PLAN 312: URBAN AND PLANNING STUDIO

Riverfront Development Design Proposal for Reclaimed Land along Turag River

Group 1

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Riverfront Development Design Proposals for Reclaimed Land along Turag River

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ABSTRACT

Dhaka city is surrounded by rivers. These rivers are the blessings of Dhaka city which provides various services. Turag river is one of them. Unfortunately rivers are dying due to illegal encroachments of river bank for trading and housing projects. Recently Bangladesh's high court has granted 'living entity' status to all rivers of the country. BIWTA has also started the eviction program to reclaim the encroached land. In this background, this study aims to propose a plan for the riverfront development of reclaimed land along Turag River. Two objectives of this study were to study the existing condition of the reclaimed land and surrounding area of the riverbank of Turag and to propose riverfront development plan for the reclaimed area on the bank of river Turag. To achieve the objectives, river bank of Turag staring from the Mirpur tamanna park to Gabtoli-Sadarghat bypass road was selected. A checklist was prepared and physical survey was conducted through checklist survey, focus group discussion and key informant interview for primary data collection. Necessary secondary informations were collected form online resources. Considering the physical features and people's expectations, the vision for designing the study area is to connect people with nature by creating eco-friendly river park for all, preserving and enhancing the environmental and socio-economic condition of the site. Three policies are formulated to accomplish the vision. A linear continuous river park promoting the river based activities is proposed to connect people with river. The main design concept is to increase the natural beauty of the river. The proposed design is applicable for other riverfront development projects of Dhaka city as it considers the socio-economic condition and promotes the culture.

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CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

A river is a natural flowing watercourse, usually freshwater, flowing towards an ocean, sea, lake or another river. (River, 2019) Rule 2 (22) categorized rivers as navigable waters and channels that allow the passage of vessels of any description (The Port Rules, 1966).

Riverfront is the interface point where land and water meet or the land or property alongside a river. Riverfront development is defined as any development in front of water or a water body which is not necessary to directly face water but need to look attached with the water body. (Riverfront, n.d.) Throughout the world, a number of riverfront development projects have been undertaken. Among those, some have been successful and revived both the rivers and riverfronts to a large extent. Examples include: Thames Riverfront development in London; Sabarmati Riverfront Development Project in India, Pittsburgh three river park in Ohiom, Isar Riverfront development in Munich, Germany etc.

In order to protect the illegal encroachment and reduce pollution of rivers of Dhaka, High court division of Bangladesh has recently conferred the status of 'Living entity' to the rivers. Recently, Bangladesh Inland Water Transport Authority (BIWTA) has started demolishing illegal establishments on the banks of river Turag and Buriganga. After the ongoing demolishing activity by BIWTA, a huge amount of land has been reclaimed from the unlawful construction. This has created opportunities for reviving the riverbank and surrounding areas in sustainable manner. The Government has already started formulating development plans for the revival process of these riverfronts.

Few studies and researches that are directly related to riverfront development in Dhaka city have been conducted. Riverfront Redevelopment in Dhaka: Reviewing the Prospects of River Buriganga is somewhat related to this project (Khan, 2012). But researches regarding redevelopment projects for Turag have yet been conducted.

A lot of people are directly and indirectly dependent on the rivers for their daily economic activities, like Turag provides a navigable waterway by boar all year round. Numerous trading farms and industries can use its water in production processes (Hossain, 2017). Civilization initiated from the riverbanks and trade-commerce flourished in places where river navigation was easier and developed. This clearly depicts the importance of saving the riverbanks in order to preserve the rivers and prevent them from further encroachment. Besides reviving the riverbanks can help in generating revenue, promote recreational activities and preserve the aesthetic value of the area.

This study and design proposal create possibilities for redeveloping the freed-up land on the riverbank of Turag in order to revive the riverbank and increase opportunities for social and economic prosperity.

1.2. Objectives of the Study

1. To study the existing condition of the reclaimed land and surrounding area of the riverbank of Turag
2. To propose riverfront development plan for the reclaimed area on the bank of river Turag

1.3. Scope of the Study

All the proposals given in this report is based on the present scenario and activities. Environmental and social functions were promoted and also heritage and cultures were uplifted. Maximum of the riverfront activities done in our country are basically structural development. Provision of promoting culture, including the local dwellers and keeping natural outlook is very less there. But the proposals given here have overcome those constrains. This report can show a direction to the authority how a riverfront should be designed with keeping all the activities and dwellers included in a plan. A procedure is proposed to prevent a park from converting it to a crime zone is also shown. This method can be followed in all the parks of Dhaka. The way of promoting culture, heritage shown in this report can be a guideline to retain our customs and traditions. Any further site investigation and facility providing work in the project site can easily be benefitted from this study.

1.4. Limitations of the Study

The data collection procedure was not smooth enough. Finding a key person who will provide sufficient data with documents was difficult and time consuming. The river was full of water as the season was late monsoon. Thus, identifying high-watermark and low-watermark was quite impossible. Google map was used as source to figure out low watermark which is actually the situation of several years ago. Contradictory arguments were found between BIWTA authority and local dwellers. Finding out the correct argument and taking decision was time consuming. Taking opinion from the local dwellers wasn't easy as they were totally uninformed about BIWTAs' planning. But the main constrain towards this project was the time limit. The scheduled time assigned for designing wasn't sufficient enough. Though there were limitations, maximum effort has been given for the best output.

CHAPTER TWO: LITERATURE REVIEW

2.1. Case Studies of Riverfront Development

The main case study of our group was about Three Rivers Park Riverfront Development Project in Pittsburgh.

a. Three Rivers Park Riverfront Development Project:

Location and Previous Condition of the Rivers:

Pittsburgh is located at the confluence of the Allegheny and Monongahela rivers, which unite at the Point State Park to form the Ohio River in the U.S.A. (Pittsburgh, n.d.) Pittsburgh led the world's production of iron, glass and steel because of its power of water in the 19th century (Tumbde, 2005). But it regulated the rivers' flow, shape and banks to serve the needs of rapid industrial, urban growth, household consumption which seriously hampered the rivers & riverfront (Collins et al., n. d.).

Vision of Three Rivers Park Project:

The vision of three river park Project was to create a great urban river park in the heart of Pittsburgh. (Force, A vision plan for Pittsburgh's riverfronts, 2001).

Underlying Design Concepts and Guiding Principles of Three Rivers Park:

The park is designed based on four key concepts:

1. The Public Realm is the dominant and defining aspect of Three Rivers Park.
2. The Park's center is the Confluence.
3. The Park's structure is built upon Pittsburgh's historic patterns of spatial organization.
4. The character of places within the Park is drawn from the uniqueness of Pittsburgh's landscape and communities

The nine guiding principles of the project are to be used to modify existing zoning for the riverfronts; to encourage developers to build in more responsive, imaginative, and civic-minded ways; and to inspire the citizens of Pittsburgh to support additional public investment in pedestrian-friendly infrastructure and riverfront public space.
The principles are to perform developmental works along riverside in compliance with the vision of the plan, like to identify suitable sites of recreation and transportation, celebrate historical programs along the riverbank to reinforce the power of place, enhance shoreline activities by providing trails, marinas; increase connections to the rivers by creating new neighborhoods near the rivers and providing water transport facilities, incorporate diverse usage of water activities (commercial, entertainment etc.), improve bridges with adequate

pedestrian amenities, bicycle tracks and introduce water-oriented programs at the bridge base to increase security and contribute to the cost of maintenance. The principles also encourage the establishment of seasonal water taxi system to improve regional connections and the construction of clear and attractive routes for roadways and railways to reach the river and riverfront attractions. They promote the use of energy efficient LEED certified buildings and encourage investigation of alternative sources of energy conservation and generation in riverfront projects (Force, A vision plan for Pittsburgh's riverfronts, 2001).

