International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 05 | May - 2023 SJIF 2023: 8.176 ISSN: 2582-3930

# CRITICAL ANALYSIS OF RIVERFRONT DEVELOPMENT

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## Abstract

Riverfront development projects have gained significant popularity globally, aiming to transform urban river areas into vibrant public spaces. While these projects often promise economic growth, environmental revitalization, and enhanced community well-being, their effectiveness and sustainability warrant critical examination. This paper presents a comprehensive analysis of riverfront development initiatives, focusing on their impacts, challenges, and sustainability aspects.

The paper employs a multi-disciplinary approach, incorporating urban planning, environmental science, and social sciences, to critically assess riverfront development projects. It explores the economic, environmental, and social impacts associated with these initiatives, considering both positive and negative outcomes. Furthermore, it highlights the challenges and limitations that arise during the planning, design, and implementation phases of riverfront development.

Sustainability emerges as a key consideration in this analysis. The paper examines the long-term viability of riverfront development projects in terms of ecological integrity, resource management, and resilience to climate change. It investigates the role of stakeholder engagement, inclusivity, and governance in achieving sustainable outcomes and avoiding unintended consequences.

By critically evaluating case studies from different regions, this paper provides valuable insights into the complexities of riverfront development. It identifies common pitfalls, such as displacement of vulnerable populations, gentrification, and loss of cultural heritage, and offers recommendations for addressing these issues. Moreover, it discusses innovative approaches and best practices that promote sustainability, community participation, and the preservation of natural and cultural assets.

The findings of this study contribute to a more nuanced understanding of riverfront development and its implications for urban areas. The analysis emphasizes the need for holistic and integrated planning, involving diverse stakeholders and considering long-term environmental and social impacts. The paper concludes by proposing a framework for sustainable riverfront development that balances economic development, environmental conservation, and social equity.

# 1 INTRODUCTION

Riverfront development is a settlement, or commercial developments that come up along water bodies like rivers, coastal regions or lakes, acting as lifelines for development of cities additional buffer, creating a non-residential zone between the river and homes in the area around it.

These spaces are essential to a city's development because of their many benefits. First is the environment advantage and human health. Riverfront green spaces can provide clean recreational places for people, especially for efficient use in urban downtown area. Second is their promotion of urban economic development. As the geographic center of a city, urban riverfronts are often nearest to all residents. They are among the best places to gather people together, and prepare for the city's commercial development.

People in cities wants a riverfront as a place of public enjoyment. They seek riverfront where there is enormous visual and physical eye catching sites remain all day the throughout. People also want riverfront to serve many purposes and a place that contributes to the quality of daily life in all of its aspect-economic, social and cultural.

**AIM**

The aim of the paper is to provide a comprehensive and critical analysis of riverfront development initiatives, assessing their impacts, challenges, and sustainability aspects. By examining case studies, identifying common pitfalls, and proposing best practices, the paper aims to contribute to the understanding of riverfront development and promote informed decision-making that balances economic, environmental, and social considerations.

**OBJECTIVE**

- To examine the impacts of riverfront development on the economic, environmental, and social aspects of urban areas.
- To identify and analyze the challenges and limitations associated with riverfront development projects.
- To assess the long-term sustainability of riverfront development initiatives, considering ecological integrity, resource management, and climate change resilience.
- To explore the role of stakeholder engagement, inclusivity, and governance in achieving sustainable outcomes in riverfront development.

- To critically evaluate case studies from different regions to identify common pitfalls and unintended consequences of riverfront development.
- To provide recommendations and best practices for addressing challenges and promoting sustainable riverfront development.

**SCOPE**

The scope of a paper on the critical analysis of riverfront development can encompass various aspects, including but not limited to:

- Economic Impacts: Assessing the economic benefits and drawbacks of riverfront development, such as job creation, tourism revenue, property value changes, and impacts on local businesses.
- Environmental Impacts: Examining the ecological consequences of riverfront development, including habitat destruction, water quality changes, biodiversity loss, and the alteration of natural processes.
- Social Impacts: Analyzing the social implications of riverfront development, such as displacement of residents, changes in community dynamics, impacts on cultural heritage, and the accessibility and inclusivity of public spaces.
- Governance and Planning: Investigating the role of governance structures, policy frameworks, and planning processes in riverfront development, including the involvement of stakeholders, decision-making mechanisms, and the effectiveness of regulatory measures.
- Sustainability and Resilience: Assessing the long-term sustainability and resilience of riverfront development projects, considering factors like climate change adaptation, resource management, green infrastructure, and the promotion of sustainable practices.
- Case Studies: Examining specific riverfront development projects from different regions to provide real-world examples, evaluate their outcomes, and draw lessons learned for future initiatives.

