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# Evaluating Open Space in Urban Fabric on Basis of Different Landscape Aspects Case Study: Circuit House Park, Mymensingh, Bangladesh

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## Abstract

Urban open spaces are integral parts of city life to provide better quality of life. Rapid development processes initiate expansion of the city but lead to declining green open spaces. Mymensingh, a city of Bangladesh, is on verge of expansion, which raises question about sustaining its riverfront, green open spaces and historical relics. Because of the close proximity with the capital, Dhaka, it will possibly become a high density city in future, while it is expanding to the other side of the river Brahmaputra. Mymensingh Circuit House Park, which is a riverfront park, is taken as a case study to structure the research and central focus, as a vast green space with a historical playground. The following study examines the quality of urban open space, integration with adjacent neighborhood and user's perception. Different methodological approaches were used for data collection and analysis, including informal interview, attitudinal questionnaire, observation through photographic evidence and spatial configurational analysis using 'Space Syntax'. The study considers the relevant type of usages and future structure plan of expansion of Mymensingh city. The study shows how to develop the relationship between open spaces and city dwellers and schematic design proposal of an ecological corridor as touristic walking trail connecting open spaces and historical places, with future growing urban settlement. The possible correlation between green and blue infrastructure could ensure the better life quality of the city and sustain its green core and historical identity.

Keywords: Open Space, City Expansion, Landscape aspects, Green /Blue Infrastructure.

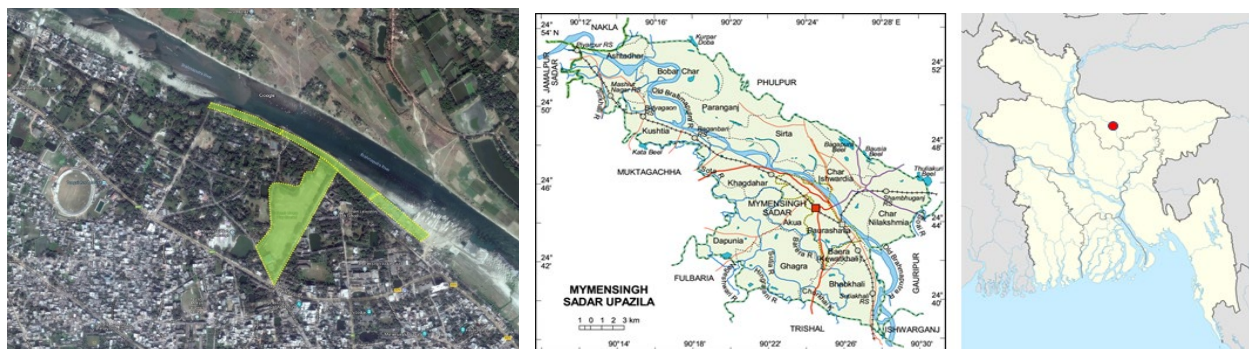
## Introduction

Accessible open space works as the breathing lungs for the city. On the contrary, the rapid development processes initiate expansion of the city but lead to declining green open spaces. Mymensingh is one of the fastest growing cities of Bangladesh because of its proximity to the capital of Dhaka, which is a key factor for its rapid growth. Both region's infrastructures and population are increasing simultaneously. However, the rich natural and cultural heritage is degrading because of this rapid urbanization. In order to protect this natural and cultural heritage of the city, the open spaces could play a significant role. With this view in mind, this paper seeks to study the factors affecting the performance of the designed open spaces of the city. One of the most visited public open spaces in the Mymensingh Circuit House Park, Bangladesh was chosen as the case study for empirical analysis of this research. This paper investigates how an urban open space performs in relation to its integration to neighborhoods and landscape aspects. The research question has been designed to evaluate an open space spatially and perceptually: "*How does an urban open space perform in relation to its integration to neighborhoods and landscape aspects?*"

This study has been conducted for fulfilling the academic purpose as course work. Due to time and distance constraints, the research process is more focused on interviews, literature and photographic evidence of the site.

