

Study of Ecological Waterfront Development in India

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Abstract: Today the water crisis is a major problem we are facing. As we go towards the future, our major concern should be how we can prevent the rapid loss of water we are having globally or at least how we can delay it. Many countries are trying to achieve a full system of planning a sustainable approach for the development of the waterfronts. The development of any city majorly depends on its infrastructure and the city's social lifestyle and a lot of these depend on the major water bodies of that city. India is one of the fastest developing countries hence in need of a well-planned approach to these developments.

Keywords: waterfront development, Ecological waterfront, sustainable planning.

1. Introduction

Architecture is all about creating spaces with the understanding of the context of that space whether it's a small area of a house or a whole city, an architect is someone who shapes the life and is an important part of creating a lifestyle of that particular space. Since architecture is an important part of society and its concerns. The biggest concern today is the water crisis we are facing and one of the many ways architecture could contribute towards resolving this problem is to have an approach for the design of several types of waterfront that should be responsive towards the specific problem of that particular water source hence an ecological waterfront. India is one of the fastest developing countries. The development of any city majorly depends on its infrastructure and the city's social lifestyle and a lot of these depend on the major water bodies of that city.

2. Related work

A. Literature review

Sustainable Urban Design Guidelines for Waterfront Developments (Reyhan Yildiz, Nihal Senlier, Burcu İmren Güzel); 2015.

Sustainable planning of coastal areas, with the study of waterfront design guidelines applied in countries like USA, Canada, UK and Australia. The process of identification of design principles and strategies of waterfront with the importance of having the recreational potential of the waterfront.

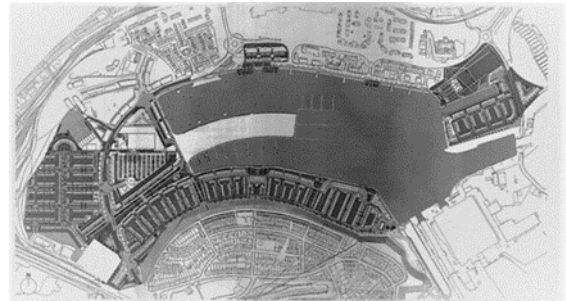


Fig. 1. Barry waterfront development principles (barry waterfront design and access statement, 2009)

Principles of Ecological Riverfront Design Refined (Nabilah Redzun and Nurul Syala Abdul Latip); 2016

To protect the waterfront development process, it is important for riverfront to be restored and rehabilitated based on the advisable approaches that will improve its features. The restoration and rehabilitation could not have been done without going through these stages of principles: (i) General, (ii) Planning, (iii) Design and (iv) Implementation. In order to identify and achieve the most appropriate solution for that. Is to reconnect the riverfront with the public while allowing the nature do its work.

B. Case study

1) *A case study of a riverfront developed on Sabarmati banks in Ahmedabad.*

It is a river waterfront being developed along the banks of Sabarmati river in Ahmedabad with major objective of environmental improvement, social infrastructure and sustainable development and it aims at redefining the identity of Ahmedabad around the river. This development project completed in 2012 and is the first well developed market that is well landscaped and is provided with pucca platforms for 1600 vendors and basic public amenities like food courts, seating's, toilets etc. People have been allowed houses for resettlement in prime locations of the city along with the playing area for children. An interceptor sewage system was constructed to divert the sewer to the treatment plant and prevent water.



Fig. 2. Photo of Sabarmati riverfront, Ahmedabad, Gujrat, India.

3. Scope of study

The main objective of the study is to identify the need of ecological waterfront development in India with general approach towards the design that sets new standards for public projects to have sustainable methods.

A. Need of ecological waterfronts

For centuries human has civilized and lived side by side water bodies since it was the main source of food and vegetation for years. As we grew socially and economically water sources become for trading and business purposes. And now many years later humans are now reconsidering water resources as more of a recreational delight than just for trading and business. In today's world a developed city is where there is a public recreational space for the whole city to reciprocate towards good health and lifestyle. Having a public space like any waterfront itself changes the whole city's lifestyle and social values. Waterfront in major cities can generate revenue as well as general awareness and appreciation towards the waterbody. Today the water crisis is a very important thing to be concerned about and it should be planned forehand hence should be sustainable towards the urban development of the city. As we are going towards the future the actual concern is to develop more ecologically and use ecological materials and techniques to minimize the damage. Strategies that will minimise the flood risk, draught or polluted water bodies. As many studies have shown that not doing anything is not good enough either. Steps should be taken and it should be ecological.

B. Response to waterfronts

Having a waterbody in the city will affect the life of the locals in many ways since it creates a recreational space for the people to reciprocate. People may respond to the waterfront in different ways which is mostly depend upon their individual experience of waterfront or life in general. The waterfront will be an impact on people, social democracy of the city and people's social connections since it will provide a space to be able to connect people to each other.

C. Blue Space

Waterfronts can have an impact on human beings as well as on the ecosystem of that river or lake or reservoir in so many ways. Hence waterfront is something of a public space which is open for everybody, the space which is provided is directly

affecting the whole neighborhood as well as the city's lifestyle. A space for social gatherings and events near the water is something which is aesthetic, pleasing as well as healthy for the public of that city by connecting people with each other. Having a public space such as a waterfront is actually very good for human health as well since the big element of a waterfront is WATER which is soothing as it is, it provides lots of health benefits to the residents that live near it or the public that visits it. The term 'BLUE SPACE' is used when there is a presence of water in a space. Many have studied and have written about blue space and its impact on human body and concluded that urban water features have an impact on our health and well being.

