (91-95) and Lalmatia D Block Park, Iqbal Road Field and Humayan Road Field are marginally successful. If we see performance level base on planned and unplanned study area, it is evident that accessible greens of Old Dhaka is more successful than new Dhaka. As Mohammadpur has more than 16 accessible green (park and play field) and the socio cultural (family pattern, job, economic status, education) issues are different than old Dhaka users are more reluctant to use the greens. On the other side accessible green of old Dhaka are the only breathing places for old Dhaka people (people of Ward 68,69 and 70) in the high density compact urban fabric. So users use to go to the green very frequent. From the spot interview of Mohammadpur greens it is apparent that they prefer to go to Dhanmondi Lake area where they get variety of places with huge openness and they feel comfortable their during morning hours. Though we rank these twelve sites but every accessible green has some problems as well as potentialities. In the next Chapter, study areas have been formulated to combine aspects of structure, function and ideas of atmosphere to overcome the problems and enhance the potentialities. Ideas are given for each site. It is hoped that they can be useful in stimulating discussions on the design features which might be included as part of a new accessible green or redesigned the existing, and the way in which they can be used.

Table 6.26: Total performance base on accessibility, frequency, sociability, comfort, users' perception, users' preferences and needs

	areas											
	Unplanned areas					Planned areas						
Categories for liveability	Bangladesh Math	Samsabad Lane Math	Armanitola Field	Sikkatuli Park	Sirajuddaula park	Lalmatia D block Park	Lalmatia New colony Field	Udoyjol Play field	Iqbal road field Park	Humayan road B block field	Tajmahal Park field	Khilji road Children park
Accessibility	18	18	19	17	18	16	19	16	15	15	18	18
Frequency	24	23	15	19	19	15	20	18	19	14	20	20
Level of Performance	**42**	**41**	**34**	**35**	**37**	**31**	**39**	**34**	**34**	**29**	**38**	**38**
Sociability	08	10	06	09	07	07	10	06	06	08	11	09
Comfort	08	09	06	09	08	08	06	07	10	08	09	09
Level of Performance	**16**	**19**	**12**	**18**	**15**	**15**	**16**	**13**	**16**	**16**	**20**	**18**
User perception	19	19	17	18	21	17	15	22	15	17	22	17
User preferences and need	24	26	26	26	26	23	22	24	25	24	25	24
Level of Performance	**43**	**45**	**45**	**44**	**47**	**40**	**37**	**46**	**40**	**41**	**47**	**41**
Total performance	**101**	**105**	**91**	**97**	**99**	**86**	**92**	**93**	**90**	**86**	**105**	**97**
	Very successful	Very successful	Moderately successful	Successful	Successful	Marginally successful	Moderately successful	Moderately successful	Marginally successful	Marginally successful	Very successful	Successful
Very successful 101-105												
Successful 96-100												
Moderately successful 91-95												
Marginally successful 86-90												

6.5 Analysis of PATTERN 60 in unplanned and planned area

According to Christopher Alexander's **PATTERN 60**, people in cities that live more than 3 minutes away, do not need parks any less than those who live less than three minutes from them. But distance discourages use and so they are unable to nourish themselves, as they need to do. This problem can only be solved if hundreds of small green spaces whether parks or play fields are scattered so widely that every house and work place in the city is within three minutes walk of the nearest one. This scenario can not be seen in present Dhaka as well as Old Dhaka, though the study area of planned area Mohammadpur has the sixteen accessible greens scattered all through the Mohammadpur Thana area within six wards (Table 5.2).The critical effect of distance on the usefulness of such parks/play fields is less well known and understood. In order to study this problem two area, each of taken from unplanned and planned area has been selected and asked 30 people who were in the selected area or live near the selected greens, how often they came here and how far they walked to the accessible green. The selected study areas are Bangladesh Maath of Old Dhaka and Khilji Road Children's Park of New Dhaka. Each person gave answer of the number of trips per week and the distance they traveled. Then the following tables have been constructed showing the results. In the first column the number of blocks people walked to get the accessible green has been written and in the second column a measure of the area of the ring shaped zone which lies at the distance. The area of this ring shaped zone is proportional to the differences of the two blocks.

In the third column, the number of people who have come from that distance where each person multiplied by the number of trips per week he/she makes has been shown. This gives a measure of the total number of trips per week, which originate in that ring. In the fourth column the number of trips per week divided by the area of the ring is tabulated and in the fifth the logarithm (base 10) of the probability measure P is shown. Simple inspection of these data shows that the probability measures P drops in between one and two blocks. Its rate of decrease diminishes from then on. This indicates that an individuals use of park changes character radically if he/she lives more than two blocks away. In figure 6.7 the relationship between distance and logarithm of P has been shown. We see that the resulting curve starts going down at certain angle, then get much steeper, and then flattens out again. Apparently there is a threshold some where between 1 and 2 blocks or 2 and 3 blocks where people behaviour and motivation change drastically. Those people who live in close proximity to a green follow a high intensity use function and it is very sensitive to increasing distance and those people who live far from a green appear to adopt a low intensity use function and their

behavior is not as sensitive to distance. Apparently within two to three blocks radius people are able to satisfy their need to access to a green.

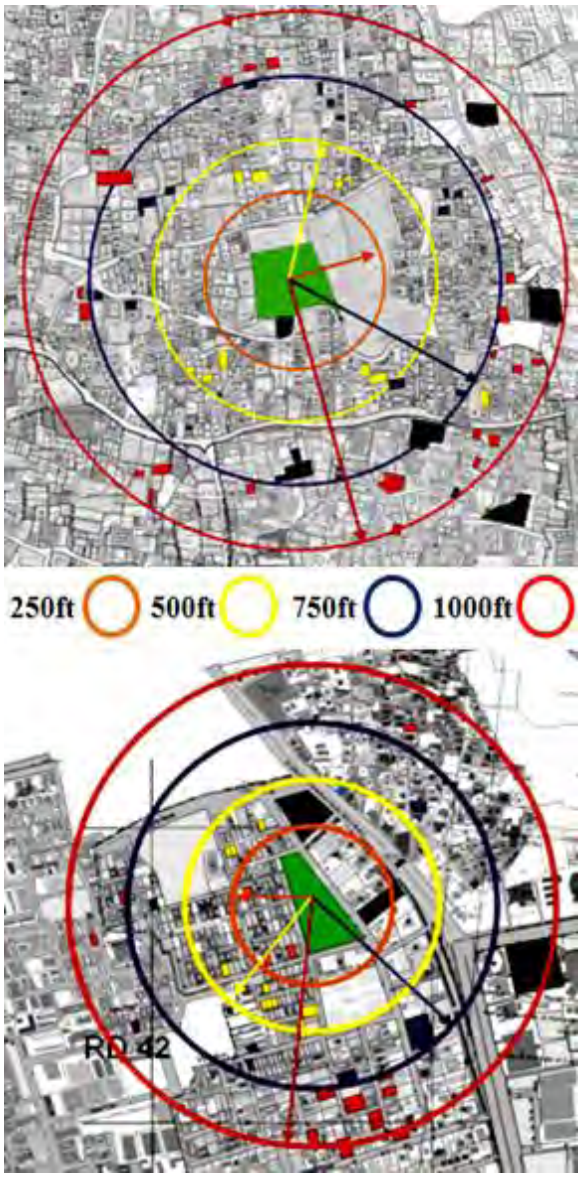


Figure 6.33: Location map of interviewed person in Old Dhaka (Bangladesh Math) and New Dhaka (Khilji road Children's Park)

Table 6.27: Analysis of visiting pattern to a local green

	Radius R blocks	**Measure of area of the ring at Radius R**	**Trips/week**	**P** (relative probability of trips, for any one person)	**Log P**
Unplanned area Bangladesh Math	**1 (250 feet)**	1	73	73.00	1.863
	2 (500 feet)	3	40	13.30	1.124
	3 (750 feet)	5	26	05.20	0.716
	4 (1000 feet)	7	09	01.28	0.100
Planned area Khilji Road Children's park	**1 (250 feet)**	1	11	11.00	1.041
	2 (500 feet)	3	63	21.00	1.322
	3 (750 feet)	5	27	05.40	0.732
	4 (1000 feet)	7	19	02.70	0.431

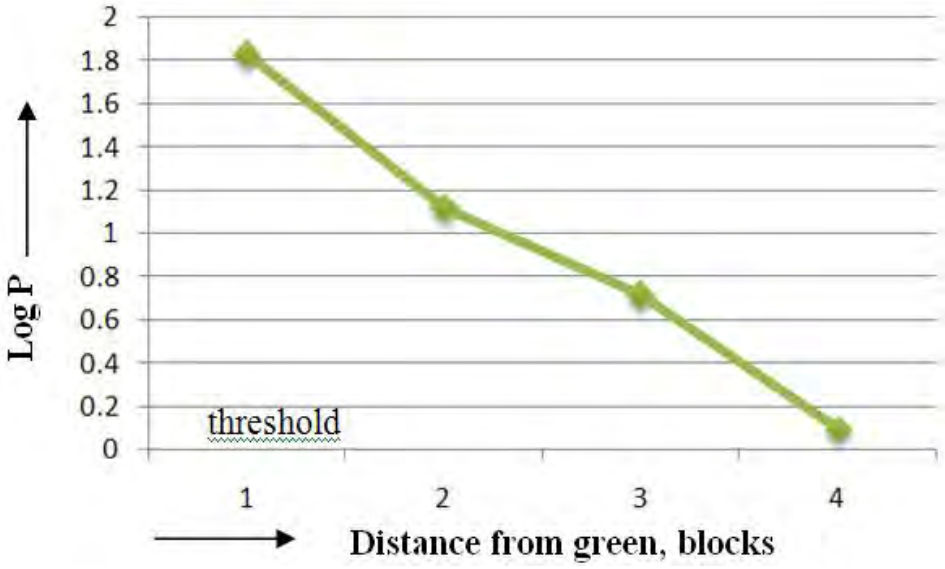


Figure 6.34: Beyond one or two blocks use of the green drops in case of Bangladesh Math

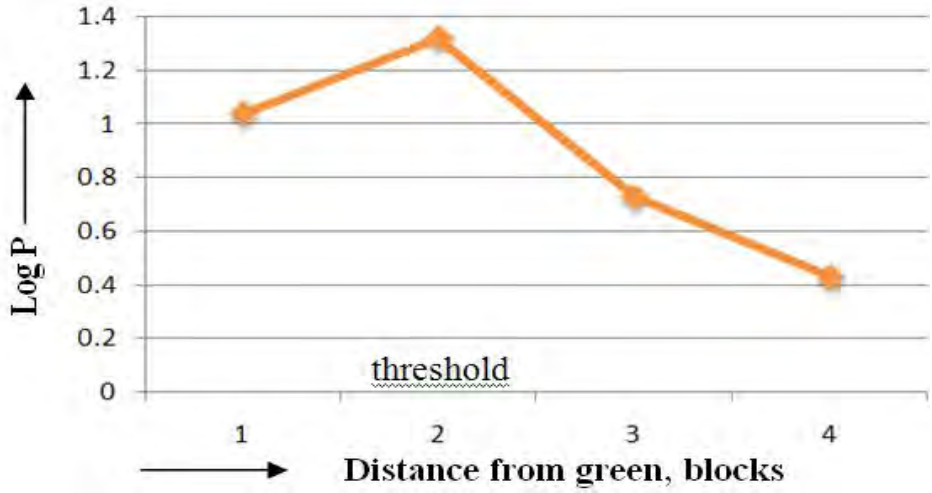


Figure 6.35: Beyond one or two blocks use of the green drops in case of Khilji road Children's Park

6.6 Summery of findings

Following findings are according the observation and interview that has been done to the twelve study areas of Dhaka. The Attributes that was analyzed were accessibility, sociability, comfort and users' preferences and needs.

Finding 01:

For study areas unplanned it takes 3-5 minutes of majority users come from 3-4 blocks radius distances (750ft-1000ft) and for planned areas takes 2-3 minutes to come from 2-3 blocks radius distance(500ft -750ft) on foot to their accessible green spaces. The constant presences of the users (aged 8yrs-18yrs) are seen in the morning and afternoon for ½ hour to 1 hour.

Finding 02: For both study areas (unplanned and planned) users come to their accessible green spaces for sociable reasons that mean these greens act as a place for interaction which can influence the liveability.

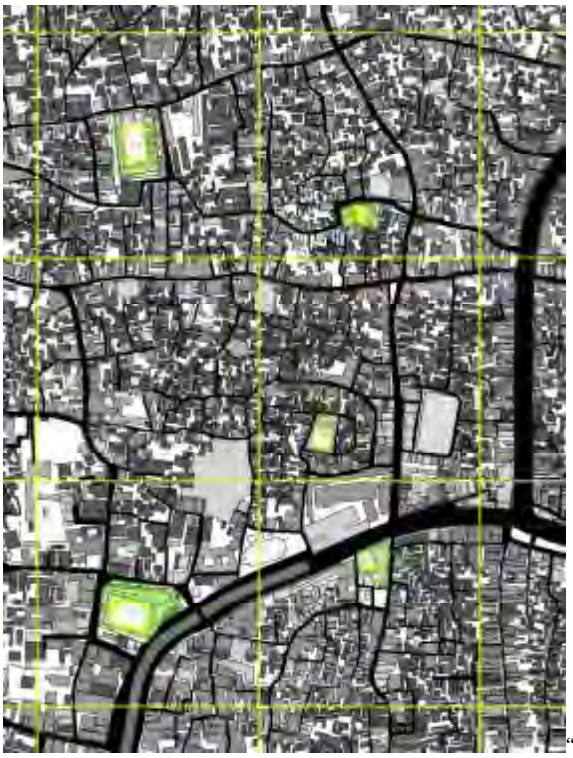
Finding 03:

Huge tree coverage, proper arrangement of furniture, plays equipments and lighting fixtures with social and physical protection will create a comfortable setting to enhance enjoyment and sociability among users.

Finding 04:

Users prefer socially interactive, diversify and secure green spaces with good physical arrangement and maintenance which are in close proximity to their home .They need accessible green that follow a high intensity use function and commence to be a vital element in their neighbourhood life.

PATTERN 60
Accessible green



"…there will be a protected regional matrix of field and forest within which the city will live and breathe. There will be, too, internally, a blue and green open space frame work around which the new cities will take their evolving form..." Simonds John Ormsbee (1994)

CHAPTER 07: RECOMMENDATIONS & CONCLUSION

7.1 Recommendations
- 7.1.1 Defining PATTERN 60 for Dhaka regarding accessible green
  - 7.1.1.1 Ideas for Unplanned study areas for liveability
  - 7.1.1.2 Ideas for Planned study areas for liveability
- 7.1.2 Developing standards for green space with Guidelines
- 7.1.3 Pattern Park Field for Dhaka

7.2 Possible future research

7.3 Conclusion

This chapter suggests some recommendations which will critically evaluate Dhaka context on accessible urban green vis-a-vis Christopher Alexander's **PATTERN 60**.

7.1 Recommendations

Access to green areas and the quality of the green areas are perhaps the two most important factors in making the green connected to the Old and new Dhaka residents. Access to green can be defined in a number of ways: it may mean making the green's edge physically connected to the inner areas; it may mean visual access to the green, i.e. to make the areas visible from various strategic points; or it may mean psychological access to the green, i.e. if in the mind of people a river is perceived accessible. We do understand that we need the accessible green which act as "threads of green" and can tie the city parts by grant us access to the natural world.

On the other hand, Livability is a concept that conveys an image that is full of life and creates living conditions in a locality that offers a desirable quality of life. In a residential colony, livability refers mainly to the immediate physical built environment that surrounds an individual as soon as he steps out of his home and walks or drives through the streets of his neighborhood to reach the nearest bus stop or main road. This perceived image of a locality determines the livability or the desire to live in a particular place. For some people nature affords livability, whereas for others livability affords nature. People understand it as having a positive connotation, referring to a pleasant residential environment and prefer to live close by green public space because it contributes positively to the livability of the dwelling environment; it provides a place to be outside, including a playground for children, and to meet others. Most respondents from both planned and unplanned areas prefer and feel that these accessible greens do and can contribute positively to their well-being enjoying life.

7.1.1 Defining pattern language for Dhaka regarding "PATTERN 60"

Patterns together will form a language, a coherent picture of an entire accessible green with the power to generate such greens in a million forms with infinite variety in all the details. We have:

- To create a pattern in macro scale for the extension of Dhaka as well as accelerate the **PERFORMANCE** of each accessible greens those are studied and prior to be studied to make **LIVEABLE DHAKA**
- To create a small list of patterns which will be capable to generate a simple **VOCABULARY of ARCHETYPAL ELEMENTS** and can be combined in various

permutations to create different types of accessible green spaces through out each neighborhood of Dhaka.

