

A FRAMEWORK FOR ASSESSING PUBLIC OPEN SPACES' MULTIFUNCTIONAL DESIGN ON THE WATERFRONTS IN EGYPT

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Abstract

Introduction: The waterfronts revival started more than forty years ago while they turned into intensive pivots of cultural and social activities. The existing public spaces are not successful enough for their inhabitants due to lack of utilization and poor improvement. **The purpose of the study** highlights the urgent need for these waterfront public spaces as they exemplify significant social and cultural values. The research aims to explore the relationship between the city and the waterfront through the waterfront public spaces and reconnoiter their viability in creating sustainable pleasant spaces that integrate with public and urban activities. The research proposes a connective vision between the city and its waterfront, which creates a new image for revitalization of Egypt's waterfronts. This research proposes a framework for urban revitalization of waterfront public spaces through design process and its elements. This framework identifies the design guidelines for inclusive public spaces on the Egyptian waterfronts. **The following methods** were used in the theoretical part as conducting various literature reviews about urban waterfronts public spaces. Then, the research explores their characteristics through analyzing international waterfront public spaces in different countries. Meanwhile, the empirical part comprises of analyzing and evaluating different case studies which will focus on the waterfronts of Egypt that utilize a contextual analysis technique in view of a qualitative research through archival research, site survey, observation, and interviews. The research proposes a framework for assessing public open spaces multifunctional design on the waterfronts in Egypt.

Keywords: Waterfront, Public Open Spaces, Multi-Functional Design Framework, Egypt.

INTRODUCTION

Waterfront Public space is considered as an unparalleled aspect of the urban framework of numerous waterfront urban cities. Since the 1960s, a greater amount of these spaces is being given trying to convey more individuals to waterfront zones (Liu, 2005). While a few urban areas have been effective in balancing a harmony between their economic needs and users' desire and request for easily accessibility to the water, there are others have fizzled. Amid this procedure, the urban waterfront has turned out to be equivalent to the concept of urban public space. Whenever individuals coexist in public areas, they are considered as part of the city. Public spaces are recognized and implemented based on the traits of the community and

individually. These public spaces ought to interact consistently with people. Thus, human life needs to be researched before creating any space and needs to be taken into account throughout the entire design as well as execution process (Gehl and Svarre, 2013). First, thoughts and words shape spaces are. Subsequently, they are reformulated by the individuals' everyday activities. According to Ramlee et al. (2015), the city is a developed place where individuals live as well as work. The behaviors of people are influenced by their social interactions and how they integrate with public spaces. Environmental psychology primarily asserts that human behaviors in space can be affected by their daily settings (Mahadi et al., 2005). Analyzing this waterfront can answer some questions identified with its accessibility, proprietorship, water-subordinate nature of its utilizations and the accessibility of public urban space on it. It likewise concentrates on formal and informal patterns of waterfronts to identify how those spaces are freely grasped, wasted, and the procedures that shape them. This research is involved in presenting the historical context of the urban public spaces on waterfront. At the beginning, it clarifies the waterfront as a contemporary phenomenon and backpedals so as to show its origins. The research features the essential historical stages of the phenomenon and what made ready for flow waterfront improvement. The historical literatures take after a successive request and concentrates on the waterfront in further developed cities while they are the wellspring of most accessible pertinent literature. It additionally endeavors to contextualize the phenomenon by following the origins of the waterfront through Arab and Islamic culture.

Problem Definition

Moretti in pre-industrial cities stated that waterfront areas were intensely used and thriving with people and activities (Moretti, 2007). Also, during this period, a close relationship was between waterfront and cities. With industrial era, this relationship was interrupted due to some uses, such as huge ports, commercial, industry, warehouses and transportation (Pekin, 2008). Through the evolution of containerization technology, port activities moved to outside the city. Accordingly, industrial plants were abandoned, and forms of transportation changed (Wrenn et al., 1983). Also, with the increasing environmental awareness and as a consequence of the pressure for upgrade in urban areas, waterfronts were rediscovered in the city. So, phenomenon of waterfront regeneration emerged. Urban waterfront regeneration projects have become an effective tool for urban planning and politics an international dimension since 1980's (Sairinen & Kumpulainen, 2006; Goddard, 2002). Waterfronts have been extensively used by humans for their utility in travel, trade, recreation, and general enjoyment, and have also suffered cycles of abuse and neglect from these very use patterns. Previous developments on the Waterfront have appeared to leave the overall planning uncoordinated.