## Background and Literature Review

Mymensingh, previously called Nasirabad, is situated on the banks of Brahmaputra, at about 120 Km to the north of the capital city of Dhaka. The old Mymensingh was clearly delineated by the Brahmaputra flowing along its north. But a change in the course of the river, resulting from the 1762 earthquake, has detached the north-east part of the city from the river. Lately, since the 1980s, the city has been expanding mostly towards the south-west, rather than along the river like it did previously. Proximity to the capital transforms this district into a possible developed zone containing dense population. Therefore, a structure plan for expansion under Mymensingh Strategic Development Plan (MSDP) has been prepared on the basis of analysis and interpretation of data collected on field. This provides an outline for potential development in the next 20 years. This proposal aims to encourage the future growth of the city to take place on the other side of the river (MSDP 2017).



**Figure 8 : Mymensingh Sadar Upazila map (left); Location of Mymensingh city in Bangladesh (Right); Circuit House park (Down)**

Circuit House Park, located beside the Barhmaputra, is a segregated part of green space along the river. It is named after adjacent Circuit House, which British settlement officials used during colonial time. The park and adjacent playground are the most popular open spaces in the city, which are articulated by the administrative zone. Non-motorized vehicles, such as rickshaws, use this area for mobility from the nearby neighborhood. Traditional water transport is also popular for recreation and communication purposes. Surrounding commercial, mixed use, administrative land use segregated the park from adjacent neighborhoods. The historical playground is known as "Panditparar Math". The park area is a popular public gathering space in both day-tourists and locals. Several cultural and religious festivities are arranged in the park and playground. Previously, the whole area was a connected zone, but some part of the park is developed into enclosed space.

The park consists of many old trees; the Sal being the dominant among them. The local birds and insects are vital for its ecological balance; which is most critical along the riparian edge. The water level of the river varies significantly from wet to dry season; and the lowlands rising above water in winter are used for agriculture. The riverbank is prone to changes by floods and erosions due to climate change. An array of small local businesses caters to the recreational and gastronomical needs of the visitors; e.g. food stalls, boating facilities, a small zoo etc. Some supporting businesses, like the non-motorized transport service, also depend heavily on the park's visitors. The park is surrounded by many heritage buildings from different periods of history, which adds to the area's public interest. Most of these buildings are from the British Colonial era, built by the Zamindars during the 18<sup>th</sup> century. Some religious temples and the archive of the works of famous artist Zainul Abedin are also noteworthy. The spiritual appeal of this place

reaches far beyond the city. Visitors not only come here from the locality, but also from faraway places of the country. For hundreds of years local songs and poetry have been heavily inspired by the river, and the life and living along the river bank.

Public open spaces have always played a major role in the development of societies and cities. There are presently increasing concerns globally regarding the essential value of those spaces. The city as a collective project exists because its public spaces (Rubén 2012). These public spaces have an important role regarding the environmental, economic and social context in the city as well as sources or providers of life, quality and sustainability (Chiesura 2004). Moreover, the public spaces are spaces of socialization where the interpersonal relationships are generated and vary regarding place characteristics, time of use and frequency of social interactions (Gehl 1956). A clear articulation of public space which connects neighborhoods connects the people within localities to their social institutions (Rogers 1999).

Case study analysis typically involves designing the case study, conducting the case study, analyzing the results, and disseminating the results (Francis 1984). As the study is concerned about spatial and perceptual evaluation of an open space, case study analysis would overlay with the findings to initiate the research. Space syntax is a methodology for measuring the relative accessibility of different locations in a spatial system by partitioning the spatial system into relatively independent but connected subspaces (Hillier and Hanson 1984, Batty and Rana 2002). Space syntax is a science-based, human-focused approach that investigates relationships between spatial layout and a range of social, economic, and environment phenomena. Its comprehensive mathematical models analyze the urban street network to compare with human movement including pedestrian and vehicle flow.