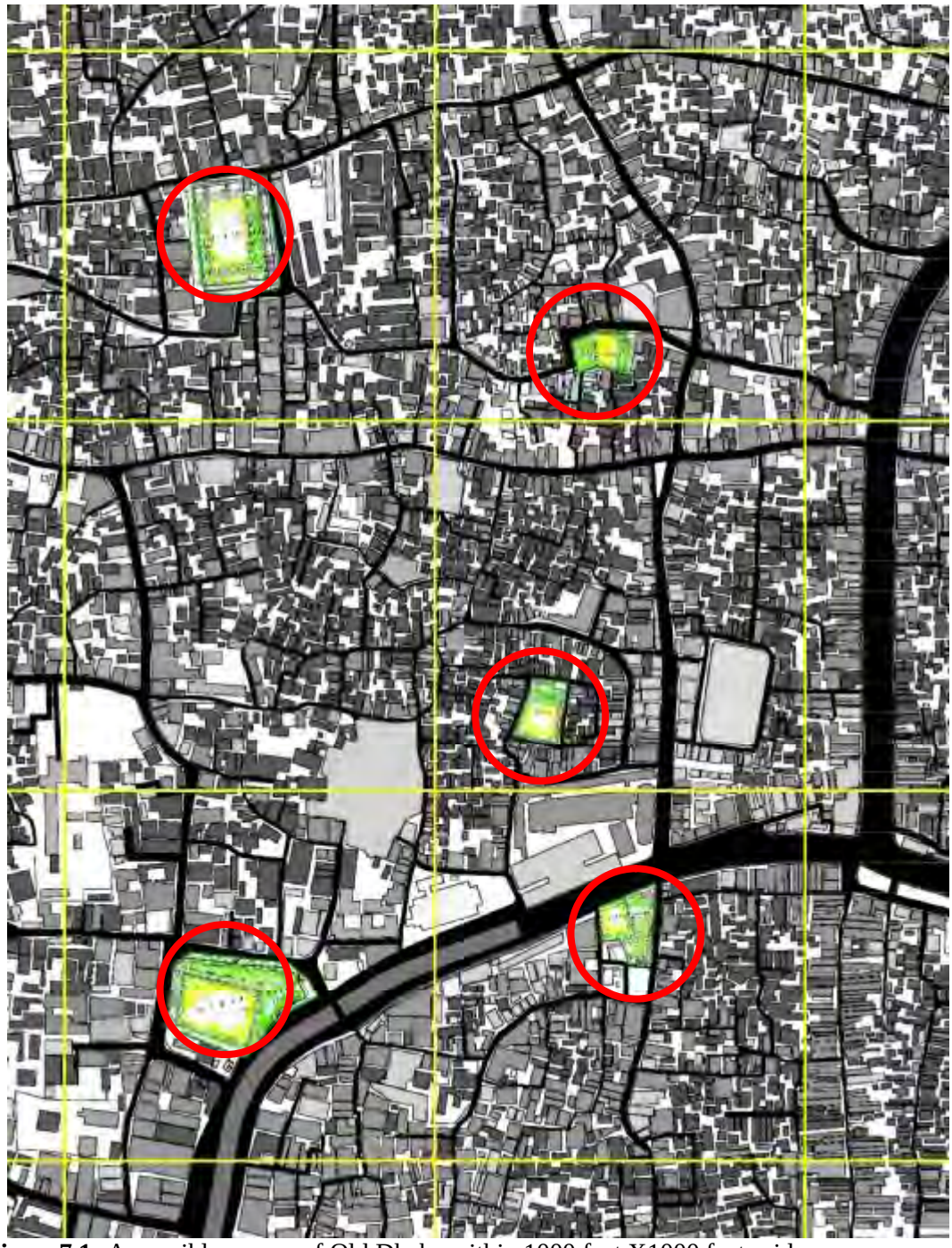


Figure7.1: Accessible greens of Old Dhaka within 1000 feet X1000 feet grid

A grid of 1000 feet X 1000 feet has been located through out the Old Dhaka Study areas. This grid contains 500 feet radius distance. According to Christopher Alexander's **PATTRN 60** greens need to be uniformly scattered at 1500 feet interval through out the city. Figure 7.1 reveals that each grid contains the studies accessible greens which have a 1000 feet interval from one to another green approximately. Figure 7.2 displays what will be the picture if the

interval is 2000 feet as users of the existing study areas do come from 4-5minutes walking distance that is about 1000-1250 feet radius as they do not have enough accessible greens in their reach.

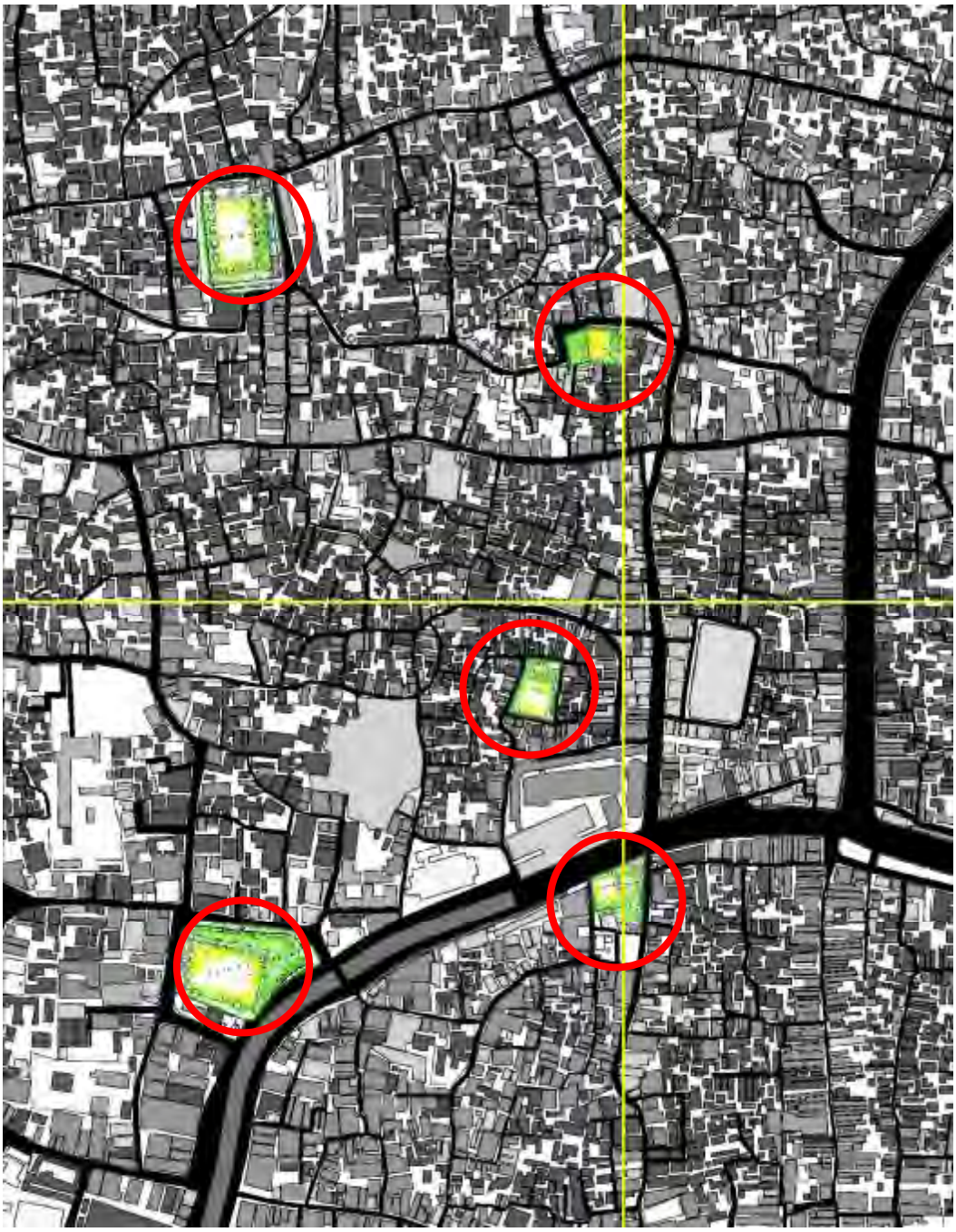


Figure7.2: Accessible greens of Old Dhaka within 2000 feet X 2000 feet grid

Figure7.3 & figure 7.4 convey the same scenario in context of New Dhaka study areas.

Figure7.3: Accessible greens of Mohammadpur within 1000 feet X1000’ feet grid

Figure7.4: Accessible greens of Mohammadpur within 2000 feet X 2000 feet grid

Mohammadpur area has several accessible greens within comfortably walking distance but not uniformly distributed as Christopher Alexander has mentioned in **PATTERN 60**.

The accessible greens of Dhaka must act as:
Common Land: A large central area of grass between houses and commercial activities, for flexible

A positive outdoor living room or public outdoor room: A prominent paved and planted space close to but not directly crossed by the main circulation routes with a range of amenities for different groups

A stage for individual sports : A paved space in a central position, which can be overlooked from one or more sides and can act as a place where local sports(football, cricket, basket ball) ideally in front of an equally informal audience.

An adventure platform to look the action: An ideally raised paved space located near the edge of the site, on which children get the chance to be together, a chance to use their bodies a place with raw materials nets, boxes, trees, grass, with a place for their parents who can lean.

Eating outdoors : A place with a unique setting, a place where people can sit lazily and enjoy the view of accessible green as well as watch the world go by, with facilities of simple, inexpensive food with friends, There may be need for more than one such place, depending on the type of open space involved.

A shady grove: A regular grid or an informal group of standard trees forming a closed canopy and an enclosed, introverted and tranquil three dimensional space beneath them, which can either be observed from the outside or experienced from within, can form a focal feature of the site as well as provide an introverted and shaded space where people can withdraw from the wider space.

At the end this accessible green will act as a piece of **“MULTIFUNCTIONAL GREEN”** to its neighbourhood .For existing accessible greens of Old and New Dhaka this concept **“PARK-FIELD MULTIFUNCTIONAL GREEN”** will portray the characteristics and qualities of parks and playfields in same ground that will meet the preferences and need of the users.

7.1.1.1 Ideas for Unplanned study areas for liveability

Study area 01: Bangladesh Maath

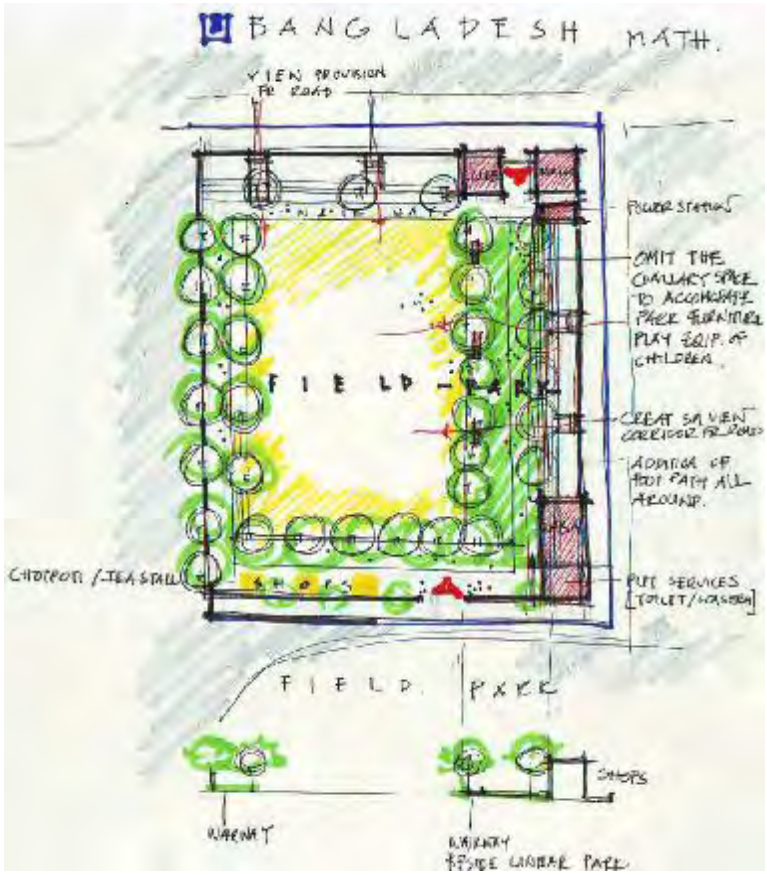


Figure7.5: Ideas for Bangladesh Maath

1. To invite people in a space continuous pedestrian atmosphere is an important issue. So addition of foot path on northern, southern and eastern side of the field.
2. View corridor from northern and eastern side. So that pedestrian people get the visual connection with the field.
3. Create park like environment with soft pave and sitting with play equipment for children on eastern side as per the above sketch. Provision for Park furniture like lamp, bench, bins.
4. Provision for services like tea stall, phuchka or jhalmuri stand, wash room.
5. Arrangement of trees along west side of the field with sitting opportunities act as talkscapes.
6. Provision of bicycle parking can be introduced.
7. Maintenance of surface quality and develop lighting strategy to suit the context of the field and a human scale.
8. Activate side Street by introducing foot path and lighting.

Study area 02: Samsabaad Lane Maath

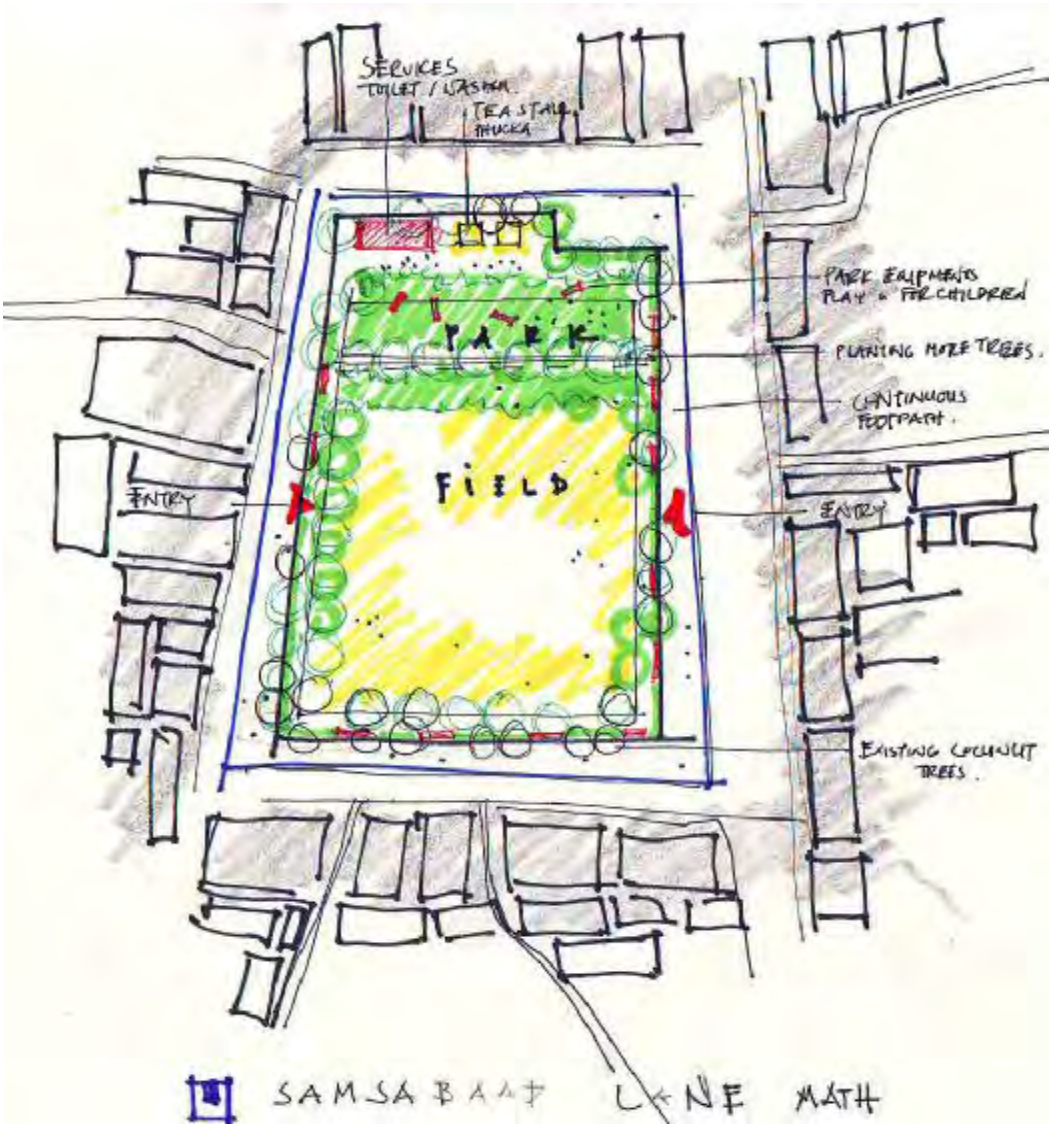


Figure7.6: Ideas for Samsabaad Lane Maath

1. Create park like environment with soft pave and sitting with play equipment for children on northern side as per the above sketch which can be around 30% of the total area.
2. Reinforce the landscape by introducing more trees and grass surfaces.
3. Introduce a lighting straytegy of human scale to cover the Samsabaad Lane Math.
4. Create a interactive place can be named as hello and good bye area that provide a satisfactory entrance .

Study area 03: Armanitola Field

Provide for new pedestrian desire line by introducing foot path along the armanitola field edges.

1. Create a sense of space through architectural elements which will act as a place for events and gatherings.
2. Reinforce landscape by planting plenty of trees all through the periphery of the field with park like environment.
3. Provide simple and attractive walking environment inside the field with transperency of surrounding wall that improve visual connection and safety.
4. Introduce a catalog of furnitures or sitting opportunities act as talkscapes.Talkscapes can invite more people to stop and pause.
5. Place benches to the field and play eqipments on the park part as shown on the above sketch.

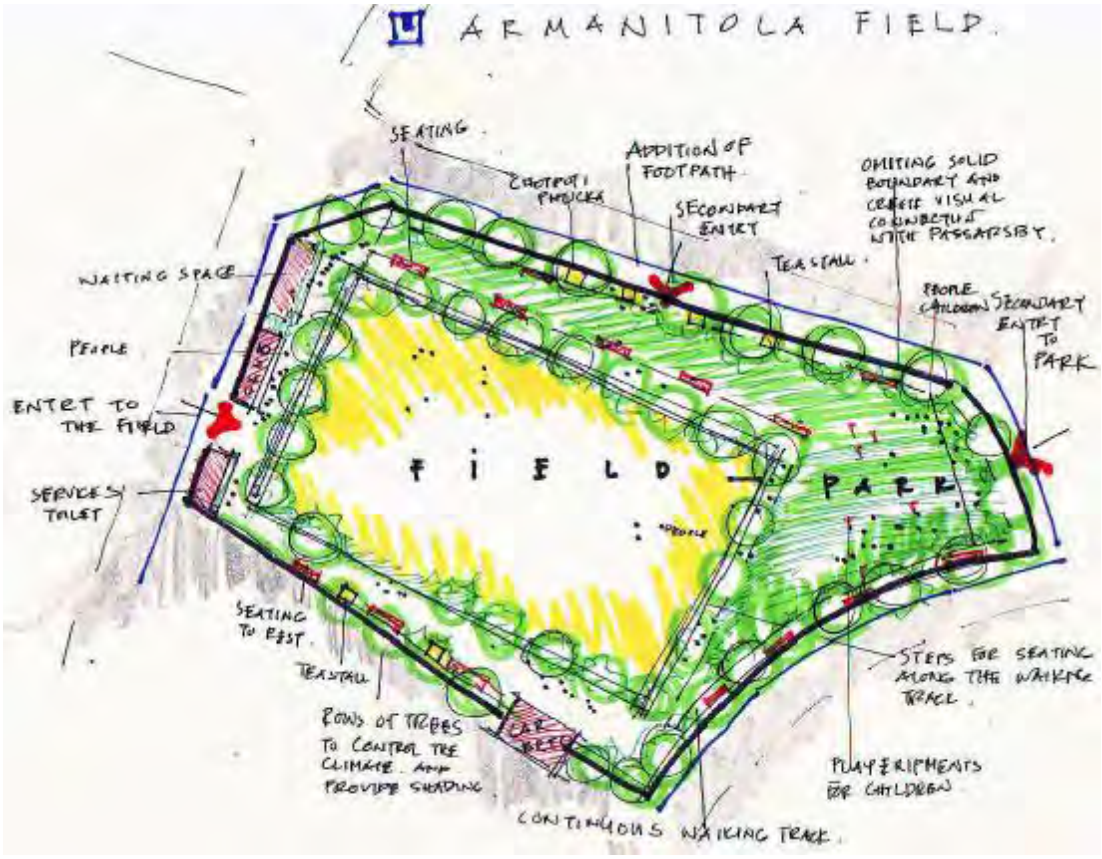


Figure7.7: Ideas for Armanitola Field

6. A big effort needs to be made in order to plan Armanitola field where it can become an attractive place to stay for longer periods of time.
7. Events can create festive and lively areas and thus streghthen and contribute to urban intensity.So special events can be organized like special days,special theme events,film festivels,sports events which will invite many different groups to use the field-the elderly,children,families,young people,working people etc.

