

Waterfront Development - A Tool to Restore the Neighbourhood

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Abstract: Water is the most significant planning component that is a comfort for human physical and psychological factors. Water resources that have played a critical role in most parts of the world throughout history in the establishment and formation of the settlements. The waterfront is a place of challenge and prospect. The essential aids and purposes our waterfronts deliver our coastal cities, joined with the reality of climate change, means we merely cannot develop our shorelines as we have in our past. This study attempts to recognize the effects of water as a planning component in urban area. It also attempts to spot out the advantages and disadvantages of urban waterfront regeneration and the principles of successful and sustainable waterfront developments. The study is an effort to articulate planning strategies for restoring the neighbourhood through waterfront development. This was done through analysing the planning aspects using the literature study and case study. Urban planning parameters are selected for framing strategies.

Keywords: Interaction, Regeneration, Sustainable Development, Waterfront Development

1. Introduction

Waterfronts are settlements, civilizations or commercial developments that come up along water bodies like rivers, canals, coastal regions or lakes, acting as lifelines for development of cities. The formation of waterfront is well thought-out as a better commercial idea for converting an else underutilized space into a thriving centre of tourism, culture, leisure and business [1].

The waterfront is a place of challenge and prospect. The requisite profits and functions our waterfronts offer our coastal cities, attached with the reality of climate change, means that we merely cannot develop our shorelines as we have in our past. Waterfront stakeholders should perceive that projects at the edge need to poise and support access, resiliency, and ecology [1].

2. The effects of water as a planning element in urban area

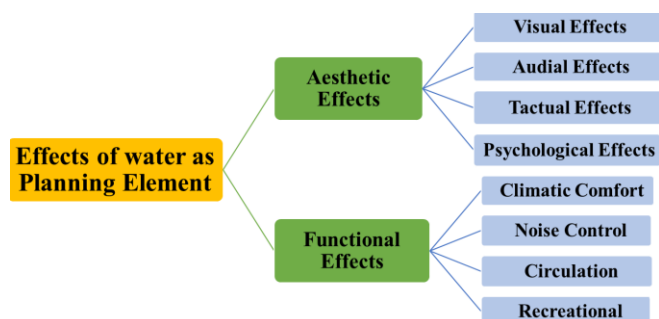


Figure 1: Effects of water as planning element in Urban Area [2]

An equilibrium is to be created between nature and social life for a sustainable development of cities. Urban natural water elements play a crucial role in the creation of this equilibrium. Water is the most vital planning element that is

a comfort for human physical and psychological factors. Additionally, it takes existing environment in a variety of features in term of aesthetic and functional [2].

3. Urban waterfront regeneration

As many of the waterfront development ventures arise in the larger setting of urban renewal, for these projects a number of alternative terminologies are used similar to this phrase. However, most of these ventures focus on the regenerating function. Such terminologies includes “waterfront regeneration”, “waterfront revitalization”, “waterfront rehabilitation” and “waterfront redevelopment”. Similarly, terms that is employed in their development may differ according to study’s limit and as a regional sphere [2].

The attention of waterfront regeneration phenomenon arose from North America in the mid 1960’s, with restoration of Baltimore’s Inner Harbour, a development that altered the degraded harbour zone to an urban leisure centre [2].

The American waterfront revival comprises of mixed uses including residential, recreational, commercial, retail, service and tourist facilities. Mainly residential, recreational and tourist-related uses were usually principal than the others in this model. Also, this mainly turn out to be the characteristic development model within the US and this model was broadly acknowledged by other countries. The experience of American waterfront regeneration, particularly Baltimore’s Inner Harbour regeneration, inclined many in Europe and worldwide. In addition, waterfront regeneration is regarded as a typical catalyst of inner area regeneration for any city or town in the mid 1980-1990’s [2].