## Goals and Objectives

This paper has the aim and objectives to achieve as follows:

- To assess the performance of the following park based on different landscape design aspects, e.g. physical features, social, environmental, economic.
- To investigate its connectivity and integration with the neighborhood and urban fabric.
- To investigate the usability of the park (frequency of use, activities, mode of travel, purpose of use, natural and cultural heritage, sense of security, sense of comfort).

## Methodology

The research framework is constructed upon field observation, secondary data, questionnaire survey and relative published documents and papers by several scholars. Different research methods are used, like questionnaire surveys and observation and space syntax tool, is used to find out spatial connection and integration. Extensive literature review has been done on two stages; initially for understanding on space syntax analysis research work and later for gathering information for Mymensingh Circuit House Park.

Observation through photograph is conducted to find out the existing situation of the park. Questionnaire survey is structured on basis of informal interviews of 5 users in different age groups and genders focusing on these concerns, surrounding historical and cultural features impacts, aesthetics and user's activities. The questionnaire consists of 30 statements following the condition of the park and its surroundings. Forty peoples of different gender, age group and professions are part of this survey which is conducted both in online and on site. SWOT analysis (Strength, Weakness, Opportunity, Threat) is done based on findings from photographic observation, literature review and questionnaire survey. A qualitative research method

is used to evaluate the performance of the park by questionnaire survey. Spatial evaluation is initiated for accessibility and integration analysis of the park with the neighborhood by ‘Space Syntax’. The axial map is developed from the GIS map 2017 created by UDD (Urban Development Directorate, Bangladesh). Then, the configurational properties are analyzed by ‘Space Syntax’. Based on the synthesis of all results, some propositions are taken in account to improve the park with its surroundings.

## Results

The following park and its surrounding area are assessed on the basis of photographic observation, related document literature and questionnaire survey. Different landscape aspects such as physical, social, environmental, economic, spiritual are observed. Focusing on the evaluation of the quality of park, a SWOT analysis is processed as seen in Table 1 below.

