

Water body restoration and development - A case study of Askar Dighi Water Tank of Chittagong

A. T. M. Shahjahan*
Panini Amin Chowdhury**
Mohd. Mostakim Ali***

Abstract

Askar dighi is a very old water tank of Chittagong, which is now encroached by illegal settlements, and because of the waste dumping activities, its water quality has degraded at a severe level. Although creation of a recreational zone is a crying need for Chittagong, no one pays any attention for utilizing the potential of this majestic dighi. The main objective of this study is to develop some ideas to turn this dighi into a recreational place, followed by designs and a draft budget plan. Improvement of the recreational facilities in the port city is a dying need to restore its heritage and culture. By reviewing various articles and projects, this paper formulates a strategic plan to restore this dighi for the best possible use. A budget plan is developed considering the present day costs and an earning and management strategy is also prepared for this project. GIS Based secondary data and field level primary data has been collected and used for the research. If the improvement plan is executed, the city will not only get a natural recreational open space, but also, it will be a big step forward for sustainable city development. Thus in future, it can be a symbol of glory for the city and a place for healthy living for the urban dwellers.

Introduction

Over the years, the importance of preservation and maintenance of the tree cover has been recognized and significant progress has been made in improving the tree cover in urban areas of Bangladesh. However, not enough attention has yet been given to the preservation of water bodies especially to the tanks that exist within metropolitan limits. 'UNEP's Global Perspective of Fresh Water Stress suggests that "Conservation and restoration requires a systematic and comprehensive plan to study selective and representative freshwater ecosystems (Hartigaan, 1988) Askar dighi is a such type of water body of Chittagong, which is situated at the center of Chittagong, Kazir Dewri, which is now losing its ancient beauty. To improve the health conditions of people living in the surroundings and to develop local economy through eco-tourism activities, this water body needs to be restored. A number of actions are required to restore this lake to a healthy state and then to ensure that it stays in a good condition.

* Assistant Professor, Department of Urban and Regional Planning, Chittagong University of Engineering & Technology, Chittagong, Bangladesh. Email: shahjahan2021@gmail.com

** Planner and Graduate Student, Michigan State University, U.S.A
Email: chowdhurypanini@gmail.com

*** Junior Urban Planner, Global Survey Consultant, Email: mostakim1992@ymail.com

Historical Background-

Mughal ruler Nawab Askar Khan dug this lake in 1669-71. The area of the dighi is approximately 3.862 acres. To meet the water needs of the people of this area, this huge lake was dug. In 1930, Barada Chakrabartee, an officer of the British Indian railway leased it. After his death, his son Sadhan Chakrawarte sold this tank to a business man, named Abul Kalam in 1976. Later he sold it to a ship breaking industrialist, named Shawkat Hossain in 1992 (Chowdhury, 2013). This excellent tank is now losing everything with the flow of time. No one pays any attention to restore this heritage.

Present Condition

The surroundings of the tank encroached by illegal furniture shops and slums. The whole waterbed is covered with water hyacinth. People of the slum area use the water of the dighi for washing their daily essentials and also for dumping wastes. The wastes of the hanging closets are also fall directly to the tank. The water is already starting to change its color. Bad smell emits from it. During the rainy season, the situation is much better but during the rest of the time, it is in a very dirty condition.

Existing Legal Obligations

Wet Land Conservation Act, 2000 Guidelines

In this legal document, class change of any wet land is strictly prohibited. This act ensures legal obligation for preservation and conservation of any ponds, dighis, water canals, springs which are specified in the Master plan. From this point of view, Askar Dighi must be preserved to ensure environmental sustainability.

Chittagong Development Authority (CDA) Master Plan Guidelines

In the Master Plan of CDA, there are strict guidelines and regulations to protect the tank. But there is no initiative for the implementation of the guidelines, which were taken in the Structure Plan. In the Master Plan, this place is denoted as a place of social gathering and for an amusement park. But no initiative has yet been taken by City Development Authority or City Corporation.