Study area 04: Sikkatuli Khalek Sardar Park

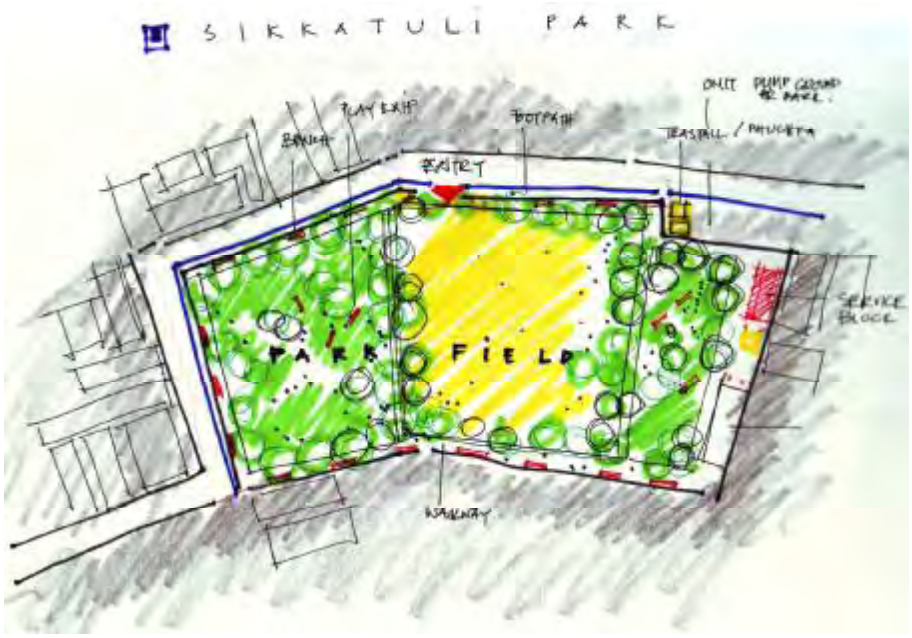


Figure7.8: Ideas for Sikkatuli Park

1. Emphasize the edge through create foot path to ensure clear differntiation between pedestrian and vehicular traffic.
2. Introduce a lighting straytegy of human scale to lit the Park area at evning and night.
3. Smaller gesture inviting people to stay in this place can tempt by passers to linger for a while.Introducing couple of benches around a table or tree.
4. Encourage more physical sports activity to take place by offering play equipments.
5. Introduce small function or structure(food stalls) that can accommodate different activities.
6. Omitting dumping ground and maintain the Pocha Pukur to enhace the aesthetic quality of the Park.

Study area 05: Sirajuddaula Park

1. Relieving overcrowding on footpath and upgrading existing entrances to define a hierarchy of entrances
2. Adding activity that can animate the spaces throughout the year.
3. Improving lighting at night
4. Strengthening the position of the Park as an unique facility for children
5. Introducing loose chairs to the park can allow people to create their own talkscapes and adjust to the climate and activities taking place.

Figure7.9: Ideas for Sirajuddaula Park

6. Establish a sense of ownership from the people living in relation to the park and invite them to use the park through easy access and semi private areas.
7. Subdivide the space by adding small leisure structures or pockets

7.1.1.2 Ideas for Planned study areas for Liveability

Study area 01: Lalmatia D Block Park

Figure7.10: Ideas for Lalmatia D block Field

1. Activate side streets by upgrading footpath and lighting.
2. Add more bench to rest.
3. Encourage more physical sports activity to take place by offering play equipments.introduce small function or structure(food stalls) that can accommodate different activities.
4. Create park like spaces for more gatherings and events.

Study area 02: Lalmatia New Colony Field

Figure7.11: Ideas for Lalmatia New Colony Field

1. Omitting dumping ground from the main entrance of the field to enhace the aesthetic quality of site.
2. Create foot path on north,east and west side which will differentiate between pedestrianized and non pedestrianized section around the field.
3. Create park like environment with soft pave and sitting with play equipment for children on northern side as per the above sketch which can be around 30% of the total area.
4. Reinforce the landscape by introducing more trees and grass surfaces.
5. Introduce a lighting straytegy of human scale
6. Special events can be organized like special days,special theme events,film festivels,sports events which will invite many different groups to use the field-the elderly,children,families,young people,working people etc.
7. Dedicate a portion of the field for weekly market and Car fair articulate with park-field portion.

Study area 03: Udoyjol Field, Iqbal Road

Figure7.12: Ideas for Udoyjol Field

1. Create foot path on north,east and south side which will differentiate between pedestrianized and non pedestrianized section around the field.
2. Create park like environment with soft pave and sitting with play equipment for children on northern side as per the above sketch which can be around 30% of the total area with proper walkways and prominent sitting areas.
3. Establish a sense of ownership from the people living in relation to the park and invite them to use the park through easy access and semi private areas.
4. Subdivide the space by adding small leisure structures or pockets.
5. Introducing a distinct characteristic to the above three spaces to invite more users of different age,background and activate the field on different time of the day.

Study area 04: Iqbal Road Field

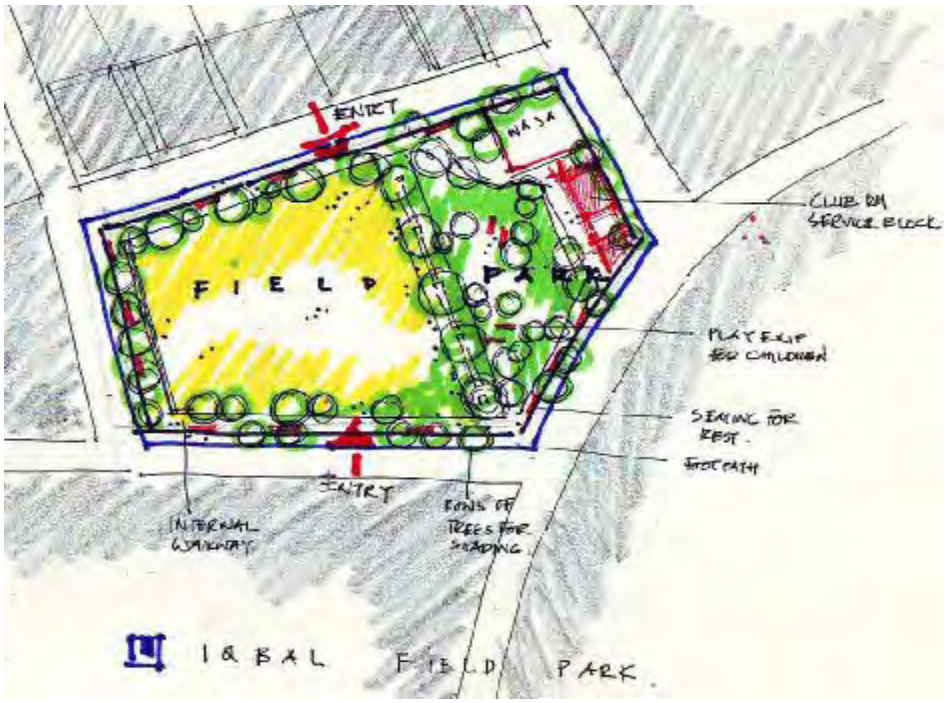


Figure7.13: Ideas for Iqbal Road Field

1. Encourage more physical sports activity to take place by offering play equipments for children as well for young people.
2. Introduce small function or structure(food stalls) that can accommodate different activities and Add more bench to rest.
3. Introduce a lighting straytegy of human scale to cover the field.
4. Create a interactive place can be named as hello and good bye area that provide a satisfactory entrance .

Study area 05: Humayan Road Block B Play Field

1. Invite people in a space continuous pedestrian atmosphere is an important issue. So addition of foot path on all sides of the field is needed.
2. Proper walkways and prominent sitting areas around the field.
3. Dedicate 30% of the areas which act like park with huge coverage of trees, play equipments which not only invite more users but also accelerate the liveability.
4. Provision for services like tea stall, phuchka or jhalmuri stand, wash room.
5. Arrangement of trees along of the field with sitting opportunities act as talkscapes.
6. Provision of bicycle parking can be introduced.
7. Maintenance of surface quality and develop lighting strategy to suit the context of the field and a human scale.

Figure7.14: Ideas for Humayan Road Block Play Field

Study area 06: Tajmahal Park/field

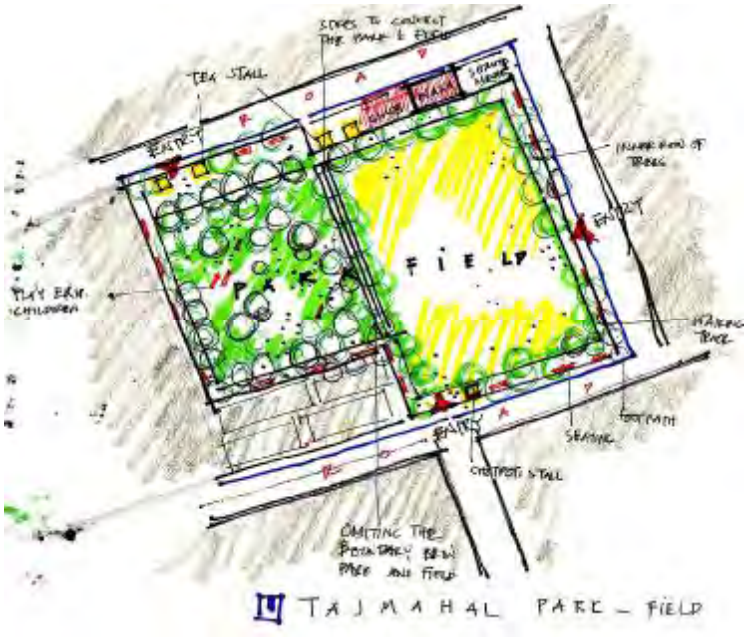


Figure7.15: Ideas for Tajmahal Park-Field

1. Combine the tajmahal park and tajmahal field by neglect the wall between the park and field.

2. Activate side streets with continuous foot path.
3. Provision for services like tea stall, phuchka or jhalmuri stand, wash room.
4. Introduce proper drainage system.
5. Establish a sense of ownership from the people living in relation to the park and invite them to use the park through easy access and semi private areas.
6. Introduce a lighting straytegy of human scale to lit the Park area at evning and night.

Study area 07: Shaymoli Children's Park, Khilji Road [PC Culture Shaymoli]

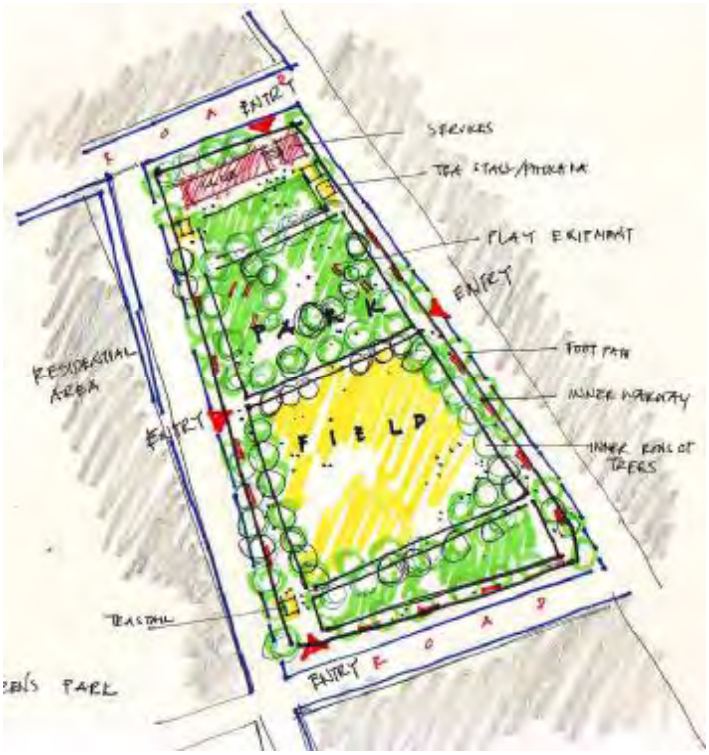


Figure7.16: Ideas for Khilji Road Children's Park

1. Side streets are poorly lit at night. No proper lighting in back streets as well as in side the field, so develop lighting strategy to suit the context of the field and a human scale.
2. Open up and diversify the use of ground floor frontage where possible.
3. Utilize the field with different activities.
4. As it is known as Khilji road children's Park emphasizing on the provision of play equipments and there proper maintenance.
5. Invite for varied use of park,redesign parts of the park.
6. Establish an urban furniture catalogue designed for park.

7. introduce more opportunities for passive recreation-benches,protection from bad climate,small pavilions.

7.1.2 Developing standards for green space & guidelines

Urban green spaces play an important role in improving the livability of towns and cities. They provide a range of benefits at both national and local level and offer many opportunities to people in different ways. However, this potential of green spaces is not always being realized, as current management practices are sometimes suboptimal. Despite the benefits that urban green spaces provide there is a serious lack of information about the quantity and quality of urban green spaces. More information and more integrated approaches for the development and management of urban green spaces are needed. Providing attractive and accessible green spaces creates benefits to the competitiveness of the urban location in a broader perspective. Setting standards allows a better benchmarking of the current status of green space assets across a Local Authority area and helps to facilitate improved decision making and setting of priorities and also allows monitoring and evaluation of performance. A 'standards based approach' for the assessment of green space provision and need, based on the four elements of:

- **Quality** - a benchmark against which quality can be measured
- **Quantity** - an amount of space per house unit or head of population
- **Accessibility** - a distance to particular types of open space that serve communities i.e. a distance threshold
- **Connectivity** - a continuous relationship among accessible greens, urban spaces, streets, lakes

There is an increasing recognition that quality rather than quantity is the critical issue in meeting green space needs and that large, fragmented and disconnected green space, in many cases, offers only very limited functional value for communities, low biodiversity value and does little to support place making, area regeneration and economic development. The connectivity of accessible green spaces is important for a number of reasons, all associated with the functions of urban open spaces.

Figure 7.17: Need to upgrade the quality to make the green liveable for the users

From the point of view of the urban climate and the encouragement of flora and fauna in urban areas, spaces which are linked to form larger corridors allow for movement of both air masses and species. Similarly from the point of view of the human users of urban spaces (green or grey), linked and networked spaces make movement safer and easier access to individual open spaces is made possible through their being all connected to an overall network. Design implication to enhance quality defining parameters of accessible urban green spaces for social functions and structural/ symbolic functions.

Accessible green should be accessible for all people (Pre-school children, school children, teenagers and young adults – girls and boys, working people, men and women, the unemployed, local residents, Commuters and incoming workers, businesses, retired people and ‘senior citizens, people with disabilities and their carers, migrants and other minority ethnic groups, tourists and visitors).But most of the studied accessible green areas experienced absence of amenities or spaces dedicated to the children, women and minority groups and disabled persons. So not only how much area is given is important but also what type of and for whom the green space is given should be in the list of concerned authority.

And for that there should be group effort and association among local community, the funding agency, interest groups and NGOs, the municipal authority, the planner / designer and other responsible authorities. But in context of Dhaka it is evident this teamwork is missing or not appreciated by some concerned authorities.

According to DAP, for 12,500 people (at neighborhood level) 12 acres of open spaces including parks /children's park, water body, playfields and green or water front which means 0.96 acres for 1000 people (Table 7.1). Whereas a number of British municipal councils have similarly adopted a standard of so called amenity open spaces, which represents 0.5 - 0.8 ha per 1,000 inhabitants and a standard of the NPFA lays down 2.43 ha of sporting areas and playgrounds per 1,000 inhabitants (known as "6 acre standard"). In 2008, a revision of this standard was carried out and this standard is called now planning and design for Outdoor Sport and Play standard quantitatively defining 1.6 hectares of recreation green areas and 0.8 hectares of playgrounds for children per 1,000 inhabitants. It may be applicable for the future residential growth of Dhaka but the existing situation should be maintained by improving the quality standard.

Facility	Quantity		Area		
	Min (No)	Max (No)	Min for unit facility (Acre)	Sub class total	Class total (Acre)
Primary School	2	3	1.0		3
High School	1	2	1.5		3
Open Space			10.0		12
Park/Children's Park	1	2	0.3	1	
Water body/Pond	As per planner		1.5	6	
Play Field	2	3	1.0	3	
Green/Vegetation/ Water Front	As per planner		0.5	2	
Mosque	2	3	0.2		
Library	1	1	0.1		
Services			0.3		
Total Area for the neighborhood Facilities			22.8 Acres(approx.)		

Table 7.1: DAP's amenity & facilities Standard at neighborhood level (12,500 people)

As the research is for identify the accessible green and evaluate those accessible green according to the **PATTERN 60** in the context for Dhaka to investigate liveability it is necessary to address the findings each research parameters and provide a total scenario that has been experienced in the accessible greens areas both of unplanned and planned area of Dhaka.

Accessibility:

For study areas unplanned and planned it takes 3-5 minutes of majority users who come from 3-5 block distances (750 feet-1000 feet) on foot to their accessible green spaces. Although more people were interviewed in the morning that did not mean that greater number of people visited their accessible green in morning. The constant presences of the users are seen more in the afternoon for ½ hour to 1 hour than morning. The provision of accessible quality of the green contributes the liveability, satisfaction and enjoyment of those spaces.