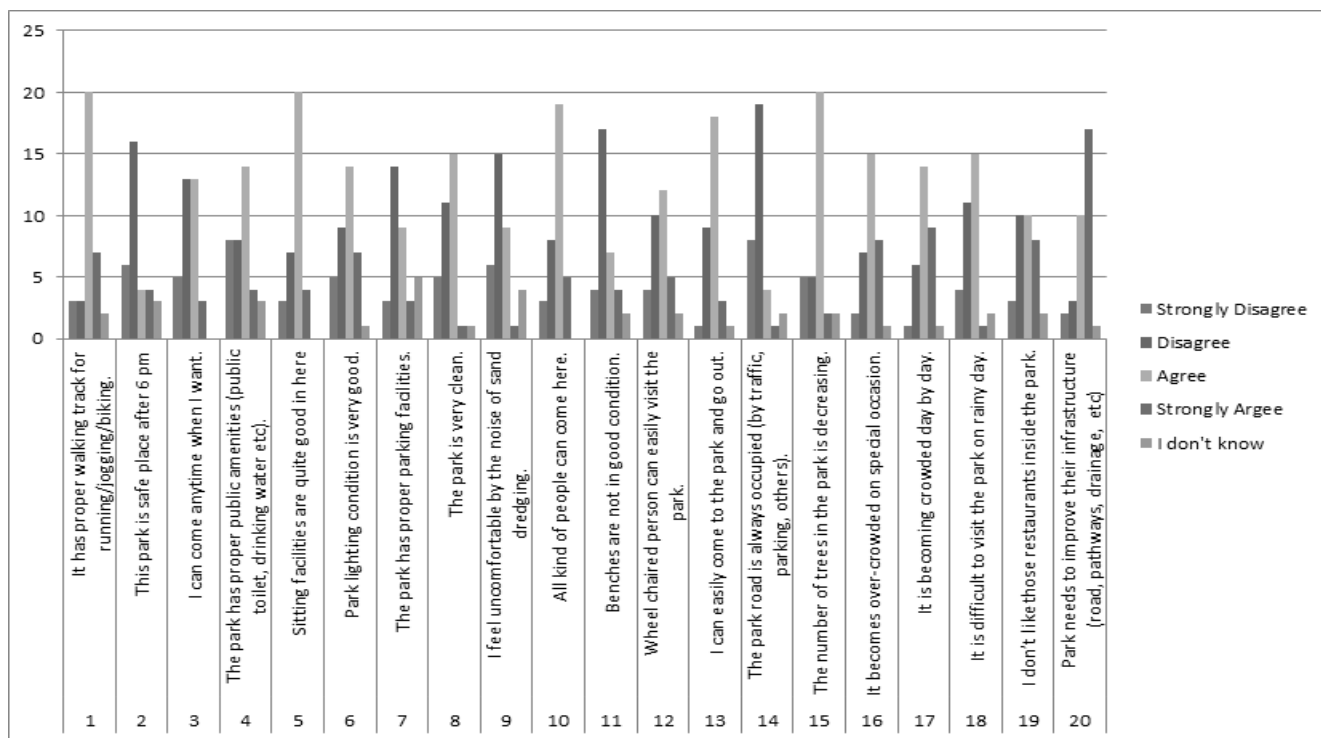
<p><b>Strength:</b></p> <ul style="list-style-type: none"> <li>Natural features like river, tree lines, river front</li> <li>Dominated by non-motorized vehicle</li> <li>Accessibility from waterway &amp; roads</li> <li>Close Proximity from the city center</li> <li>Social gathering place</li> <li>Growth of Local economy e.g. boating, restaurant etc.</li> <li>Historical and cultural value</li> <li>Multi-purpose uses (Sport, event, leisure etc)</li> <li>Extension of park space during dry season.</li> </ul>	<p><b>Weakness:</b></p> <ul style="list-style-type: none"> <li>Controlled entry</li> <li>Noise of river dredging</li> <li>Disconnected with other bank</li> <li>Poor maintenance</li> <li>No proper parking facility</li> <li>Down-graded Infrastructure</li> <li>Lack of touristic facilities</li> <li>Segregated from neighborhood</li> </ul>
<p><b>Opportunity:</b></p> <ul style="list-style-type: none"> <li>Touristic attraction</li> <li>Future center of attraction for cultural activity</li> <li>Possibility to create a central green hub</li> <li>Green &amp; blue infrastructure development</li> </ul>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>Over bearing crowed due to demographic change</li> <li>River erosion</li> <li>Encroachment</li> <li>Uncontrolled development</li> <li>Degraded aesthetic value by insensitive development approach</li> <li>Excessive commercial uses</li> </ul>

**Table 1: SWOT analysis outcome**

The result of the questionnaire survey shows that the higher percentage of the young people (73% in age group 18-24 years and 25-34 years) visit the site for the purpose of social gathering, leisure and recreation. Most of the people visit the park with family (34%) or friends (66%). A big number of visitors (35%) come as day visitor from Mymensingh city (not within 5 km) and Dhaka city. The preferable transportation mode (58%) is non-motorized vehicle e.g. rickshaw, bi-cycle etc. 76% visitors come to the site occasionally. The park area is the most visited place and young people come to play in the field. According to the survey, Artist Zainul Abedin Archive is the most visited area (68%) in the surrounding historical

and cultural spaces. Other historical places remain unvisited because of accessibility issues like poor transportation connection & restrictions and unawareness of the existence. Most of the places are now government authorized and used as restricted zone.

Respondents were asked for agreement on 20 statements to find their perspectives on the existing situation in the site. The Statement responses chart is shown below.

