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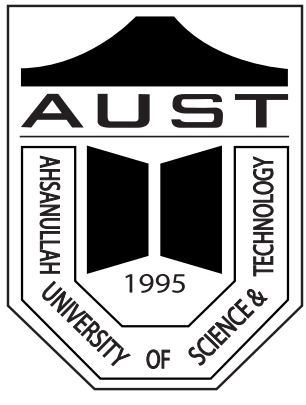

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Rethinking spatial performance to address liveability of accessible neighbourhood greens (angs) in mohammadpur, dhaka

Sarah Bashneen Suchana[1], Syeda Faeza Hasan[2], Farjana Rahman[3]

Abstract : *The accessible neighbourhood greens (ANGs) of Dhaka are gradually disappearing due to greed and manipulative interest of the private sector in association with the city authorities. Thus the demand of ANGs with favourable spatial pattern becomes the primary concern to enhance quality of life and liveability of the city. So, this paper makes a pragmatic analysis of the spatial performances of selected ANG of Mohammadpur to examine and rethink the configuration of physical environment to evoke frequency of neighbours' experiences for better liveability. An extensive survey has been conducted including participant observations and in-depth interviews to evaluate the performances of selected ANGs of Mohammadpur. At the end, this paper represents a rational archetypal layout, emphasizing on the spatial pattern of ANGs which is currently deficient in megacity Dhaka.*

Key words: *Accessible Neighbourhood Greens (ANG), Spatial Performance, Liveability, Mohammadpur*

Introduction

Dhaka has ranked the second least liveable city in the world for the third consecutive year, according to the economist intelligence unit's 2015 global liveability ranking. In the frenzy of urbanization, Dhaka, in the last 30 years, has seen a drastic reduction in its physical environment and declination of quality of life. 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 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 neighbourhood) has only 5% and new Dhaka (planned neighbourhood) has about 12% open space. Unplanned urbanization has tilted the ratio of open space and habitation and other settlements for worse in the Dhaka over the years, narrowing the access of the residents to such places of recreation (Zaman Mahtabi, 2006).

Figure 1a: *News concerning green areas of Dhaka. (Source: News paper "Prothom Alo- Dhakai Thaki") &* ***Figure 1b:*** *scenarios of encroachments of the ANGs*

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Despite all of its positive attributes, Dhaka's tremendous population growth has negatively affected its socio-economic and physical structure of the green areas. Many of city people do not have adequate access to parks and open spaces. In addition accessible neighbourhood greens (ANG) at a reasonable distance ensures visual breaks between and within residential areas and can contribute to create user friendly opportunities for social interaction. A series of opinion poll on Dhaka's citizens (*Prothom Alo 'Dhakai Thaki'*) like to see vibrant green spaces in their close proximity. Dhaka has accessible neighbourhood greens [ANG] of different sizes which are used as multiple resources. ANG have a great ecological importance in urban environment – from microclimate control to biodiversity but spatially many ANG are mainly neglected in national nature resources management activities and have undergone human-derived changes that have increased threat of pollution (*Bashneeen S., Soud S. I. & Haque S. 2013*). Therefore, this research focuses on the users of ANG in order to identify their needs and understand what attract users in terms of accessibility, users' perceptions & needs, frequency of uses, comfort and sociability. The undertaken study examines spatial performance of ANG to enhance users' satisfaction and improves the relationship among people; built and natural environment for better liveability.

2 Objectives & Methodology

The objectives of this study are:

01. To investigate and portray the quality of physical environment and the frequency of neighbours' spatial experiences with ANG
02. To evaluate the spatial performances of selected ANG of Mohammadpur in terms of accessibility, users' perceptions & needs, frequency of uses, comfort and sociability
03. To create an integrated rational archetypal layout emphasizing on the spatial pattern of ANG, for liveability currently deficient in Dhaka city.

For the above objectives an extensive survey has been conducted on seven selected ANGS of Mohammadpur from year 2013 to year 2016 including observational surveys and in-depth interviews of 140 residents. The following table shows the checklist for analysis the spatial performances of ANGs in terms of Social & functional dimensions of the spatial environments of those ANGs. 'Accessible neighbourhood green performance' (ANGP) of Mohammadpur on the basis of a comparison of seven selected spots will be defined in four categories: (1) very successful, (2) successful, (3) moderately successful and (4) marginally successful.