Sociability:

For both study areas (unplanned and planned) users come to their accessible green spaces for sociable reasons that means these greens act as a place for interaction which can influence the liveability. Not only the use patterns (passive, sociable, active) but also the nature of surrounding uses influences social interaction. A combination of favorable attributes such as attractive activities, the presence of food vending (which is people condenser), children's amenities, opportunities for exercising are important attributes that the accessible greens should have. One more important finding was that providing amenities for children attracted many families to the accessible greens. The existing condition of these accessible green need some improvement such as better physical condition and maintenance to enhance social environment.

Comfort:

Climatical conditions were the most important attribute that determined liveability, enjoyment and comfort of the greens. The pattern of use depends on the microclimatic condition. The presence of cool climatic condition during early morning, afternoon and night attract more users. The undesirable condition of the noon reduced the number of the users to use the accessible green. Huge tree coverage, proper arrangement of furniture, plays equipments and lighting fixtures with social and physical protection will create a comfortable setting to enhance enjoyment and sociability among users.

Users' perception and preferences:

Most of the users of the accessible greens were young people and service holder. Women were less in number and seen with children. Professionals used the greens to exercise on a daily routine. Users prefer socially interactive, diversify and secure green spaces with good physical arrangement and maintenance which are in close proximity to their home .They need accessible green that follow a high intensity use function and commence to be a vital element in their neighbourhood life. A set of favorable physical, functional, social and economic conditions were the determinants for increased liveability and use in greens. The design implications provided in the previous chapter are not intended to be deterministic solution for accessible green space design and renovation. Instead they are general design

recommendations developed according to the research findings and through on spot observation. It is important to note that the environmental conditions of a green are site specific and therefore design implications should vary and adapt to the particularities of each green space setting. There fore these implications require adaptation to the existing accessible green's functional, physical, social, security and climatical conditions. These ideas are only a starting point which can be enhanced with further research and design developments. Therefore they can be considered as experimental strategies. The design ideas are not intended to ensure complete liveability and use in all the greens but rather to improve the conditions of the greens addressed in this research in order to make them better and more comfortable urban environment in Dhaka.

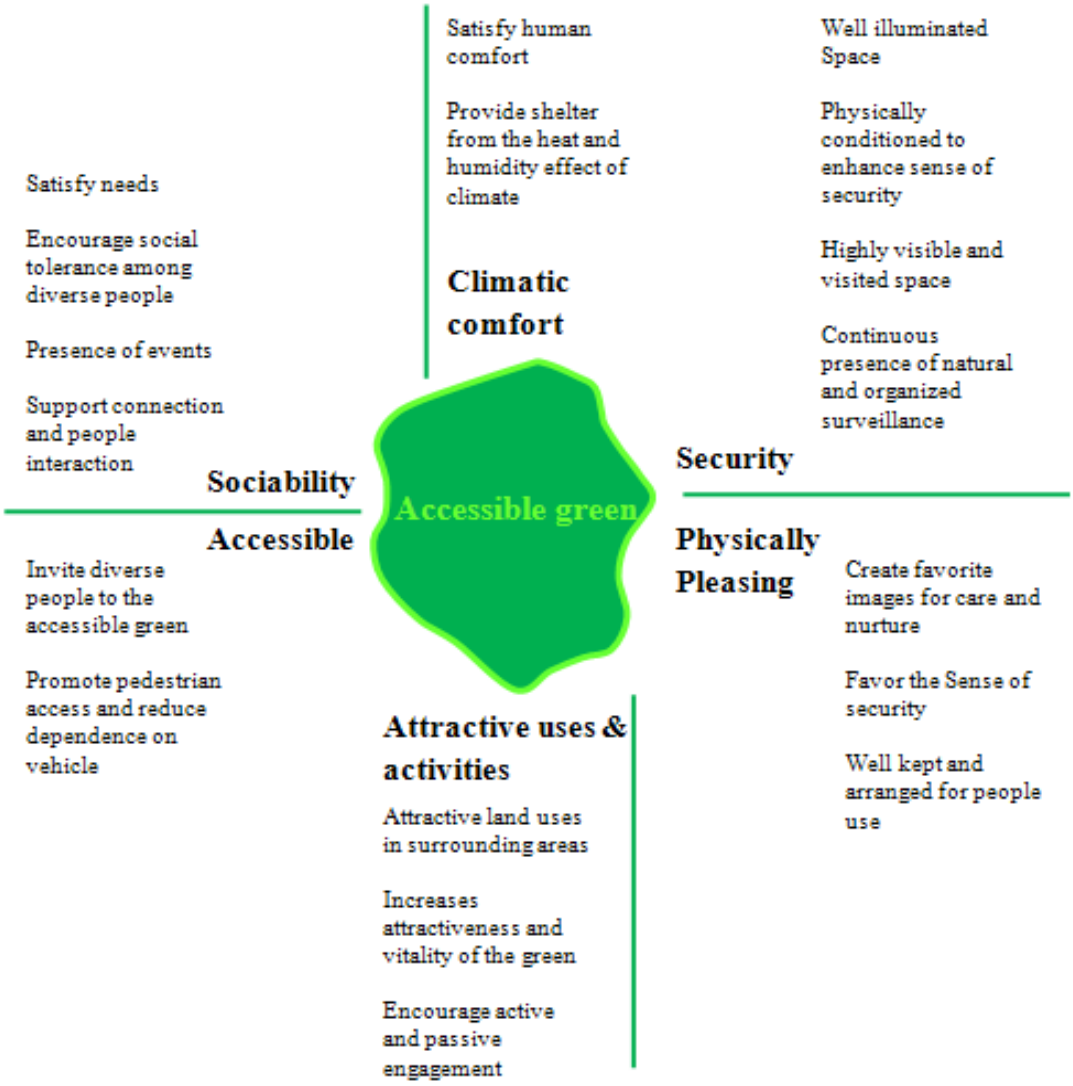


Figure 7.18: Factors that make green spaces liveable

7.1.3 Pattern Park Field for Dhaka

Most of the parks and playfields of Mohammadpur have the area of land from 0.5 acres to 2.0 acres and distributed nearly 3-5 minutes walking distance from each other within an interval of 1000-2000 feet. Area of the accessible green will be 1.5-2.0 acres that means 64,800sq ft. The width of the green is 150 feet and length around 430 feet that possess 1:2.88 ratios. 20% of the area will include walking track, services like wash room, food stalls ,pavilion, sitting, 30% park with huge tree coverage, play equipment for children, woman's corner and 50% field area where sports like foot ball, cricket, basket ball will take place. And the distance should not exceed 750 feet from the users place. Though there is lack of amenities but those fields are the breathing spaces for residents as well as visitors or for minor groups. So the standard should comprise with such area and distance (3-5 minutes).

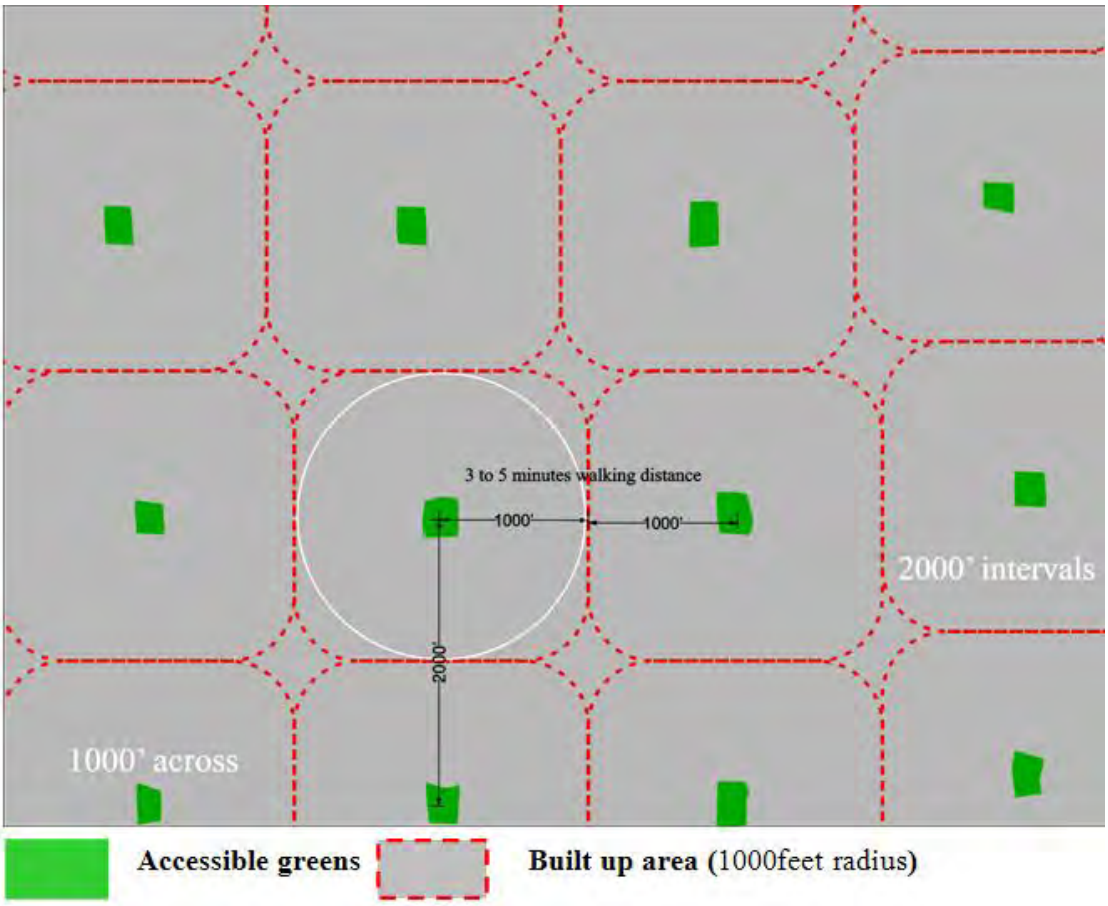


Figure 7.19: PATTERN 60 in context of Dhaka: accessible green and distribution of accessible green

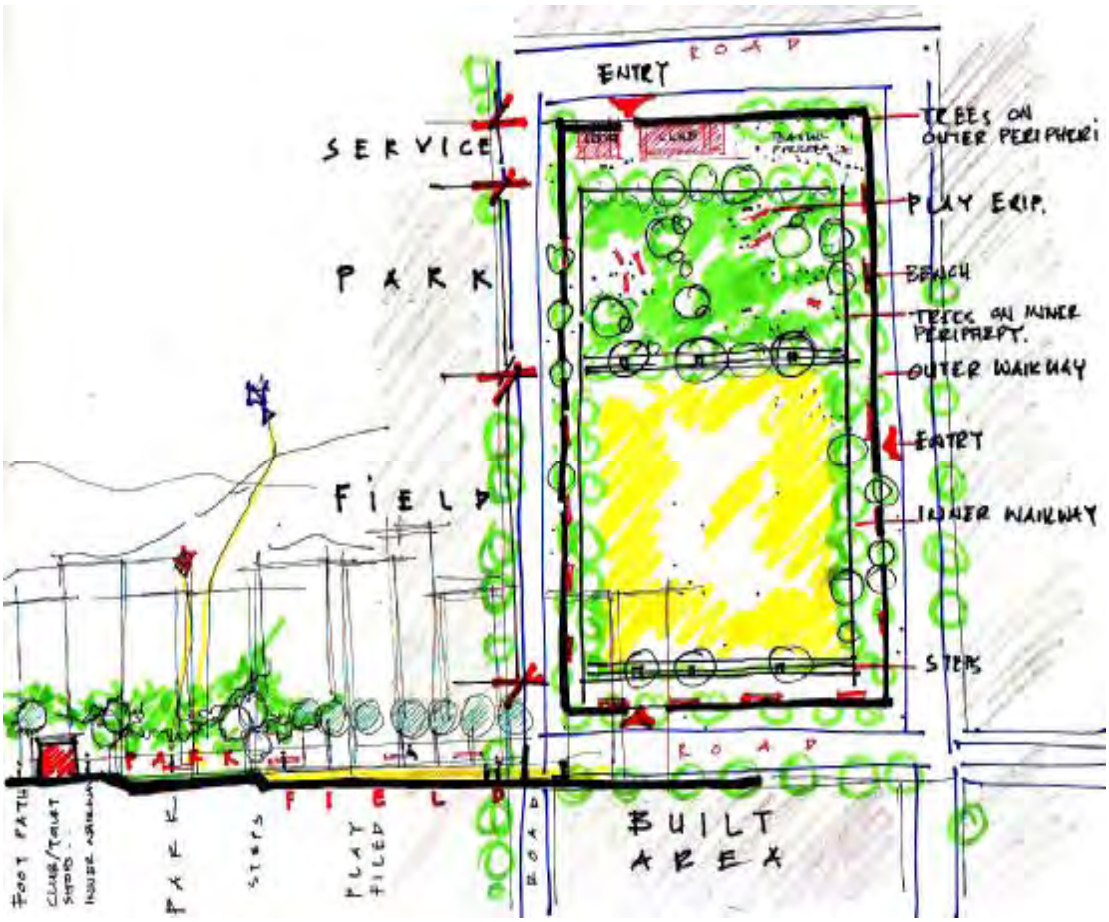


Figure 7.20: 2D sketches Pattern Park-Field for Dhaka

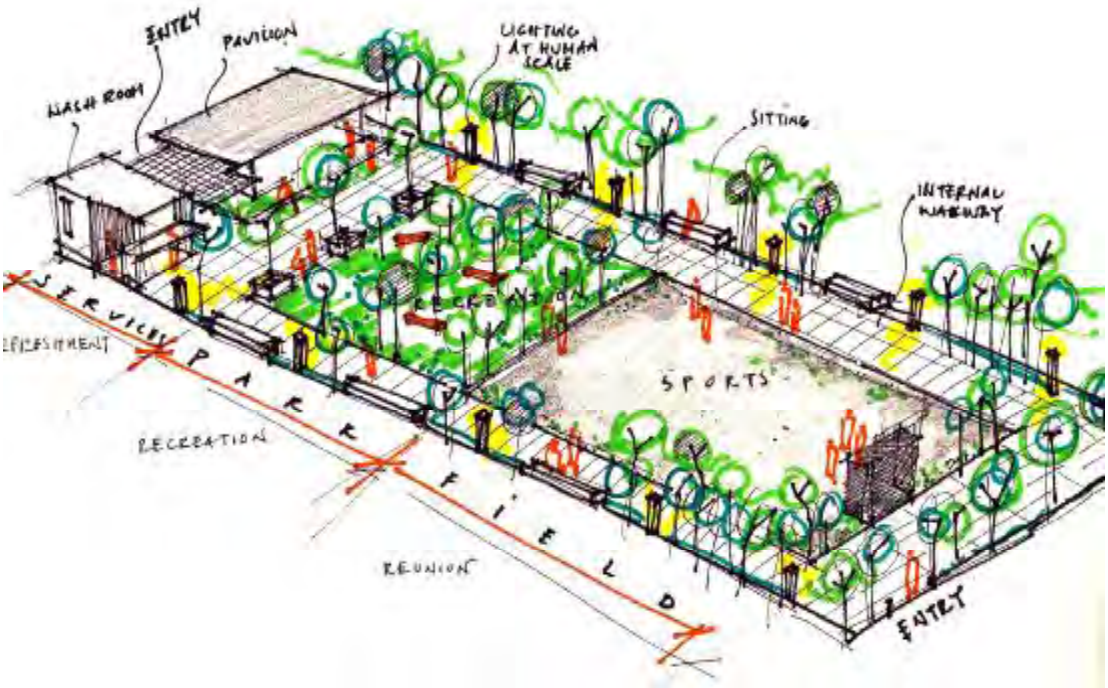


Figure 7.21 : 3D sketchs of Pattern Park-Field for Dhaka

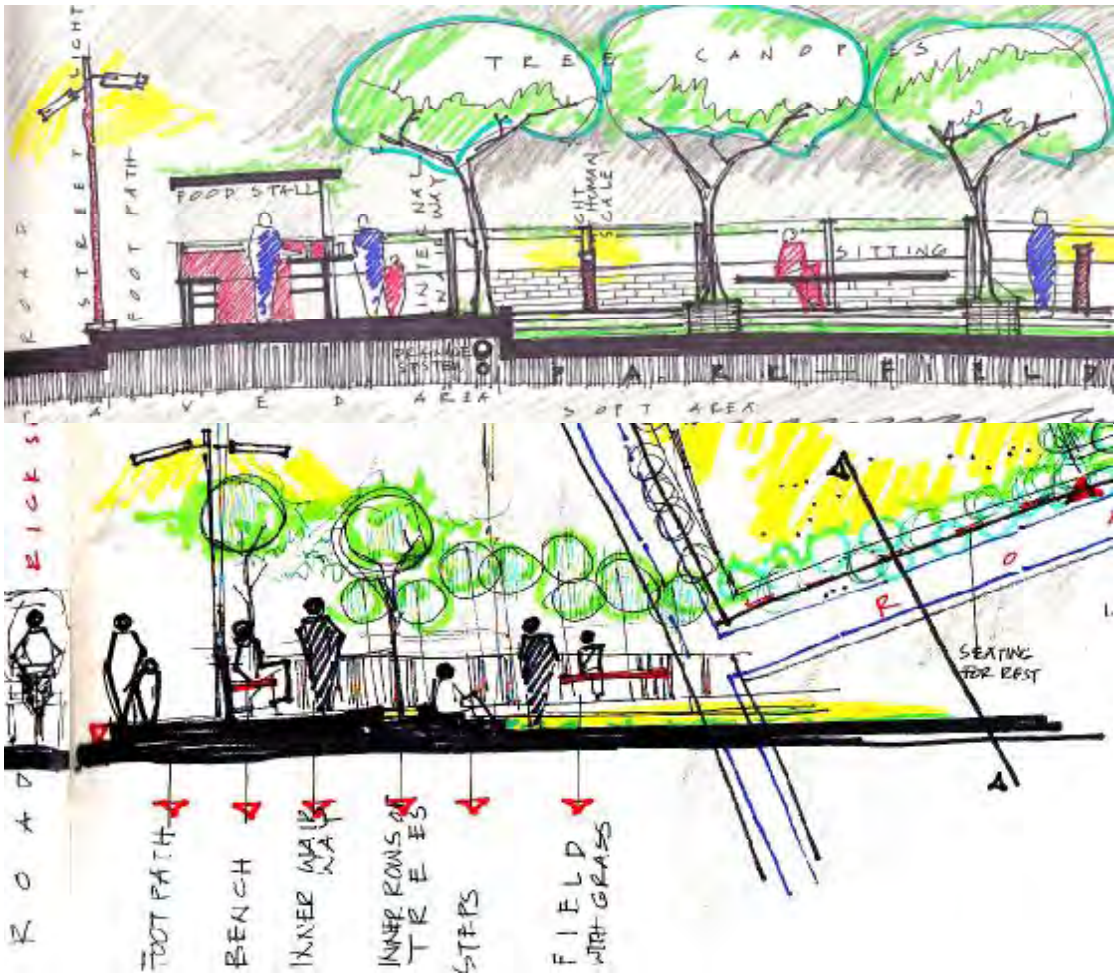


Figure 7.22 : Possible sections of Pattern Park-Field for Dhaka

7.2 Possible future research

Further work may involve the presentation of these finding to the academic and professional institution as well as to DCC responsible for the renovation and maintenance of such green spaces in Dhaka. This effort will make no sense if the findings sit on a library shelf as a simple master thesis work. This thesis is influenced by Christopher Alexander's **PATTERN 60: ACCESSIBLE GREEN** in order to improve the attraction towards the accessible green, life quality and satisfaction of the liveable outdoor environment in future extension of Dhaka. As the research is done on neighbourhood level of southern part of Dhaka further possibilities of this pattern can be done in northern part as well. Such Pattern can be examined in City level greens both in commercial and other socio cultural context. Introducing accessible green spaces network throughout Dhaka can be made by examining the need, potentials and adjoining the small pieces of urban fabric.

