

REANIMATING OF SMALL STAGNANT WATERBODIES OF CHITTAGONG: CASE STUDY ON ASKER DIGHI AND RANIR DIGHI

KUHELI, CHOWDHURY & HOSSAN MURAD

Lecturer, Department of Architecture, Premier University, Chittagong, Bangladesh

ABSTRACT

Within a process of rapid urbanization, Chittagong city is faced with the constant threat of encroachment of land and Waterbodies like ponds, dighis, canals and rivers by the public and private sectors to accommodate housing and commercial facilities to the growing population. This phenomenon is changing the landscape of the city in to a mixed use pattern. Therefore, this study aims to raise the level of attention on revitalizing the threatened small stagnant Waterbodies and bring them into planning framework to regenerate. This paper is based on a comprehensive study on the area including field survey; public- specialists' interviews and secondary data has been collected from different online resources, Chittagong development authority, published documents and books. After a depth analysis, it indicates that the uncontrolled and unauthorized growths of different urban amenities are rapidly diminishing this Waterbodies. There has no visual connectivity; illegal settlements are encroaching by grabbing the pond. This paper will finally propose an appropriate revitalization strategy based on SWOT analysis of these dighis (large pond) which might be helpful for the planners and policy makers to articulate sustainable urban development policies.

KEYWORDS: Encroachment, Revitalization, Regenerate, Stagnant, Urban Amenities, Urbanization

INTRODUCTION

Centralized in the urbanized area, People are not aware of some spaces which are titled lost dighis and the trend is continuing. As a result, the problem of degenerating water courses in urban areas is unchecked. Chittagong is a major coastal seaport city which is located on the banks of the Karnaphuli River between the Chittagong hill track and the Bay of Bengal. But this city has completely lost its image of "Venice of the East or the City of Channels" which presently stands as "City of Concrete". Recently a growth pattern of this city severely compresses its flood resilience and thus the city's liability. A city requires 25 percent open spaces including vegetation and water to keep it geographically and environmentally fit. Chittagong is far away from this required percentage. Not only that but there were nearby 16,000 ponds in and around the city even 28 years back, but rampant filling of the Waterbodies has sharply reduced the figure to 1,000. it's evident that Chittagong citizens forgot about the existence of most of the inner city Waterbodies or at least avoid visiting them and few people have seen to care about water issues. The lack of Waterbodies causes more and more problems during the rainy season. Flood occurs during heavy rainfall and every day at a fixed time, tidal water comes from the river and overflows the roads. Water logging is a common issue for this city. Public open spaces around the Waterbodies are abounded. Most of the cases these are turned into vehicular access and illegal settlements. So provide opportunities or proper use this Waterbodies to reshape an urban center by which it can attract people back to the public realm. Cities are growing fast and to keep them right track rethinking and reanimating the stagnant Waterbodies are necessary. From this assessment we have selected to study on two (0.77 – 2.04 acres) ponds according to their

ownership patterns, social, environmental perspectives and SWOT analysis.

METHODOLOGY AND OBJECTIVE

This study has regulated into 2 major phases to achieve following objective:

- To restore and conserve degraded small stagnant urban Waterbodies both for functional needs as well as for recreational and aesthetic purposes.
- Phase-1 is to identify the present physical condition of ponds from user's perspective and also point out the problems, prospects.
- Phase -2 is to focus some strategies for preservation and reanimating of these ponds and surroundings based on urban design element and criteria analysis.

This study is conducted based on both primary and secondary information. Primary data has been collected through questionnaires survey and secondary data has been collected from the Chittagong development authorities, municipality and different online sources. The planning strategies under this study are completely done by user's opinion survey and urban design criteria analysis. To identify the existing difficulties of Ponds and surroundings, all urban design elements and criteria have been analyzed. To have the public opinion, people from different ages have been interviewed to know their impression about the present condition of the sites. It investigated visitor's ideas for preservation and reanimating of the sites.