# 2 CASE STUDY

## SABARMATI RIVERFRONT DEVELOPMENT

Sabarmati river has been an integral part in the life of Ahmedabad since the time the city was founded in 1411 along the river banks. It provided a backdrop to cultural and recreational activities. During the dry seasons, the

river bed became a place for farming. With time it also offered place for various informal economic activities, and the river banks were used by informal squatter settlements. There had been a long-standing acknowledgement that the riverfront could be turned into a major urban asset from its undesirable state. Proposals to achieve the same have been made since the 1960s and it was finally in 1998 that this multi-dimensional project was envisioned and undertaken by the city.

The project has provided Ahmedabad with a meaningful waterfront environment along the banks of the Sabarmati River and to redefine an identity of Ahmedabad around the river. The project has reconnected the city with the river and has positively transformed the neglected aspects of the riverfront.


Ahmedabad Since ancient times, Ahmedabad has been a wealthy city. Currently, Ahmedabad is a major industrial and financial city also is considered the commercial capital of the state of Gujarat. Gujarat has experienced a rapid growth of population which is much higher than that of the country in unison since the beginning of the 20th century, which can largely be attributed to a high rate of immigration. Ahmedabad is located in one of the highly industrialized and urbanized parts of Gujarat State. It is the seventh largest metropolis in India. Ahmedabad has a citizenry of 5.8 million in the municipal area and 6.3 million in the urban area in 2011 and is the seventh largest metropolis in India and the largest city of Gujarat State

The Sabarmati is a very specific element in the city's framework. Broadly speaking, there are three distinct, historically grown areas – or cities – in which Ahmedabad is segmented: two are located east of the river and one west. There is

1) the dense, historic old town on the eastern banks, which is surrounded by
2) the industrial city stretching to the eastern periphery
3) the new city, which lies on the west of the river.

Provision of Socio-Cultural Facilities

It provides new and improved facilities for the city and to include sections with particular needs, provision of markets and vending areas to include street vendors, laundry facilities for the washing community, trade and fair facilities for the business community have been made in the project. The project replaces a largely private riverfront with an expansive public realm with a network of parks, waterside promenades, markets, cultural institutions, recreational facilities and commercial developments for the city's five million residents.

The significant facilities that have been provided in the project are:

- Riverfront Market
- Laundry Campus
- Events Ground
- Exhibition Centre

**ENVIRONMENTAL IMPROVEMENTS**

Strategies for overall environmental improvement have been formulated to achieve the following objectives:

- Reduction in Erosion and Flood
- Sewage Diversion
- Water Retention and Recharge

**Reduction in Erosion and Flood**

Strategies for flood protection, bank protection, and river training have been formulated based on detailed hydrological and hydraulic analysis. An optimal width of 263 meters for the water way has been selected and implemented. Both banks of the river have diaphragm walls built into the riverbed at a depth of more than 10m, and retaining walls which protect low-lying areas from periodic flooding and prevent erosion of the river banks. The Sabarmati has been channelized to a constant width without altering the flood carrying capacity of the river. Now the project can sustain flood levels of 4.75 lac cusecs without spillage into the city.

**Sewage Diversion**

To stop the pollution of the river from the storm water outfalls and industrial effluents, an integrated storm water and sewage system with interceptor sewers has been implemented. These interceptor lines have been installed along both banks of the river capturing 38 sewage discharge points and routing the sewage with new pumping stations in the reclaimed banks. These lines carry untreated sewage to the recently augmented sewage treatment plants south of Vasna Barrage.

**Water Retention and Recharge**

Sabarmati is not a perennial river, a comprehensive strategy to manage and maintain water in the river throughout the year has been worked out. Water retention in the river shall enable recreational activities as well as recharge the groundwater.

As Sabarmati is not a perennial river, a comprehensive strategy to manage and maintain water throughout the year in the river has been worked out.

The Vasna Barrage, located just downstream of Ahmedabad, makes it possible to retain water for 15 kilometers upstream, the entire length of the river within the city. The Narmada Canal, which crosses the river a few kilometers upstream from the city, makes it possible to replenish the barrage-retained water that is used up for irrigation or is lost to evaporation and seepage.

A more sustainable alternative is undergoing planning to use treated water from the sewage treatment plants to replenish the river. Hence, the traditionally monsoon-fed Sabarmati shall be able to hold and replenish water year-round. Water retention in the river enables recreational activities as well as groundwater recharge.

**Design Elements**

The design elements, trees and lamps, which are endlessly repeated following a perfect order, create an image of a geometrically constructed and dominated landscape. Seen from up close, however, one cannot avoid feeling a certain boredom when confronted with the high redundancy of the space, which seems somewhat oversized for a pedestrian. Walking on this urban landscape, which perspective this space might have been created. At a certain point of my research, I even bought a bicycle in order to cope with the enormous dimensions of this space – and became a delinquent by using it on the Riverfront.