The urban waterfront phenomenon materialized nearly five decades ago in post-industrial cities. The main aim of waterfront development was to reuse the centrally-located waterfront lands which were left behind by industrial, railway and port activities. The move was stimulated by public demand for better access to the water through the provision of public space on the waterside. The phenomenon spread from North America to the rest of the world to become one of the outstanding contemporary urban trends (Sairinen & Kumpulainen, 2006). Overall, many of these projects were successful in bringing the public to the waterside. Other cities are

witnessing the phenomenon in a different manner. Cities like Tokyo, Amsterdam, Hong Kong and Dubai grew up over lands reclaimed from the water. The city/water relationship keeps changing, depending on the functions taking place on those reclaimed lands, and the overall approach of planning and design authorities towards public access to the water (Hradilová, 2012). In some cases, lands were reclaimed to bring the public to the water in greater numbers, and in many others the new water edge was restricted to private users.

Among the variable factors contributing to societal segregation is the absence of public space that may have been caused by financial shortages, the privatization process, and traffic. Vibrant walkways, stalls, and a variety of activities are what define public space (Ravazzoli & Toso, 2013). Egypt is one of those countries that have grown up over reclaimed land. But urban development on this type of land results in a different manifestation of the urban waterfront phenomenon than is found in North America and Europe. In Egypt, land reclamation is a major planning policy with the purpose of providing affordable and buildable land (Al-Ansari, 2009). This is driven both by demand from the government, seeking to accommodate public projects, and from the private sector, seeking land for developments.

This is not to say that there exists no empty land in Egypt with the above-mentioned qualities: there are vast tracts of empty land on the island. However, this land is 90% privately owned and most of it does not feed into the local market through the regular channels.

Subsequently many communities have been displaced away from the water and therefore deprived of the use of the water for their economic benefit and leisure needs (Figure 1).



Figure 1: Various images comparing the changes of waterfront public accessibility through time (Pekin, 2008)

During the past few years the public in Egypt has started to express their dissatisfaction with the inaccessibility of the sea. Their frustration with the style of urban growth and the decline of public space and access to the water is frequently expressed through statements conveying a sense of loss, deprivation, and social injustice. The public outcry has been followed by informal and later official statistics showing that publicly accessible waterfront in Egypt represents small area of the country shoreline.

As mentioned previously, land reclamation from the water is not restricted to Egypt; other cities around the world adopt the same method in satisfying their needs for land to accommodate their growth. However, not many end-up having similar problems to Egypt. On the contrary, land reclamation has given many cities new opportunities to reconcile their relationship with the water with environmental and public access requirements. This raises many questions, such as what has led Egypt to grow in such a manner, how it reached the current situation, exploring what is the nature of the available public space on Egypt 's waterfront, and discussing if there is a link between their condition and the land reclamation policy followed in Egypt or not.

Given this background, this research is conducted with the aim of understanding the nature of the emerging public open spaces on the waterfronts of Egypt in the light of the changing relationship between the city and the water.

Scope of the Research

The scope of this research is to develop and evaluate a framework for assessing the multifunctional design of public open spaces on urban waterfronts in Egypt. The research focuses on understanding the current state of waterfront public spaces in Egypt, examining different design approaches, and assessing the effectiveness of the proposed multi-functional design framework in the Egyptian context (Figure 2).