DEFINITION AND IMPORTANCE OF WATERBODIES

Different kinds of Waterbodies are seen in Bangladesh. On basis of size, they are categorized in six types. They are Doba, Pond, Dighi, Khal, Beel and River. A Pond is generally described as a water body of a smaller size, man-made or developing it from its natural origin. Dighi is a Bengali term of pond but it's bigger than Pond. In the present study the term Dighi has been used as an water body in the urban and peri-urban area and it also refers to a relatively shallow body of water, contained in an earthen basin, natural, retaining sewage or organic wastewaters to stable the waters and to make them in-offensive for discharge into receiving water body or on land through various physical, chemical and biological processes, involved therein. The role of the Waterbodies in urban milieu is multifaceted such as social, ecological and economical importance. Ponds are now increasingly being created for ecosystem services and leisure activities. The major use in our contextual setting is bathing, cleaning and other requirements. The major productive activity related to these ponds is fish cultivation. Environmentally these stagnant dighi play role as controllers of microclimate in many cases the banks of these Waterbodies are the only spaces for development of greenery. Waterbodies are protectors of biodiversity and receptors for rainwater harvesting and maintaining local ground water levels. In neighborhood scale, these stagnant Waterbodies are also act as a centre of local social and cultural activities. Finally, these Waterbodies act as a source of water for fire fighting in the crowded and over-expanding urban areas. According to Ray & Majumder (2004) the inter-relation of an urban water body with environment, economy and society is:

Table 1: Role of Ponds in Urban Areas (Ray & Majumdar, 2004)

Urban Environmental Components	Activities	Description
Water Resource	Bathing	A large number of people from lower economic background use them for bathing
	Washing	Washing of clothes, utensils and other domestic requirements
	Rainwater Harvesting	Acts as rainwater storage
Environment	Climate Control	Waterbodies affect local micro-climate, making it cooler and soothing
	Open space	Waterbodies provide an open space, Providing room for air movement, Space for recreational use.
	Trees	Generally the waterbodies banks have tree plantations, preserving urban nature
	Aquatic Ecology	Waterbodies support many aquatic and other species, a receptacle of biodiversity in urban context
Economy	Fish cultivation	Source for local employment and good protein
Social	Community Gathering	People spend time sitting around these waterbodies. Many waterbodies have seats around them and are an important place for local community gathering.
	Clubs	Because of open space, there often exist many clubs by the waterbody side.
Culture	Fair	Fairs are organized in the open spaces in front of waterbodies
Safety	Fire Extinguishing	In congested urban areas, Waterbodies are very useful as a source of water supply for extinguishing fire.

CASE STUDIES

Chittagong has dighis of different sizes spread within its municipal corporation boundary (under institutions like university, Govt. offices, under mosques & temple, under various garden and within neighborhood level) which are used as multiple resources. Two dighis of different neighborhood has been selected for the studies which are sequentially described in following:

Dighi-1- Asker Dighi

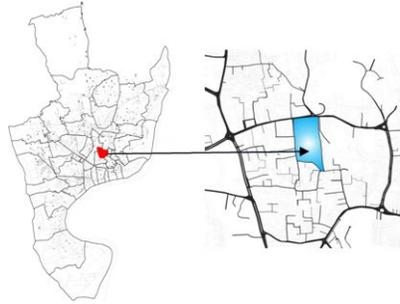
Location: Askerdighir Paar, Chittagong.

Area: 3.78 acres (659'6''x262'1'')

Activities: Mixed-use.

Condition: Abandoned Space.

Surroundings: Mixed Use Settlement



N
Chittagong Map (Location Map)

YEAR	Length	Width	Area
In 1898	_____	_____	8.49 acre
In 2000	722'-10"	319'-6"	5.01 acre
In 2015	659'-6"	262'-1"	3.78 acre

Source: Primary Survey, 2015

Dighi-1- Ranir Dighi

Location: Enayet Bazar, Chittagong.

Area: 44346 sft. (1.02 acres)(150'x280')

Activities: Mixed-use.

Condition: Renovated.

Surroundings: Residential Settlement



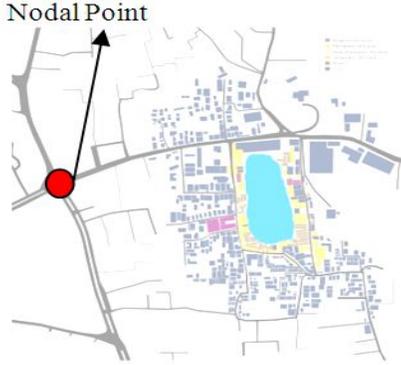
N
Chittagong Map (Location Map)