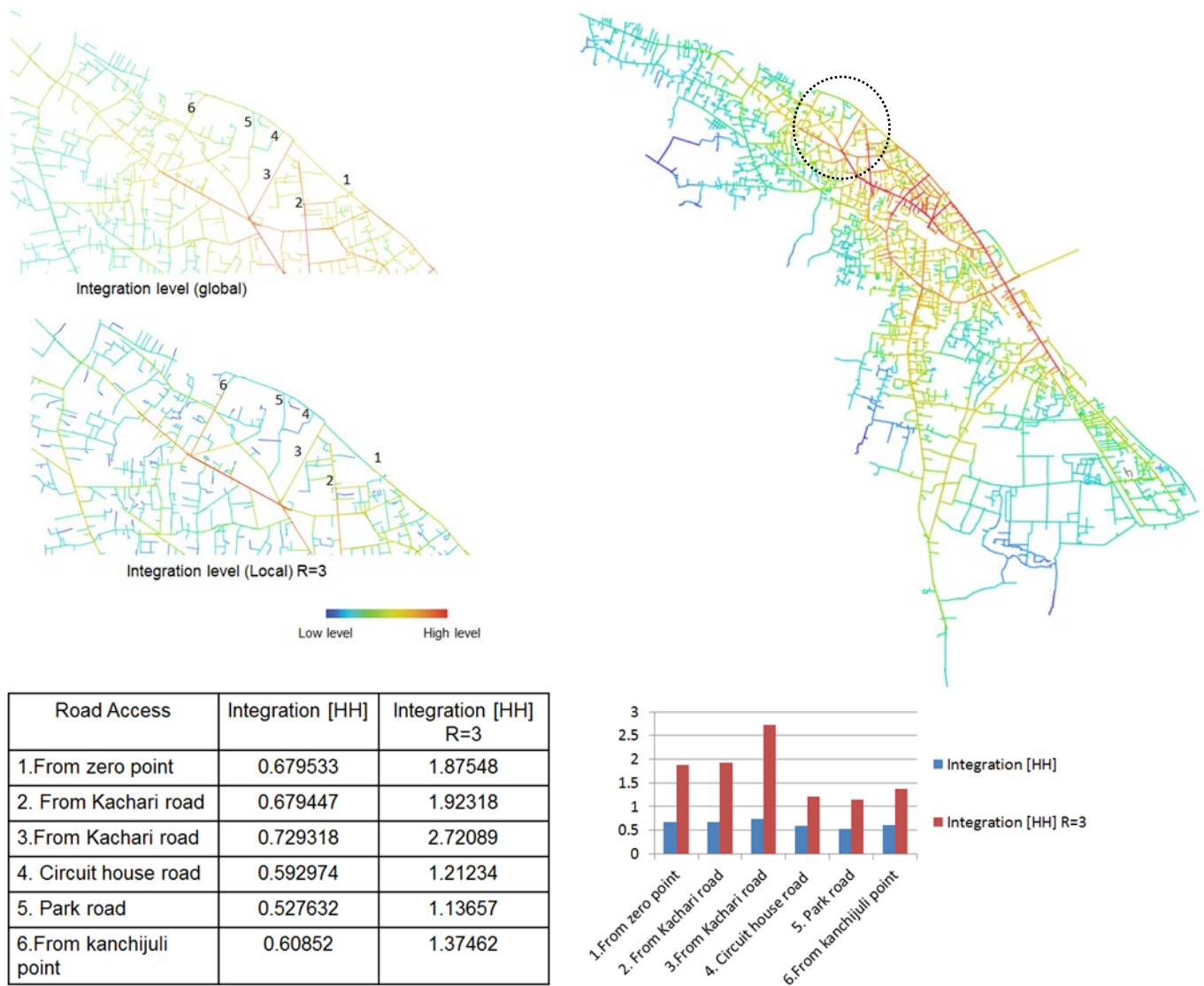


**Figure 9. Statement responses chart**

The respondents agreed on good conditioned pedestrian paths & cycle trails (Statement 1 or S1), lighting system (S6), Public amenities e.g. public toilet, drinking water etc. (S4) and sitting facilities (S5 & S11). However, as a monsoon country, during rain, the condition becomes worse (S18). Most of the respondents agreed on improvement of the park’s infrastructure (S20). Safety concern is visible in user’s response and also there is restriction of stay at evening (S2). Accessibility is unresolved in the statements where some respondents give consent of easy access (S10 & S13), on other hand they differ on any-time access issue (S3). But for wheel-chaired persons, the place is accessible (12). Demand of proper parking facility is evident on responses (S7). Because of increasing demographic situation, park capacity would not enough on special occasion (S16 & S17). Mixed responses were given on clean environment of park (S8). Green spaces of the park are decreasing. Number of trees is less than before (S15). There are also mixed responses on occupying restaurant area (S9). But the responses mostly inclined on opposition of restaurant commercialization inside the park. Riverside is the most visited and aesthetically pleasant space according to respondents. Open-ended question was asked about the improvement of the park. Most of respondents highlight the improvement of green area, discourage commercial aggression and facilitate the area with different park facilities as well. But historical places along the river and around the park are unrecognized

and often restricted for public accessibility.

The goal of measuring the spatial quality of a space is to find out the integration of the street network patterns. Accessibility towards the open space could be defined as “the intensity of the possibility of interaction” (Hansen, 1959). Using Space Syntax theory, a certain area is measured with respect to local integration (a part of whole area) and global integration (whole area). The spatial configuration is analyzed based on street network pattern transformed into axial map by using DepthMap software, developed by Alesdair Turner. The global and local