Impact after Implementation:

Price of area inside and outside zone of intersect increased 60% and 32% respectively. Among zone of implementation land value of south side increased 117%, 65% at north and 25% at central. Overall the approximately $130 million invested in Three Rivers Park over the past 15 years has helped to catalyze nearly $2.6 billion in riverfront development activity, and nearly $4.1 billion in total riverfront and adjacent development. The strip concept is making the 150 years old riverside market functional in a modern way. All the terminus or landing of new roads to river is beautifully designed with jetty, restaurants, park, walkway, fishing zone, a large community center, children playlots, flower garden etc. This concept has drastically changed the economy and appearance of riverside portion. Commercial activities has boosted along the riverside (Riverlifepgh.org, 2019).

Notable findings from other riverfront development case studies:

b. Dravyawati River Rejuvenation Project, Jaipur:

The river became seriously polluted and narrowed by encroachment, had direct sewage discharge, industrial and domestic waste dumping and urban sprawl. Jaipur Development authority started the redevelopment project of 1,676 crore Rs (Unique 'Dravyavati River, 2018). Under the project, five waste treatment plants, four rubber dams were developed and three different types of park - Bird Park, with a water-work museum-café, Landscape Park with a walkway, cycle track, yoga pavilion etc. and a Botanical garden were built.

c. Sabarmati Riverfront Development Project:

This project is recognized in the list of '100 Most Innovative Projects'. It had three main objectives- environmental improvement, sustainable development and social infrastructure development. For preventing bank erosion, RCC diaphragm walls, anchor slabs and for flood protection, retaining walls were built. To enhance the scenic beauty and to separate public activities, walkway and urban park were developed. Riverfront Market, Exhibition Centre,

Events Ground, Laundry Campus, Public washrooms, boating stations etc. were also provided based on current land use and present dwellers (Bismi, 2017).

d. **Bishnumoti River Development Project, Kathmandu:**

Located at Kathmandu, Nepal, this project aims to develop a public open space that will serve people of neighbouring areas and offer a wide range of mixed uses including retail, civic and recreation within an accessible range. The plan proposes to improve the riverfront in segments. This includes: establishing a small treatment plant for improvement of stream water, cycle track and walkways, developing ghats and space for religious purpose and building permanent embankment. (Rijal et al, 2012).

e. Hafencity's Waterfront Development Project in Hamburg Germany:

This project aims to connect the riverfront to the Hamburg's city center by building an urban structure with mixed functionality and create new employment opportunities such as retail, education, culture, leisure and tourism. The project is to be completed within 2025. The infrastructures like: terraces, ship harbors, plazas, halls, museums, different parks have not only enhanced the beauty but also created housing, job opportunities and increased commercial activities. (Timur, 2013). One drawback is that the surface of Hafencity lacks trees and other natural elements. (Pratico, 2015)

f. Dalian Waterfront Development Areas:

The project has reclaimed 114 hectares of land Xinghai bay area by filling solid waste and 62 hectares of land by relocating existing industries and residents. A development plan was proposed to make a new CBD in Dalian. 33 hectares road, 3400 meters a bathing beach, 100 hectares green spaces were constructed. After twenty years of continuous development, the waterfront belt along the Binhai Road area has become the most beautiful area in Dalian. Dalian port area provides port facilities, railways and rows of warehouses (Dong, L., 2004).

g. Trans Ganga Riverfront Development Project:

Launched in 2017, the main features of this project include designing a sustainable city with green roof, earth cooling, solar panels, ground water recharge & waste management, establishing a central green area that will act as breathing lungs of the city and a functionally rich urban plaza. It also has a provision mall, exhibition center, retail shops and beautiful landscape with water bodies and ample green spaces (Upinvestorssummit, 2017). A planned STP (Sewage Treatment Plant) and wastewater recycling systems have been proposed to

improve the current state of the river which is very poor due to direct waste pollution from tannery hubs and drains. (Sengupta, 2015)

2.2. Previous Related Studies of Turag River

Turag river is 40 miles in length (Sami et al., 2018). It is approximately 180-200 ft wide river (Demarcation of Dhaka Rivers: 2,000 pillars, 2016). Unfortunately it has turned into a narrow canal of 30- 40 feet width in some places due to continuous encroachment along the river bank (Chowdhury et al., 2015). The river banks are mostly encroached for sand trading, brickfields, and housing projects. Continuous encroachment along the river bank also increases erosion risk and reduces the navigability of the river (Sami et al., 2018).

Turag river offers a spacious drainage facility & water ways for transportation to Dhaka City through its canals. It provides fresh air and entertainment facilities to the city dwellers. The Bishwa Ijtema is organized along the turag river which attracts millions of Muslims annually from over sixty countries (Hossain, 2017).

A study has found 51 encroachment sites where about 72.55% of the total encroachment sites are along the city side bank of the river, 25.49% along the north-western bank and 1.96% at midpoint of the river channel. About 1.5 acre area of the riverbanks has been encroached illegally. The frequency of encroachments is higher along the city side bank of the river as it is adjacent to the Dhaka City Corporations (DCCs) area where land is scarce and land price is very high (Hossain, 2017). Most of the illegal housing projects on encroached riverbanks are located at Adabar, Savar (Birulia, Bagchotra, Kaundia), Mirpur (Jahurabad, Jahanabad, New Sand Ghat, Goranchatbari), Mohammadpur (Katasur, Ramchandrapur) (Hossain, 2017).

A large portion of the Turag river was occupied by the land grabbers due to wrong demarcation of Gazipur district in April, 2011 excluding the foreshores of Turag river (Ali, 2011). Amin Mohammad Group grabbed land violating the government's river demarcation pillars near the Birulia Bridge (Khan, 2015).

2.3. Government Plans and Initiatives for Rivers

Bangladesh Inland Water Transport Authority (BIWTA) conducted the eviction in two phases. In the first phase of the drives, from January 29 to February 20, at least 1,721 illegal structures were demolished and 35 acres of land reclaimed on the banks of Buriganga and Turag rivers (Nabi, 2019). The second phase of the eviction drive started from March, 2019 (2nd phase of Buriganga-Turag's eviction drive begins, 2019).

The rivers around Dhaka City are declared as Ecologically Critical Area in September 2009 (Hossain, 2017). Bangladesh's high court has granted 'living entity' status to all rivers of the country to save the rivers from encroachment (Rivers are now 'legal persons', 2019). BIWTA has started the eviction program on 29 January, 2019 to reclaim the encroached land of the river bank (Nabi, 2019). Proposals of the new project to save the rivers of Dhaka city are:

- As the demarcation pillars were set up along the river banks during dry season excluding 2,500 acres of foreshores and wetlands of the five rivers, government will replace the old pillars and will install 12,000 demarcation pillars along the Dhaka rivers.
- The authorities built 20km walkways about 10 years ago on both sides of the Buriganga and Shitalakkhya. In the second phase, the government will build 50km long walkways, plant trees along the walkways and set up three eco-parks at Shinnirtek, Tongi and Ashulia. Then in the third phase, they will build 150km walkways.
- 19 jetties will also be built at Amin Bazar, Gabtoli, Kanchpur, Tanbazar, Machuwa Bazar, and Khanpur. Total budget of the project is 850 crore taka. (New plan for saving 4 rivers, 2019)
- A circular waterway service of 110 km surrounding Dhaka City along Buriganga, Turag, Balu, Shitakhya River was planned by BIWTA. 29 km waterway service is running from Sadarghat to Ashulia with 6 landing stations. The remaining length is still under preparation. 50 meter wide continuous green zone along the ‘circular water way’ will also be preserved (RAJUK, 2016)

2.4. Regulations and Acts for Riverfront Development in Bangladesh

Some regulations and acts regarding protection, conservation and development of riverfront in Bangladesh are given below:

- **The Constitution of the People’s Republic of Bangladesh:**
  It is stated in article 18(A) that “the State shall endeavor to protect and improve the environment and to preserve and safeguard the natural resources, bio-diversity, wetlands, forests and wild life for the present and future citizens” (Constitution Drafting Committee, 2011, p. 13).
- **The Environment Conservation Rules, 1997:**
  Wetland is considered as one of the factors for the declaration of Ecologically Critical area (Environment Conservation Rules, 1997)
- **The Bangladesh Environment Conservation (Amendment) Act, 2010:**

It is stated that ecological criteria area are to be protected, area should have a legal demarcation region which will be taken responsibility by government, activities should be specified (Gaziazizul, 2014).