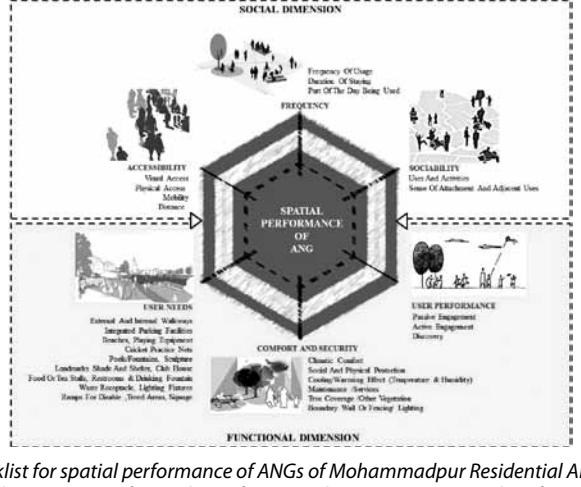


Figure 02: *Checklist for spatial performance of ANGs of Mohammadpur Residential Area/ Performance evaluative criteria for analysis of Case studies Source: Primary data for survey*

3 Theoritical Background

3.1 Accessible Neighbourhood Greens [Ang]

Neighbourhood green spaces are the spaces where facilities tend to attract a significant proportion of their users from particular units of the surrounding local areas e.g. at least two neighbourhoods. They will relate not only to a physical issue but also to the social context. 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. Example: play grounds, Play fields, medium sized parks (*Islam, Kawsar and Ahmed, 2002*). By such neighbourhood spaces we understand green spaces primarily covered by vegetation, which are involved for either active or passive recreation or creating a positive impact on the urban environment, available for the users to use free of charge and without time restrictions within walking distance. Following Table 01 conveys the area/size of green spaces according to various authorities of Dhaka.

<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>Neighbourhood or Local park</td><td>300 sq ft/person</td><td>2.0 acre</td></tr>
</table>

Table 01: *Area/Size of green spaces according to various authorities*

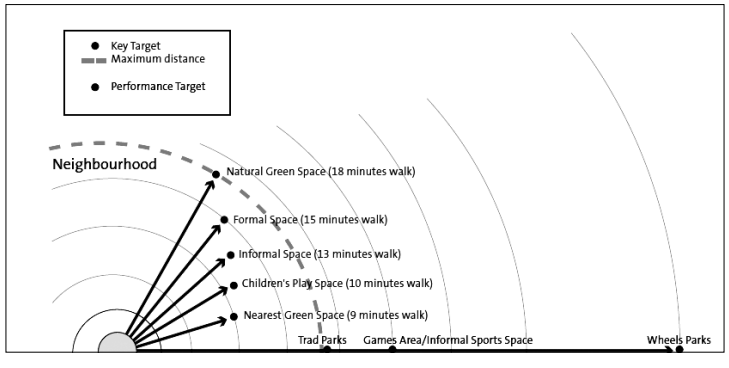


Figure 03: *Time and distance matrix*

According to Christopher Alexander's PATTERN 60, people use greens most when they are in close proximity to their residences or work places. Distance and accessibility are the main physical 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*). These green spaces could involve different networks of people such as residential neighbours, workmates, and parents as well as people from other activities those who live and work in the area.

3.2 Liveability

Liveability means what we experience ourselves as real persons in the city (*Casellati .A. 1997*). 'Liveability' 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, eighbourhoods, convenience, and the presence of eighbourhood amenities such as parks, open space, sidewalks, restaurants, and eighbourhood-serving stores(*Wheeler, Stephen,2001*) The lack of such assets can make life much harder. The degree of Liveability' of a place as experienced on a personal level is the product of two main aspects:

- ♦ The extent to which that place conforms a person's positive needs.
- ♦ The degree to which stress is absent from the person in that place.

Key Liveability themes and desirable indicators are:

A. Environmental Quality (Psychological) B. Place Quality (Physical)

C. Place Quality (Functional) D. Safer Places (Social)

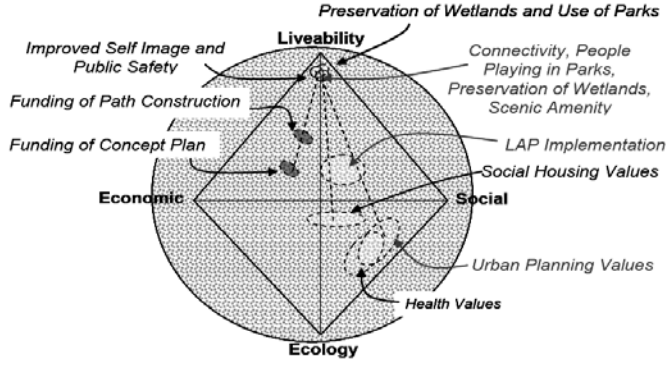


Figure 04: *Grounding Values in the Axiology of Liveability (Baharuddin 2010)*

3.3 Spatial Performance

Spatial performances comprise of two entities: the Physical Environment & the Functional Environment of accessible green spaces. Accessible green spaces posses two environment: physical environment & psycho-social environment which provide opportunities for active and passive recreation. Green spaces not only promote a healthy environment, but it also provides spaces for wildlife, involves community learning and social development. Other spatial 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 neighbourhood green space (*Van Herzele and Wiedemann, 2003; Bedimo-Rung et al. 2005; Giles-Corti et al. 2005, Jasper & Stigsdotter,2010*).