7.3 Conclusion

It is confirmed in this research is that accessible green are needed in close proximity of the users. These greens acquire their social and community roles according to what they offer people. The more positive attributes (social, physical, functional comfort, security and accessibility) accessible green has become more liveable and enjoyable for people. These greens will contribute to positive attitudes and behaviour, social tolerance, dialogue, connection, and liveability.

From the above discussion, the definition of PATTERN **60** for Dhaka is an accessible green approximately 64,800 square feet in area and at least 150 feet wide in the narrowest direction within 3 to 5minutes walking distance which need to be uniformly scattered throughout the future neighbourhood of Dhaka not surround with roads or cars but with continuous pedestrian street containing proper lighting atmosphere to give the feeling of safety to the Park-field users. This Pattern can be designed for existing neighbourhood and built for new neighbourhoods also. For existing greens special attention should be given to the old trees as well as on plantation new trees, shape the green so that it forms one or more positive outdoor living room and surround it with trees, or walls which are visually connected with neighbourhood people, passersby. Develop and add good movement framework where possible, which is totally missing in old Dhaka's green and in some cases of new Dhaka's also. Introduce internal walkway with proper sitting arrangement and necessary services with maintenance.

As this pattern which is named **PATTERN PARK-FIELD** for context of Dhaka is a "base map", architects, urban designer and planner can make their own language for their project by readjusting with their context, need and requirements. For example neighbourhood is incomplete unless it contains accessible green, positive outdoor living or tree places. **PATTERN PARK-FIELD (MULTIFUNCTIONL GREEN)** will act as a common land which will hold an adventure play ground for children, local sports for young generation, hangout spot for passersby, working people, a pavilion for old people to rest and play chess or read newspaper as well as watch his/her grandchild play in the park, a positive space where people feel comfortable and safe, a liveable place for neighbourhood.

This research has demonstrated **PATTERN 60: ACCESSIBLE GREEN** and that many factors existent in these greens influence the liveability enjoyment, social interaction and general satisfaction and comfort provided the users. Therefore it has been proven both

theoretically and methodologically that the physical attributes of environments do not determine by themselves the success and enjoyment of accessible green. It is also important to note that these accessible green are representative spaces of users and citizen's life, which are open system able to change along time. Therefore places, people's needs and even the problems that these spaces confront evolve through time. A key issue when dealing with accessibility and social environment is to be aware that patterns of life and needs in the urban environment change and designer must adjust their design to these societal changes in order to create better accessible environment for people. This research suggests the need to refocus on the study of social aspects in the urban environment in order to users' satisfaction and improve the relationship between the built environment and the land. The research also has showed that a way to contribute to the creation of qualitative green spaces in Dhaka is through the creation of pattern to help the designer, urban designer and planner to enhance their intention and practice. But most important is to promote design awareness in the making of human spaces that better suit people's needs that enhance peoples' experiences and enjoyment in the accessible greens and assure quality of life.

PATTERN 60

Accessible green

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Appendix 01: Survey Method (observation and interview script)

Observation and on spot interview: The feedback form

Interview no [ ]	**Accessible green space**	**Interview hours**	**General weather conditions**
	Name: Location:	[ ] morning [ ] noon [ ] afternoon [ ] evening [ ] night	[ ] sunny [ ] cloudy [ ] cool breeze [ ] hot-humid [ ] other:
Average of people engaged at this time of day:		morning	[ ] AP [ ] FP [ ] NP
		noon	[ ] AP [ ] FP [ ] NP
Approx. no of people in green space:		evening	[ ] AP [ ] FP [ ] NP
		night	[ ] AP [ ] FP [ ] NP
AP –a lot of people / FP-few people / NP-no people			
Observation statistics			
Accessibility	Connectivity with the city	[ ] good connectivity [ ] poor connectivity	
	Inner area connectivity	[ ] good connectivity [ ] poor connectivity	
	Accessible	[ ] full access [ ] conditional access [ ] proximate access [ ] remote access [ ] no access	
	Pedestrian journeys	[ ] easier [ ] harder	
Physical characteristics	amenities		
	Traffic intensity	[ ] low._____._____._____. [ ] high	
	Maintenance conditions	[ ] clean._____._____._____. [ ] dirty	
	safety	[ ] safe._____._____._____. [ ] unsafe	
Types of activities	Special events		
	activities	[ ] talking/conversing [ ] walking/jogging [ ] watching people [ ] sleeping on bench [ ] studying [ ] gathering [ ] attending special event	
	Surrounding activities	[ ] restaurant [ ] fast food [ ] pavement café [ ] informal vendors [ ] memorial	
Activity location	Activity location [no of people]	[ ] under tree [ ] exposed to sun [ ] open space [ ] close to water [ ] greenery [ ] internal walkway [ ] external walkway	
	Areas of users concentration	Maps:	
	Social interaction	[ ] minimum [ ] moderate [ ] maximum	
Types of users/perceived behavior	Predominant gender	[ ] male [ ] female	
	Predominant user age	[ ] children [ ] youth [ ] adults [ ] elderly	
	Predominant user	[ ] office workers [ ] students [ ] family [ ] children [ ] couples [ ] vendors [ ] homeless [ ] other	
	User's perceived attitudes	[ ] quite._____._____._____. [ ] noisy [ ] active._____._____._____. [ ] passive [ ] fast._____._____._____. [ ] slow [ ] energetic._____._____._____. [ ]inert [ ] interactive._____._____._____. [ ] isolated	

Questionnaires: The feedback form

Interview no	**Ward:**	**Planned** [ ]	**Spot:**	250 ft[ ] 500 ft [ ] 750 ft[ ] 1000 ft [ ] 1200 ft[ ]
		Unplanned [ ]	**Address:**	

Users profile			
Gender	[ ] male [ ] female	Age	[ ] below 15 years [ ] 15-25 years [ ] 30-50 years [ ] above 50 years
Profession	[ ] service holder [ ] businessman [ ] students [ ] housewife [ ] other:	How long does s/he live at this place?	
Perception of the users			
How many days ago did you last visit your nearby open and green space?			
Why do you need open and green spaces?	[ ] variety [ ] openness [ ] 'wilder' environments [ ] Walking [ ] sports [ ] entertainment		
Do you feel there is adequate amount of green space in your area?	[ ] yes [ ] no		
What type of green space is lacking in the area?	[ ] Areas for children/young people [ ] areas to play sports [ ] parks/garden		
Accessibility			
Time –distance-arrival pattern			
Is distance affects your visit to existing open and green space?	[ ] yes [ ] no		
Would you prefer open and green space near to your home?	[ ] yes [ ] no [ ] if so, why?		
How long does your normal journey take?	[ ] less than 1 minutes [ ] 1-2 minutes [ ] 2-3 minutes [ ] 3-5 minutes [ ] more than 5 or 10 minutes		
How far do you live from this open and green space?	[ ] very far [ ] far more than 5 blocks radius [ ] Relatively close 2 to 3 blocks radius [ ] very close- less than 1 block radius		
How did you arrive to this open and green space?	[ ] public transport [ ] own vehicle [ ] walk [ ] other:		
Frequency of uses			
How frequently do you come this open and green space?	[ ] 1-2 times a year [ ] 2-3 times per month [ ] 2-3 times per week [ ] Every day		
How much time do you usually spend in the open and green space?	[ ] less than 30 minutes [ ] 30 minutes-1 hrs [ ] 1hrs-2 hrs [ ] more than 2 hrs		
What time of the day do you generally come to the open and green space?	[ ] morning [ ] noon [ ] afternoon [ ] evening [ ] night		
Sociability			
Uses and activities			
What do you usually do in this open and green space?	[ ] Passive [ ] Sociable [ ] Active		
Passive	**Sociable**	**Active**	

[ ] Enjoy flowers/trees [ ] Get some fresh air [ ] Enjoy the beauty of the surroundings [ ] See birds and wildlife [ ] To relax [ ] For peace and quiet [ ] To think	[ ] Children/family outing [ ] Meet friends [ ] Visit the children's playing area [ ] Enjoy entertainment/events [ ] Watch sports or games [ ] Picnic/ barbeque [ ] To eat/drink	[ ] For a walk [ ] Play sports or games [ ] Take a shortcut [ ] Walk the dog [ ] To keep fit [ ] Organized educational visits [ ] Guided walks and talks [ ] Ride a bike
Do you interact with others here?	[ ] yes [ ] no [ ] if so, with whom and in what way?	
Comfort		
How comfortable do you feel in this open and green space?	[ ] very comfortable [ ] comfortable [ ] uncomfortable	
Do you feel secure when you visit the open and green space?	[ ] yes [ ] no	
Users preferences and needs		
What attracts you to this place?		
How important are each of the following in attracting you to this open and green space?		
Accessibility/distance	[ ] not important [ ] important [ ] very important	
Proximity to public transport	[ ] not important [ ] important [ ] very important	
Physical arrangement	[ ] not important [ ] important [ ] very important	
Places to sit	[ ] not important [ ] important [ ] very important	
Opportunity to walk/jog/sports	[ ] not important [ ] important [ ] very important	
Landscaping/trees/vegetation	[ ] not important [ ] important [ ] very important	
Proximity of food and retail	[ ] not important [ ] important [ ] very important	
Social interaction	[ ] not important [ ] important [ ] very important	
Feeling safe	[ ] not important [ ] important [ ] very important	
Good maintenance/neatness	[ ] not important [ ] important [ ] very important	
Special events/entertainment	[ ] not important [ ] important [ ] very important	
Do you visits others open and green space in Dhaka?	[ ] yes [ ] no [ ] if so, which one and why?	
What are the things you like best about this open and green space and why?	[ ] A good variety of areas /Diversity [ ]Good place for children/playgrounds [ ]Other facilities/features [ ]Well maintained [ ]Feel safe [ ]Variety of trees/old trees [ ]Spacious	
What puts you off visiting this place?	[ ] Too far to walk [ ] Lack of public transport [ ] not easily accessible [ ] Physical barriers [ ] Lack of variety [ ] Lack of facilities like sittings, foods, toilets [ ] lack of personal safety, poor lighting [ ] Poor maintenance/ management [ ] Lack of trees [ ] Low awareness [ ] No signage [ ] Have no interest in going	

comments	
Date:	**Name:** **Signature:**


PATTERN 60
Accessible green

legends		Activity/accessible green matrix												
High ○		Study areas												
Medium □		Unplanned areas					Planned areas							
Low △														
Possible activities		Sirajoddoula Park	Sikkatuli Khalek Sardar Park	Armanitola field	Bangladesh Math	Samsa-baad lane math	Lalmatia new colony	Lalmatia D block math	Iqbal road math	Udoijol club Field	Humayan road B block math	Tajmahal park	Khilji road Park
Passive	Enjoy flowers/trees	○	△	△	△	△	△	△	□	△	△	○	△
	Get some fresh air	□	○	□	○	□	○	△	□	□	○	○	○
	Enjoy the beauty of the surroundings	△	□	△	△	□	△	△	△	△	□	△	
	To relax	□	□	△	□	○	□	□	△	△	□	□	△
	For peace and quiet	□	△	△	□	□	△	△	□		□	△	△
	To think	△	△	△	△	□	△	△	△	△	△	△	△
Sociable	Children/family outing	□	□	□	△	□	□	△	△	△	□	□	□
	Meet friends	○	○	○	○	○	○	○	○	○	○	○	○
	Visit the children's playing area	△	△	□	△	□	△	△	△	△	□	□	□
	Enjoy events	△	△	□	□	△	□	△	△	△	□	□	△
	Watch sports or games	△	△	□	□	△	□	□	□	○	□	△	△
	To eat/drink	□	△	△	△	△	△	△	△	△	△	△	△
Active	For a walk	○	○	□	○	○	○	○	□	○	○	○	○
	Play sports or games	△	□	○	□	□	○	○	○	○	□	□	□
	Take a shortcut	△	△	△	△	△	△	△	△	△	□	△	△
	To keep fit	□	□	△	△	△	□	□	△	△	△	□	□

Activity/accessible green matrix

legends	User's preferences/accessible green matrix (Importance of different attributes according to users preferences in attracting users to the green)																																			
very important ○	Study areas																																			
important □	Unplanned areas														Planned areas																					
not important △																																				
High% Red																																			
Medium% Blue																																				
Low% Yellow																																				
attributes	Sirajoddoula Park			Sikkatuli Khalek Sardar Park			Armanitola field			Bangladesh Math			Samsa-baad lane math			Lalmatia new colony			Lalmatia D block math			Iqbal road math			Udoijol club Field			Humayan road B block math			Tajmahal park			Khilji road Park		
Accessibility/distance	△	□	○	△	□	○	△	□	○	△	□	○	△	■	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Proximity to public transport	▲	□	○	▲	□	○	▲	□	○	▲	□	○	▲	□	○	▲	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	▲	□	○
Physical arrangement	△	□	○	△	□	○	△	□	○	△	■	○	△	□	○	△	■	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Places to sit	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Opportunity to walk/jog/sports	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Landscaping/trees/vegetation	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	▲	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Proximity of food and retail	▲	□	○	▲	■	○	▲	□	○	▲	□	○	▲	□	○	△	□	○	▲	□	○	△	■	○	△	■	○	▲	■	○	△	■	○	△	■	○
Social interaction	▲	□	○	▲	■	○	▲	□	○	▲	■	○	▲	■	○	△	□	○	▲	□	○	△	■	○	△	■	○	▲	■	○	△	■	○	▲	□	○
Feeling safe	△	□	○	△	□	○	△	□	○	△	□	○	△	■	○	△	■	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Good maintenance/ neatness	△	□	○	△	□	○	△	□	○	△	□	○	△	■	○	△	■	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○	△	□	○
Special events	▲	□	○	▲	□	○	▲	□	○	▲	□	○	▲	□	○	△	□	○	▲	□	○	△	■	○	△	■	○	▲	□	○	△	■	○	▲	□	○

Users preferences /accessible green matrix

	Perception of the users /accessible green matrix											
	Study areas											
	Unplanned areas					Planned areas						
	Sirajoddoula Park	Sikkatuli Khalek Sardar Park	Armanitola field	Bangladesh Math	Samsa-baad lane math	Lalmatia new colony	Lalmatia D block math	Iqbal road math	Udoijol club Field	Humayan road B block math	Tajmahal park	Khilji road Park
Why do you need open and green spaces? [deep shades to light shades are indicating higher % to lower %]												
Variety	23.5	17.0	16.5	13.0	20.0	10.0	06.5	21.0	27.0	13.0	23.5	17.0
'Wilder' environments	63.5	53.0	50.0	30.0	50.0	23.0	20.5	33.0	29.0	17.0	50.0	60.0
Openness	30.0	29.0	25.0	10.0	33.0	07.0	16.5	---------	---------	07.0	10.0	----------
For sports /game	--------	20.0	10.0	23.0	20.0	23.0	16.5	---------	---------	20.0	20.0	17.0
For walk/exercise	--------	--------	06.5	13.0	03.0	03.0	----------	---------	---------	--------	--------	10.0
Eid gah	--------	---------	--------	--------	10.0	----------	----------	---------	--------	--------	---------	----------
Entertainment(fair/concert)	----------	----------	---------	--------	--------	----------	----------	---------	--------	--------	23.5	07.0
Do you feel there is adequate amount of green space in your area? [deep shades to light shades are indicating higher % to lower %]												
Yes	16.5	33.0	26.5	30.0	50.0	43.0	30.0	45.0	40.0	37.0	40.0	40.0
	Avg.**31%** people in planned areas think there is adequate amount of green spaces in their areas.					Avg.**39%** people in planned areas think there is adequate amount of green spaces in their areas.						
No	80.0	67.0	60.0	70.0	50.0	10.0	60.0	54.0	57.0	50.0	60.0	60.0
	Avg.**65%** people in planned areas think there is not adequate amount of green spaces in their areas.					Avg.**50%** people in planned areas think there is not adequate amount of green spaces in their areas.						
findings	**Due to high density of population and built areas of old Dhaka it is evident from the above data that more accessible green spaces are needed in unplanned areas than planned areas of Dhaka.**											
What type of green space is lacking in the area? [deep shades to light shades are indicating higher % to lower %]												
Areas for children/young	33.5	27.0	30.0	30.0	33.0	07.0	40.0	25.0	25.0	30.0	50.0	27.0
Areas to play sports	70.0	53.0	23.5	27.0	35.0	17.0	43.5	29.0	29.0	57.0	50.0	27.0
Parks/garden	56.5	40.0	43.5	40.0	53.0	43.0	40.0	27.0	27.0	47.0	40.0	27.0