- **Dhaka's Four Rivers as Ecologically Critical Areas:**

  Any activities that may pollute soil, water, air and or create noise pollution are strictly prohibited in ecologically critical area. Activities that may be harmful for fish and aquatic life are also prohibited (Oikya, U. A., 2017).

- **Preparation of Detailed Area Plan (DAP) for DMDP :**

  In section 3.3.8, It is stated that "Water body should be preserved not only for environmental concern but also for active and passive recreation" (RAJUK, 2010, p. 4-38). The permitted land use in water body zone are aquatic recreation facility (without structure), fishing club, utility lines, water parks, memorial structure (RAJUK, 2010, p. 4-38). Plantation (except narcotic plant), marina \ boating facility, motorized recreation are the conditionally permitted land use in this zone that may be permitted or denied after the review and approval by the authority/committee. "All uses except permitted and conditionally permitted uses are restricted" (RAJUK, 2010, p. 4-39)

- **Sand Quarry and Soil Management Act, 2010 :**

  Any sand extraction from river bed which may further cause erosion on bank or may affect the ecology, fisheries of river is illegal. This law also declares punishment of imprisonment of 2 years or fine from 50,000 BDT to 10,00,000 BDT for the violation of law (Sand Quarry and Soil Management Act, 2010).

- **The National River Conservation Commission Act, 2013 :**

  This commission was formed to prevent illegal occupation of rivers, pollution of water and environment, pollution of rivers caused by industrial factories, illegal constructions and various irregularities and ensuring multidimensional use of rivers (National River Conservation Commission Act, 2013).

- **National Water Policy :**

  It is stated that any type of illegal & unauthorized encroachments on rivers & water course is strictly prohibited. Unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land should be stopped (National Water Policy, 1999).

CHAPTER THREE: METHODOLOGY OF THE STUDY

3.1. Problem Identification and Objective Formulation

The ongoing demolishing activity by BIWTA has made it possible to reclaim a large portion of land that was being illegally encroached for many years and has opened up opportunities of reviving the river bank and surrounding areas. Objectives have been formed to study the potential future use of the land and propose a sustainable plan for the area

3.2. Study Area Selection

Collected base map of Turag from Rajuk on 16th July, 2019. At the initial stage, the Turag riverside was surveyed to identify the suitable portion beside the river to work with on 19th July, 2019. River bank of Turag staring from the Mirpur tamanna park to Gabtoli-Sadarghat bypass road was selected for study area.

3.3. Secondary Information Collection

***3.3.1. Motijheel and Sadarghat Office Visit*:** Contacted office staff to know about the ongoing plans and policies to improve the riverfront on 21st July, 2019

***3.3.2. River Policy, Newspapers and Online Resources*:** Laws and policies, legal framework of Bangladesh and different conservation acts regarding river encroachment were reviewed to learn about the possible ways of saving and protecting the riverbank through river policy resources. Newspapers and online resources were used to learn about the existing condition of Turag and its encroachment.

***3.3.3. Case Studies*:** National and global practices regarding riverbank development were studied to know about the successful riverfront projects and the process of reviving the riverfronts with the help of online resources. Total 7 main case studies were focused along with 21 subsidiary studies.

3.3.4. BIWTA Office Visit: - Contacted BIWTA office to identify evicted areas, present condition of the site and collected visual documentation of different proposals on 30th July, 2019.

3.4. Preparation of Basic Indicators List

A list of indicators was prepared to identify the present condition of the reclaimed land after eviction. Some variables were identified that helped in collecting data.

3.5. Primary Data Collection

With the help of the list of indicators, data were collected from the riverfront mainly by Primary data collection method. It involved social and physical surveys. This was done in the following way:

3.5.1. Preparation of Checklist: A checklist was which included physical features to be identified and open ended questions. (See appendix for checklist).

3.5.2. Physical Survey*:* Observed site and selected 4 km length along the river to be surveyed on 23rd August, 2019. Divided the length into seven equal parts for surveying by seven groups. The site was surveyed again on 30th August, 2019 and information were collected through photographs, video and notes.

3.5.3. Social Surveys:

i. Focus group discussion: An average group of three to four people were gathered to collect information about the daily activities that take place in the river and along riverside. Each group interviewed one-three focus groups. The members were mainly local people, shopkeepers and boatmen. The discussions took place on 30th August, 2019

*ii. Key informant interview****:*** Four groups had a discussion with four key informants on 30th August, 2019. All the interviews were recorded with the informants' permission.

3.5.4. Preparation of Site Profile and Data Incorporation: A site profile containing detailed information of each of the seven areas was prepared and the findings were incorporated to gain an overall idea of the living condition of the people of the area and site characteristics.

3.6. Plan Proposal:

From overall site analysis, a riverfront development plan was proposed for Turag. This was done in the following way:

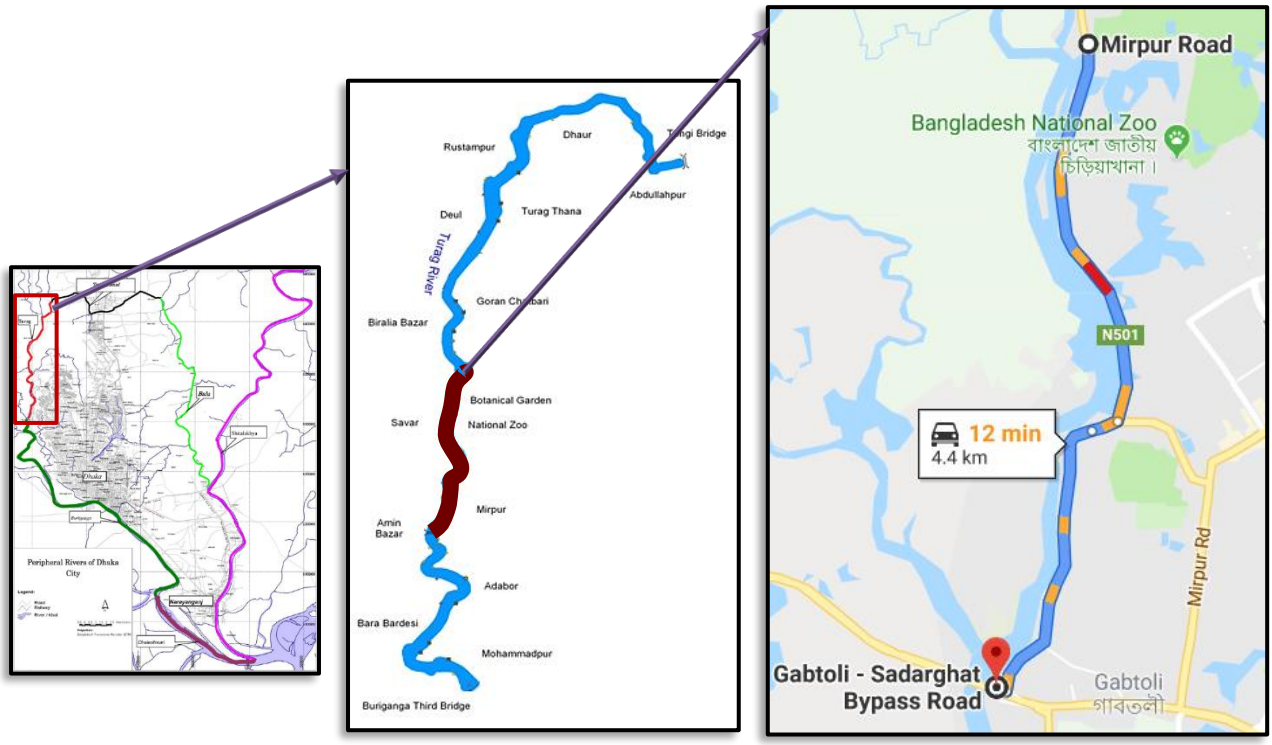
3.6.1. Vision and Policy Formulation: A vision was set and some policies to achieve the vision were formulated.

3.6.2. Site Design Proposal: A detailed design was proposed considering the socio-economic condition of the site and feasibility.