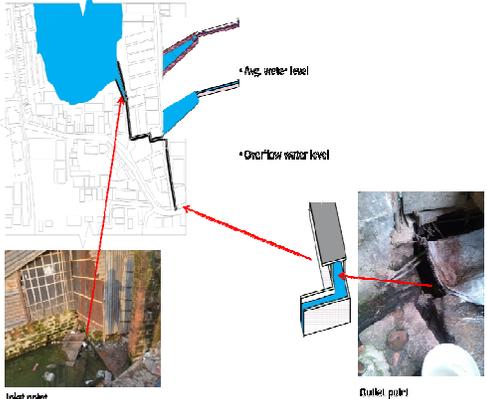
YEAR	Length	Width	Area
In 1898	_____	_____	2.41 acre
In 2000			1.22 acre
In 2015	280'	160'	1.02 acre

Source: Primary Survey, 2015

ANALYSIS OF PROBLEMS AND PROSPECTS

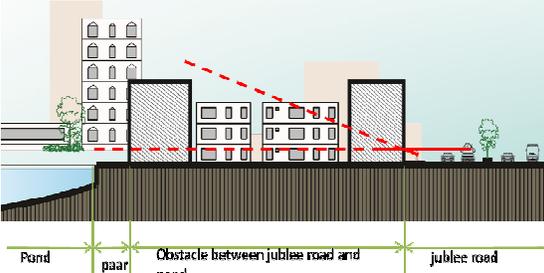
Asker Dighi

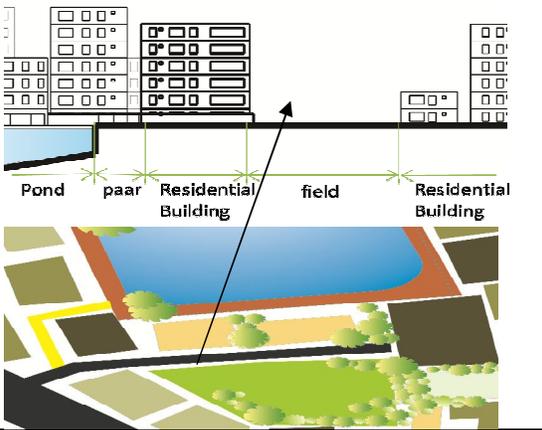
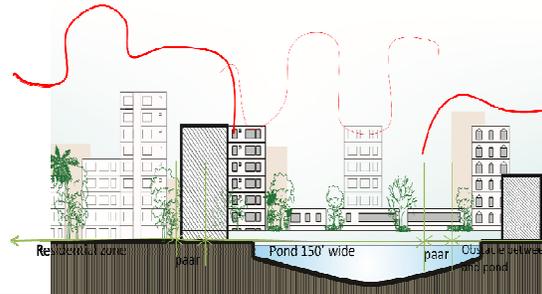
Strength	Roads and Circulation	Surrounded by primary, Secondary and Tertiary roads. Image-1	 <p>Nodal Point</p> <p>Image -1</p>
	Land Use	A mix used of commercial, residential, institutional and recreational development, the areas activity is more vibrant.	
	Natural Resource	There is a hill in east side of the dighi.	
Weakness	Roads and Circulation	No visual connection. Narrow pedestrian and no pedestrian walkways to ensure safe movement adjacent to vehicular roads.	
	Land Use	Unplanned settlements are, encroached on the bank of dighi. Improper use of public and private land. Image-2	 <p>Image-2</p>

	<p>Drainage And Waste Management System</p>	<p>The drainage system is not adequate for the dense neighborhood. The garbage disposal system is not planned and remains scattered and exposed in the streets. Unhygienic environment. Water logging is a common issue for this phenomenon. Image-3</p>	
<p>Opportunities</p>		<p>Primary road beside the dighi. A eastern hill is connected with dighi</p>	<p>Image-3</p>
<p>Threat</p>		<p>Unplanned settlement and illegal slum are encroached around the dighi. Dighi is getting smaller day by day. Image-4</p>	 <p>Image-4</p>

Source: Primary survey

Ranir Dighi

<p>Strength</p>	<p>Building Orientation</p>	<p>building are faced towards the dighi Close to vibrant urban point (Enayet bazar). Dighi provides thermal comfort to the adjacent community. Helps in fire fighting system.</p>	
<p>Weakness</p>		<p>No visual connection between dighi and main road.</p>	

		<p>Paars are used as vehicular access and pathway.</p>	
		<p>No connection with adjacent field.</p>	
		<p>Imbalance height of buildings obstruct the view of dighi from backward buildings</p>	
		<p>No walkway at north-west corner.</p>	
		<p>Surrounding continuous boundary walls give appearance of a blocked space.</p>	
<p>Opportunities</p>		<p>have many connection roads with dighi</p>	

<p>Threat</p>		<p>Tendency of increasing building height.</p>	
----------------------	--	--	--

RECOMMENDED STRATEGY

This section briefly explains the revitalization strategy to reanimate the Dighi and the surroundings side area. The first thing comes in to consideration is to decontaminate the dighi, shape up the water-shade area, open it up and make it easy accessible to public.