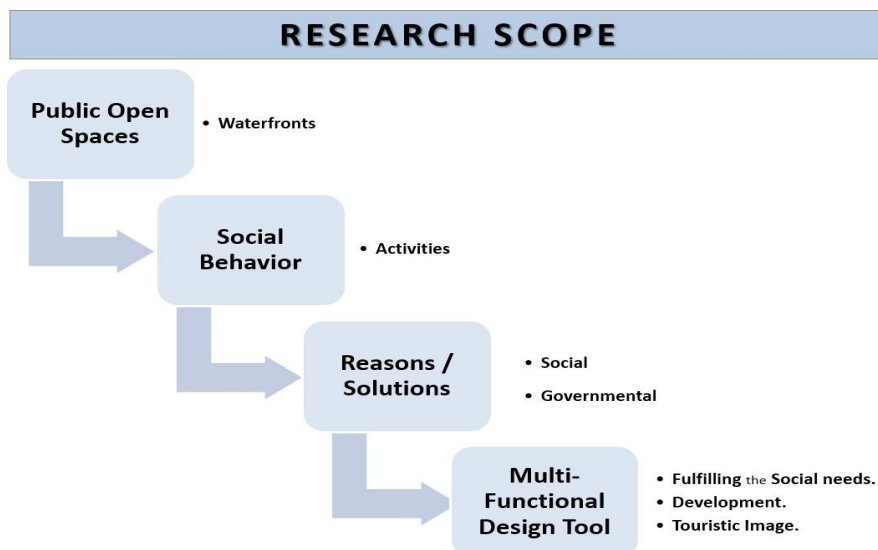


Figure 2: Scope of the research (Author)

The research aims to provide insights into the applicability and potential benefits of the multi-functional design framework in developing countries, and to establish guidelines for its implementation in future urban planning and design regulations. It explores the potential for incorporating additional functions into these public open spaces on the waterfronts.

This framework will provide a systematic approach for evaluating and improving the design of public open spaces on the waterfronts, with the aim of creating more vibrant, and inclusive spaces for the community.

RESEARCH METHODOLOGY

The research methodology for this study involves a qualitative case study approach, utilizing a variety of data sources and tools for investigation and understanding. The case study is conducted on a substantial scale, allowing for the integration of multiple data sources. This assortment originates from the substantial size of the chosen case which is conducted by this research. The data gathering relied upon an arrangement of apparatuses which were archival research, site survey on micro and macro scales, Semi- structured and easygoing interviews, and site perceptions and observations (Figure 3).

The archival research might help in revealing some light into the problem origin. It will help in responding to some questions which are concerned with the followed land distribution techniques, advancement of urban planning regimes in Egypt, history and types of land recovery in Egypt, and how this relates to the urban expansion of Egypt.

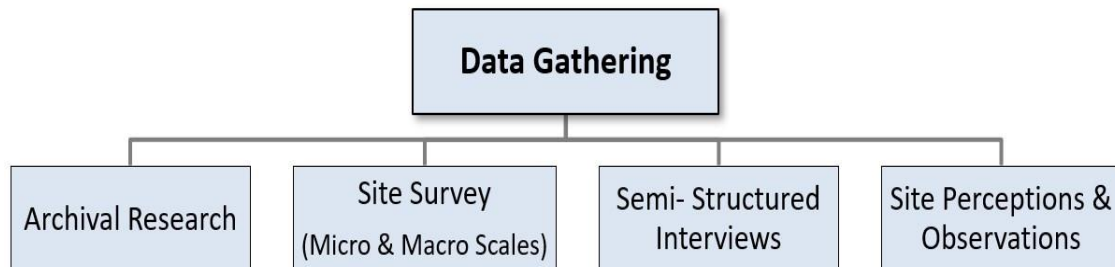


Figure 3: Types of data collection used in the research methodology (Author)

The survey of Egyptian waterfront will be led in two stages. The first stage is a physical survey of waterfronts as shown in Figure 3. To survey the state of the waterfront in Egypt, an all-encompassing approach was contrived in view of various existing models. This approach functions as a framework which comprehend the multifaceted quality of the waterfront.

This survey will be intended to follow the physical state of the waterfront and to contextualize and promote its social environment. The conducted data from the survey could respond to various questions related to the quantity of the public waterfront, the types of public accessibility to the water, impacts of land recovery and privatization of the waterfront on those types of accessibility, influences of those styles on the availability of public space on the waterfront, influences the patterns of public accessibility to the water, and the tangible status of the available public space on the urban waterfront.

This aim of the contextual methodology looked to acquire the users' ambition, objective, experience, and perception of waterfront public space. It additionally addresses diverse inquiries which are linked to the ability those spaces to be utilized, struggled, and their general social status. Following the survey of Egyptian waterfronts, two specific waterfront public spaces will be selected for further empirical work. The selection criteria will consider the formation technique. It will focus on the social aspect of the waterfront, observing and interviewing individuals within these spaces to gain insights into their behaviors and experiences.