D. Cultural values

In India thing with waterfronts have another aspect to it which is the religious aspect. Indian culture compromises of honoring and believing water bodies as a divine entity which are commonly rivers. The people respect and cherish the water bodies as it is divine to them. For centuries India has given water a different respect and hence has designed according to it. Ghats and kund are major examples of how the people of India has responded and treated waterbodies in the past. One of the examples is the Ghats in Varanasi where the steps leading to the banks of the River Ganges making it a connecting space between the people and the river. The city has 88 ghats. Most of the ghats are bathing and puja ceremony ghats, while two ghats are used as cremation sites. And there are always religious activities happening in almost everywhere in India that may or may not affect the ecological aspect of that particular waterbody.

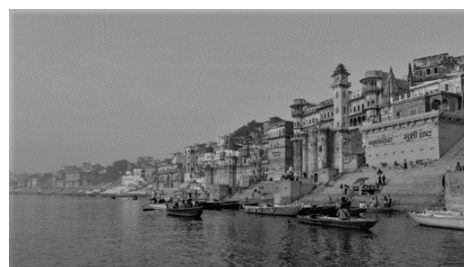


Fig. 3. Photo of Varanasi ghat, Uttar Pradesh, India

E. Floating Island

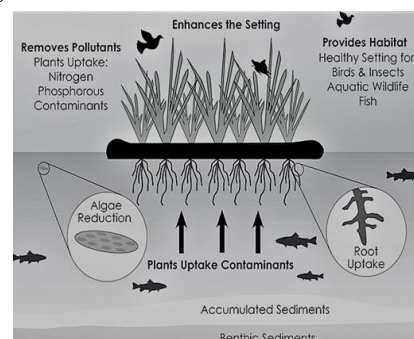


Fig. 4. Iowa state university faculty and students launch water quality pilot project on campus lake

Floating islands are sometimes called man-made floating wetlands or floating treatment wetlands. These islands are made of thick porous mats which floats on the surface of the water with vegetation planted in pre-made holes. These plants grow long roots down below the island. These floating wetlands can help lessen algae by cycling phosphorus and nitrogen. They can reduce total suspended solids which cause cloudy water. The system also automatically filters out pollutants, like metals and particulates. The elimination of contaminants not only improves the water itself, but also helps the waterbody to foster a healthier ecosystem. Clearer water allows light to go through deeper, encouraging the growth of various aquatic plants, which produce oxygen and become part of the food chain, supporting larger populations of fish and other animals. Considering these while developing a waterfront (not streaming waterbody) into the design will improve the water condition as well as will help aesthetic aspect of the waterfront. These floating islands is available and also implemented in few places in India.

F. Design approach

There is already standardized design approach towards an urban waterfront development which is well descriptive. In order to have a sustainable approach towards any design new and smart techniques and methods should be considered. These approaches can be technical as well as social to elevate the process. There are strategies which are very effective and are in practice in India. The basic design requirements for any waterfront is to be accessible, visually accessible, improvement of water quality, protection of the water, provision of promenade, parks, plazas, proper fencing for the security of visitors, vehicular access, parking, service areas, proper lighting, sitting areas and providing specific signages. All these are to develop or to revitalize waterfront and making them accessible to all types of transport like bus, taxi, public transport, pedestrians, cyclists and cars. Since waterfront is divided into different categories having different objectives and segregation of activities for each area therefore particular waterfront should have specific design approach according to its heritage and city’s identity and should provide a range of facilities for the people of the city whether it is residential, business, mixed use or only for recreational purposes.

4. Conclusion

The study has discussed various principles and approaches towards an ecological and sustainable development of waterfronts considering the social and cultural values of India. Since India is developing/growing rapidly with great infrastructural way the country is going to consider some of these approaches in order to develop city or country’s future with also respecting the environment and nature as well as the cultural aspect of that particular city. The identity of that city will be with that waterbody and vice versa. Whether it is river or lake this basic design consideration with is considerate towards nature as well as the people of that particular city thus

creating a vibrant space for the people modifying their lifestyle and health. By the consideration of the effect of ‘BLUE SPACE’ while designing for the people in a particular cityscape. Applying basic design approaches like providing proper vehicular access to the waterfront with sufficient parking space according to the population of that particular city. Provision of public plazas, sitting spaces, and required signages along with the segregated pathways/road network according to the activity desired or needed like cycling, jogging, vendors etc. Having the consideration of the city’s cultural values and aspects along the specific religious activities that are to be done should be segregated with proper area or spaces required for it. Provision of any possible treatment of the pollutant if there will be any from these activities.

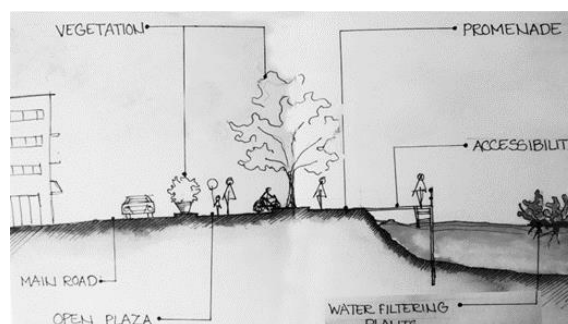


Fig. 5. Vegetation

Creating an individual solution to the specific possible threat of the particular waterbody will be a more efficient way for the revitalization of it. Several passive techniques and design approaches for the purification of water is already there. The floating island with the property of cleaning the water as well as the property of having to be the part of the ecosystem of that waterbody will be an effective way of solving the major problem which consistently has been water pollution and quality thus waterfronts should be designed considering it into the design.

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