4. Benefits and risks of urban waterfront regeneration

Urban waterfront regeneration, that is marvel in global

dimension, have a social, economic and environmental benefits to the community. Bestowing to Papatheochari (2011), Jones (2007) and Goddard (2002), the foremost noticeable benefits urban waterfront regenerations are:

- The rise in real estate property values,
- The conservation historical and local heritage and re-use of historic building,
- The enhancement of water quality and water ecology through innovative management processes,
- Offering of openings for new uses and activities,
- Providing new economic regeneration prospects for deteriorating inner-city areas,
- Attracting tourists not solely at the regional level, however moreover nationally and internationally,
- The provision of many new homes,
- Offering new jobs,
- The upgradation of the environmental conditions,
- The improvement of better services of transport and social service,
- Bringing of relationship between water and the city,
- Encouraging economic investment on tarnished areas,
- With the enhancement of the city's image that results right marketing strategies [2].

Urban waterfront regeneration may additionally have a number of risks and menaces. Those explain as follow according to Morena (2011).

- **Standardization of the Invertensions;** Models can be unrelated with space under assessment. The result often leads to a sort of perplexity where the identity of the place is lost.
- **Little room to real estate logics;** "Sometimes, the ultimate outcome does not match to the project's initial objectives, and therefore 'common good' in terms of spaces, enjoyment and access, is partially ignored in favour of property interests".
- **An excessively commercial-tourist functions;** Domination of these purposes over residential and productive ones are a significant risk. The neighbourhood of residential areas ought to be mixed both functionally and socially.
- **Aim of high profit level;** The achievement of high profit level is considered important rather than the quest for a high quality.
- **Free access to the waterfront;** Access of this areas ought to be free and unselective. Recently, such alteration has formed new prohibitions and new areas earmarked for just a few categories [3].

5. Principles for successful development of urban waterfront areas

Waterfront plans are of vibrant importance to waterfront developments. According to Acosta (1990) while the plan formation, three components are considered: public access, walkways and open spaces; urban design and landscaping; and landuses along the waterbody's edge [2].

The foundation of waterfront regeneration is combined with water and city. So, public access and open spaces more vital

for fruitful development of urban waterfront areas. Approachability of the water is evaluated in three formats: City-waterfront connectivity, inter waterfront zone continuity and waterfront-water connectivity [2].

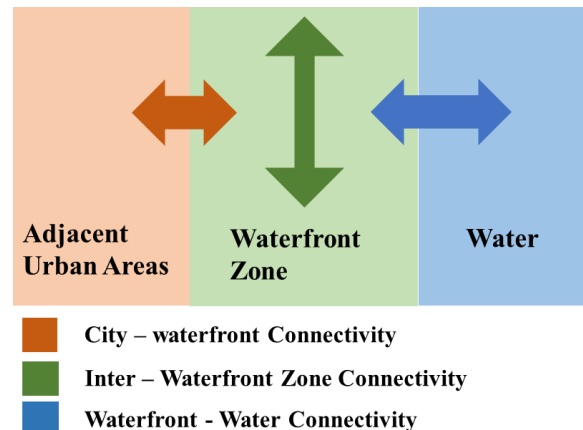


Figure 5: Accessibility of waterfront [2]

Land uses in urban waterfront areas ought to be branded by degree of incorporation with water. During this context water dependency is also significant. Sairinen & Kumpulainen (2006) and Erdoğan (2006), specified that a threefold sorting of it if dependency is possible:

- 1) **Water-dependent uses:** Waterfront location is essential.
- 2) **Water-related uses:** Since in waterfront areas are uses that are in the condition of beneficial.
- 3) **Water-independent uses:** This set uses are neither in need of nor associated to waterfront [2].