3.6.3. Maintenance Mechanism: Finally maintenance policies were formulated.

CHAPTER FOUR: STUDY AREA PROFILE

Turag river is situated to the north-west sided of Dhaka city .Whole Turag River are not considered for the study area. For the study purpose, a portion of that river was selected. It starts from Gabtoli-Saderghat Bypass road from south & ends to Mirpur road near Bismillah hotel to north. It is about 4.4 km length & lots of variation are found in width of the bank.



(Banu et al., 2013) (Hossain, 2017) (Google Map, 2019)

Figure 4.1: Study Area

CHAPTER FIVE: EXISTING CONDITION OF THE RECLAIMED LAND AND SURROUNDING AREA OF THE RIVERBANK OF TURAG

The area is located at north-west site from central Dhaka. Total length of the site area is around 4.5 kilometer. The riverbank width varies from maximum 110m to minimum 8m. At the opposite bank there is Kaundia union under Savar Upazilla, which is actually an island between Karnatali and Turag river. But, that site of river isn't much developed as its' opposite. Thus, dwellers of that islan often need to come in the project site area for higher facilities and demands. Those people are also figured as stakeholder of this project. A two lane major road along project area starts from the Aminbazar Bridge, meets a junction at Diyabari ghat and continues toward Ashulia through Mirpur. At the opposite of road ward no nine ends at Dhour road - Mirpur road junction and then ward no eight continues. There are several illegal truck stands along the roadside in both wards. But residential and other activities are seen dense in ward nine than eight. Automobile body workshop and garage, rickshaw stand, small temporary tea stall, grocery shop are common scenario at entire roadside. The renowned Barabazar, a pottery named 'Palpara', Darus salam thana, a Hindu- community named 'Harirampur', Mirpur buddhijibi graveyard are in ward nine. Significant features of ward no eight are turag city residential zone, some blocks of Mirpur section-2, Mirpur zoo, Kaji furi, Botanical garden, south lake and north lake. All the described places are at the right bank of river. Only at the endpoint there seen some space in left bank where Tamanna park is located. A significant fact is that, maximum of residential landuse covered by ward nine and recreationals by ward eight. All this features and existing surroundings were evaluated in our design concept for both preserving the best and enhanching where require.

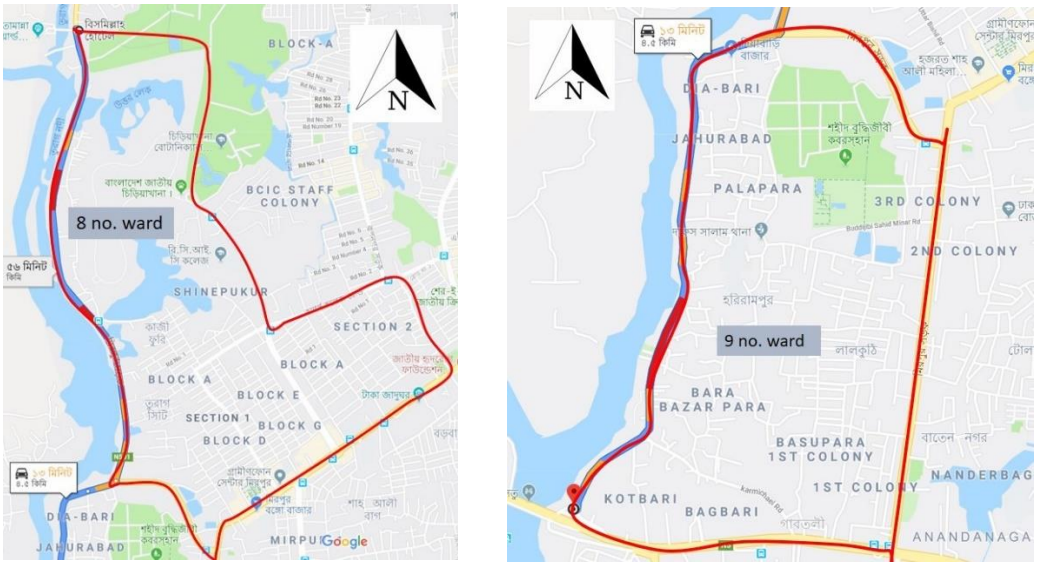


Figure 5.1: Adjacent land of study area (8 and 9 no ward) (Source: Google Map, 2019)

CHAPTER SIX: VISION AND POLICIES

6.1. Vision

Connecting people with nature: An eco-friendly river park for all, preserving and enhancing the environmental and socio-economic condition of the site.

6.2. Policies

Three policies to accomplish the vision

1. To connect people with nature by creating eco-friendly river park for all
2. To enhance the environmental condition of the site
3. To preserve and enhance the socio-economic condition of the site

CHAPTER SEVEN: PLANNING PROPOSALS FOR CONNECTING PEOPLE WITH NATURE BY CREATING ECO-FRIENDLY RIVER PARK FOR ALL

A linear continuous eco-friendly river park is proposed to connect people with nature. A 4km continuous river park which will provide various opportunities for people to enjoy and experience the river.

The proposed design of the river park is divided into three segments (Figure 7.1). Each segment is designed with various elements to promote the natural river based activities.

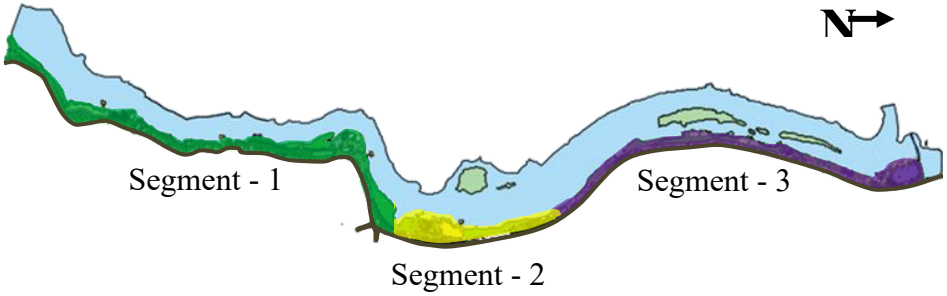


Figure 7.1: Three segments of the proposed design

7.1. Proposed plan for Segment - 1:

Proposed design of segment – 1 includes entrance of the river park, linear green space, three ghats, flower garden, open playfield for children, playlot for kids, fitness space for adults, traditional zone, bird park, fishing pier and view platforms (Figure 7.2). The proposed design of segment – 1 is divided into four parts for the detail design: A (Entrance & Flower Garden), B (Recreational Facilities for All Ages), C (Traditional Zone) and D (Bird Park, Event Lot and View Platforms).

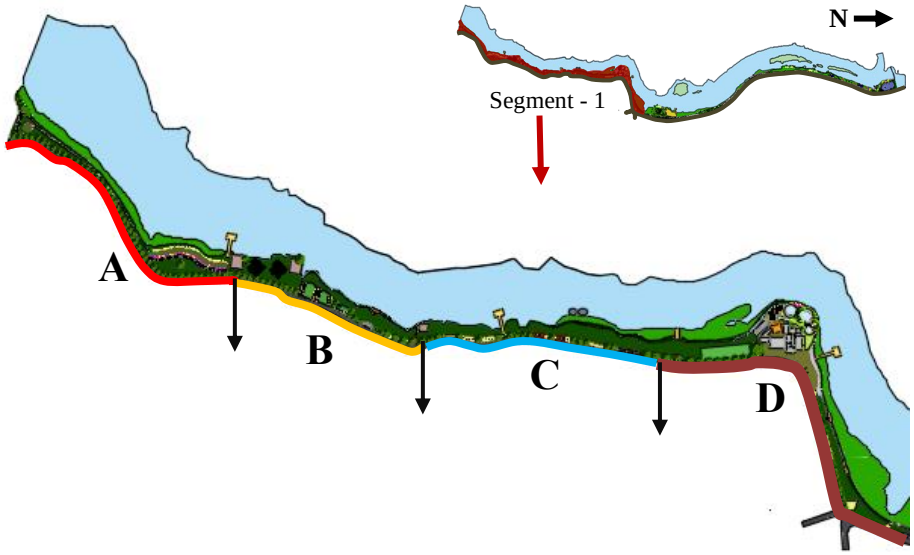


Figure 7.2: Proposed plan for segment - 1

A. Entrance & Flower Garden:

Entrance of the river park is designed at the starting point of our site. After entering into the park, people will find a continuous green space designed with trees, a concrete walkway from where they can enjoy the river view and a flower garden (Figure 7.3). The natural steep slope of the river bank has been preserved in the proposed design which is showed in one section of the design (Figure 7.4 & 7.5). The sloped area will be filled with grass.