	Positive elements	
Physical environment	Quantity and quality of space Passive recreation amenities Absence of a physical barrier Distance to park Access to competing local facilities Level park maintenance	
Psycho-social Environment	Characteristics of potential users Match between park attributes and perceived needs Perceived barriers Safety from crime Aesthetic features	

Figure 05a: *Accessible Neighbourhood Greens with social circles (different ages, activities) in Dhaka*

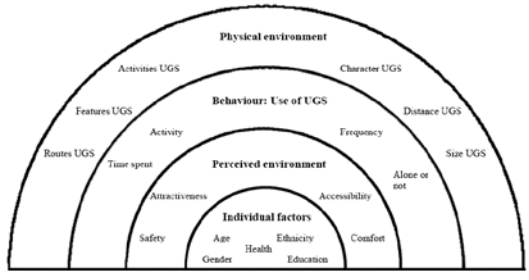


Figure 05b: *Model for the use of urban green space (Schipperijn J., 2010)*

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. 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 and decreases spatial performance. There is a growing recognition of the multi-functional values of green spaces in urban areas. Here the spatial performance of ANGs is discussed in two aspects as social dimension comprising the physical environment and functional dimensions comprising the psycho social environment.

3.4 Social dimension

Accessibility: Accessibility is the distance necessary for access to the green space and way users arrives to it. Two aspects of access – having a space nearer and being easier to access – were clearly identified as issues that would encourage greater use of ANGs.

Frequency of uses: Frequency of use concerns the number of times a person visits the nearby accessible green and the time spent there, peak hours of visit and the frequency of use during which days of the weeks. Distance decay also affects the frequency of use.

Sociability: Sociability deals with the different functions that occur inside the ANGs and in the surrounding areas and perception of the users towards other users of the green. This attribute contain uses and activities pattern and what activities and uses attract people to the field and explores how social interaction took place in the ANGs.

3.5 Functional dimension

Users' need: In order to understand the users and create a user profile participants were asked their age, gender and occupation (Bashneen S., 2013). Asking this information also allowed knowing the users need and preferences in the public settings with what type of green they prefer in their area.

Users' performance (Spatial Behaviour): Spatial Behavior means to investigate pedestrian movement and the ease of access to the ANGs, identify the more used and less used spaces, type and intensity of activities, relations between physical distinctiveness and intensity of use, their experiences, behavior and preference with the ANGs

Comfort & security: Comfort in this particular study will be related to climatic conditions and security factors of the green (*Bashneen S., 2013*)

4 Study Areas

Two distinct spatial patterns are dominant in Dhaka; they are the planned and unplanned (i.e. organic or informal) patterns (*Khan Nayma & Nilufar Farida, 2009*). Major part of Dhaka is planned though in a fragmented way. Unlike some parts of Dhaka city, most parts of

Mohammadpur was planned in the 1950s, and therefore, it have relatively broad streets and avenues. Mohammadpur now a "miniature city" resulted from the massive urbanization leading to degradation of natural environment. The concept of social neighbourhood, commonly known as 'para' in the newer parts of the City, like Segun Bagicha, Dhanmondi, Mohammadpur , 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*). As a planned area Mohammadpur is divided by commercial streets. There are 16 big play grounds and several important parks situated in Mohammadpur under ward 42, 44 and 45. Not all of them are accessible as few of them are under schools and other institutions. Mapping of accessible neighbourhood green spaces are done through Google Earth maps and GIS ward maps. 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. The Selected Accessible Neighbourhood Greens of Mohammadpur under Ward 42, 44 and 45 are as follows:

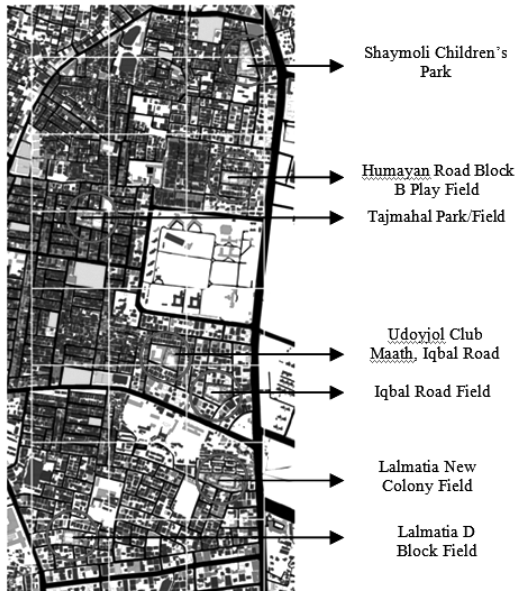


Figure 06: *Site surroundings with landmarks and connectivity through major road network of Mohammadpur showing selected ANGs*