integration of the park surroundings are analyzed to evaluate spatial quality of the existing condition and accessibility towards the park area. Blue color of the spatial map indicates low integration value and red color indicates high integration value. The main accesses of the park are road from zero point (1), road from Kachari road (2) (3), Circuit house road (3), Park road (4) and road from kanchijuli point (5).



**Figure 10 Spatial Analysis by Space Syntax; Integration level Global R=HH, Local R=3**



Global integration of the access road towards the park shows that access from Kachari road (3) has high integration value. Other access roads are low integrated in global level [HH]. But in local level [R=3] both roads from Kachari road have high integration value than other roads. Though Park road is used for pedestrian mostly, it is not too integrated with the neighborhood. The park area is segregated from the southern neighborhood by the high integrated Kachari road.

The park area between road access 5 and 6 is the least integrated zone and has poor visibility and broken permeable space then the rest of the site in both global and local level. Broken-up permeable spaces with poor visibility and poor movement are most at risk of crime (Shu 2009). Summation of the results implies the conflicts in the context which is shown as figure 4. While unplanned commercial activity (restaurants) and concentrated functional distribution occupy the enclosed park area, other portion is deprived of any facilities. Low integrated public accesses towards park area make segregation and broken permeability. As result, security issues are increasing. There is a need of improvement in general public amenities e.g. public toilet, drinking water, infrastructure etc. Tree zone outside the enclosed area of the park is poorly maintained. Commercialization of the park changes the identity of the park. There are threats of playground area declination due to uncontrolled development. The highway interrupts connectivity between neighborhood area and the site. Missing relationships among surrounding historical and cultural place and the park raises existential questions. There is no riverfront development which can incorporate the river within the park.