Urban Waterfronts

Feldman argued that contemporaneous urban waterfront scheme for redevelopment and renovations are now a universal urban arranging and policy undertaking (Feldman, 1999). As per Norcliffe, the modern urban waterfront has five primary categories of overlapping activities with the impact of postmodern culture; culture and heritage, employment, hospitality industries, lodging and leisure, posing a diverse landscape and land-use in urban waterfront (Norcliffe et al., 1996).

The varying geographical setting and range of necessities make planning and rezoning a challenge as well as a chance. The waterfront improvement popularity is triggered by the obsolete old port and downtown waterfront industrial areas (Dovey, 2005). Those waterfronts are distinguished by their vicinity to downtown areas and offer an assortment of scales, uses and improvement opportunities (Fagence, 1995). Other than these opportunities, the long neglect and ecological degradation of numerous waterfront areas has prompted to the ascent of public demand for enhanced, accessible waterfront areas which they can enjoy and use (National Research Council, 1980).

Naturally, waterfronts are susceptible to restoration and regeneration as they are located in the city's oldest areas. Nevertheless, Tunbridge indicated that, in opposition to prevalent thinking, there is a whole other world to it than just incentives and growth demands of individuals (Tunbridge, 1988). He suggests that a parallel string to the general process of urban regeneration is provided by the waterfront revitalization movement. Therefore, it is influenced by all current motive powers of the movement, not just by those components that are naturally related to the water.

Waterfront revitalization has experienced a huge level of research and documentation, yet most of these projects are in the developed world (Hoyle, 2001). In this way, most of the accessible literatures are closely linked to developed countries, for example, the port cities' reconstruction and their relationship with the cycle of urban reestablishment, regeneration and renewal in post-industrial cities.

It is significant to peruse the waterfront phenomena in the sense of various countries' context. For instance, in a North American setting, the waterfront is viewed as a fundamental aspect of the urban reestablishment procedure, though in Europe it is considered as a pure side-effect of the transformations in the maritime transport (Hoyle, 2001).

For the time being, the awareness of the revitalization of the waterfront has spread throughout the globe, and reports from both developing and developed countries. Furthermore, the utilization of water serves to enhance external air quality. On a broader scale, water surfaces play a pivotal role in regulating regional air temperatures. Given its visual and climatic impact, water stands as a crucial component for urban areas. Additionally, water bodies within urban settings act as a deterrent to artificial noises, establishing a natural acoustic environment (Timur, 2022).

Features of Urban Waterfronts

Ten features, as listed by PPS (2010) and cited by many authors and organizations (Evans, 2013; Alexandria, 2011; Andini, 2011), identified the great urban waterfronts. Furthermore, those features provided a thorough comprehension of the optimal implementation of multifunctionality across waterfronts. In addition, those features are identified as;

1. Enhancing public spaces by nearby buildings.
2. Limitations on residential development.
3. Livable activities.
4. Versatile design fosters adaptability.
5. Creative features stimulate comfort.
6. Easy accessibility.
7. The distinctive local identity.
8. The water itself attracts notice.
9. Several purposes are served by iconic structures.
10. Competent management maintains public perception.

Numerous emerging urban waterfronts have demonstrated their commitment to establishing appealing environments for urban dwellers. This involves fostering visual connections with water, facilitating promenades along the waterfront, and incorporating waterborne transport, among other initiatives. Cities engaged in waterfront redevelopment projects adhere to distinct guidelines when designing public spaces within these endeavors. They adopt varied approaches tailored to specific contextual challenges, aiming to generate public spaces that cater to diverse needs. The place-making approach, as formulated by the Project for Public Spaces, appears to encompass both the spatial and human dimensions of public spaces discussed earlier. According to PPS, this approach empowers citizens to transform public spaces into vibrant locales that showcase local assets, stimulate revitalization, and fulfill common requirements. The underlying goal of the place-making approach is to foster a participatory design solution from the grassroots (PPS, 2010). PPS has delineated ten qualities crucial for the development of an exceptional waterfront destination (table 1). This discussion aims to explore each of these qualities systematically, establishing connections with existing literature to provide a more comprehensive understanding.