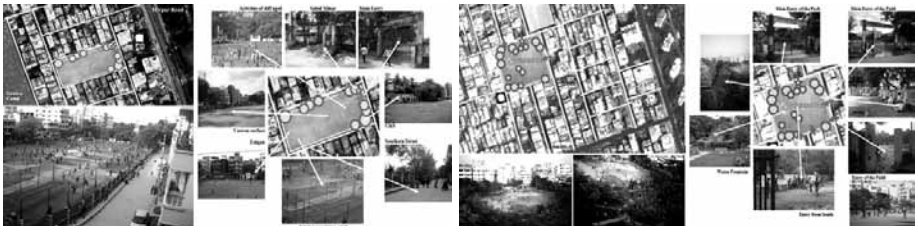
01. Lalmatia D Block Play Field [1.00 acre, use: play field, park]
02. Lalmatia New Colony Children's Park [2.30 acres, use: play field, park]
03. Iqbal Road Field Park [1.70 acres, use: park]
04. Udoyjol Club Maath, Iqbal Road [1.20 acres, use: play field]
05. Tajmahal Park/field [1.46 acres, use: play field, park]
06. Humayan Road Block B Play Field [1.37 acres, use: park]
07. Khilji Road Children's Park, Shaymoli [2.00 acres, use: park]

5 Findings and Comparative Analysis of ANGs

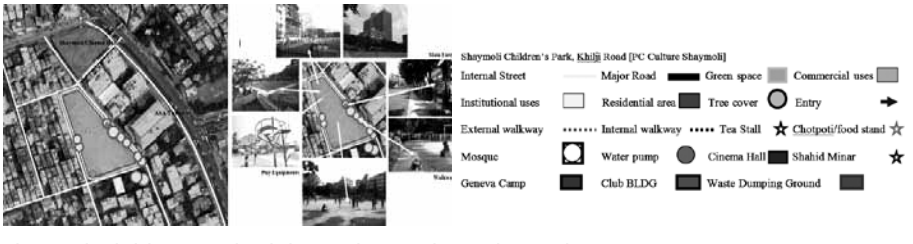
This part of the paper briefly describes the observational characteristics of ANGs of planned areas and residents responses towards ANGs. Analysis and synthesis of the case studies includes various attributes under which different measures are taken to investigate liveability.

Lalmatia D Block Park Lalmatia New Colony Field

Udoyjol Club Maath, Iqbal Road Iqbal Road Field Park



Humayan Road Block B Play Field Tajmahal Park/field

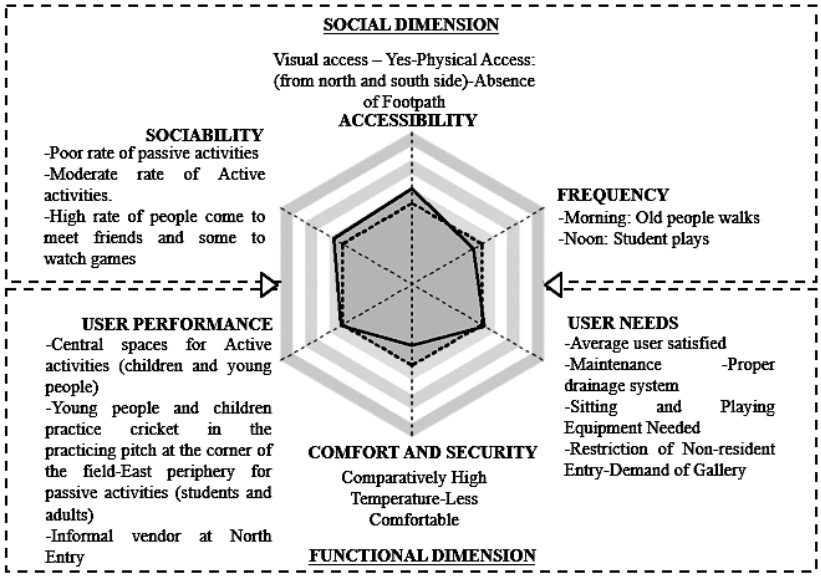


Shaymoli Children's Park, Khilji Road [PC Culture Shaymoli]