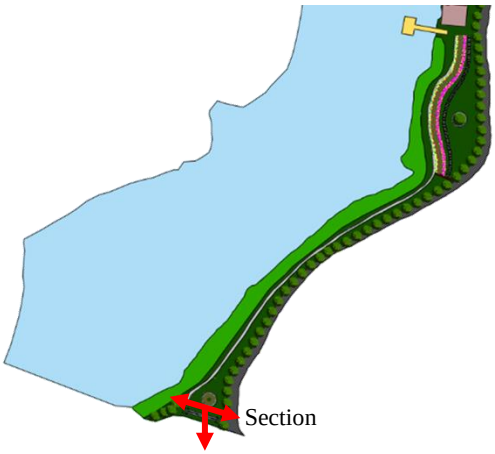


Figure 7.3: Proposed design of Part A

Figure 7.4: Existing slope of the river bank (Source: Field Survey, August, 2019)

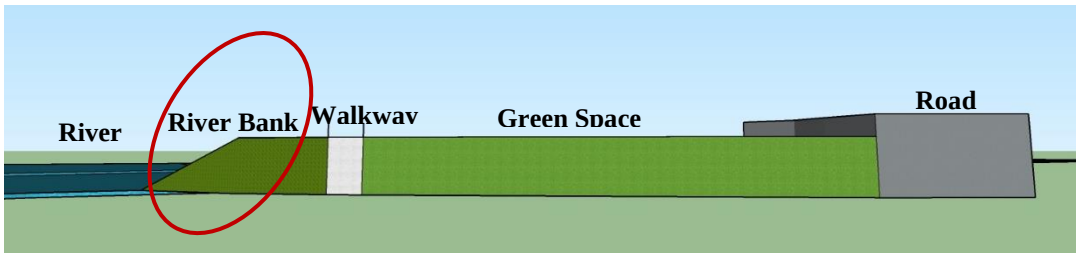


Figure 7.5: One section of the design

A wide concrete walkway is proposed as there already exists a concrete walkway. Width of the walkway is 3 meter which is wider than the existing one. It will provide easy access to the wheelchair users also. The new walkway is designed in a way to provide green space on both side of the walkway. All the existing bamboo storage and illegal rickshaw garage will be removed and there will be a flower garden on that space.

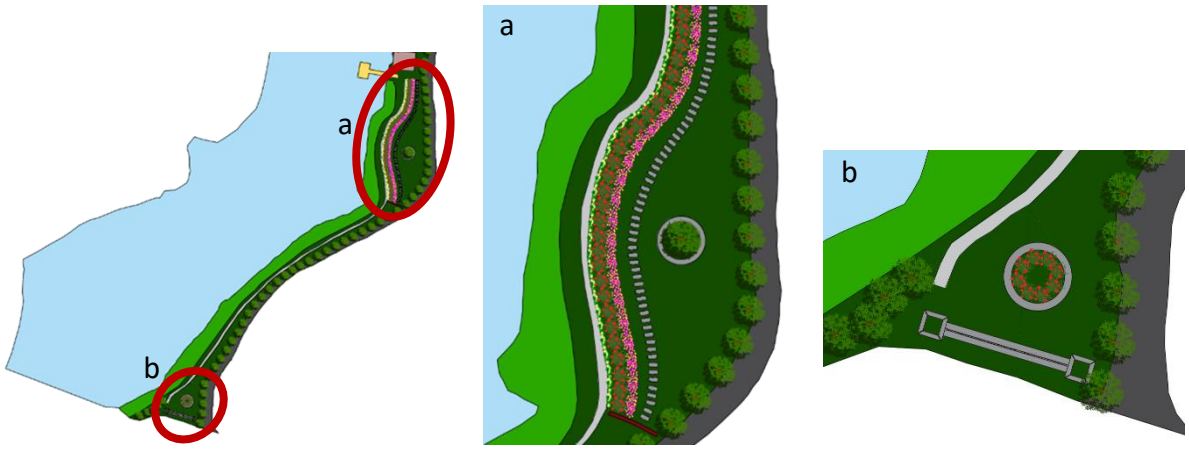


Figure 7.6: a. Flower Garden, b. Entrance of the park and walkway

B. Recreational Facilities for All Ages:

Recreational and sport facilities for all ages are designed in this part. Proposed facilities are provided to support the present activity pattern of the site. Community children currently use the space between moshjid and mondir for playing cricket, football and for kite flying. So this space is designed as an open playfield for children to support that activity (Figure 7.7.a). The existing brick storage will be removed and the open space will be used for providing facilities for others. A playlot bounded by fence is designed beside the fitness lot of the elders (Figure 7.7. b & c). The playlot will be bounded by fence to ensure safety of children. A fishing pier is designed in this part to create a fishing zone for the young people (Figure 7.7.d).

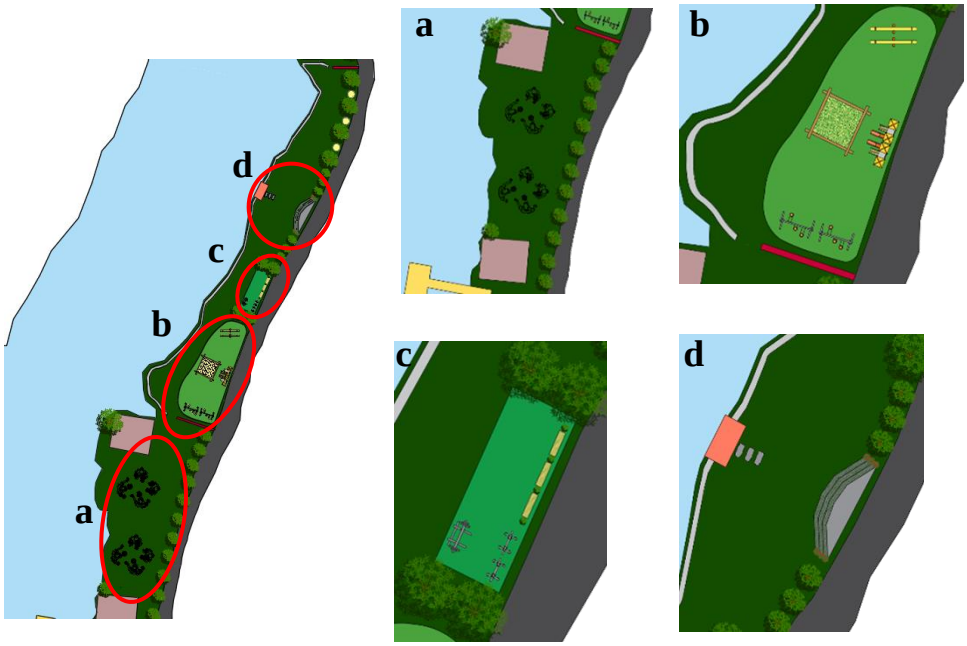


Figure 7.7: Proposed design of part B: a. open playfield, b. playlot, c. fitness lot, d.

C. Traditional Zone:

A traditional zone is designed to promote our culture. This part was selected for this zone as the pottery works are done nearby. Moreover storage of pottery works was also found on river bank in this part of the site (Figure 7.8). Hut shaped pottery shops are designed for pottery works exhibition which will promote our historical pottery works and will also create a village like atmosphere (Figure 7.9.a). A seasonal food market and some local food shops are also provided (Figure 7.9.c). Some seating arrangements are designed near the shops so that people can enjoy the local foods on river bank. A fishing zone is designed where local people will do fishing with net (Figure 7.9.b). The green space will be used for various cultural festivals which will gather more people.