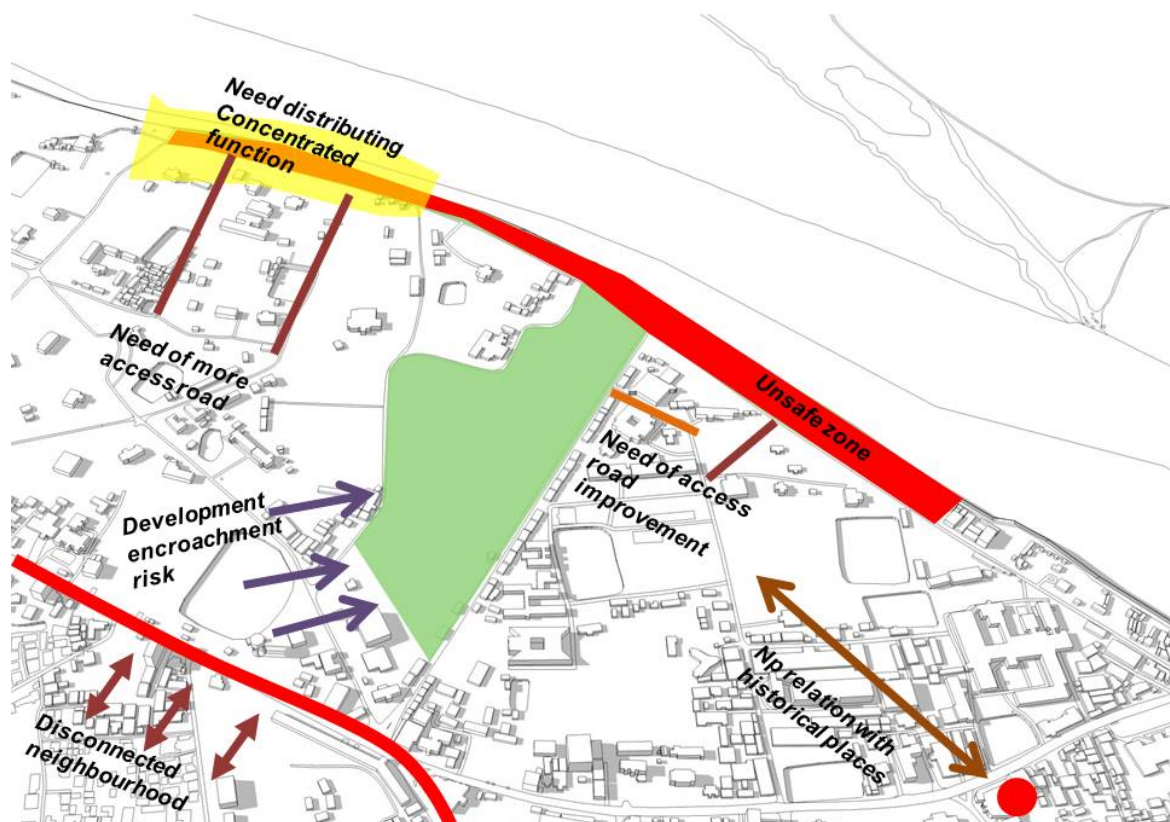


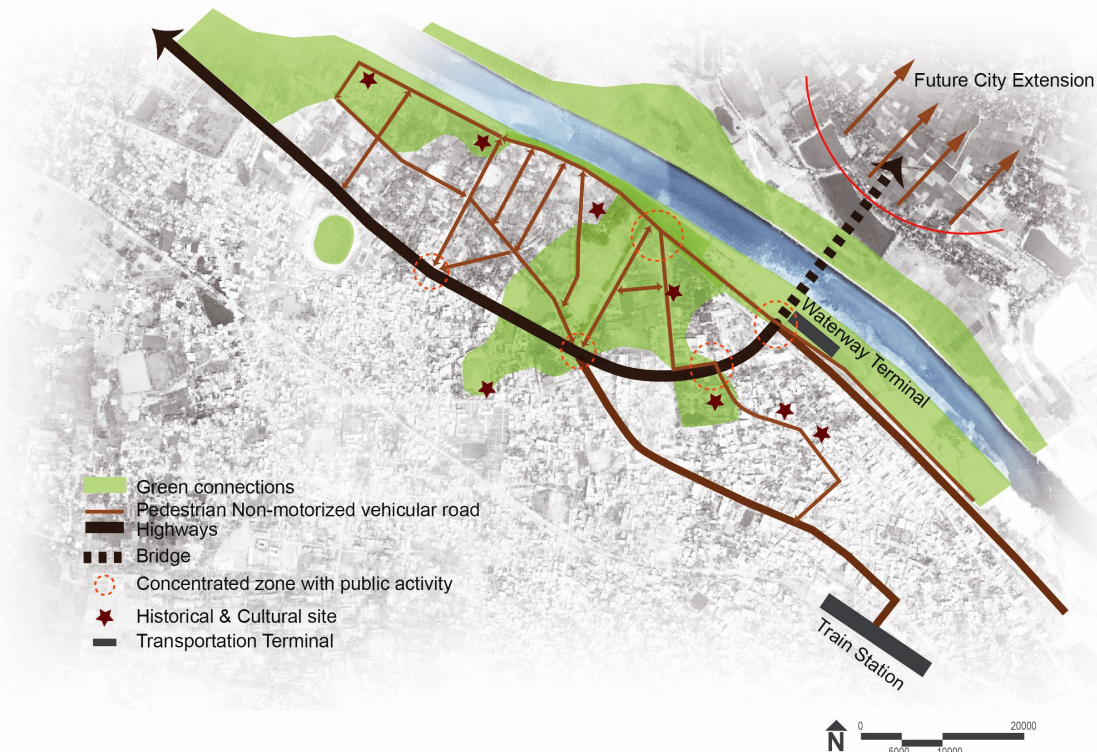
Figure 11. Conflict map of the site



## **Discussion**

It is evident that the condition of park and its connection with the surroundings should be improved. The structure plan for MSDP project (Mymensingh Strategic Development Plan) area has been prepared based on collected data and their interpretation. There is no detailed proposal as described yet. Future development of the city as a district city and expansion at other side of the river will have a big impact on the green infrastructure of the city. The possibility of being a central green area makes the following site very important. The river also has a great impact on the park. Dynamic flow of river should be a part of park design consideration. The connection with historical places around the site could emphasize the park zone as a main touristic attraction trail. The following study shows that present park development approaches don't have enough positive impact on surroundings and have permanent solution for existing concern about safety. Enclosed area, security protection (CCTV), restriction at evening may initiate safety but the rest of the zone remains unsafe. Poor maintenance and lack of post occupancy monitoring and evaluation cause demotion of park quality. Unnecessary decorative development creates more hard-surface inside the park area. The big playground remains ignored in account of any kind of development concerns.

Some recommendations are proposed to give a direction towards the circuit house park design complementing future development. Several functions and park facilities such as public toilet, drinking water fountain etc. need to be provided and distributed in all the parts of the area sensibly. Old trees should be maintained properly and given name tag as a part of educational purpose for children. More focus should be given to determine proper landscape planning with the local plants. New pedestrian