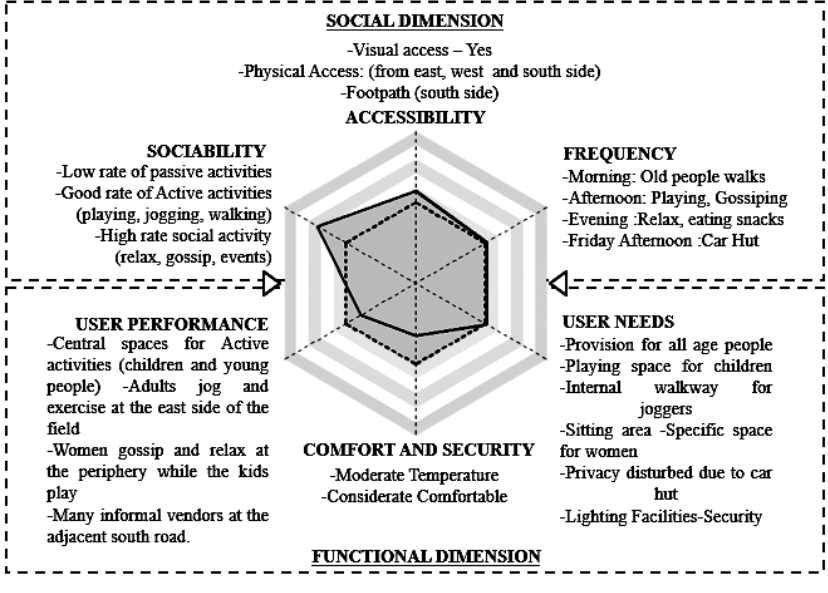
Figure 07: *Surrounding areas and spatial organization of selected ANGs of Mohammadpur with Internal environment, activities, main entry, surrounding road*