Perception of the users /accessible green matrix

Comparative data analysis and level of performance base on accessibility and frequency

categories	parameters		areas												
			Unplanned areas					Planned areas							
			Bangladesh Math	Samsabaad Lane Math	Armanitola Field	Sikdatuli Park	Sirajuddaula park	Lalmatia D block Park	Lalmatia New colony Field	Udoyjol Play field	Iqbal road field Park	Humayan road field	Tajmahal Park field	Khilji road Children park
Accessibility	Time	3 minutes or less	2	4	2	1	1	2	2	2	2	1	2	2
		5 to 10 minutes	3	2	4	3	4	3	3	2	2	3	3	3
		more than 10 minutes	2	1	1	1	1	1	1	2	2	1	1	1
	Distance	less than 5 blocks	1	3	2	1	1	2	2	1	1	1	2	2
		5 to 10 blocks	3	2	3	4	4	2	4	2	2	3	3	3
		more than 20 blocks	1	----	1	1	1	1	1	1	1	1	1	1
	Arrival	Walk	5	5	5	5	5	4	5	5	4	4	5	5
		transport	1	1	1	1	1	1	1	1	1	1	1	1
	Level of Performance		18	18	19	17	18	16	19	16	15	15	18	18
Frequency	Use	1 to 2 a year	1	1	----	1	1	1	1	1	1	1	1	1
		2 to 3 per month	1	1	1	1	1	1	1	1	1	1	1	1
		2 to 3 per week	1	1	1	1	1	1	1	1	1	1	1	1
		every day	4	4	1	2	2	1	3	2	2	1	2	2
	Duration of stay	less than 30 minutes	2	2	2	3	2	1	3	2	2	1	2	2
		30 to 60 minutes	2	2	2	2	2	2	1	1	1	1	2	2
		60 to 120 minutes	2	1	2	1	1	2	3	2	2	2	2	1
		more than 120 min	1	1	1	1	1	1	1	1	2	1	1	1
	Time of the day	Morning	2	2	1	1	3	2	1	1	2	2	2	2
		Noon	2	1	1	----	1	1	----	1	----	----	1	1
		Afternoon	4	3	3	4	2	2	3	3	4	2	4	4
		Evening	1	2	----	1	1	----	1	1	1	1	1	1
		Night	1	2	----	1	1	----	1	1	----	----	----	1
	Level of Performance		24	23	15	19	19	15	20	18	19	14	20	20

Comparative data analysis and level of performance base on users' perception, their preferences and need

categories	parameters		areas											
			Unplanned areas					Planned areas						
			Banglades Math	Samsabaad Lane Math	Armanitola Field	Sikkatuli Park	Sirajuddau la park	Lalmatia D block Park	Lalmatia New colony Field	Udoyjol Play field	Iqbal road field Park	Humayan road B block field	Tajmahal Park field	Khilji road Children park
Users perception	Adequate amount of green	Adequate	2	3	2	2	1	2	3	2	3	2	2	2
		Not adequate	4	3	3	4	5	3	1	3	3	3	3	3
	Type of green absent	Areas for children	2	2	2	2	2	2	1	2	2	2	3	2
		Areas to play sports	2	2	2	3	4	3	1	3	2	3	3	2
		Parks /garden	2	3	3	2	3	2	3	3	2	3	2	2
	Need of green spaces for	Variety	1	1	1	1	2	1	1	2	2	1	2	1
		Wilder environment	2	3	1	3	3	2	1	1	1	1	3	2
		Sports	2	1	1	1	1	1	2	1	-----	1	1	1
		Openness	1	-----	1	-----	-----	1	1	2	-----	1	1	-----
		Walking	1	1	----	-----	-----	-----	1	1	-----	------	-----	1
		entertainment	----	-----	1	-----	-----	-----	-----	2	-----	------	2	1
	Level of Performance		**19**	**19**	**17**	**18**	**21**	**17**	**15**	**22**	**15**	**17**	**22**	**17**
Users preferences & needs	Users visits others green	Visit other green	2	2	3	4	3	4	3	3	4	3	3	2
		Do not visit	3	3	1	2	2	1	2	2	2	2	3	3
	Characteristics users like most of others green	Diversity	1	2	2	2	2	2	1	1	1	2	1	2
		Children place	1	1	1	1	1	1	1	1	1	2	1	2
		Other facilities	1	1	----	1	1	----	1	1	1	1	1	1
		Well maintained	1	1	2	1	2	1	1	1	1	1	1	1
		Feel safe	1	1	2	1	2	2	1	1	1	1	2	1
		Variety or trees	2	2	3	3	2	2	1	2	2	2	1	2
		spacious	2	2	2	3	1	2	2	2	2	3	2	2
	Reason puts off visiting green	Too far to walk	2	2	1	2	3	1	2	3	3	1	2	1
		Not interested	2	3	2	1	1	1	1	1	1	2	2	1
	Accessibility/ distance	Not important	2	2	2	1	1	1	1	1	1	1	1	1
		Important	2	2	2	2	2	2	2	2	2	1	1	1
		Very important	2	2	3	3	3	3	3	3	3	2	4	4
	Level of Performance		**24**	**26**	**26**	**26**	**26**	**23**	**22**	**24**	**25**	**24**	**25**	**24**

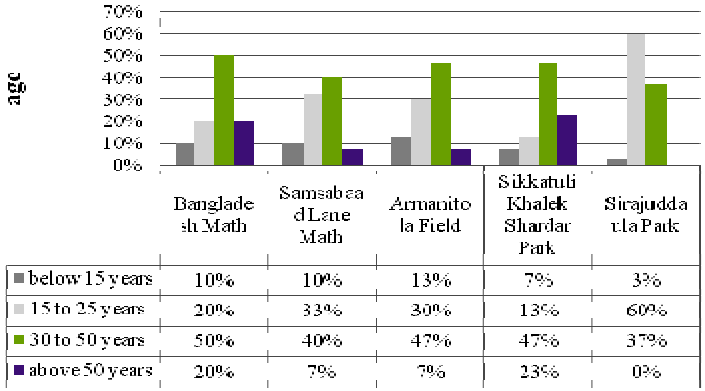
Total performance base on accessibility, frequency, sociability, comfort, users perception, users preferences and need

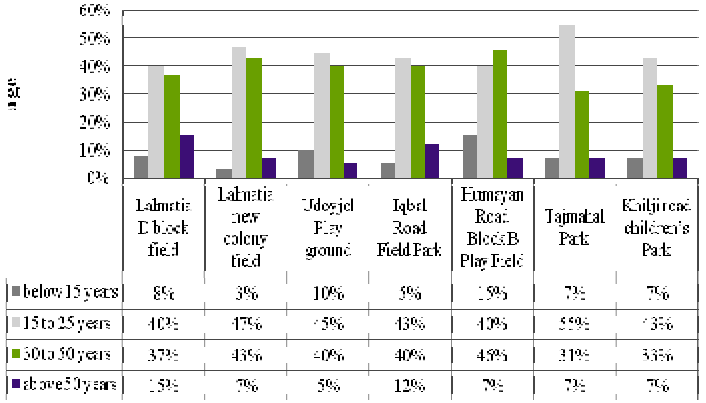
Categories for liveability	areas											
	Unplanned areas					Planned areas						
	Bangladesh Math	Samsabaad Lane Math	Armanitola Field	Sikkatuli Park	Sirajuddaula park	Lalmatia D block Park	Lalmatia New colony Field	Udoyjol Play field	Iqbal road field Park	Humayan road B block field	Tajmahal Park field	Khilji road Children park
Accessibility	18	18	19	17	18	16	19	16	15	15	18	18
Frequency	24	23	15	19	19	15	20	18	19	14	20	20
Level of Performance	**42**	**41**	**34**	**35**	**37**	**31**	**39**	**34**	**34**	**29**	**38**	**38**
Sociability	08	10	06	09	07	07	10	06	06	08	11	09
Comfort	08	09	06	09	08	08	06	07	10	08	09	09
Level of Performance	**16**	**19**	**12**	**18**	**15**	**15**	**16**	**13**	**16**	**16**	**20**	**18**
User perception	19	19	17	18	21	17	15	22	15	17	22	17
User preferences and need	24	26	26	26	26	23	22	24	25	24	25	24
Level of Performance	**43**	**45**	**45**	**44**	**47**	**40**	**37**	**46**	**40**	**41**	**47**	**41**
Total performance	**101**	**105**	**91**	**97**	**99**	**86**	**92**	**93**	**90**	**86**	**105**	**97**
	Very successful	Very successful	Moderately successful	Successful	Successful	Marginally successful	Moderately successful	Moderately successful	Marginally successful	Marginally successful	Very successful	Successful
Very successful 101-105												
Successful 96-100												
Moderately successful 91-95												
Marginally successful 86-90												

PATTERN 60

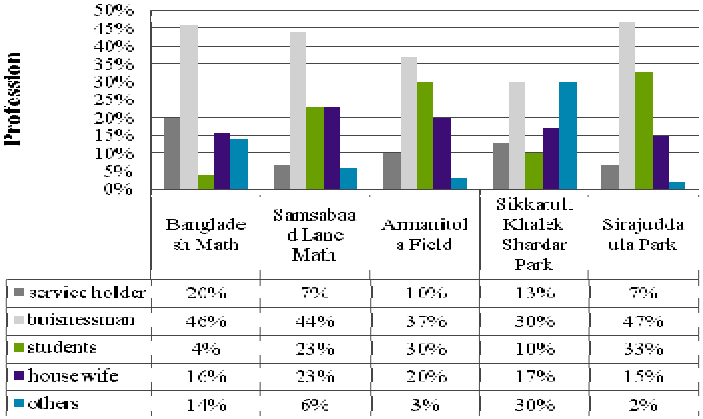
Accessible green

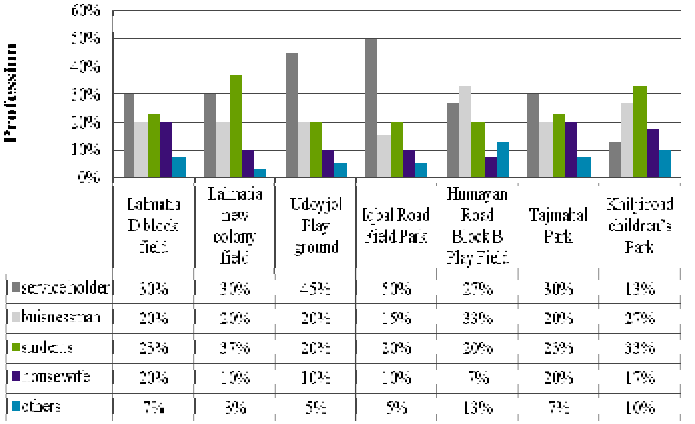
Users' Profile:





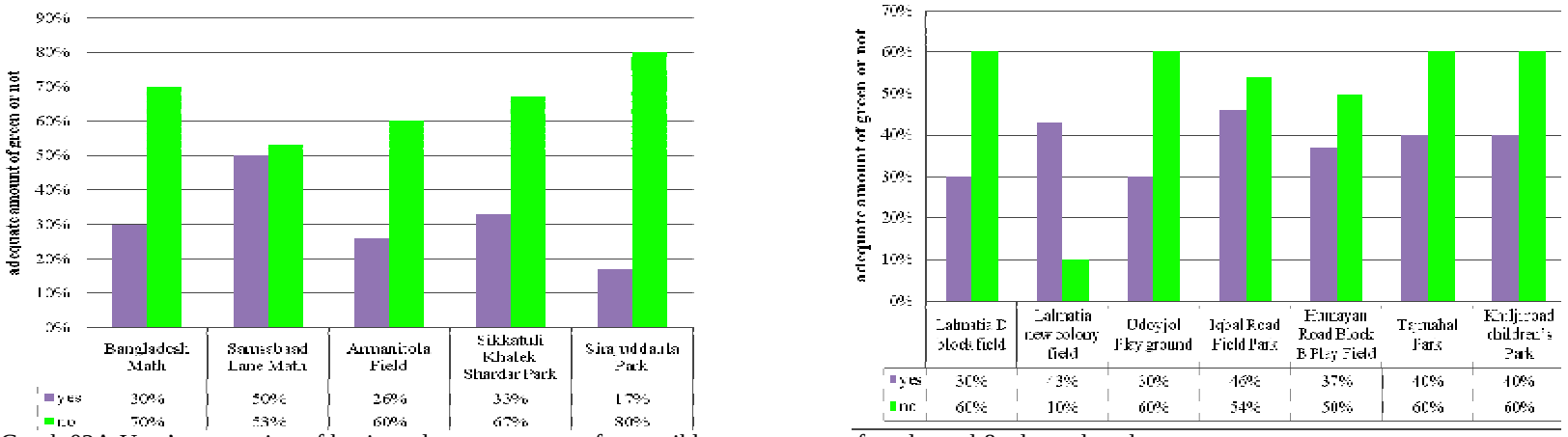
Graph 01A:User's profile according to age of unplanned & planned study areas



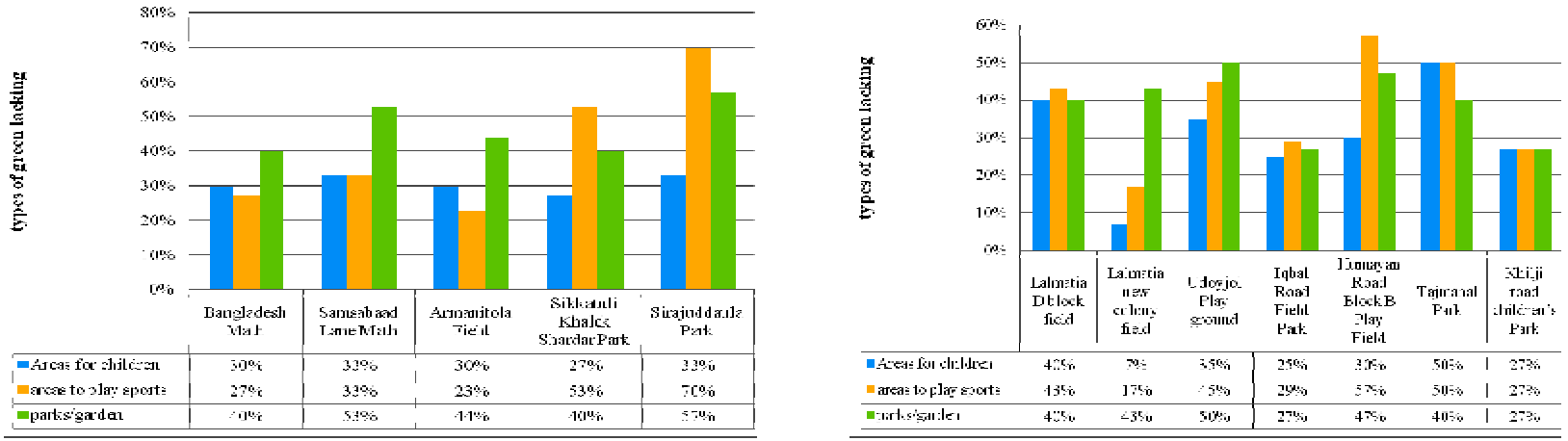


Graph 01B:User's profile according to profession of unplanned & planned study areas

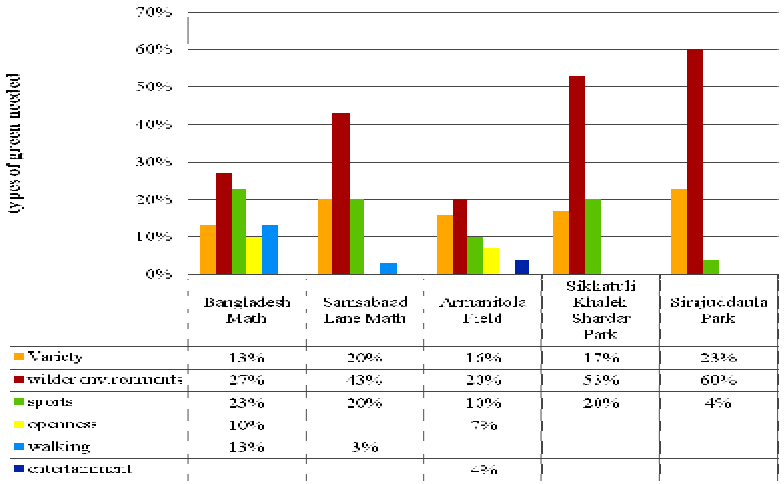
Users' Perception:

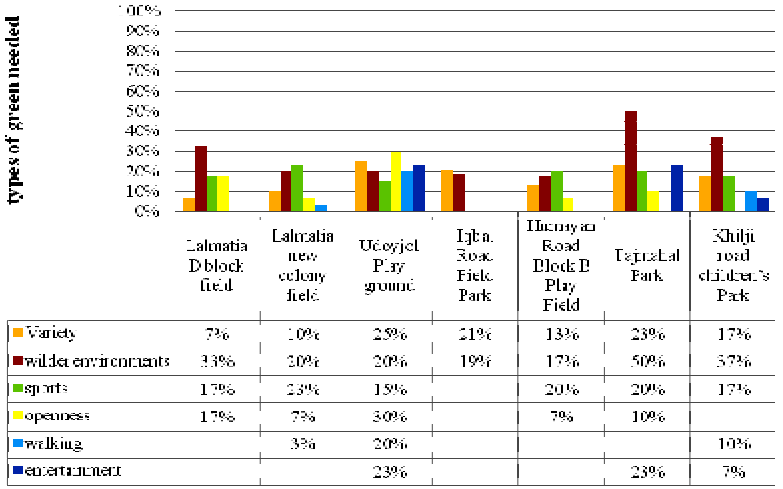


Graph 02A:User's perception of having adequate amount of accessible green or not of unplanned & planned study areas



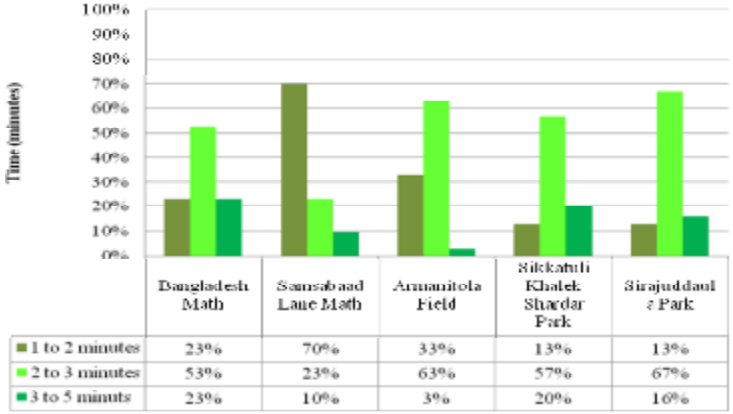
Graph 02B:User's perception on types of green spaces lacking in unplanned & planned study areas