Proposals

The first and foremost proposal for this tank is to lease it to private sector for its proper development and management following our existing rules and regulations. In our neighboring countries, like in India, tanks like Hebbal, Nagavara, and Kankaria are now in the private ownership. The private developers have developed amusement parks along these water bodies to preserve these water bodies and utilize them for recreational purposes. For example, a private company, named L.D.A leased the Hebbal Lake for 15 years by 12,25,700 rupee. Nagavara lake is leased by Lumbini Corporation for same 15 years period by 68,39,100 rupee (Development of lake conservation project Karnataka, 2013) for this tank. We can initiate this type of Public Private Partnership (PPP) related projects in urban redevelopment. The total area of the Askar Dighi is approximately 3.862 acre. So, infrastructural development can be allowed here. But before that formation of peripheral bund along the shore line of the tank, desilting of the lakebed by dredging, strengthening and widening of main bund, restoration of surplus weirs and sluices and restoration of inflow and outflow channels are necessary.

Water Quality Management

For managing the water quality, steps such as interception, diversion and collection of sewage, screening of floating matter and grit, and de-nitrification (Biological process) can be adopted (Dinar et.al, 1995). The necessary other activities include Extended Aeration with fine pore diffused membrane, Flocculation with Alum dosing for phosphorus removal, Settling by Plate Settler (Dinar et.al, 1995), Chlorination and Filtration, Clear treated effluent to wetland, where special type of plants viz. cattails and bulrush are planted for removal of further phosphates and nitrates (Dinar et.al,1995).

Biological Treatment Facility

Trees, Bamboo and ground cover helps in increasing the bio-diversity as well as self-purification by absorption of Phosphates and Nitrates. Floating macrophytes like pistia and duckweed help in removal of inorganic Nitrogen and Phosphorus in the wetland (Abel, 1996).

Budget

We may check how much the project will cost and how much it can earn. At first, the sources of earning and expenditures are given and then an investment and earning estimation is given in Table 1.

Table 1: Sources of earning and expenditure

Earning source	Expenditure source
Ticket	Infrastructural development
Boating	Maintenance and other technological development
Advertisement on selected restricted place	Different landscaping
Restaurant rent	Walkway, retaining wall, small scale suspended bridge.
Occasional rent	Entrance and boat costing.
Swimming training programs	Other

From a project cost of Karnataka of India, the estimation as shown in Table 2 has been prepared.

Table 2: An estimation of expenditure

Expenditure cost	Amount(in taka)
Infrastructure	15,00,000
Landscaping	10,000,00
Other	12,000,00.
Total	37,000,00.

Similarly, estimation as shown in Table 3 is made on the monthly income of the site in respect of project taken in Nepal Kathmandu (Financial feasibility report, naya naipur, 2012).

Table 3: Estimation of income

Earning source	Amount(in taka)(Monthly)
Ticket	30*1300=39,000.(Everyday earning 1300 taka estimated)
Boating	20*3000=60,000.(Per ticket tk.20 and monthly visitors 3000 estimated)
Advertisement	1600*50=80,000.(50 sq.ft estimated for this and per sq.ft charged tk 1600).
Restaurant rent	40,000.
Occasional rent	2,00,000.
Swimming training	8,000.
Net total	4,27,000.

Thus from the income and expenditure point of view, it is clearly visible that this project is not white elephant and the outcome in future will definitely be beneficial for both the tank users and the developing companies.

Description of the Design

As the area of Askar Dighi is not very big, the overall design is developed on the basis of the improvement of the existing condition. Tree plantation can be an effective tool for the overall design development. Round overs are proposed from where people can stand and enjoy the view of the tank. Location for the stair case development is also prescribed in the design. The proposed width of the walkway is 4.5 ft. and can be decorated with colorful tiles. A restaurant is proposed at the side of the tank, which can be used as a community gathering place. An adequate parking facility is provided on the side for the visitors. Advertisement billboards can be set up at the parking lot. The side walls of the area can be decorated with beautiful designs and painting, which will reflect the culture, natural beauty and heritage of our country and also will enhance the beauty of the water body. Laser lights can be set up at the lower and upper part of the walkway and also in the middle. Different stones and gravels can be used for overall beautification of the water near the ghat.