Spatial Performance of ANGs of Mohammadpur

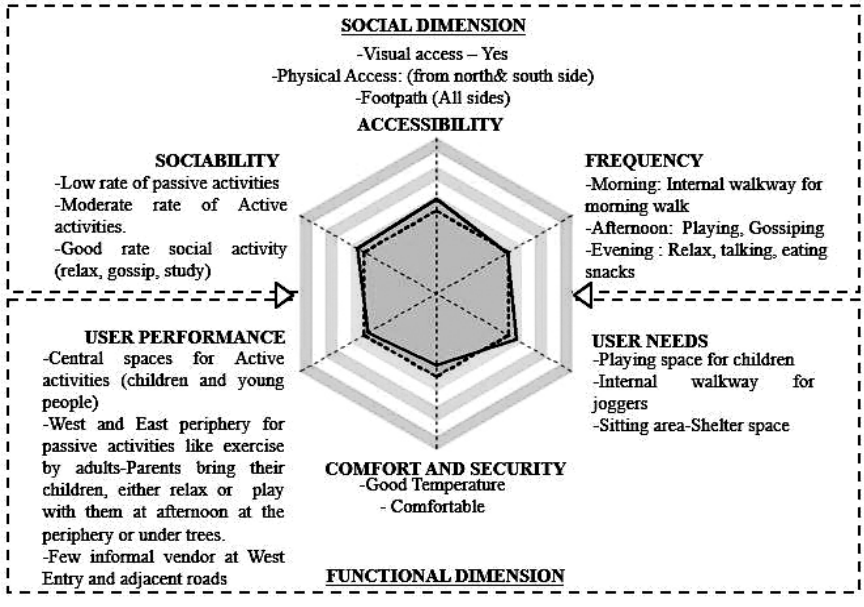
Lalmatia D Block Play Field



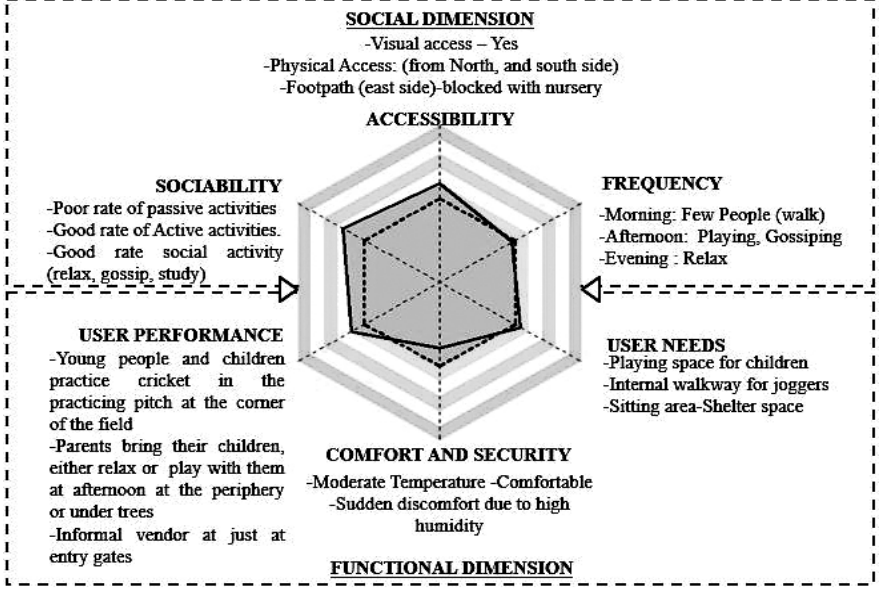
Lalmatia New Colony Children's Park



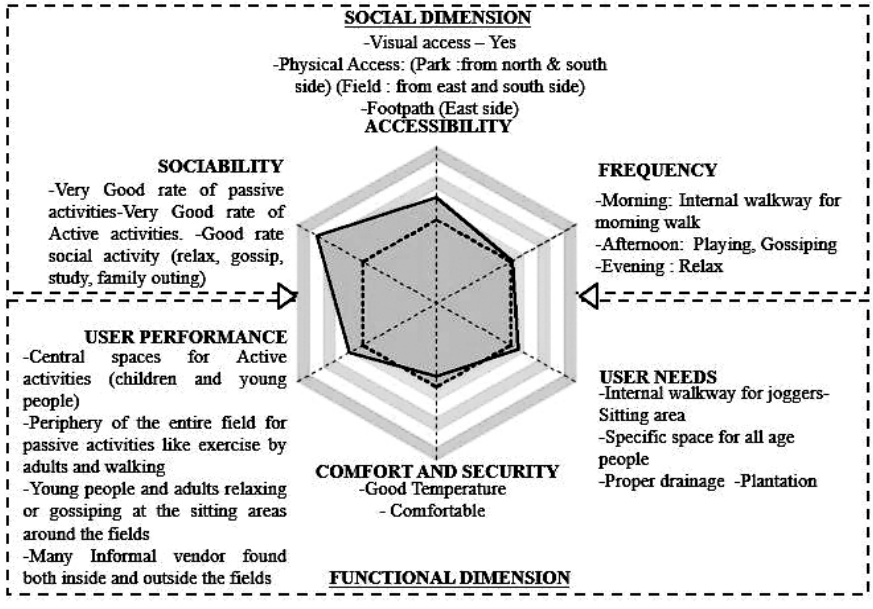
Iqbal Road Field Park



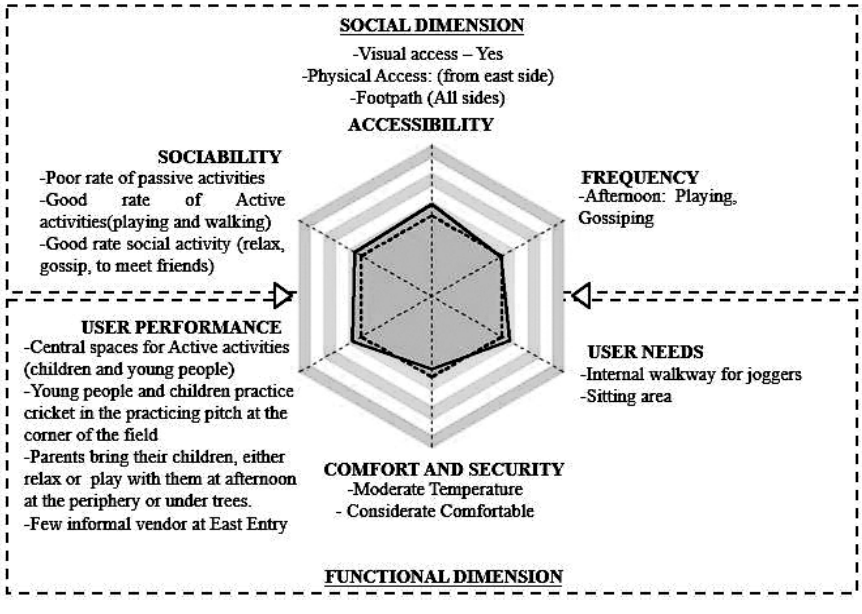
Udoyjol Club Maath, Iqbal Road



Tajmahal Park/field



Humayan Road Block B Play Field



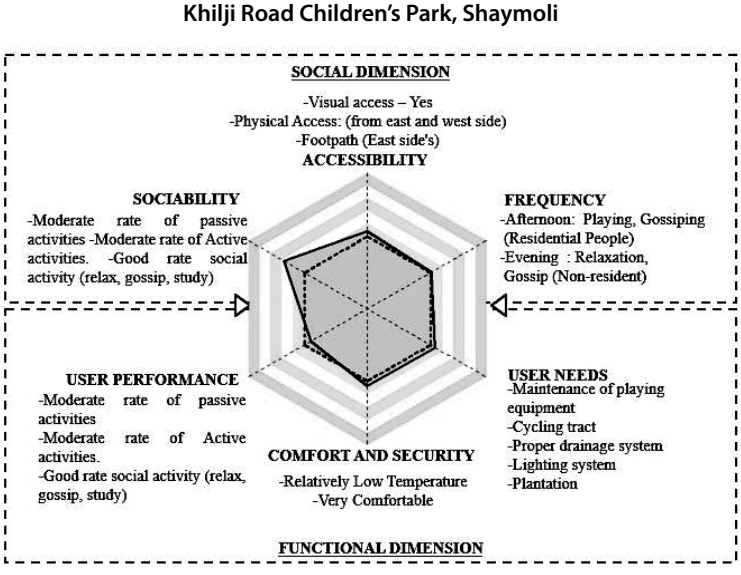


Table 02: *Observational findings of selected ANGs of Mohammadpur through questioner survey*

Following findings are according to the observation that has been done to the seven ANGs of Mohammadpur. It can be noticed that in the studied ANGs, users come to the green spaces mostly for sociable reasons as these greens act as a place for interaction and relaxation which influences their daily lives. Selected areas possess different characteristics in terms of physical layout of built up and natural green spaces

5.1 Accessibility:

It takes 2-3 minutes to come from 2-3 blocks radius distance (500ft -750ft) on foot to their accessible green spaces.

5.2 Frequency:

The participants who were users visited urban green spaces on a daily or weekly basis. Observation detected peak hours for the greens were morning, afternoon and evening hours which during weekends have higher intensity of use. The constant presences of the users (aged 8yrs-18yrs) are seen in the morning and afternoon for ½ hour to 1 hour.

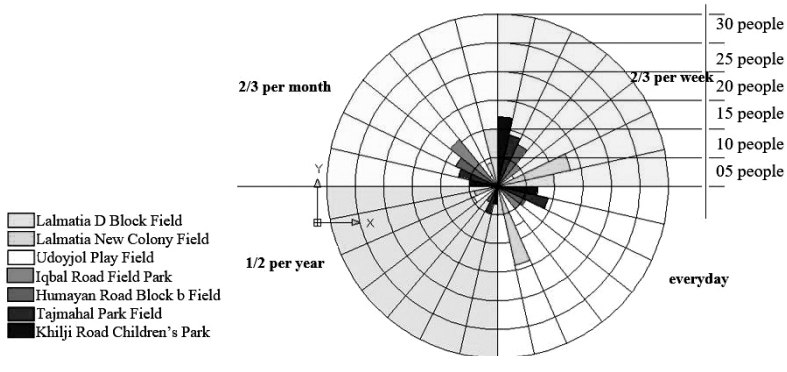


Figure 08: *Frequency distribution of planned area of Dhaka*

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

Table 03: *People and distance*

Figure 9: *Different activities of different age group people in the selected ANGs*

5.3 Sociability:

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. Many users said that an active events program 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.