Table 1: Features of urban waterfront (PPS, 2010)

No.	Features of urban waterfront	Discussion
1	<p>Enhancing public spaces by nearby buildings.</p> <ul style="list-style-type: none"> • Buildings boost activity in the public spaces. • A mix of uses, no gap interaction between inside and outdoors. • Avoid high-rise towers that lack any public uses on the ground floor because they usually create a wall that physically and psychologically cuts off the waterfront from the surrounding. 	<ul style="list-style-type: none"> • The integration between activities in buildings and public spaces (ground floors should be open for public activities). • Buildings can be retailing along the street – stores, windows with displays, signs to attract people’s attention, (Whyte, 1980). • Visual attractiveness of the waterfront should not be blocked by buildings as the rights of visual access.
2	<p>Limitations on residential development.</p> <ul style="list-style-type: none"> • Waterfront should not be dominated by residential development to get greater public activities: festivals, markets, concerts, spontaneous celebrations and gatherings. 	<ul style="list-style-type: none"> • Waterfront public space which is dominated by residential development will limit public activities there. • Mixed use is priority functionally and socially (Giovinazzi & Moretti, 2010).
3	<p>Livable Activities.</p> <ul style="list-style-type: none"> • Creative programming should consider any circumstances as rainy & winter season. • Smart use of amenities can provide protection from inclement weather. • Appropriate lighting features & special events to enliven evening situations. 	<ul style="list-style-type: none"> • It is important to facilitate public activities in any circumstances by providing creative programs and amenities, so people have chances to stay in public spaces.
4	<p>Versatile design foster adaptability.</p> <ul style="list-style-type: none"> • Spaces should be adaptable for different users at different time. • Flexibility must be built into the design of the place e.g. on-site storage for movable chairs, tables, umbrellas, and games. 	<ul style="list-style-type: none"> • Right of change; the ability of a place to permanently or temporarily evolve and change over time (Lynch, 1972). • Public spaces can allow users to continually add and take back elements that facilitate desired activities (Seamon & Nordin, 1980).
5	<p>Creative features stimulate comfort.</p> <ul style="list-style-type: none"> • Waterfronts feature amenities that increase people’s comfort and enjoyment e.g. a bench or waste receptacle in the right location, lighting to strengthen the place and draw attention to activities, public art, etc. 	<ul style="list-style-type: none"> • Amenities establish a convivial setting for social interaction. Qualities that people seek in public spaces should be fulfilled to be responsive spaces. • People seek psychological and physical comfort as sitting areas, shade areas, safety, etc.
6	<p>Easy Accessibility.</p> <ul style="list-style-type: none"> • Waterfront should be easily accessible. Accessibility enhances the character and experience of the waterfront. Streets should be designed to minimize their impact on pedestrian safety and enjoyment and be closed for events. 	<ul style="list-style-type: none"> • Public access is a prerequisite. Waterfronts should be accessible for all. They should allow intensive use (Giovinazzi & Moretti, 2010). • Reclaimed streets, as users feel comfortable to linger; eat and drink (Shaftoe, 2008).
7	<p>The Distinctive Local identity.</p> <ul style="list-style-type: none"> • Making the most of local identity and culture stimulates widespread interest and creates a unique sense of place. • Frequent opportunities to appreciate local art helps draw a community together. 	<ul style="list-style-type: none"> • Public spaces should be meaningful to give urban waterfronts local characters. • The local identity gives character. Collective heritage of water and city should be utilized to give waterfront public spaces character and meaning (Giovinazzi & Moretti, 2010).

8	<p>The water itself attracts notice.</p> <ul style="list-style-type: none"> • The water should become the centerpiece for programming and activities. • Embracing the natural uses of a waterfront. 	<ul style="list-style-type: none"> • Water was the most desired feature that people prefer (Buker & Montarzino, 1983; Carr et al., 1992). People seek both passive and active engagement with water feature. • The quality of water is a prerequisite for all waterfront developments (Giovinazzi & Moretti, 2010).
9	<p>Several purposes are served by iconic structures.</p> <ul style="list-style-type: none"> • Iconic buildings that reflect a human scale can be a boon to the waterfront, if they serve multiple functions. • Iconic buildings should strive to achieve flexibility and public-spirited presence. 	<ul style="list-style-type: none"> • This quality points out how an iconic and historic building in urban waterfront may support public life and activities; becoming a shared space for the public.
10	<p>Competent management maintains public perception.</p> <ul style="list-style-type: none"> • Management could be conducted through partnerships in sustaining a diverse variety of activities that can be used to generate useful revenue that benefits the waterfront. 	<ul style="list-style-type: none"> • Management of public spaces are an effort to maintain both spatial and human qualities of urban waterfront as maintaining the infrastructures, facilities, activities, safety, etc.