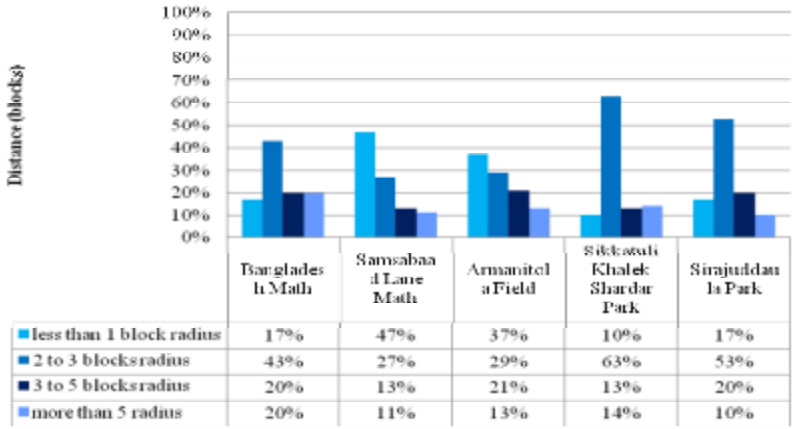


Graph 02C:User's perception on types of green spaces needed in unplanned & planned study areas

Accessibility (unplanned study areas):

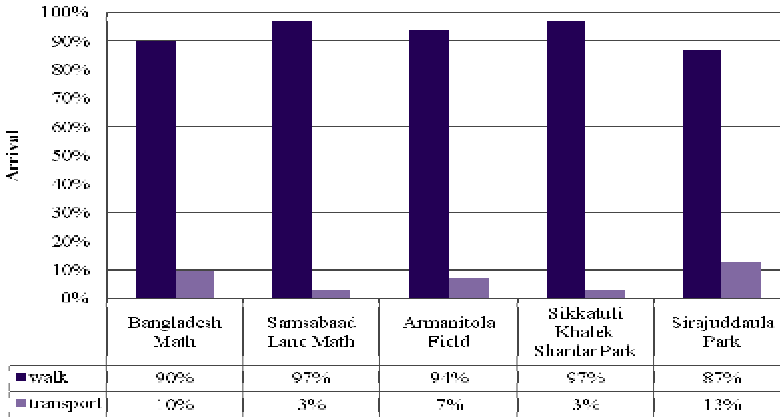


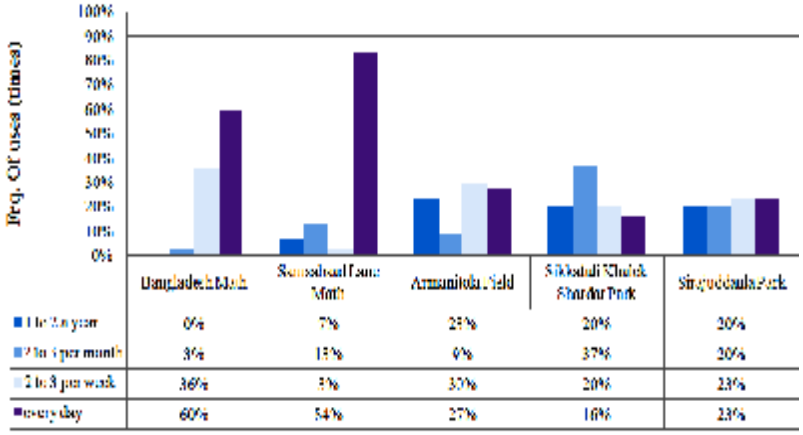
Graph 03A: Accessibility in term of time of unplanned study area



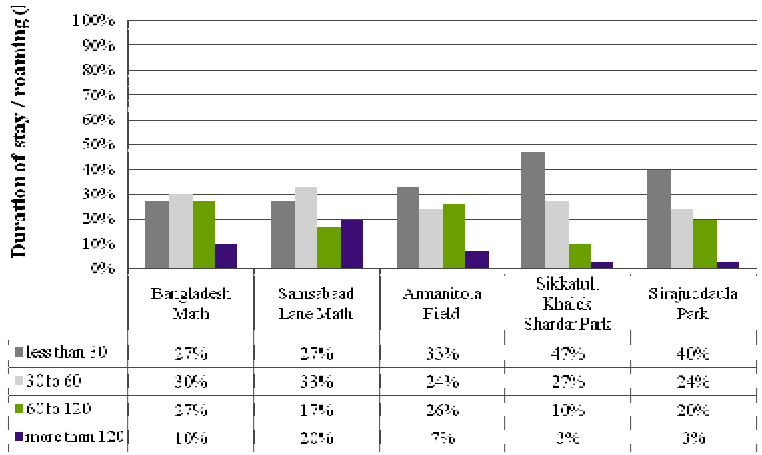
Graph 03B: Accessibility accessibility in term of distance of unplanned study area

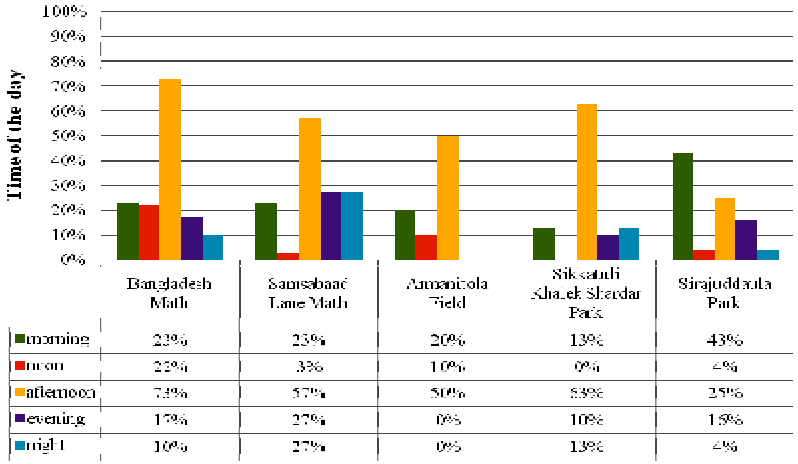
Frequency analysis (unplanned study areas):





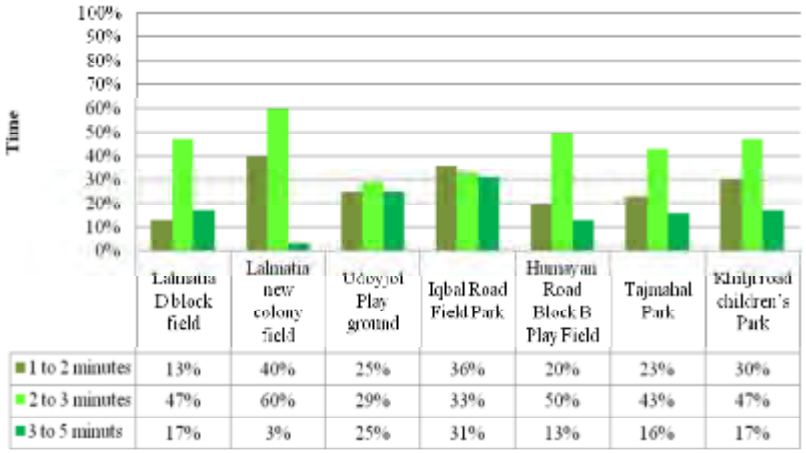
Graph 03C: Accessibility in term of Arrivality of unplanned study areas Graph 03D: Frequency of uses by the users of unplanned study areas



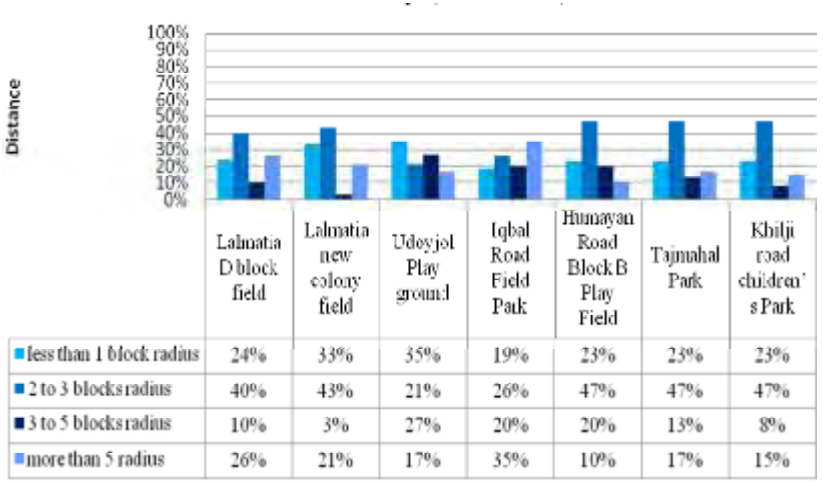


Graph 03E: Duration of stay by the users of unplanned study areas Graph 03F: Time of stay by the users of unplanned study areas

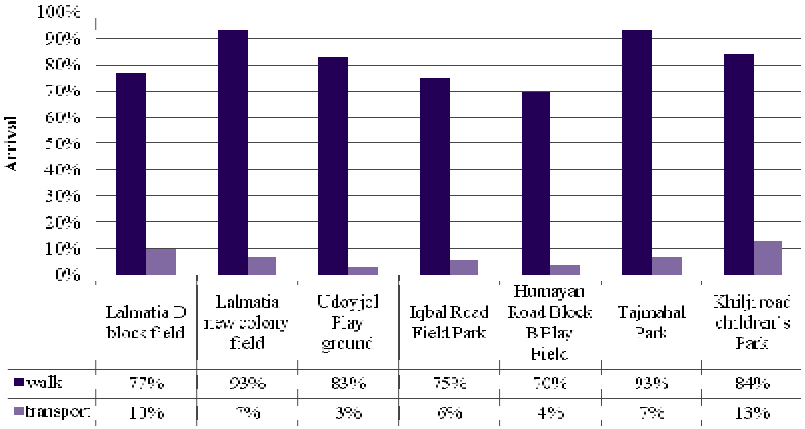
Accessibility (planned study areas):



Graph 03G: Accessibility in term of time of planned study area

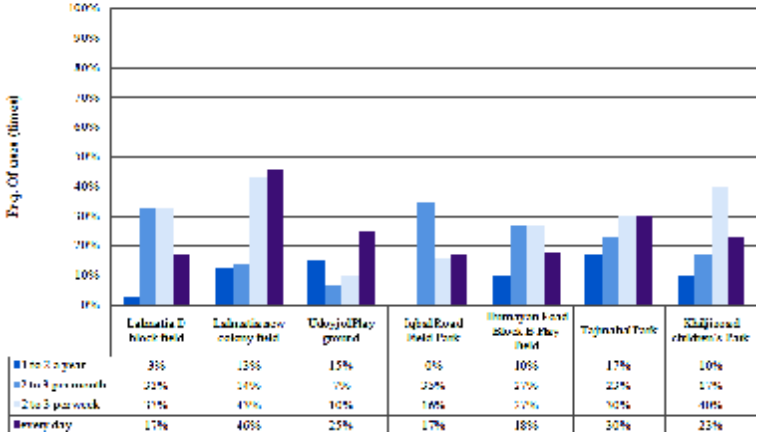


Graph 03H: Accessibility in term of distance of planned study area



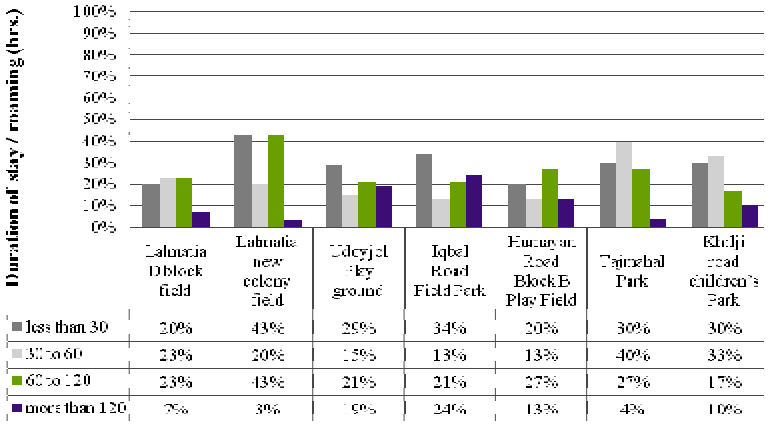
Graph 03I: Accessibility in term of arrivality of planned study area

Frequency analysis (planned study areas):



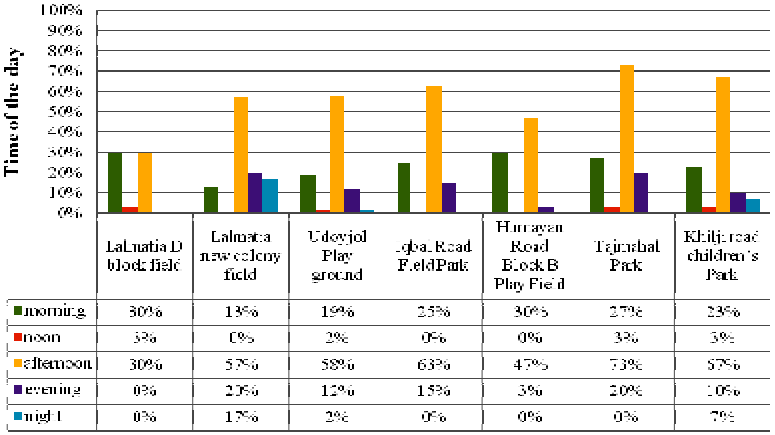
	Lalmatia D block field	Lalmatia new colony field	Udoyjol Play ground	Iqbal Road Field Park	Humayun Road Block B Play Field	Tajmahal Park	Khilji road children's Park
1 to 3 per year	8%	13%	15%	0%	10%	17%	10%
2 to 3 per month	33%	14%	7%	33%	27%	23%	17%
2 to 3 per week	17%	47%	10%	17%	13%	30%	40%
every day	17%	40%	25%	17%	18%	30%	23%

Graph 03J: Frequency of uses by the users of planned study area



Duration of stay / roaming (hrs.)	Lalmatia D block field	Lalmatia new colony field	Udoyjol Play ground	Iqbal Road Field Park	Humayun Road Block B Play Field	Tajmahal Park	Khilji road children's Park
less than 30	20%	43%	25%	34%	20%	30%	30%
30 to 60	23%	20%	15%	13%	13%	40%	33%
60 to 120	23%	43%	21%	21%	27%	27%	17%
more than 120	2%	3%	9%	24%	13%	4%	10%

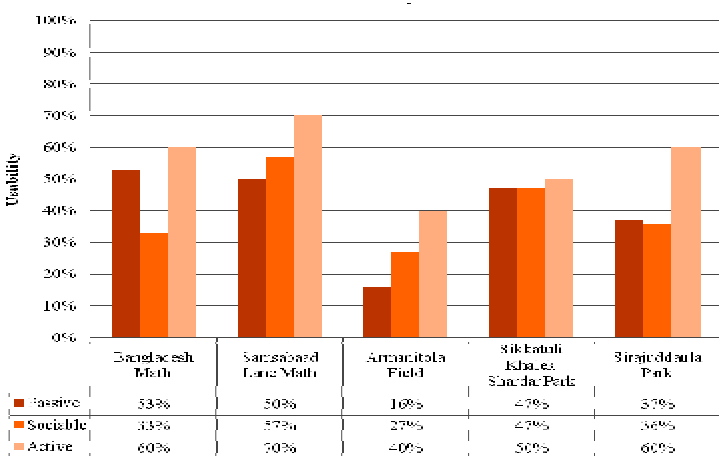
Graph 03K: Table for duration of stay of by the users of planned area



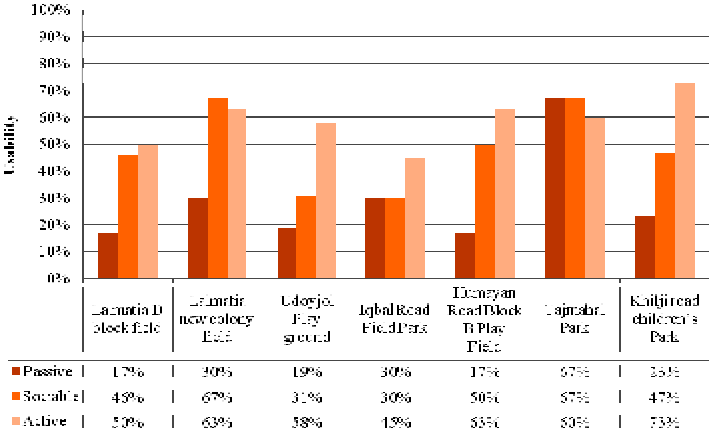
Time of the day	LaLmatia D block field	Lalmatia new colony field	Udoyjol Play ground	Iqbal Road Field Park	Humayun Road Block B Play Field	Tajmahal Park	Khilji road children's Park
morning	30%	13%	19%	25%	30%	27%	23%
noon	3%	0%	2%	0%	0%	3%	3%
afternoon	30%	57%	58%	63%	47%	73%	57%
evening	0%	20%	12%	13%	3%	20%	10%
night	0%	17%	2%	0%	0%	0%	7%

Graph 03L: Time of stay of by the users of planned study area

Sociability:

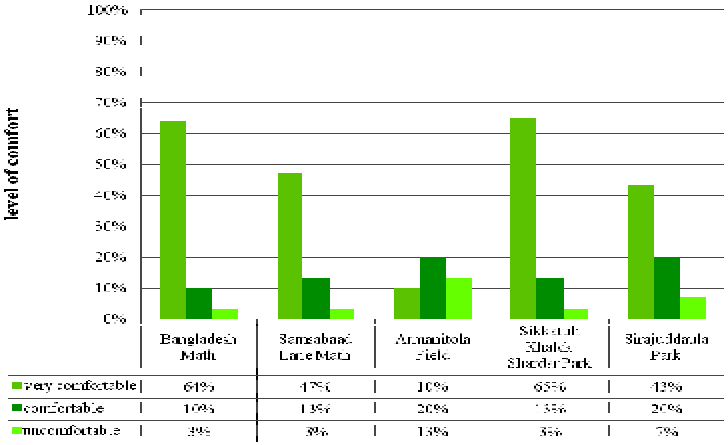


Graph 04A: Uses and activities in unplanned areas

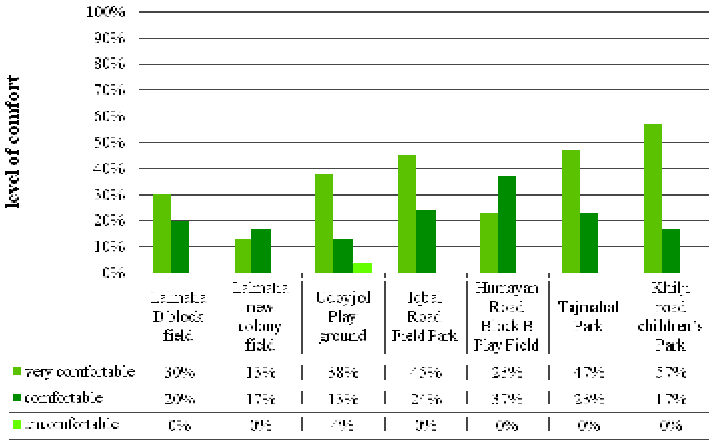


Graph 04B: Uses and activities in planned areas

Comfort

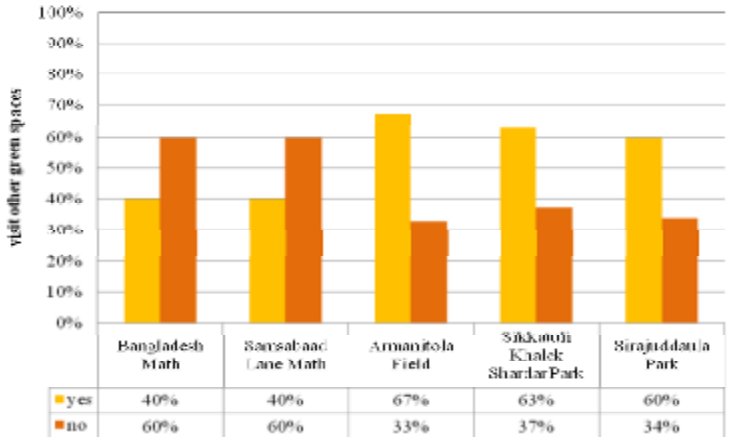


Graph 05A: Level of comfort in unplanned area

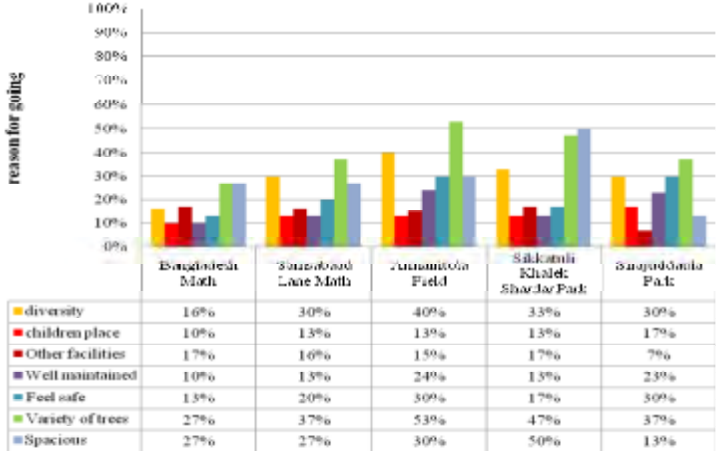


Graph 05B: Level of comfort in planned area

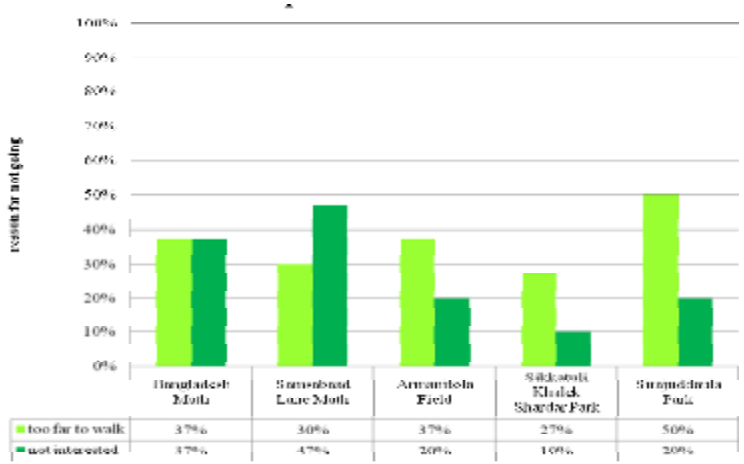
Users' preferences and need analysis:



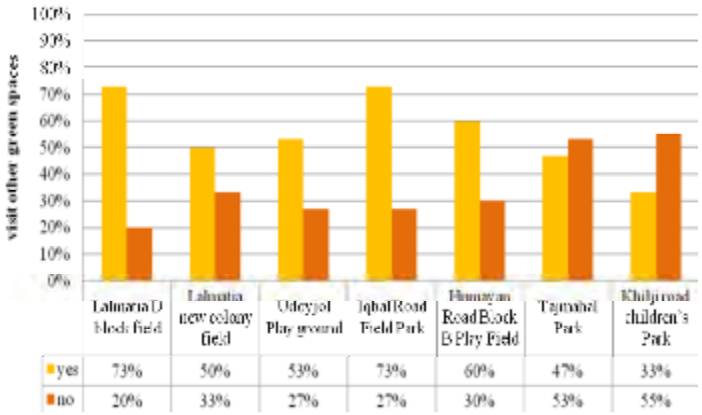
Graph 06A: Visiting other open spaces (unplanned areas)



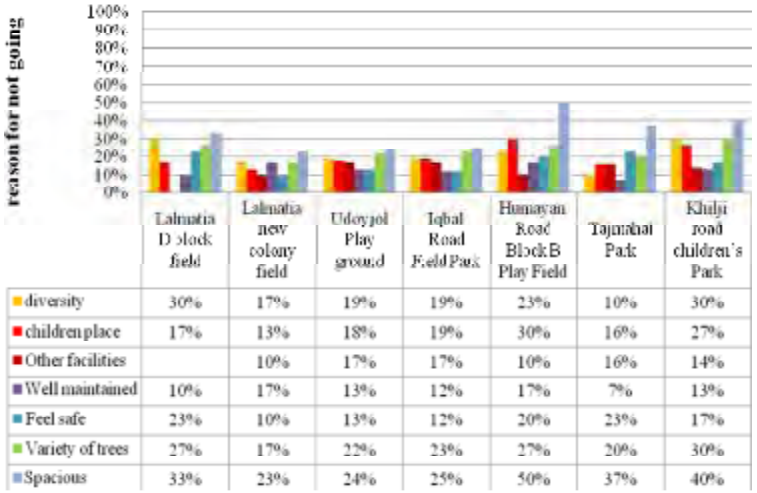
Graph 06B: Reasons for visiting other open spaces (unplanned areas)



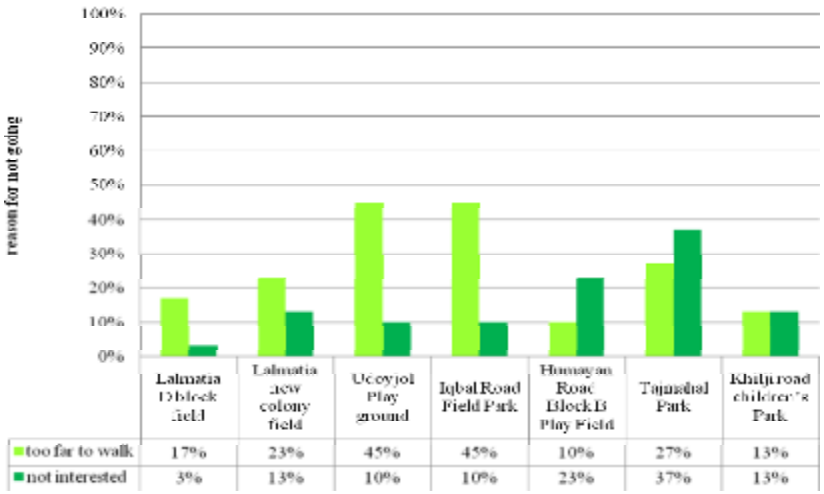
Graph 06C: Reasons for not visiting other open spaces (unplanned areas)



Graph 06D: Visiting other open spaces (planned areas)



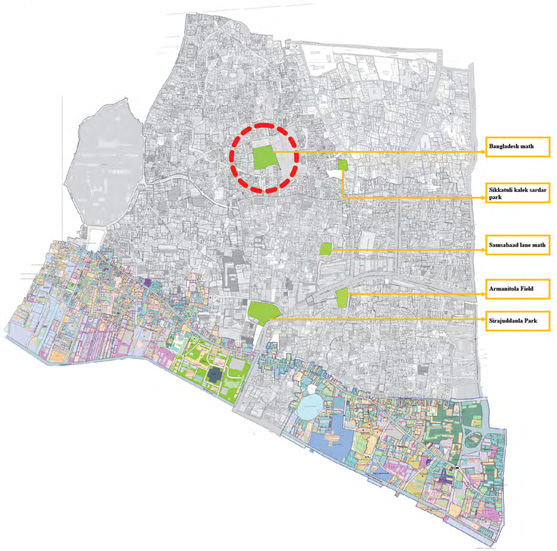
Graph 06E: Reasons for visiting other open spaces (planned areas)



Graph 06F: Reasons for visiting other open spaces (planned areas)


PATTERN 60
Accessible green

Bangladesh math



Location Map

Surrounding areas and spatial organization of Bangladesh Math

Fig: entry from north side of the field and trees on eastern side with gallery Northern gallery of the field.

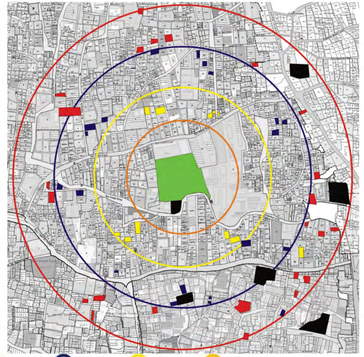
Street layout	Landscape structure & Spatial organization	Functional characteri stics [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Ward commissioner office
Circulation / Entrance	Entry internal walkway Gallery Seating	Residential area
Urban elements	Water pump, Club BLDG, Mazar Tea Stall, Chotpoti/food stand	
Area:	**Major Activity**	Playing football or cricket
	Most Active hour	Afternoon

Functional and physical Characteristic of Bangladesh Math

Analysis	**Problems**	*No differntiation between pedestrianized and non pedestrianized section around the field. *Play field is visually non accesible from north,east and west. * Good number of shops at north- eastern part of the field which block the visual accessibility. *Side streets are poorly lit at night. No proper lighting in back streets as well as in side the field. *Problem of the field is that it lacks proper drainage system.
	Potentials	*Natural flow of people *Good possibilities of walking as there is continuous internal walkway ,sitting as there are gallery on north and east side. *Edges are well defined *a good number of trees at the eastern side

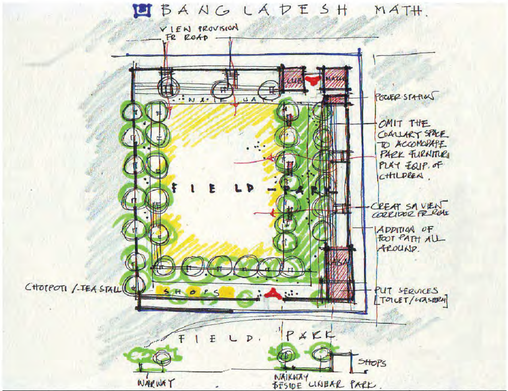
Fig: Continuous walkway, plantation boxes and the gallery, Entry from North with the Mazar

Fig: environment, surrounding road, different type of activities in different periodic of day



Accessibility parameters			
Do you feel there is adequate amount of green space in your area?		Time needed for normal journey to the green	
Yes	**09 no**	Less than min.	**07 no**
No	**21 no**	1-2 min.	**16 no**
Distance affects users visit to existing open and green space		2-3 min.	**07 no**
		3-5 min.	**X**
Yes	**09 no**	Distance of users living from this open and green space	
No	**12 no**		
Users preference for green space near to your home		Less than 1 block radius	**05 no**
		2 to 3 blocks radius	**13 no**
Yes	**28 no**	More than 5 blocks radius	**06 no**
No	**X**	Very far	**01 no**
Arrival of the users to this open and green space			
Walk	**27 no**	Own vehicle	**X**
Public transport	**X**	Other	**03 no**

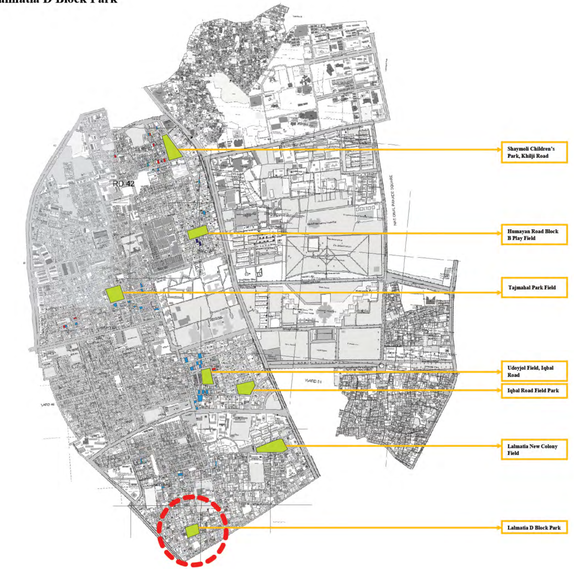
Users perception on accessibility parameters for Bangladesh Math



Language		
	Ideas/ pattern	*To invite people in a space continuous pedestrian atmosphere is an important issue. So addition of foot path on northern, southern and eastern side of the field. *View corridor from northern and eastern side. So that pedestrian people get the visual connection with the field. *Create park like environment with soft pave and sitting with play equipment for children on eastern side as per the above sketch. Provision for Park furniture like lamp, bench, bins. *Provision for services like tea stall, phuchka or jhalmuri stand, wash room. *Arrangement of trees along west side of the field with sitting opportunities act as talkscapes. *Provision of bicycle parking can be introduced. *Maintenance of surface quality and develop lighting strategy to suit the context of the field and a human scale. *Activate side street by introducing foot path and lighting.

Pattern language for Bangladesh Math

Lalmatia D Block Park



Location Map

Surrounding areas and spatial organization of Lalmatia D Block Park

Fig: Arial view, main entry of Lalmatia D Block Field.

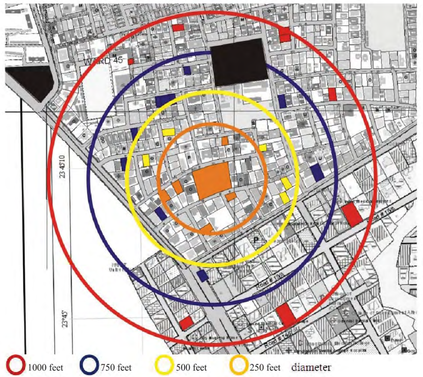
Street layout	Landscape structure & Spatial organization	Functional characteristics [land use around green space]
Internal Street layout	Green space	Commercial uses
Major Road	Tree cover	Institutional uses
Circulation / Entrance	Entry	Residential area
Urban Elements	Mosque, Tea Stall, Chotpoti/food stand	
Area: 1.184 acres	Football tournament	
Shape: Rectangular	**Major Activity**	Playing football or cricket
	Most Active hour	Afternoon

Functional and physical Characteristic of Lalmatia D Block Park

Analysis	Problems	*No differntiation between pedestrianized and non pedestrianized section around the field. Lack of external and internal walkways *Problem of the field is that it lacks proper drainage system. The field gets clogged with rainwater during monsoon due to the faulty drainage system. *Side streets are poorly lit at night. *Only one bench in entire field area. Limited opportunities to rest. *Absence of lamp and bins as well as services like washroom. *No dedicated parking stands for bicycle. *Recreational activities are few
	Potentials	*Good accessibility. *Good protection from sun and rain due to canopy on east side of the field.

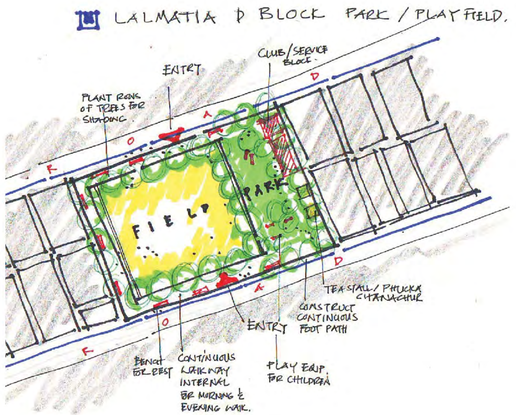
Fig: There are some sittings but they are not enough thats why people carries extra sittings, tea stalls

Fig: environment, surrounding road, different type of activities in different periodic of day



Accessibility parameters			
Do you feel there is adequate amount of green space in your area?		Time needed for normal journey to the green	
Yes	**09 no**	Less than min.	**04 no**
No	**18 no**	1-2 min.	14 no
Distance affects users visit to existing open and green space		2-3 min.	**05 no**
		3-5 min.	**02 no**
Yes	**10 no**	Distance of users living from this open and green space	
No	**16 no**		
Users preference for green space near to your home		Less than 1 block radius	**07 no**
		2 to 3 blocks radius	**12 no**
Yes	**18 no**	More than 5 blocks radius	**03 no**
No	**03 no**	Very far	**X**
Arrival of the users to this open and green space			
Walk	**25 no**	Own vehicle	**01 no**
Public transport	**X**	Other	**02 no**

Users perception on accessibility parameters for Lalmatia D Block Park



Language	Ideas/ Patterns	*Activate side streets by upgrading footpath and lighting. *Add more bench to rest. *Encourage more physical sports activity to take place by offering play equipments. *Introduce small function or structure(food stalls) that can accommodate different activities. *Create park like spaces for more gatherings and events.

Pattern language for Lalmatia D Block Park