5.4 Comfort and security:

It is observed that more or less temperature varies from 32.6°c to 27°c and humidity from 32% to 22%. People tend to visit in Morning, afternoon and evening hours when temperature and humidity is low during the day and often prefer to occupy space under tree to relax. More foliage and canopy for shading the area will attract the ANGs users. When asked about security while visiting the ANGs most users mentioned that they feel secure being in the green space but some users said they feel insecure to go to the field at evening hours because the absence of night lighting. Food vendors are supporting elements in such spaces at evening and they can act as protector under the certain conditions to secure the ANGs also.

5.5 User's Needs:

Participants were asked what attract them in the ANGs. Most participants are attracted to easy accessibility and the social environment. 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. Walking trail should be served in many ANGs.

5.6 User Performance:

All the ANGs users have the tendency to use the central spaces for active activities (*figure 11*). The internal perimeters are used for passive activities like walking, exercising, social gathering which increases during weekends. Old age people are seen to come daily for the morning walk and in the afternoon the parks scenario changes to young people or children playing, adult gossiping or sitting some are practicing games and exercising in groups in different part of the field. Informal vendor are often found selling at the periphery of the field.

Figure 10: *Spatial behaviour during afternoon at selected ANGs of Mohammadpur*

Comparative performance of seven ANGS of Mohammadpur has been defined in four categories: (1) very successful, (2) successful, (3) moderately successful and (4) marginally successful and shown in the following table (Table04).