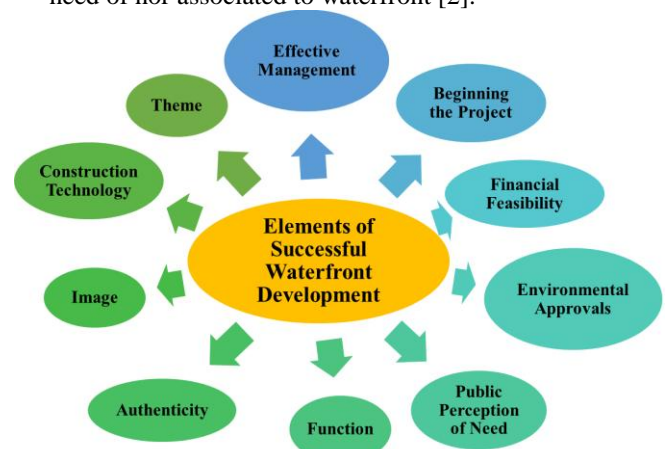


Figure 3: Elements for successful waterfront development [2]

The success of a waterfront development is only attained, once it can operate on all levels and advantage all stakeholders. 10 elements suggested to be taken into thought while planning a waterfront development to accomplish the explicit goals of a successful waterfront development [2].

Elements of Successful Waterfront Development

- 1) **Theme:** Theme is planned in the early stages and primarily to manage future spatial analysis, land use materials, scale and meaning. Resolute with several deliberations; climate, layout, design, land use of development and project's culture and history.
- 2) **Image:** Image might provide a perception of the upcoming waterfront project, and good images have become standards for other projects.

- 3) **Authenticity:** Sustaining authentic values within the waterfront area and areas encompassing them is imperative for a fruitful waterfront project.
- 4) **Function:** Pedestrian access to dynamic outdoor eating areas and recreation centres gives visitors the opportunity to appreciate the water environment, along with suitable services for residential and working districts.
- 5) **Public perception of Need:** The blend of theme, image, authenticity, environmental and financial should contain public consideration to evade environmental problems.
- 6) **Financial feasibility:** A waterfront is considered feasible once it is bundled, designed, promoted, managed and operated efficiently. The key vital is a waterfront concept that leads the financial valuation, not the reverse.
- 7) **Environmental Approvals:** Inter-agency meetings are essential chronologically to regulate the environmental effect of the waterfront development. Consent from numerous agencies is required.
- 8) **Construction Technology:** Use cost-effective and environmentally friendly materials for construction.
- 9) **Effective Management:** Proper management should embody a variety of different sources of expertise, and synchronization between them is very imperative – no matter whether for public or private waterfront development.
- 10) **Beginning the project:** Combining all the elements listed above will effect in an inclusive, balanced and self-contained waterfront project. Plan an opening celebration; celebration demonstrates an obligation to the development [4].

6. Principles for a sustainable development of urban waterfront areas

Water is elementary source of life for the living. At the same time, it is an ecological, economic and social advantage for the cities. Areas that seen these advantages are waterfronts. To be benefited from those ought to be supplemented sustainable developments in these areas [2].

Sustainability is assessed in three dimensions: economic, environmental and social. These three dimensions should be combined at all levels. Giovinazzi & Moretti (2010) specified the 10 principles for a sustainable development of urban waterfront areas [2].

Principles for a sustainable development of urban waterfront area were described as follow.

- 1) Protect the quality of water and the environment
- 2) Waterfronts are portion of the prevailing urban fabric
- 3) The historic identity provides character
- 4) Mixed use is important
- 5) Public access is a necessity
- 6) Public participation is a component of sustainability
- 7) Waterfronts are long term ventures
- 8) It necessitates a multidisciplinary work
- 9) Look beyond the boundaries
- 10) Flexibility of Masterplans [5].

7. Case Study

The paper recognizes waterfront developments which are experiencing post-industrial regeneration, in parallel with additional awareness of the necessity for environmentally sensible development of waterfront areas to reinstate and reinvigorate ecological balance - it is apt to scrutinize the dynamics of these developments among the region on a comparative time-scale [6]. Case studies are chosen to learn from the successful waterfront revitalization plans.

7.1 Louisville, USA

Louisville is the sixteenth largest city in the United States with a population of 256,231 (US Bureau of Census 2000). It is situated on the banks of the Ohio River [7].

In Louisville, the Ohio River had been cut-off from the city for many years. Highway construction, particularly an elevated freeway, high-speed roads, railroads, and semi abandoned industrial land reduced the river both unapproachable and invisible. The waterfront was not a prevalent site for community residents and buildings along the riverfront were built without bearing in mind the ecological requests of the river or its aesthetic value. The recognition of the significance of the river and its ecosystem to the city led to the formation of a plan for the Ohio River [7].