Figure: 7.8: Existing storage of pottery works on river bank
(Source: Field Survey, August, 2019)

Figure 7.9: Proposed design of part C: a. Hut shaped pottery shops, b. fishing spots, c. local food shop

D. Bird Park, Event Lot and View Platforms:

In this part, a bird park, an event lot and view platforms are provided (7.10). An event lot is designed where various cultural festivals and exhibitions will be arranged. The bird park is designed preserving the existing mosque and the locality buildings. There will be separate entrance for the community people to enter into the locality area and for the visitors to enter into the bird park (7.11). After crossing the bird park there will be green space with two view platforms from where people can enjoy the natural view of the river.

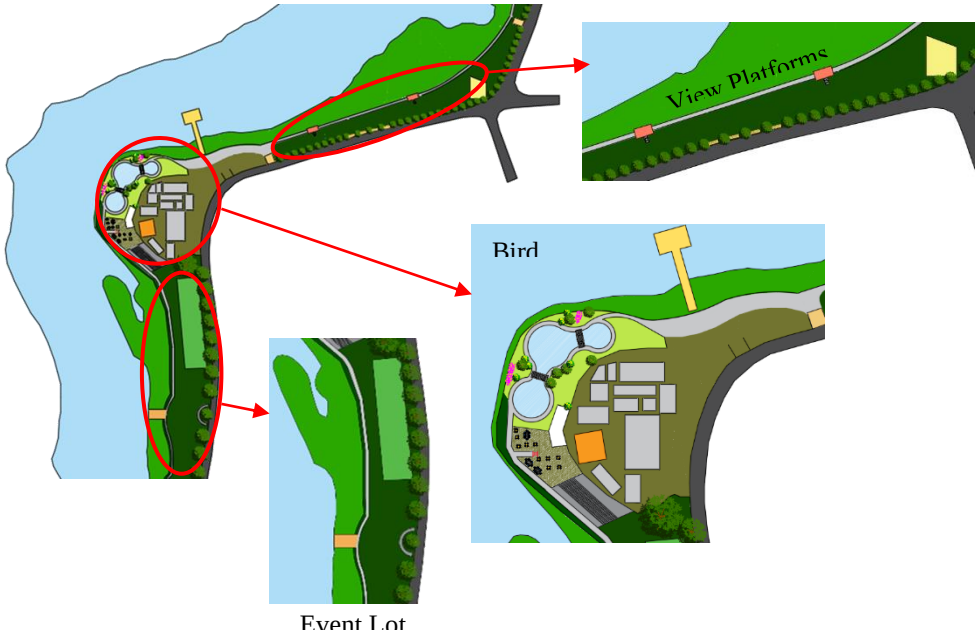
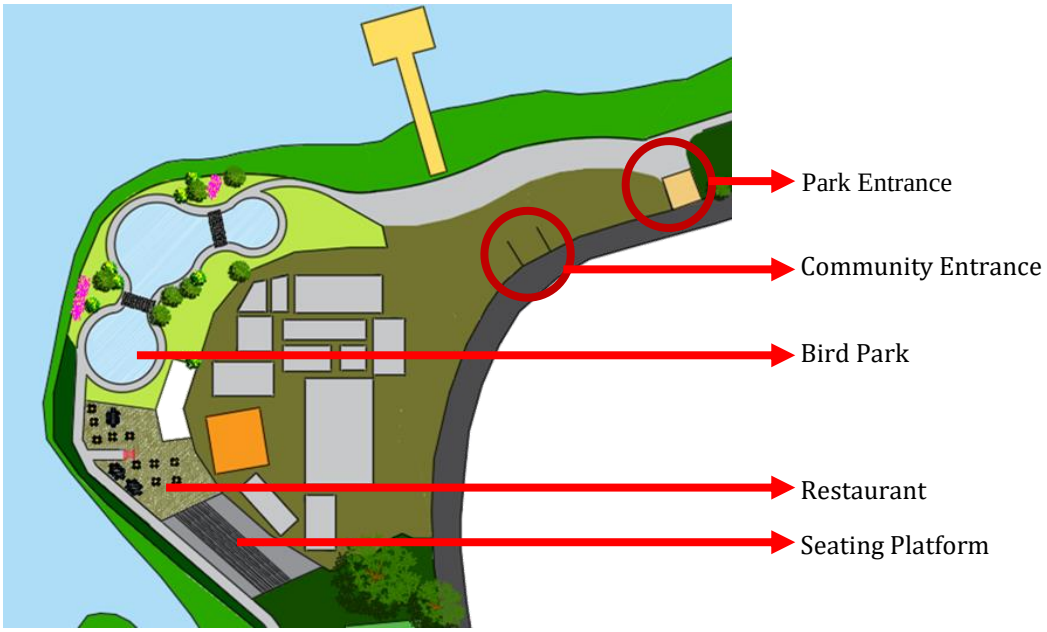


Figure 7.10: Proposed design of part D in segment – 1



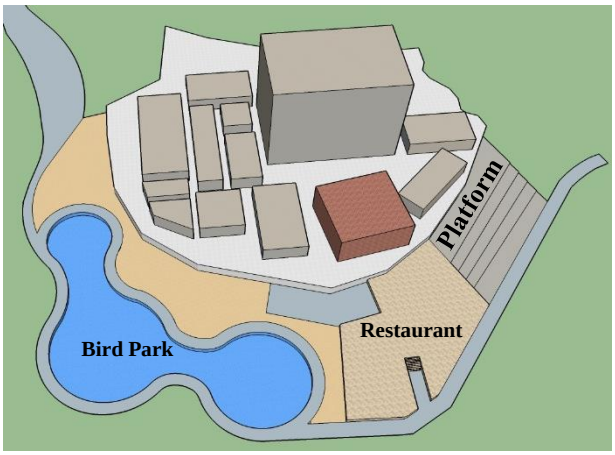


Figure 7.11: Proposed design of bird park

7.2. Proposed Plan for Segment - 2:

Parking facilities is provided in this segment. This parking zone can serve the whole river park as it situated at a middle position of the park. The entrance of the parking zone is far away from the junction of the roads so it will not create any traffic jam on road. Almost 170 parking spaces are designed to park both car and trucks. Increased river bank can be found in this segment in dry season where camping activities are proposed.

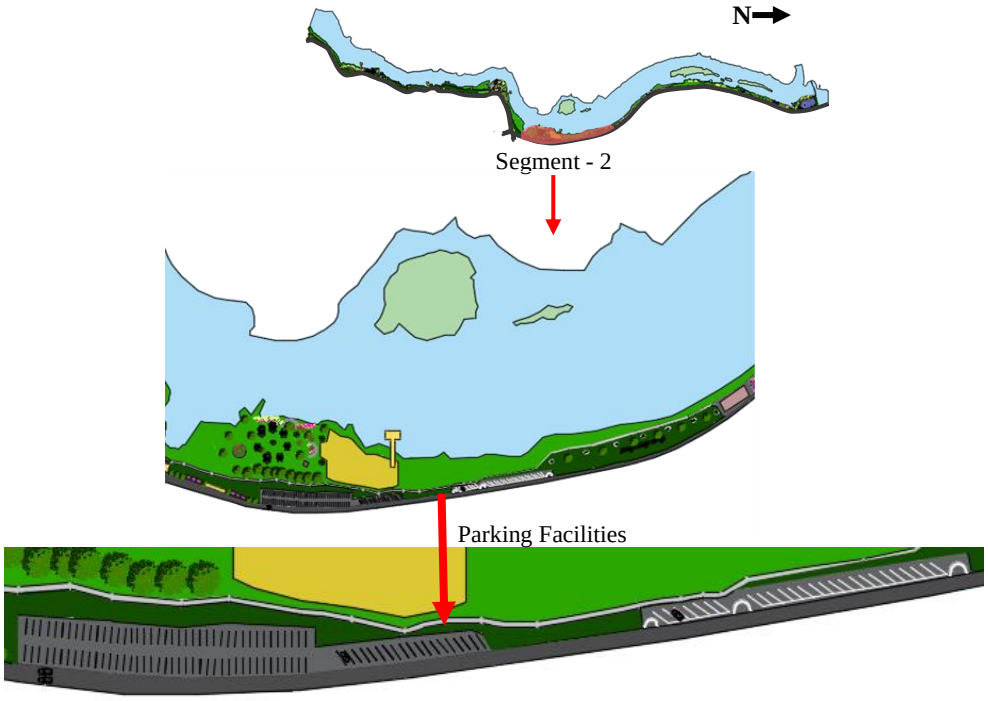


Figure 7.12: Proposed parking facilities

7.3. Proposed Plan for Segment - 3:

The linear greenway of this segment is designed with a walkway and 1 km cycle lane. Both at starting and ending point of the cycle lane there will be cycle stand where cycles will be available for the visitors. At the end of the site, the existing pond will be used to create a pond park. There will be a restaurant, open seating arrangements near the pond (Figure 7.13).