From the above assessment it is evident that these ponds may need prescribed recommendations such as followings:

- Restoration and conservation of degraded stagnant urban dighis
- Guidelines for transformation of existing ponds to sustainable ponds
 - Water aeration which will increase the oxygen saturation of water.
 - Introduce Fish cultivation for economical sustainability
 - Enhance the community garden with small market facilities
 - Moderate plant (algae, moss or water grass, water lily, smart weed, arrowhead etc.) growth is essential to Waterbodies for oxygen, food and cover for fish and other aquatic organisms. Boiling Potassium-Di-Chromate should imply for reducing COD level up to zero.
- The effective pond landscape includes the pond and its immediate catchment
 - Enhance the community gathering by promoting walkway, cycle paths, sitting
 - Create a place for people for watching bird and wildlife, for fishing, and other outdoor activities, such as swimming, because the pond is large enough, it can be explored by boating also.
 - The dighis should have made accessible to the public realm, by increasing both - physical and visual connectivity between the water front and the neighborhood.
 - The visibility is ensured by replacing high fences with low green hedges so that the dighis becomes visible from the periphery roads.
 - Physical connectivity was achieved by insulating walk ways through the periphery of the water side and

also approaching from the side roads from accessible locations.

- To make this links sustainable, some passive activities became a pre requisite along the walk ways.
- The circular path around the waterfront side acted as the-necklace and the facilities that generate moderate traffic resembled as the precious stone concerning the oneness of the sustainable issues.
- The scheme looked for some moderate function that will generate less traffic in the residential area.
- Functions like, Food kiosk. Drink corner. Small restaurants, Community boat club, Community health club, Open air theatre and children's play area, can be distributed in different visually and spatially strategic locations throughout the development. The concept was to act these functions as attractor, to bring in more people in the water front side areas.
- A few large green spaces were selected in strategic locations with better visibility towards the lake and accessible from within the neighborhood. To avoid direct traffic flow from the busy and congested peripheral roads of the neighborhood, contributing to the major road network of the city, the functions were embedded in more localized areas.
- Considering the management aspects of the project and to make it financially self sustainable, these facilities would generate income and hence could be maintained modestly by a public private partnership. In reality, the idea contributed to the restoration of the overall environmental quality of the serene lake side area.

CONCLUSIONS

In Chittagong, rampant expansion and commercial development are brutally transforming the urban tissue where the significance of these urban stagnant Waterbodies as water recourses is diminishing. The coordination between assigned government authorities for these ponds and private organization should be addressed to overcome alarming situation which will help to enhance the sustainability of the existing pond throughout the Chittagong. If they are not designed and managed properly, they can turn into liability. Modernity coupled with an indigenous intelligence is indeed timeless and can guide Chittagong well in the coming century.

Notes

- The term 'Dighi' is frequently used as a synonym for words such as big size pond
- Khal, Beel are a Bengali word, meaning small channel.

REFERENCES

1. Hossain.S; January 2008; Rapid Urban Growth and Poverty in Dhaka City; Bangladesh e-Journal of Sociology. Volume 5, Number 1. Dhaka, Bangladesh.
2. Khan, N.; 2008; Study of Morphological Transformation in Planned Residential Areas of Dhaka
3. City; Unpublished March Thesis; Department of Architecture; Bangladesh University of Engineering and Technology; Dhaka, Bangladesh.
4. Novak, J.; 1993; Bangladesh: Reflections on the Water; The University Press Ltd.; Dhaka, Bangladesh.

5. Shannon and Nilufar; September 2008; Transforming Urban Landscape; Growing Cities, Topos, Review of Landscape Architecture and Urban Design/64.
6. Shumi, S.; 2006; Commercial Impact on Dhanmondi Residential Area; Unpublished BURP Thesis; Department of Urban and Regional Planning ; Jahangir nagar University, Savar, Dhaka; Bangladesh.
7. Dinar A, P Seidl, H Olem, V Jorden, A Dada, R Johnson. (1995). Restoring and protecting the world's lakes and reservoirs. World Bank Technical Paper No. 289. The World Bank, Washington D C, pp.85.