Figure 4: Polluted Ohio river in Louisville [7]

Plan and Implementation

The state, county, and municipal governments decided to envoy waterfront development to a single-purpose not-for profit corporation. Citizen participation in planning also played a crucial role in the park's success. Staff of the City of Louisville and the Waterfront Development Corporation created hundreds of presentations and conducted regular public discussions on the way to creating a plan [7].



Figure 5: Riverfront Biking & Jogging trails [7]

The goal was to remodel the waterfront into a vivacious, dynamic space that would be not solely a public park, but also an economic development tool for attracting new business and residential development. 55 acres of parkland on the Ohio River was formed in Phase I of Louisville's Waterfront Park at the rate of \$58 million. The land had traditionally been used for industrial and transportation associated purposes and was edged by an elevated interstate highway and rail yards. The whole 72 acres had to be remediated and the list of pollutants was huge, found mainly in the soil but also in some groundwater contamination, as the project confronted the challenge of being situated in a flood plain. The unpredictable nature of the river had to be taken into consideration when deciding how to develop the land [7].

The park links downtown Louisville upstream to a wharf and festival plaza, the Great Lawn, a boat harbor, and a children's play area. Additional 30 acres of parkland directly east of the prevailing 55-acre first phase was added in Phase II. One of the most uncommon elements of the park development was the Big Four Walkway – an abandoned railroad bridge that links Kentucky with Indiana, to be transformed for use by hikers, joggers, and cyclists and connected to a regional pathway network [7].

Influence of the Plan

The park has accommodated 1.4 million guests per annum since its commitment in 1999, and its design has been known both nationally and internationally, captivating a numerous prestigious award. In 1986, before the Waterfront Development Corporation was shaped, there were 18 businesses in the Waterfront neighborhood, employing 350 people. Currently there are more than 23 businesses paying 5,300 people [7].

The Waterfront Park has been a motivation for several new visitor attractions in the area, including the \$39 million Louisville Slugger Field, that depicts 13,000 seats, 22,000 square feet of restaurant/retail space and a historic façade. A estimated 1.25 million individuals visit Waterfront Park each annum for concerts, fireworks shows, festivals, and general recreational uses. The minor league baseball stadium has taken in an estimated 668,000 individuals per annum in the two seasons it has been open. Waterfront Park has become the central civic space that Louisville had long lacked. The park is additionally stuffed with events, about 120 a year [7].

7.2 Marina Bay, Singapore

Marina bay is the area where the Singapore River meets the sea. The developments at the Marina bay area comprised progressively converting the area into a world class CBD with numerous major reclamations changing the profile of the bay [6].



Figure 6: Marina Bay District Then & Now [8]

Starting in the 1880s, there was substantial traffic on the Singapore River because of rapid urbanization and escalating trade. It brought in water pollution triggered by the dumping of garbage, sewage and other by products of industries located along the river's banks. The mouth of the Singapore River was the old Port of Singapore, being naturally protected by the southern islands. Traditionally, the city of Singapore primarily grew around the port so the river mouth turned out to be the centre of trade, commerce and finance. To the present day, area around the old Singapore River mouth, the Downtown Core, remains the utmost luxurious and economically significant piece of land Singapore [9].

Plan and Implementation

The modern vision for Marina Bay is to convert it into an global recreation centre. It will be a high-quality, live-work-play atmosphere, one that captures the spirit of the international city, Singapore. The Master Plan for Marina Bay emphasizes on inspiring a mix of uses (commercial, residential, hotel and entertainment) to guarantee that the area remains lively around the clock. The concept of 'white' site zoning also offers developers extra flexibility to adopt on the mix of uses for each site, including housing, offices, shops, hotels, recreational facilities and public areas [6].



Figure 7: Gardens by the Bay [8]

The previous mouth of the Singapore River has been reworked from an operating waterfront through retrieval and place-making to the current and future leisure and cultural landscape of Marina Bay, with the intention also visibly modify the image and implication of Singapore's waterfront [6].