Qualities of Waterfronts Public Open Spaces

Waterfront public open spaces encompass three categories of outdoor activities, as outlined by Gehl (1996); necessary activities, optional activities, and social activities. Necessary activities are essential tasks that people generally undertake regardless of conditions, such as going to school or waiting for the bus. Optional activities, on the other hand, pertain to leisure and recreational pursuits that are contingent upon specific times, places, weather conditions, and settings (Carmona et al., 2008). Enhancing the prevalence of optional activities in public spaces necessitates favorable physical qualities of the space, ensuring it is appealing to attract individuals willingly engaging in activities like stopping to enjoy the view or sitting down to appreciate the weather. Social activities involve opportunities for interactions, and their occurrence is not solely dependent on the quality of public space but also on the presence of other people in that space. Enhancing the quantity of optional and social activities within public spaces is achievable through the incorporation of positive physical attributes. These attributes, as delineated by Dempsey (2008), encompass three key dimensions. First, visual-artistic quality, associated with the visually appealing and robust characteristics of public spaces. Second, social-usage quality, influenced by factors such as connections, diverse functions, legibility, and safety. And third, making places quality, which pertains to accessibility, inclusiveness, and maintenance. Nevertheless, it is essential to recognize that architects and planners can only establish 'place potential,' as the success of a place ultimately hinges on the active engagement of its users (Carmona et al., 2003). The public space effectiveness is discernible by its ability to stimulate user activities, reflecting an environment actively utilized by people (Dempsey, 2009). In the realm of public space creation, the often-overlooked human qualities play a pivotal role. Carr et al. (1992) advocate for public spaces ought to be responsive, democratic, and meaningful. Responsiveness implies catering to the needs of users, and as a space for diverse user groups, public spaces should embody democratic principles, safeguarding the rights of users. Users should possess the right to utilize public spaces and

experience a sense of control within them, necessitating a delicate balance among different user groups to prevent conflicts. Moreover, public spaces should be meaningful, fostering strong connections between the place, individuals' personal lives, and the broader world. Table 2 provides an overview of these human qualities, based on the framework proposed.

Table 2: User qualities of waterfront public spaces (Carr et al., 1992)

No	Qualities of public open space	Features	Description
1	Responsive	Comfort	People seek both physical and psychological comfort e.g. sitting area, shade and exposure to the sun, safety, etc.
		Relaxation and/or liveliness	Some people seek public space for relaxation – to experience natural elements, greenery, and silence – but some others look for liveliness in public space – engagement with the life of a city.
		Passive engagement	Passive experiences with a place and people within it e.g. the possibility to observe people and sceneries.
		Active engagement	More direct experiences with a place and people within it. As social interaction, physical contact with place elements, and active use for exercise and health.
		Discovery	The diversity in the physical design and the changing vistas to create the opportunity to observe the different things, physical qualities and human activities, when people are moving through the site.
2	Democratic	Right of access	This includes physical, visual and symbolic access. This right is fundamental to achieve other rights.
		Freedom of action	Layout of public spaces should offer the opportunity for people to carry out their desired activities. There is a clear need for a balance of users and activities so that no one group dominates a space to the exclusion of others.
		Right of claim	Claims of space refer to spatial control in search of anonymity & intimacy, privacy & territoriality by particular groups. It is necessary for them to act freely and comfortably in the space as time sharing on shared space.
		Right of change	The ability of a place to permanently or temporarily evolve and change over time (Lynch, 1972). Public spaces can allow their users to continually add and take back elements that facilitate desired activities – place ballet (Seamon & Nordin, 1980).
		Right of ownership	All truly public space is in fact owned by the public even though the control implied may not be exercised.
3	Meaningful	Place identity	The relationship and connection between the site and its context. A place needs to be relevance individually and culturally. In individual level, a place must satisfy the need. In cultural level, a place should be congruent with norms and practice.
		Place experience	Must be comfortable to allow an experience to occur.
		People-place connection	It should have connections to the people; create a sense of belonging, safety, a feeling that personal rights will be protected. Public space must have recognizable cues that are understood by potential users, communicate what kind of place it is and whether they are welcome or not.