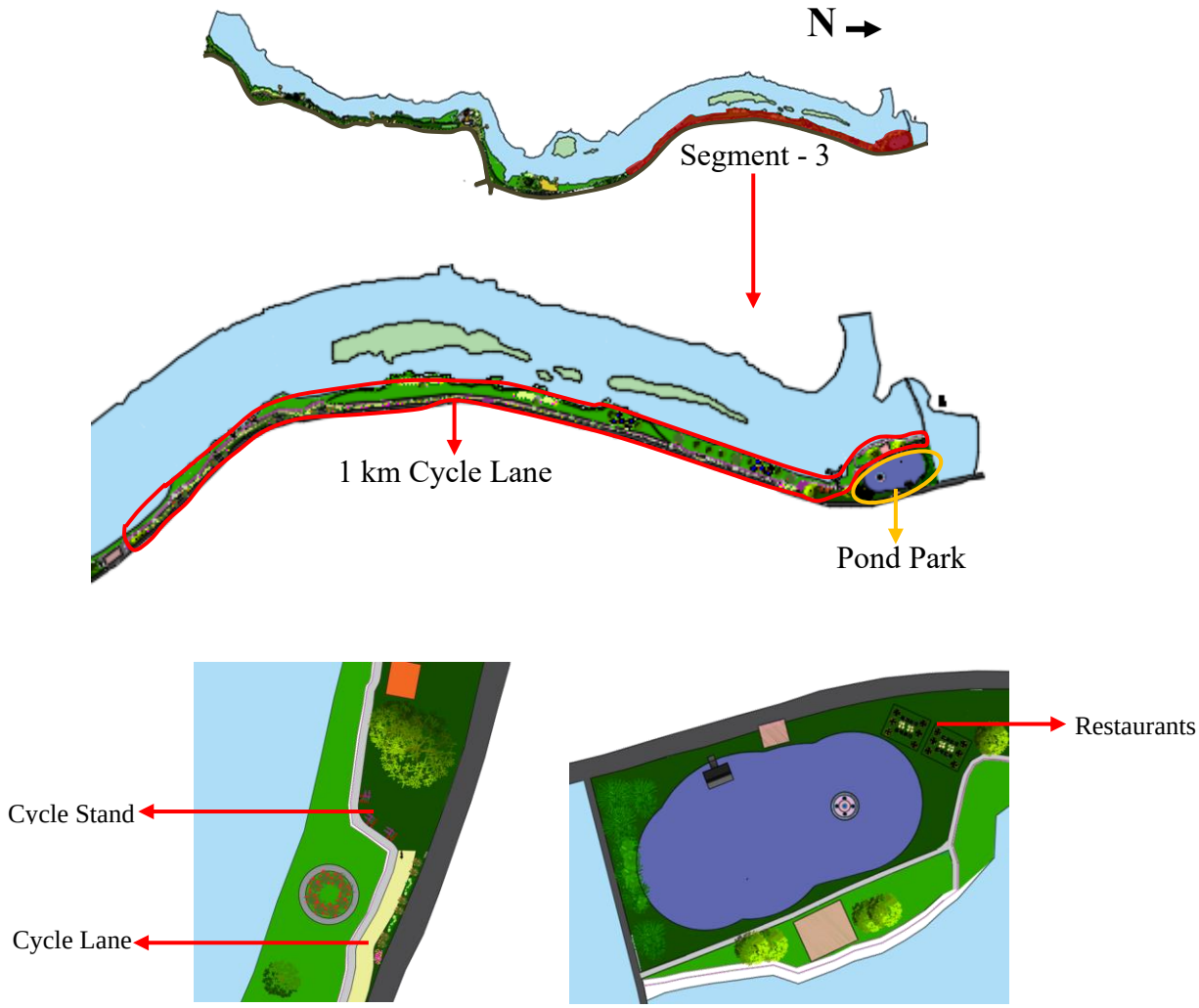


Figure 7.13: Proposed design of segment – 3

7.4. Accessibility of the River Park:

Three entrances are proposed for the river park. Both stair and ramp facilities will be provided to ensure accessibilities of all people (Figure 7.14).

Figure 7.14: Entrances of the river park

7.5. Riverside Camping Spot in Dry Season:

Riverside camping spot is proposed for the river bank which is available only in dry season. People will get direct accessibilities of water form this spots (Figure 7.15).

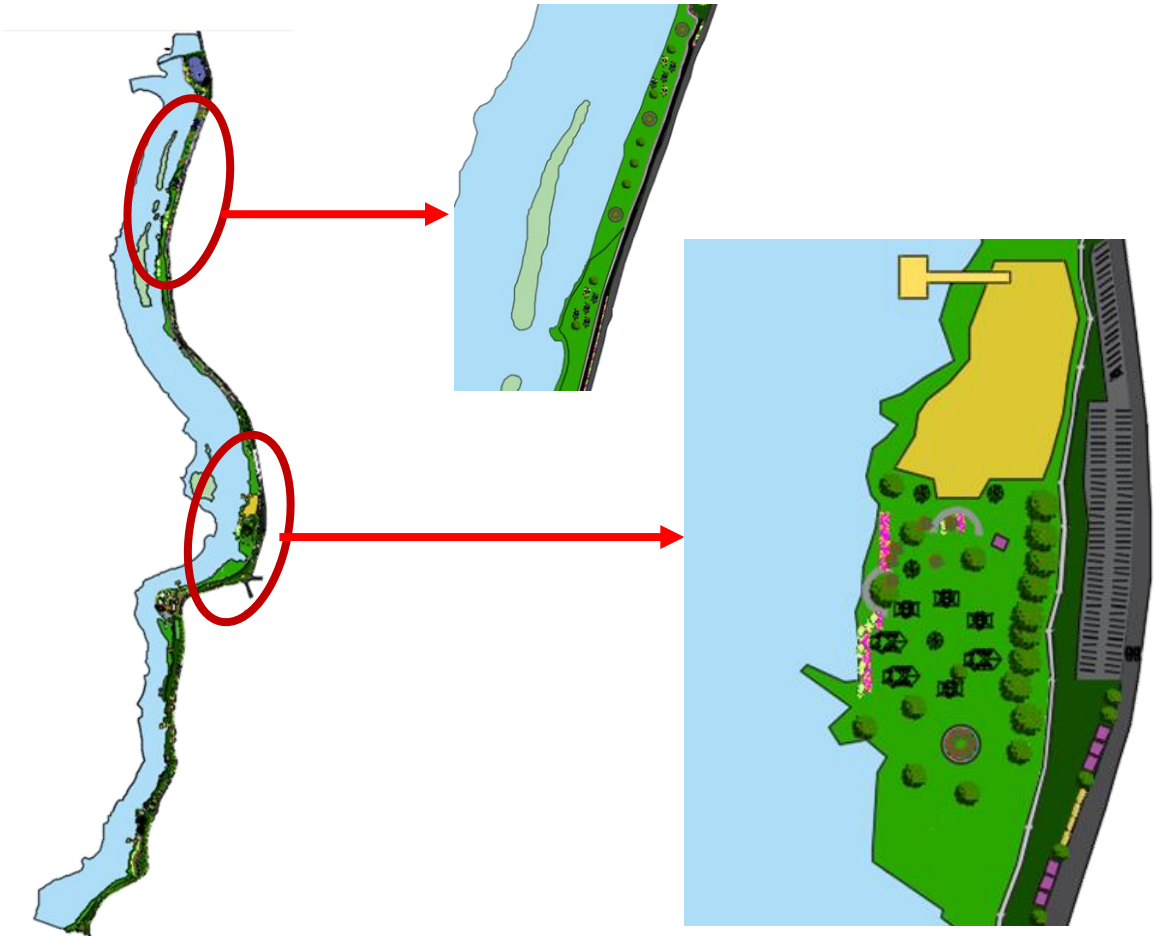


Figure 7.15: Proposed camping spot on river bank in dry seasons

CHAPTER EIGHT: PLANNING PROPOSALS FOR ENHANCING THE ENVIRONMENTAL CONDITION OF THE SITE

The existing site is full of waste dumping along the road side and along the river bank (Figure 8.1). This hampers the natural beauty of the river. Moreover many illegal sand and brick storage are also found on river bank. Open spaces are used as a graze land. No planned plantation is found on the river bank area which increases the air temperature of the site. The visitors don't get a shaded place on that site. To improve the existing environmental condition of the site, planned plantation is provided on the site, all the illegal storages are removed from the river bank. To prevent the open defecation, toilet facilities are also provided in the site near the restaurants. The river bank is kept as natural as possible in the proposed design by enhancing the existing environmental condition. More green open space are designed with planned tree plantation (Figure 8.2). Policies will be made to manage the waste management system of the site in a planned way.