## Case study 02 - Springfield Riverfront, USA

The City of Springfield, Massachusetts is one of the largest cities in western Massachusetts, and was established on the Connecticut River for trading and as a fur collecting post. In 18th and early 19th century, it experienced an industrial boom and became a regional financial center. Springfield became a major railroad center and grew to become the regional center for banking, finance, and courts. However, in mid-19th century Springfield suffered due to the flooding of the Connecticut River and the disinvestment in industry. These resulted in an urban sprawl as people started moving away from heart of the city.

**River Access & Ecological Function**

River Access & Ecological Function Limited access to and awareness of the river within the surrounding neighborhoods and the city translates into the loss of a tremendous ecological, recreational, and cultural resource for downtown Springfield. The river functions to divide, rather than unite, the urban fabric. The consequences of the river's problems are profound and impact the Connecticut River watershed as well as its immediate environment. The heavily urbanized and ecologically unhealthy confluence with the Connecticut is one example of the severe restriction of both ecological function and human access. Restoring the Lower Mill's ability to treat surface run-off and function as an effective tributary to the Connecticut would positively impact both rivers and their watersheds.



Springfield sits on the bank of the Connecticut River, just a few miles north of the border between Massachusetts and Connecticut. The city is most commonly known as the birthplace of basketball. It also used to know by its nickname 'The City of Homes' in the 18th and early 19th centuries. The purpose of establishing the city of Springfield was for trading and as a fur-collecting post. Springfield's location at the crossroads of New England is the most significant reason for its progress and continuing economic success in the 18th century.6 The Connecticut River served as an easy and economical means of transportation north and south for early settlers. Midway between New York and Boston and on the road between New York and Canada, Springfield is ideally located for travel in all directions. The United States Armory was located here in 1794 due to location and technological advancements, particularly in metal crafts. The city gradually grew into a thriving industrial community through the establishment of mills of all varieties.

**Parks and Open Space**

Most areas of the four neighborhoods of the Lower Mill River are moderately well served by city parks and open space, however connectivity, access, and maintenance are continuing problems for all of the neighborhoods. Forest Park, a major recreational destination located on the southern edge of the Forest Park neighborhood, serves the neighborhood but also the City of Springfield and the entire Western Massachusetts region. Neighborhood parks along the Lower Mill River, such as Harriet Tubman Park, the Oakland Street Park, and Johnny Appleseed Park are important resources that receive varied levels of maintenance and use.

**Environmental concerns - Water quality of the River near the City**

Springfield's riverfront holds enormous potential to become a central focus of the region's urban life through the development of river oriented attractions like boating, kayaking, fishing, river beach for swimming and recreation. But to develop these amenities, the water quality of the Connecticut River near the city is not very suitable due to Combined Sewer Overflow (CSO) system. CSO is an old sewer collection system that was designed to carry both sewage and storm water in the same pipe. When there is not a lot of storm water, this class does not allow swimming and fishing activities due to the high bacterial percentage, which can cause diseases. Sometimes it also generates a bad odor as human waste get mix into the water during heavy rainfall. However, in the dry and sunny weather water is good for activities like boating and kayaking.

## Case study 03 - The Hangang

The Hangang, about 500km long, is the largest and longest river in Korea. North and south Hangang in the upstream merge into one in Gyeonggi Province and it flows to the West Sea. The river crosses the center of Seoul from east to west, streaming along 41.5km. In Seoul, the total surface area of the river is 40㎢, comprising about 7% of the city. The Hangang itself is Korea's history and life. in the present, as well as the past, Koreans have lived with the gently flowing the Hangang at the heart of their lives. And now Koreans will be able to live in an environment with a more beautiful, more enriched, and more pleasant Hangang thanks to the Hangang Renaissance Project. The Hangang Renaissance is a new chapter in the long history of this river and create a new brand of Seoul as a world-class green city by discovering the river's potential values and infinite possibilities.

**Enhancement of the Natural and Built Landscape**

The Hangang Renaissance Project is power to change the Hangang and also city of Seoul. The project, which started by reflecting on the modernization process, is designed to resolve the Han's problems and prepare a cornerstone to transform the river into a hub for the development of Seoul that meets our era of change. In other words, the Hangang Renaissance Project sets out to achieve Seoul's urban innovation by recognizing the river as Seoul's major ecological and cultural resource and focusing on it as a significant growth engine. At the same time, the project focuses on restoring the intrinsic functions of the Hangang as the way to revitalize the Hangang most effectively. The goal is to restore its boundless utility, which has been on display throughout its long history.

Changes of the Hangang is modern, but not harmful to nature The Hangang Renaissance Project has modernized the city's infrastructure along the river so that people can enjoy waterfront spaces more safely and conveniently. Outdated and decrepit facilities has been renovated or changed into completely new ones. The project is not only modern but also eco-friendly. Every process of the project has been carried out within a boundary that it must not ruin nature and ecological system in any circumstances. The Hangang Renaissance Project seeks to restore the damaged relationship among people, water, and nature. under the one of its primary goals, "Restoration", the project enables citizens reach more closely to the Hangang and have a new understanding the river's value.