Marina Bay Sands offers a completely new urban experience. Its organization around two principal axes provides the complex a logic of orientation, placing prominence on the pedestrian and civic life in the background of a mega scale structure that comprises a diversity of uses – convention, museum, theaters, casino, promenade, hotel, and tourism. It has the logic of all the formalities of urban activities. A sequence of layered gardens delivers sufficient green space throughout Marina Bay Sands, spreading the tropical garden landscape from Marina City Park towards the Bayfront. The landscape network strengthens urban links with the resort's surroundings, and each level of the district has green space that is accessible to the public [9].

Influence of the Plan

New mega events held at Marina Bay draw worldwide crowds and uphold Singapore's position as a global city. The new Marina Bay as well claims new iconic structures and brand-name architecture that perceptibly alter the landscape of Singapore's urban waterfront, that fascinate several foreign buyers from China, Hong Kong, Indonesia, Taiwan and India. The expected high-rise, premium offices and residences in addition to high-end leisure-oriented facilities and open spaces are inclined to put right on the city's ambitions to global business and finance, besides a world-class leisure and entertainment destination [6].

The conversion of Singapore's urban waterfront is incredibly a product of the government operating fruitfully with the markets. In several ways, this partnership is established in the Government Land Sales program, with the government offering direct public infrastructure and a pure, transparent outline for the development in the form of land sale conditions and tender process. For its share, the private sector provided the creative proficiency and financial capital [10].

What distinguishes Singapore's cohesive planning regime from other cities is that its plans do not exist simply on paper. They are coordinated, implemented and executed efficiently through devoted government agencies, with attendant skill and resources [10].

8. Analysis

The aims of waterfront revitalization plans comprise a variety of aspects for various cities. Since the key issue of waterfronts was the stigma of dilapidated, neglected and polluted sites, cities took the initiative of an environmental cleaning program as the first step in the process of restoring their waterfronts.

Many waterfronts were detached from the city as railroads and highways were constructed for transportation or floodwalls were erected to protect the city against the floods in the waterbody. Connecting the waterfront with the central business district or other recreation areas in the cities was thought of imperative so as to encourage individuals to visit the waterfront.

Accessibility to public was recognized as an significant characteristic for revitalization of Louisville's riverfront. Louisville stressed the formation of parks, open spaces and recreational activities at the riverfront for the public. These initiatives facilitate cities develop a consciousness of the natural aspects of the river.

For Marina Bay, even though the development planning and sales of sites were handled by a government agency, developers were given the chance to propose feasible projects on "white" sites – sites that do not have a previous density or usage allocated. Concepts competitions were also conducted for sites reserved for residential development. The planning authorities of Singapore had protected public access to the water's edge through cautious urban design guidelines and conditions of sale hooked up to the waterfront sites tendered in the Marina Bay development.

The case studies prove that passionate and determined, public and/or non-profit development agencies at work with the city establish the appropriate and synchronized processing of a waterfront revitalization project.

Spatially, new waterfront developments, even though superficially stand-alone new developments with their own urban core, a dialogic association with the old city core, with good transportation networks linking both appeared to be a feature of the waterfronts studied here. The new developments incline to be morphologically discrete from the old urban cores, however play harmonizing roles within the cultural identities of the city.

Public areas and accessibility of waterfront to public has perceived substantial overall improvement in these projects to varying degrees. An area that remains to be assessed in time would be the degree of integration of these new areas with existing social and cultural areas in the city.

On the environmental front, these new waterfront ventures are usually preceded by the clear-out and shipping out of polluting industries. These are vital in place-making and marketing, and in encouraging the image of the new waterfronts.

9. Strategies

1) Public awareness & Participation

Before the real planning process begin, it is important to make individuals aware of the inevitability of revitalization. This will facilitate create a curiosity and emerging a consensus for the project. Citizen and non-profit groups are inspired to come forward and take part in the planning process and also perform as a link between the public and private sectors.