road accesses could be made parallel to park road towards the park due to improve integration with neighborhood. A boundary for the playground should be defined in order to save it from uncontrolled development. Different cultural activities inside the park could be alternative of commercialization of the spaces inside the park. Demarcation could be provided for the control of economic activity. The riverfront area could have floating zones to extend the park area and it could be used both in the wet and dry seasons. Design along the river could let the water flow as waterspace, rather than strengthen the dyke which will bring a different dimension inside the park. Historical places and the park and playground could be connected through a walking/cycle trail which may become city tour route for day tourists. In future, the entire small green zone in the city could be connected in the existing ecological corridor along the river. This potential greenway could be coupled with river and provide green connection inside the city towards neighborhoods. A schematic idea has been shown according to propositions in Figure 5.



**Figure 12. Schematic proposal for Mymensingh Circuit House Park**

## Conclusion

Mymensingh Circuit House Park holds the identity of this small city. While rivers around Dhaka city become polluted, this place brings a small escape for the people from their mechanical life. There is huge potential to improve the following site as a future center of attraction in the new divisional city. The possibility of connecting Circuit House Park and the remaining historical places around it, may become a green infrastructure corridor and revitalize the identity of the city. Hence, social, cultural, and physical enhancement of the park and possible correlation between green and blue infrastructure could ensure the better life quality of the city and sustain its green core and historical identity.

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