**Riverside parks**

The appearance of Seoul has been transformed, propelled by the metamorphosis of the Hangang. First of all, twelve riverside parks alongside the Hangang will have been reborn as premier cultural spaces with respective themes. It is all designed in consideration of the land-use situations of the hinterland areas and citizens' patterns of park use. In 2009, first four parks out of twelve reopened after two year-renovation process; those are the Banpo, the Yeouido, the Ttukseom, and the Nanji Hangang parks. Furthermore, all of three ecological parks were just completed when the Yeouido Saetgang(small river) Ecological Park opened last May. The Gangseo Wetland Ecological Park and the Amsa Ecological Park previously opened in Dec 2009. Each park has been uniquely designed to promote development appropriate for themes considering the land use of hinterland areas, economic and cultural values, and potential. In the result of that, the Hangang's riverside parks are fostered into hubs of culture, tourism, and leisure, equipped with spaces open to the waterfront and landmark buildings in harmony with the river. For example, the Yeouido Hangang Park is a core business and cultural area and is created as the Hangang's representative park. A 2km section created by piling up earth through the improvement of the cross-sections of embankments will be utilized as premium and high-quality cultural space. It is a space equipped with a remarkable "floating stage", which accomplishes a beautiful scenery by itself, pleasant cafe and activity space where events take place on an ongoing basis. It is also made in harmony with the nearby the Yeouido Saetgang(small river) Ecological park.

**Concrete Revetments to be Natural Revetments**

The Hangang Renaissance Project has removed the concrete revetments of the Hangang, which are regarded as a by-product of the city's expansion and rapid growth, and experience nature itself. The revetments that have been built along the Hangang has been changed into natural streams. It is planned that the ratio of natural revetments, which was no more than 14% of current the total in 2008, will be gradually increased to 87%(72㎞ out of 82㎞) by 2014. The 21㎞-long natural revetments were completed in Dec. 2009. Also, the shape of the revetments will vary, depending on hydraulic characteristics and conditions of embankment spaces. Most of them, with the exception of cases where the width of embankments is narrow, will be created in the shape of gradual slopes. Through such efforts, the living environment for fish and aquatic plants in the Hangang will be improved and they will also be transformed into a waterfront space which people can enjoy and experience more intimately.

**Ecosystem Preservation Area in the Hangang**

Seoul has tried to hard to restore and recover the deteriorated nature in the city. As a part of this effort, the Bamseom(the Bam islet) was designated for the ecosystem preservation areas by the Seoul Metropolitan Government in 1999. A pair of uninhabitable islests, The Bamseom is valuable as the only habitat of migratory birds in the center of downtown. About 70kinds of 3,000 migratory birds visit this islet, 273,503㎡. Also a part of the Amsa and the Godeok Hangang parks has been preserved as a ecosystem and landscape conservation area. Especially, the Godeok Hangang Park is registered for the green belt, and water source reserve area, so it has been remained in a fine state of nature.

**Designation for conservation area and applying integrated system for managing**

Three part of the Hangang parks have been designated for the nature conservation area and managed with the integrated system by the "Nature Conservation Law". Around the Hangang, there are three areas protected by the law and they are The Gangseo Wetland Eco-Park, the Amsa Eco-Park, and the Bamseom.

**Fish Friendly**

Fish way (Underwater-Weir) to be Made With the scale of 4m in width and 228m in length, the Fish Way helps the weak fishers to jump up to the high stairs of underwater-weir to go up-streams of river along this way, their movements becomes an attraction to many citizens visiting this place.

**Water Friendly Revetments**

Water Friendly Revetments to be Made Steep slope of the concrete revetments has been transformed into water friendly revetments. It updates the scenery and also makes people be closer to the river.

**Planting Trees**

Planting Trees and Plants Produced in Our Own Parks Trees and plants filling in eco-friendly parks has been produced also in other Hangang parks. It resulted in curtailment of expenditure about 152million when buying trees and plants and the project of building eco-friendly parks was completed faster than expectation. The total area of planting fields is 25,700㎡ in the five Hangang parks. Also, total 54,097 unit of eleven kinds of trees and plants like willow, metasequoia, lawn grass, and so on, had been planted and moved to four eco-Hangang parks.

**Community Participation and Empowerment**

One of the Hangang Renaissance project's values is communication. So we have provided many kinds of opportunities for the public to participate in the decision making process. People from all walks of life have taken part in the various processes of - 17 - project and many of their opinions were reflected positively.

Ecological Parks The ecological parks that have been established around the Hangang were meant to restore the local ecosystem to its original state. Many trees were planted in these ecological parks, which makes the air of Seoul fresher than ever. Here, citizens are able to commune with nature and enjoy taking a stroll and exercising. We initiated ecological educational programs for the whole family but that specifically furnished children with the opportunity to learn about the wonders and preciousness of nature.