	Lalmatia D Block Play Field	Lalmatia New Colony Field	Iqbal Field Park	Udoyjol Club Field	Tajmahal Park	Humayan Road Block B Play Field	Khilji Road Children's Park
Accessibility							
Frequency							
User perception							
User need							
Sociability							
Comfort							

Marginally Successful **Moderately Successful** **Successful** **Very Sucessful**

Table 04: *Comparative analysis in terms of social & functional dimensions*

6 Recomandation

From the above discussion it is evident that the provision of ANGs with favourable spatial pattern becomes the primary function to enhance quality of life of the city dwellers and liveability of the city. A rational archetypal configuration of physical environment has been suggested regarding an extensive survey including participant observations and in-depth interviews to evoke frequency of neighbours' experiences for better liveability.

01. To create a pattern in macro scale for the extension of Dhaka as well as accelerate the *PERFORMANCE* of each accessible green those are studied and prior to be studied to make LIVEABLE DHAKA

02. To form 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 throughout each neighbourhood of Dhaka.

03. To engage community people and promote *DESIGN AWARENESS IN THE MAKING OF HUMAN SPACES* that better suit user's needs that enhance users' experiences and enjoyment in the accessible greens and assure quality of life.

The ANGs of Dhaka must act as a *Common Land* with central grass area between neighbourhood and commercial zones, *a positive outdoor living room or public outdoor room* with prominent paved and planted space with a range of amenities for different groups, *a stage for individual sports* for young generation where local sports (football, cricket, basket ball) can take place, *an adventure platform* for children on which they get the chance to be together, a chance for physical activities in a place with raw materials nets, boxes, trees, grass, a place for their parents who can lean, *a pavilion* for old people to rest and play chess or read newspaper as well as watch his/her grandchild play in the park, *an Eating outdoors place* with a unique setting, a place where people can sit lazy and enjoy the view of ANGs as well as watch the world go by, with facilities of simple, inexpensive food with friends, *a hangout spot* for passersby, *a shady grove* which holds regular grid or an informal group of standard trees forming a closed canopy and an enclosed *positive space* where people feel comfortable and safe, a liveable place for neighbourhood.

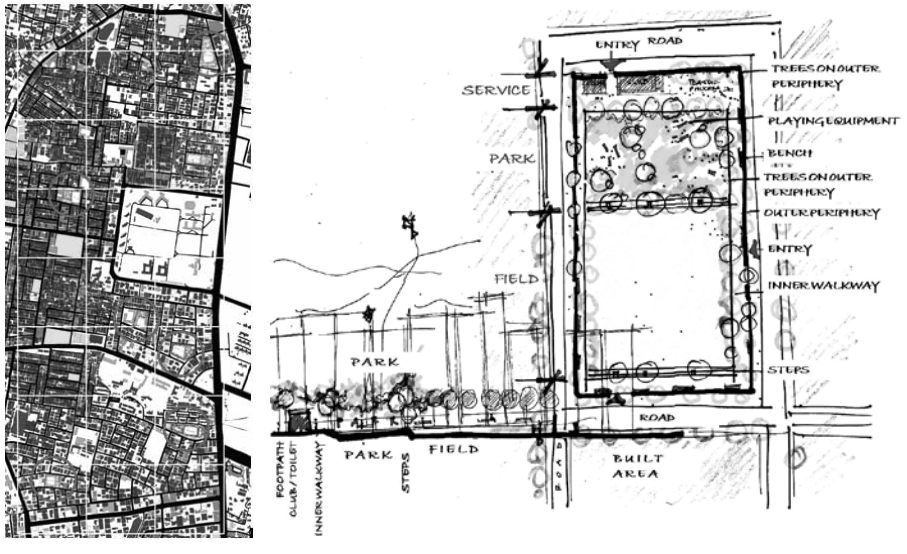


Figure 11a: *Accessible greens of Mohammadpur within 1000 feet X1000' feet grid & Figure 11b: 2D sketches Pattern Park-Field for Dhaka*

At the end this ANGs will act as a piece of "*MULTIFUNCTIONAL GREEN*" to its neighbourhood that will portray the characteristics and qualities of parks and playfields in same ground that will meet the preferences and need of the users.

7 Conclusion

Quantitatively accessible neighbourhood greens (ANGs) should be provided in close proximity of the users and well distributed in each cluster of planned-unplanned neighbourhood with appropriate ratio in between size of accessible neighbourhood greens and density of population. These greens acquire their social and community roles according to what they offer people. More the positive attributes (social, physical, functional comfort, security and accessibility) more accessible green becomes livable and enjoyable for people.

These greens will contribute to positive attitudes and behavior, social tolerance, dialogue, connection, and liveability. 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.

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