Impact of Water Bodies on Developing Healthy Urban Environment

For the development of water sensitive urban design and healthy urban environment, water bodies inside the center city area can play an important role. It can be used as a water reservoir and can be designed as a recreational zone also. This water body is an important part of urban ecosystem. Though relatively small in size, it can perform significant environmental, social and economic functions, ranging from being a source of drinking water, recharging groundwater, and acting as sponges to control flooding, supporting bio-diversity and providing livelihoods (Churning Still Water, 2012). Eutrophication, siltation, pollution, illegal encroachment etc. are the impact of rapid urbanization of this urban water body. The World Lake Vision has been developed by International Lake Environment Committee (ILEC), Japan, in collaboration with UNEP, where it is stated that sustainability of a city largely depends on its ecological state, where water bodies are the prime factors. Citizens and other stakeholders should be

encouraged to participate meaningfully in identifying and resolving critical lake problems. Good governance, based on fairness, transparency and empowerment of all stakeholders, is essential for sustainable lake use. For this, measures like de-silting, de-weeding, aeration, reduction of nutrient, removal of floating and other invasive aquatic plant-species or any successfully tested and technologically suitable to the local condition, may be taken up.

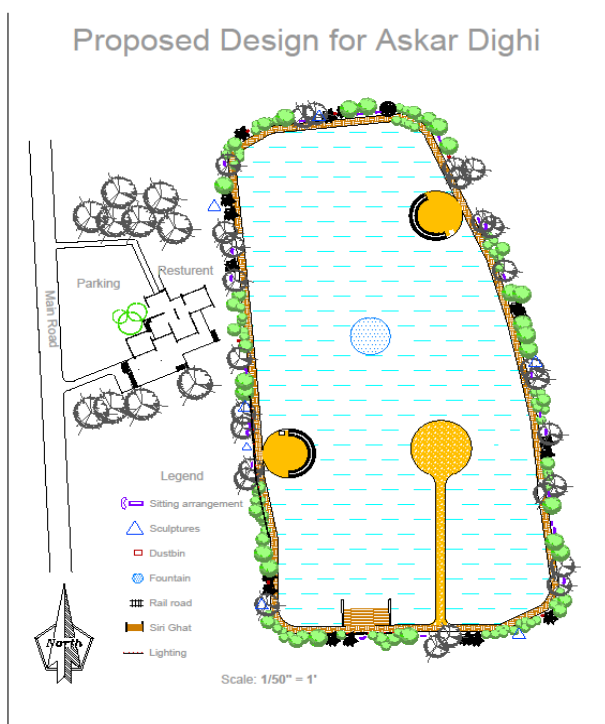


Fig. 2: Proposed design for the Askar Dighi

Urbanization has to take into account the delineation and protection of catchment areas, feeder channels and command areas of this tank and restore or protect them to the extent possible (Haugton and Hunter, 1994). Stakeholder participation and capacity building must be used as an important instrument for better management of urban Water Bodies. Urbanization in most cases results in downgrading the integrity of water bodies and watershed in urban and urbanizing areas. Urban streams are used for a variety of purposes, including : (1) flood conveyance; (2) disposal of urban runoff and overflows from sewer systems; (3) aesthetic enjoyment by the urban population; (4) aquatic life propagation; (5) contact and noncontact recreation (sailing and fishing); (6) potable and non-potable water supply (e.g., golf course irrigation); (7) other uses that may include cooling, navigation, and groundwater recharge (Novonty et, al, 2012). Such actions will improve health of the residents of the surrounding areas and can be used for pisciculture activities also. So it should be protected by any means for the common benefit of the urban dwellers.

Conclusion

Many of our cities and their environment is a gift passed from our earlier generation. However, our negligence turns these resources into nuisance. Askar Dighi of Chittagong is such an example. Therefore, we must make constant efforts in focusing both aspects of restoration-rejuvenation and sustainability with regular engagement of the citizens and users. To obtain benefit of this important water body, policy level and local level interventions are necessary. By protecting the natural features, we are actually protecting our future. For the sustainable restoration of water bodies in our cities and towns, it is expected that the ideas and design, which are introduced here can be a good guidance for future.

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