**Strategic Planning**

The Hangang Renaissance Project is a macroscopic, long-term comprehensive plan to comprehensively transform the appearance of the Hangang. It is a plan that reflect the city's future vision to become a sustainable city. The plan is alive. It will evolve and will be modified continuously. Until now, the Hangang Renaissance Master Plan has enhanced its substance and heightened the comprehensiveness of the plan through the collection of various opinions and by making the plan open to public debate through the Hangang Renaissance Citizens' Committee, international symposiums, and briefing sessions for residents. In order to ensure the successful implementation of the plan, a comprehensive and collaborative system involving the central government, local governments in

the Hangang areas, and related academic institutions should be established. As a parallel effort, various institutional frameworks will be sought to elicit brisk investment by the private sector to minimize the financial burden on the city government. The Hangang Renaissance Project will be implemented in a phased manner in consideration of the city's financial constraints, economic investment impact, technical feasibility, social and cultural conditions, and land-use situations of the hinterland areas of the river.

**Public involvement**

The Hangang Renaissance Project involves citizen participation in the process of implementation. For example, in April, we arranged the planting of trees in the ecological parks by the united efforts of officials and citizens together and sometimes we carried out a cleaning campaign involving volunteers from all walks of life.

# 4 Successful Riverfront Regeneration

Successful riverfront regeneration refers to the revitalization and transformation of urban river areas into thriving and vibrant spaces that benefit the surrounding communities and the environment. It involves a holistic approach that integrates economic, social, and environmental considerations, aiming to create sustainable and resilient urban spaces.

Key elements of successful riverfront regeneration include active stakeholder engagement and participation. Involving community members, local businesses, and relevant organizations from the planning stages ensures that diverse perspectives are considered, and the project aligns with the needs and aspirations of the community. This inclusive approach fosters a sense of ownership and pride among residents.

Preserving cultural heritage is another vital aspect. Riverfront areas often have historical and cultural significance, and successful regeneration projects find ways to honor and integrate these elements into the design and development. This can include the restoration of historic buildings, incorporation of public art, and programming that celebrates local traditions and events.

Each project is successful in a specific area according to its concept and was awarded in a view of that. For example, Sabarmati the closest example to Cairo’s context, was awarded the HUDCO National Award for innovative infrastructure development for the Riverfront Project in 2012, as well as the Prime Minister award for the best concept and design of a public project and the most significant award, the USP prize of landmark project.

Finally, and Hangang is a unique example of a regeneration over a long period of time. Some differences were obvious between the projects, the Manzanares uniquely states the importance of moving away the roads and conserving historical structure, Sabarmati tackles the issue of enhancing the informal economy, however generally most principles were aligned.

***Table: Successful Riverfront Regeneration Examples***

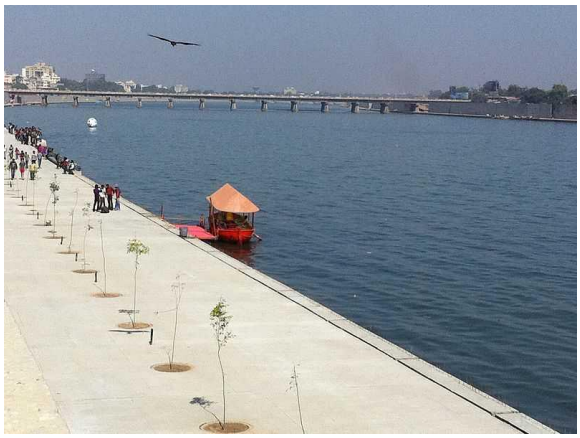
| | **Sabarmati River Project** | **Manzanares River Project** | **Springfield Riverfront** | **Hangang River** |
|---|---|---|---|---|
| **Location** | Ahmedabad, India | Madrid, Spain. | Missouri , USA. | Seoul, South Korea |
| **Date** | 1998-2016 | 2004 | 1950 | 1988-2011 |
| **Aim** | Redefine the identity of the city as well as give an important waterfront environment by connecting the river and the city and transform the neglected parts of the river bank | Reconnect the river to the urban center by taking the multilane motorway underground and reclaiming the natural landscape for green zones and gardens. | Revive Missouri's riverfront and bring concrete benefits to the City of Missouri and its residents | Restoration of Ecological Environment and Creation of Economic Potentiality along the Han River. |

| | | | | |
|---|---|---|---|---|
| **Objectives** | Environmental Improvement: reducing the land erosion and flood and plans for cleaning the rivers through the sewage diversion, including water retention and recharge locating riverbed dwellers and developed activities, parks and public spaces. It also included the provision of socio-cultural amenities for the city. Sustainable Development: enabling the sustainability of the project through generation of resources and regeneration of neighborhoods. | The planning and construction of the world's longest urban tunnel, which formed a ring around the city, underground and installing electrostatic filter ventilation systems to filter the pollution produced by vehicles inside the tunnels. The redesign and implementation of a new linear park along the banks of Manzanares River. | Designing an athletic complex with a walking and biking trail, floating boat dock, bright orange boardwalk, and settings for relaxation, picnics, exercise, and environmental education. | Improving Accessibility, developing the Waterfront Town, Reinforcing Urban Center, Inducing Fine Townscape and Skyline, and forming a Riverfront Park |