Figure 8.1: Waste dumping along the river and the road

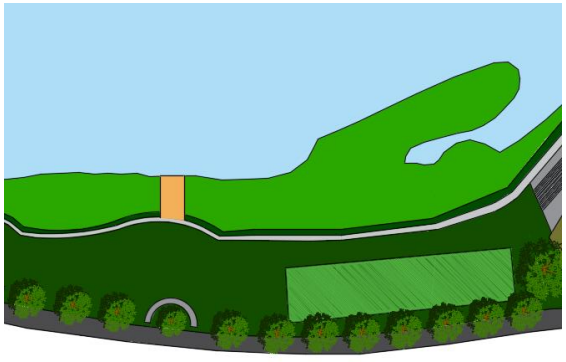


Figure 8.2: Planned tree plantation on the site

CHAPTER NINE: PLANNING PROPOSALS FOR PRESERVING AND ENHANCING THE SOCIO-ECONOMIC CONDITION OF THE SITE

Around six mosques, one temple, one locality of 300 people are preserved in the proposed design. The existing pottery works are promoted in the proposed plan. Eco-friendly riverview restaurants are designed which will provide more opportunities of employments. The proposed traditional zone will increase the sell of pottery works. Moreover local food shops are also provided in the plan which will benefit the local people. The existing jetties are updated and reconstructed in a planned way. 5 updated jetties are provided in the proposed design which will serve the boating activity of the site. Two separate landing platform is provided in the jetties to carry passengers and goods. People can enjoy the whole river and the river park using the boating facilities. This will also benefit the local people. Fishing piers and zones are also created in some places which also support the existing socio-economic condition of the site. More revenue can be generated by arranging cultural events, festivals and camping on dry seasons.

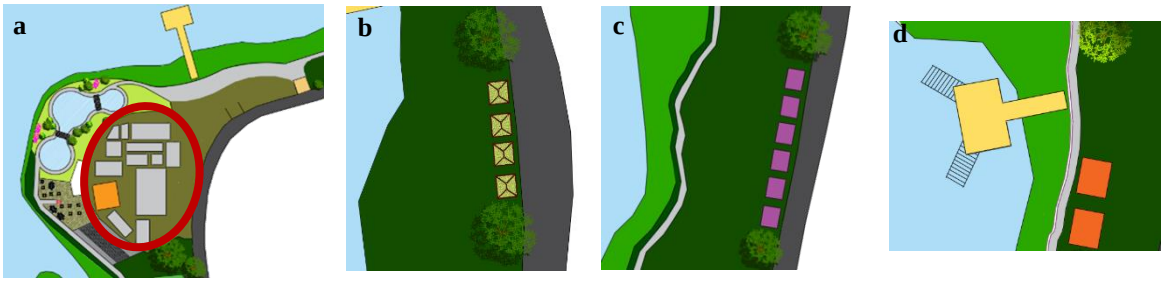


Figure 9.1: a. Bird park and restaurants preserving the mosque and locality, b. pottery shops, c. local food shops, d. Jetties with two platforms

CHAPTER TEN: MAINTENANCE & SECURITY

Recent studies on the parks of Dhaka city have figured out many of those as crime zone. Crime and unsocial activities are too much frequent and intense in those parks than general roads. (ref1) Thus, the maintenance and security issues are too crucial. As our filed survey figured out the surrounding dwellers as most concerned community about the security of the park, we set up our maintenance policy including them. Manpower for maintenance like guard, gate-man, night-guard, electrician, cleaner etc. should include the local people. Including maintenance-sustainability this will also support our policy-3 which says about enhancing the socio-economic condition of the site. There are four fixed entrances to the park area and the whole area should be fenced by visible barrier. Also, adequate eco-friendly lighting should be provided and maintenance of those should be ensured. Such steps should increase the safety. The Darus-Salam thana is situated within only 300m distance from the site. For any emergency which is beyond the ability of park-guard can be backed up by police easily just within minutes. So, scope providing patrol police is easier. Campsite and the restaurants will be leased to any private companies under proper terms and policies. The maximum waste dumping seen in the site now are from neighboring locality, small industries or from outside. These waste generator sites should be brought under control of City Corporations' waste management unit. Thus, maintaining the environment from both social and environmental aspect will be ensured.

CHAPTER ELEVEN: CONCLUSION

Any development activities proposed or done in our country are seen mainly structural development. Analysis on current situation, taking all the stakeholders in account, ensuring the environmental sustainability, keeping the project outcome eco-friendly etc. most of the time seen absent in those plans. By evaluating the proposals given in this report, BIWTA or related authorities connected to riverfront development can rethink their current plan. This plan can easily be claimed best suitable for this project area as detailed survey and analysis done on the site in several stages by skilled manpower. Preserving the natural look, including the local dwellers, promoting eco-friendly activities, uplifting our heritage and culture, including exceptional ideas like camping, bird-park, boating to connect people with the nature etc. are the uniqueness of this design proposal. To get the highest benefit from nature, to keep the environment functioning in its own way, to connect the townee of this polluted town with nature and giving them the flavor of nature just at the periphery of their city and to keep maximum convenience to all stakeholders, this report is certainly going to be a trusted and helpful guideline to the correspondent authority.

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Appendix A

Figure A1: Fisherman Catching fish

(Source: Field Survey, August 2019)

Figure A2: Boat jetty

(Source: Field Survey, August 2019)

Figure A3: Recreation Boat

(Source: Field Survey, August 2019)

Figure A4: Trucks parked beside river

(Source: Field Survey, August 2019)

Appendix B

Checklist

1. Physical Features of the Study Area:

a. Basic Information:

Name of the Area		
Location		
Length of the river bank		
Depth of the river bank (in dry season)	Maximum	
	Minimum	
Depth of the river bank (in monsoon season)		

b. Existing Structures & their uses:

- Availability of built structures:
  - ☐ Yes
  - ☐ No

If yes, fill up the following table:

	Types of Built Structure	**Uses**	**Need of preservation or removal in future**
1			
2			
3			
4			
5			

c. Activities Related to River (Dry season & Monsoon season):

…….....

…….....

…….....

…….....

…….....

d. Other Activities on Riverbank (Dry season & Monsoon season):

…….....

…….....

…….....

…….....

…….....

e. Surroundings Landuses:

…….....

…….....

…….....

…….....

f. Adjacent road network:

paved/unpaved	vehicular/ pedestrian	Width

g. Waterway transportation:

- Modes:

  ……..……

  ……..……

- Passengers types

  ……..……

  ……..……

- Ghats & their conditions:

  Number:

  ……..……

Frequency of passengers:

……..……

h. Condition of landscaping furnitures:

- **Plantation:**

  ……..……

  ……..……

- **Sitting arrangements:**

  ……..……

  ……..……

- **Walkway:**

  ……..……

  ……..……

- **Others:**

  ……..……

  ……..……

i. Pollution

Type	Severity	Reason

2. Focus Group Discussion

a. Previous condition of the area

b. Present condition of the area

c. Comparative Scenario

d. Expectations

e. Removal or Construction of any structure