2) Upgradation of existing infrastructure

The local governments ought to build efforts to develop and upgrade existing infrastructure and support in land assembly. These responsibilities are out of the scope of private developers for the high costs associated. These government initiatives encourage private efforts and investments in the revitalization process.

3) Public Access & Interaction:

Augment physical, visual, and psychological access to the water. Make new public access or maintain and expand prevailing public access at the water's margin. Refrain from building walls or other barriers to access. Water is a public resource for all. Look for and boost functional and meaningful community input precisely relating to the waterfront aspects of the project. In order to decide the necessity for and viability of water-dependent facilities, evaluate currents, water depth, susceptibility to wakes, waves and storm conditions, vessel traffic, ecological problems, and regulatory requirements.

Construct a pier or renovate an existing pier on site that is open and accessible to the public. Augment connections

between adjacent properties by orienting existing and new pathways along the shoreline to produce a continuous and accessible edge. The utmost significant initiative in attracting crowds to the waterfront is developing new access and enhancing existing ones.

4) Mixed Use Development:

The interdependence of various land uses generates a lively and 24-hour waterfront. Recreational, commercial, retail, residential and institutional activities together aid the purpose of offering alternatives for individuals to come to the waterfront for enjoyment, work or stay.

5) Recreational Facilities:

Recreational activities are indispensable part of any waterfront revitalization plan as they can be very well planned and executed in the open spaces in the flood zones. Activities at the waterfront and in the water entertain individuals by providing options for active and passive entertainment. They result in the required resonance and sparkle at the waterfront.

6) Heritage Conservation:

Preserving historic buildings at the waterfront facilitate to create the character of the waterfront. It encourages tourism and cultural values of the place. The adaptive reuse of buildings aids in their consistent maintenance. It additionally benefits in procuring special grants and incentives for renovating and rectification of the building.

7) Architectural Character:

While it is necessary that new buildings and alterations be compatible with the traditional background, they should not imitate older building styles. New construction should be stylistically unique from historic buildings. It should uphold a comparable scale and also comprise character-defining features compatible with traditional buildings.

8) Economy Generating Activities:

Vast investments like aquariums, museums, and convention centers produce anchor activities. These attractions contribute towards creating the businesses, retail and tourism related activities feasible. These investments are attractions for individuals all over the globe and not only for specific region or city.

9) Edge Resiliency:

Evaluate waterfront edge conditions to determine suitable design. Design waterfront edge for climate conditions projected for the horizon period. Reinststate or replicate a natural feature along at least 25% of the shoreline.

10) Enhance Ecology:

Conserving and enhancing the natural environment is indispensable to avoid any further environmental degradation of waterfronts. Awareness regarding the preservation of the ecosystem makes it a healthy place for recreation and public use. Environmentally sound sites reassure development by private sector developers for business and residential purposes.

11) Public Private Participation:

Partnership of the public and private sectors is critical to accomplish the goals of revitalization. Efforts ought to be taken by the planners to house both private and public sector roles in their plan. Clearly delineated roles help avert an overlap of efforts and guarantee smooth progress of the project. Incentives should be given to the private developers through tax abatements, tax increment financing and bonds. This is also supported by developing a non-government agency to organize the activities between public and private sectors.

10. Conclusion

The study was an effort to frame planning strategies for restoring the neighborhood through waterfront development. This was done through analysing the planning aspects using the literature study and case study. Urban planning parameters are identified for formulating strategies. With a revitalized waterfront, downtowns gain liveliness and a lot of businesses get attracted in establishing at the waterfront. The vitality is restored due to more people visiting the waterfront during evenings and weekends. These projects also fetch in money from various places with a rise in tourism activities.

Strategies are generalized to such a level that it can be applied to any waterfront without any major changes and maintaining the elementary structure. Waterfront regeneration of cities at the bank of a waterbody is an outstanding tool for restoring the character of the central core. Enhancing and reutilizing the waterfront best aid the purpose of improving cultural values and rejoicing the history of the city. Revived waterfronts function as the community's living room and provide a congregational place at the scale of the city.

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