# 5 ROLE OF PUBLIC SPACES

## THE RIVERS AS PUBLIC SPACES

Historical development of the city showed that the rivers have been an important 'public open space' where people conducted their everyday activities. This evidence still can be seen today. Although the frequency of the activities today is not as high as what had happened in the past, the rivers are still functioning as public open spaces at least to people who live along the rivers and canals. You can experience these activities, especially in the morning and in the afternoon, along the rivers. A group of people would gather on the docks nearby their houses taking a bath and washing. Some children are swimming or taking a small boat; playing on the rivers. Some people are fishing over their boat. On houses with a veranda fronting the rivers, you may see the owners are sitting and watching the children playing. During these activities, interactions happen amongst neighborhood dwellers as well as between the dwellers and people who pass by; they greet each other, wave at people on boats, hang out together. The rivers are the setting for everyday activities in this type of settlements.



On the riverfront areas, people who live along the settlements usually have their private access into the rivers – simple wooden platforms. Riverfront settlements usually consist of wooden stilt houses along the rivers; some include floating houses. They have docks on several spots along the rivers where the members of community may use for daily activities. Few docks are also nicely designed to give access for visitors who come by boats; where the housings found in layers over the rivers, long and narrowed wooden paths are used for access. These paths also become their communal areas – the setting for social interactions amongst the residents. In the past, every house had a boat as their transportation mode. The rivers served as waterways, connecting one place to another. Water public transportation was also easily found. Nowadays, less people travel by boats; waterways

serve only as an alternative transportation and recreational matters. Land transportation is considered more effective since the presence of the road networks. Trading is also started on the rivers.

## PEOPLE-BASED APPROACH IN CREATING PUBLIC SPACES

The presence of urban public spaces has important roles for both cities and urbanites. Some researchers argue that the quality of public spaces is a reflection of the quality of urban. As a public domain, urban public spaces – streets, parks, markets, playgrounds – are the stage for public life; the settings of everyday experiences, memories of places, escape, and social interactions. Public spaces possess subjective meanings that accumulate over time which for certain groups of people become a setting for recalling other places – memories of places. Public spaces are also the settings for escape; places for people to pull out of their hectic life. And, the most important thing, public spaces are the arena for social activities and interactions – meeting places for all citizens. Urban public space has always been a meeting place; a place where people meet and greet, exchange information, and the setting to conduct communal activities such as festivals and town meetings.

So, interactions between people and public spaces as the setting involve continuously two-way process in which the setting influences public life and at the same time is influenced by people. Public space possesses both physical and social dimensions. Its physical dimensions relate to physical features that 'form' public space – public facilities, furniture and materials, signage, natural elements, etc. Social dimensions of public space involve people's activities in it as the space becomes the setting when there are people and activities present. So, to understand the social dimensions of public spaces means to consider people and their activities as part of the setting. There are some prominent sources of literature and research that discuss both physical and social dimensions of urban public spaces and build argumentations on how these dimensions' influence each other.

People-based approach in creating public spaces provides influential concepts on how to create public spaces for people by exploring how they use the spaces and what they would like to experience in public spaces. Below I highlight some important findings of literature and research that explored public spaces through people-based approach. For this study, this part is important to develop research design and discussions later on.

**FACTORS THAT INFLUENCE THE PRESENCE OF PEOPLE ON PUBLIC SPACE**

The analysis and the findings describe some important factors that influence the presence of people on the quays. First, the weather. More people and activities are found when the weather is nice. What I mean with 'nice' is when it is not too hot or raining. Unlike in the western cities with four seasons where people go to public space to enjoy the sun, people avoid being outside at noon when the sun usually shines too brightly in tropical cities. They would also prefer being in shaded areas rather than sitting facing the sun. So, in the morning and in the afternoon are a perfect time to enjoy outdoor places. In the evening, it is also nice being outside as the sun has gone; people try to cool themselves when the temperature is high and being indoors without air conditioning is uncomfortable.

Furthermore, no people would go to the quays when it is raining as there are no shelters to provide them protection. Besides, there is no reason to be there when it is raining. Second, the food vendors. More people are

most likely to be found near food vendors along the quays. In fact, these food vendors attract people to come to the quays. Eating out is a common in open public spaces.

**THE SOCIO-SPATIAL ISSUES ON THE PRESENCE OF PUBLIC OPEN SPACES ON THE RIVERFRONTS**

In general, the presence of the quays brings positive impacts for the everyday life of the city dwellers. They offer rooms for outdoor activities and wider open space on the riverfronts as this city has lack of representative public open space. People positively appreciate the fact that the quays give them cleaner and wider view into the river as most of the riverfronts in the city provide a view of messy settlements that block the edge of the rivers. Various activities found along the quays; ranging from simple leisure activities to more organized socio-cultural activities. The findings of this research show that the quays as a setting for public life have invited more public activities to occur and these public activities create the opportunities for social interactions amongst the city dwellers. So, the presence of the quays as public spaces on the riverfront can be considered successful as these areas are used by the people and fulfill different functions as an urban public space.

However, there is also a situation which can be considered negative regarding the presence of young people on the quays. As mentioned before, these quays offer a bigger space for a bigger group of teenagers to visit and to conduct their desired activities which concern other members of society. Indeed, this can be seen as the practice of democratic public space – freedom of action and right of claim. However, as they claim the space and usually dominated these areas in the evening which ruin the balance of users and activities, lack of supervision on their activities worries other groups of users. Poor physical qualities of the quays take part in causing negative activities to occur.

Maintenance is one of the qualities of making place that the quays lack of. Poor maintenance and management is a typical problem of built environment in Indonesia. Creating the quays as urban public space was a good plan, yet the government – the one that responsible for this – seems to less care about the management and maintenance of the quays. A common reason to blame is a small budget for this subject. It usually takes sometimes to fix the broken elements of public facilities. Littering is another problem that I noticed influencing the condition of the quays. People found snacking or drinking on the quays. When they finished eating or drinking, they just left their trash on the place where they sit or carelessly throw it into the river – the quays look dirty because of these leftovers. The users also mentioned it during the informal conversations.

Despite the fact that the quays have lack of garbage bins around, this also shows that the users are less care for the conditions of their public space; they litter rather than keep their trash and throw it later into garbage bins. Poor qualities of public spaces have caused lower attentions from the users regarding the physical conditions of public spaces. People do use the quays and appreciate the presence of this public space, yet the connection between people and place is still low as people are less care for the conditions of their public spaces.

Furthermore, it is usually happened that irresponsible city dwellers damage or even steal the physical elements of the quays. This problem should be taken into account for further development of public spaces certain group of the city dwellers who do not really care for public properties and use them for their own benefits. Public spaces should be well-managed to avoid such problem.

# 6 CONCLUSION

**Research Methodology**

The research uses a deductive methodology to investigate the problem and to meet the main objective of the study. Data is gathered through both primary and secondary methods then analyzed in both qualitative and quantitative methods. The research is divided in to three stages, the first stage aims at presenting the literature covering the principles for a successful waterfront regeneration. Then stage two, analyzes successful precedents and reaches another set of principles, finally stage three validates the outcome of the previous two stages through an inductive professionals' survey applied through the internet, assessing the framework on the case study of various riverfront waterfront.


The research's methodology is designed to triangulate the data collection sources with both primary and secondary sources. Secondary sources are used to analyze the international examples and present selected literature including academic journals, published books, and secondary reports and website material to obtain timely data for the literature and selected examples.

**Principles from Literature study**

To indorse the compiled set of criteria, successful examples were analyzed to confirm and enrich those principles, the research investigates international riverfront regeneration projects selected upon, first the success of the regeneration projects according to their international recognition, second the riverfront project being in a major city, third a mega project of 10 km long or more, and Finally that it encompasses public recreational areas.

***Principles for a Successful Riverfront Regeneration***

| | | **Derived principles from Literature** | **Derived principles from Examples** | **Compiled Principles** |
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| **Environmental** | **River** | Maintain a high quality of water and environmental standards by utilizing innovative technical designs that: enhances the human - environmental interaction, and develops the economic activities of a recreational waterfront, as well as decreasing (pre-existing) industrial pollution. | Adapt with Climate change and design for the protection from flooding and drought, Install Storm tanks to avoid flooding and recycle water, and Minimize the risk of erosion | Adapt with Climate change and Maintain a high quality of water and environmental standards by utilizing innovative technical designs. Design for the protection from flooding and drought, through Installing Storm tanks, recycling water, and minimizing the risk of erosion |
| | | | Build or improve sewer plants and pipes | Build or improve sewer plants and pipes |

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| | | | Improve water conditions, ensure a high Water quality class and that the pollutants are not emptied in the river, and Eliminate the effect of industrial toxins from the water of the river. | Ensure a high Water quality class and Eliminate the effect of industrial toxins and make sure that pollutants are not emptied in the water |
| | **Ecology** | | Restore and keep plantation, protect green areas ,And sustain and enhance the ecology of the area (flora and Fauna) | Sustain the ecology of the waterfront (flora and Fiona) |
| **Urban** | **Accessibility** | Ensure public accessibility - both physically and visually - to the water and waterfront | ensure public waterfront accessibility on both sides of the river and to all specially people with impairments through diverse modes of access ramps , elevators and stairs | Ensure public accessibility both physically and visually - to the water and waterfront. On both sides of the waterfront and to all specially people with impairments |

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| | | | design for continuous access through a Continuous trail, and by introducing pedestrian bridges , piers and platforms | Design for continuous access through a Continuous trail |
| | **Connectivity** | | Connect both sides of the river through creating overpass bridges for pedestrians and cyclists. | Connect both sides of the waterfront through creating overpass bridges for vehicles, pedestrians and cyclists. |
| **Urban** | | | Renovate directing avenues | avenues Renovate Directing avenues |

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| | **Connectivity** | Integrate the waterfront development within the surrounding environmental context and urban fabric to contribute to the city's vitality through: creating a waterborne transport system, connecting to the surrounding neighborhoods (and city-center) by fostering an entertainment and a cultural hub | Improve urban integration between the city center and the districts to the south and west of the city, transforming the River from a barrier into a meeting place for citizens, connecting between neighbors and facilities. | Improve urban integration between the city center and the districts, transforming the waterfront from a barrier into a meeting place for citizens, connecting between neighbors and facilities. |
| | **City enhancement** | Take identity into consideration. | Use the waterfront revival as a start point for the revival and redevelopment of the whole city, and to enhance city identity, and create a memorable image | Use the waterfront revival as a start point for the revival and redevelopment of the whole city, and to enhance city identity, and create a memorable image |
| | | | Revitalize waterfront neighborhoods | Revitalize waterfront neighborhoods |

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| | | | Re-allocate informal waterfront residents and provide them with a permanent residence | Re-allocate informal waterfront residents and provide them with a permanent residence |
| **Urban** | **Parks and open spaces** | Emphasize social connectivity and sustainability of waterfronts by creating parks and green spaces. | Create waterfront parks and spaces for all (children playing zones, sports zones and parks for elders) along the banks allowing citizens to enjoy nature amidst the urban setting. | Emphasize social connectivity and sustainability of waterfronts by creating parks and green spaces. for all (children playing zones, sports zones and parks for elders) along the banks allowing citizens to enjoy nature amidst the urban setting. |
| | | | Design diverse spaces for special cultural celebrations and occasions such as ecological parks, Design open swimming pools, | Design diverse spaces for special cultural celebrations and occasions such as ecological parks, Design open swimming pools, Design for camping areas |

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| | | Design with regards to urban needs and aesthetics. | Design with regards to urban needs and aesthetics | Design with regards to urban needs and aesthetics. , ensure Proper efficient landscape design ,proper urban design , lighting landscape paving …etc. |
| Urban | Mobility | | Improve mobility, free the city center from traffic, saving in-city traveling times and reducing accidents and offer parking | Improve mobility, free the city center from traffic, saving in-city traveling times and reducing accidents and offer parking |
| | | | Create cycling paths | Create cycling paths |
| | Transportation | Support multiple transport systems which includes pedestrian and vehicular. | Allow multiple modes of transportation and improve the road network, post new signage, provide more pedestrian accessibility via sidewalks. Placing the road underground has | Allow multiple modes of transportation, improve the transportation networks, post new signage, provide sidewalks. |

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| | | | created easy pedestrian access to the huge public parkland | |
| | **Services and activities** | Prioritize mixed uses and create multiple destinations thus encouraging 24 hour activity. | design for current and futuristic mixed uses , retail, residential , business and entertainment | Design for current and futuristic mixed uses , retail, residential , business and entertainment, and encourage 24 hour activity. |
| **Urban** | **Services and activities** | | Provide the city with cultural, trade and social facilities, And upgrade the current services and make public activities possible | provide the waterfront with adequate services to make public activities possible and use the waterfront for cultural, educational, trade and social uses |

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| | | Ensure that buildings are designed to engage people, and serve multiple functions, encouraging iconic building design. | | Ensure that waterfront buildings are iconic and designed to engage people, and serve multiple functions. |
| | **Social** | engage citizens in the development of the public space, by encouraging participation and providing information | Adopt meaningful public participation in the waterfront scheme development. | Adopt meaningful public participation in the waterfront development, and encouraging participation and providing information |
| **Commercial** | **Economic, Financial and Managerial** | Introduce a mix of public and private partnership for investments and management | Apply public-private partnerships to enhance the operational efficiency of the waterfront development. | Introduce a mix of public and private partnership for investments and management, to enhance the operational efficiency of the waterfront development. |
| | | Develop a plan with all the stakeholders to maximize the benefits and values of the riverfront | Include the original stakeholders in the management of existing waterfront developments. | Develop a plan with all the stakeholders to maximize the benefits and values of the riverfront |

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| **Commercial** | **Economic, Financial and Managerial** | Form a special purpose vehicle for the implementation of the project, to avoid the delays associated with municipal decision making, introduce ease in raising resources, and give implementation efforts a definitive thrust and focus. | Endorse separate organizations or protocols, to ensure that the objectives are realized independent of economic cycles or short term (political) interests. | Endorse separate organizations or protocols, to ensure that the objectives are realized independent of economic cycles or short term (political) interests |

# 7 References

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