Several significant factors contribute to the appeal of water bodies and their potential to attract people, thereby presenting opportunities for the creation of public spaces along the waterfront (Andini, 2011). The mental image associated with water often evokes feelings of refreshment, coolness, and dynamism, supporting leisure and recreational pursuits. This positive mental association may motivate individuals to visit the waterfront to experience these sensations. Moreover, the expansiveness of the water body generates an open atmosphere within the urban landscape, providing an opportunity for unique panoramic views of the city. This openness fosters passive engagement between individuals and the waterfront, as people can appreciate distinctive cityscapes along the water's edge. The water body itself serves as an intriguing space that can stimulate various leisure activities, encouraging more active engagement. Opportunities for activities can be created directly on the water, enhancing the overall appeal of the waterfront and attracting a diverse range of visitors. Hence, there are some essential attributes of public spaces designed for individuals on urban waterfront spaces. They are water attraction, accessibility, public amenities, activities and uses, identity, maintenance and management (table 3) (Andini, 2011; Üzümcüoğlu and Polay, 2022; Author, 2024).

Table 3: Features of public spaces on urban waterfronts (Author, 2024)

No.	Features of public spaces on urban waterfronts	Description	Discussion
1	Water attraction	The existence of a natural water body as a significant draw in public spaces.	<ul style="list-style-type: none"> • Unpolluted water body & well-maintained environment. • The expanse of water provides chances for engaging activities.
2	Accessibility	Transparent and easily accessible entry points to public spaces for all individuals.	<ul style="list-style-type: none"> • Physical accessibility: pathways, cycling lanes, ramps for disabled access, etc. • Visual accessibility: openness, panoramic views, landscapes. • Symbolic accessibility: affordability of dining options, locally owned shops, vendors, absence of restrictive access measures.
3	Public amenities	Providing public amenities that offer both psychological and physical comfort to users.	<ul style="list-style-type: none"> • Public amenities that are well-maintained and of high quality to ensure safety include; seating areas, shading structures, public toilets, waste bins, adequate lighting, parking facilities, piers etc.
4	Activities and Uses	<ul style="list-style-type: none"> • Public spaces ought to offer a variety of options for diverse activities to unfold. • Activities and uses within these spaces should foster social interactions. • Users should possess the rights to assert, engage in action, and instigate change within these public areas. 	<ul style="list-style-type: none"> • Diverse spatial configurations to accommodate various uses, spanning from passive to active engagement. • Implementing a flexible design with open spaces to facilitate the emergence of different activities. • Incorporating contextual activities and uses, such as cultural events and community projects.

5	Identity	Public spaces should reflect the significant physical and social values important to their users.	<ul style="list-style-type: none"> • Repurposing valuable urban elements: introducing meaningful new functions to historical structures, incorporating artifacts or materials from the past in the design of urban waterfront. • Incorporating public spaces on the ground floor of buildings with welcoming facades. • Adhering to contextual architectural styles. • Integrating contextual activities and uses such as cultural events and community projects.
6	Maintenance and Management	An effort to preserve both the physical and human attributes of public spaces to ensure their optimal functionality for users.	<ul style="list-style-type: none"> • Sustaining public facilities, infrastructures, and activities. • Forming collaborations among municipal entities and community organizations to ensure the collective operation of public spaces for the mutual benefit of all.

The Multi-Functional Design Framework

The proposed multi-functional design framework for assessing waterfront public spaces is conducted based on the different previous literature review with a focus on analyzing each literature and highlighting the significance of each one. The proposed multi-functional design framework composes from many parts, the conducted principles of contextual integration of urban waterfronts and the fundamentals of urban waterfronts redevelopment, the qualities and variables of waterfront public open spaces, and the design process and elements of urban waterfront revitalization with taking into consideration the approaches of assessing urban waterfront (table 4). This multi-functional design framework will be applied on two international case studies to check its impact on the selected case studies and discuss if the case studies will add any features to the proposed framework before for its application on the selected local case studies.

Table 4: The Multi-Functional Design framework for assessing waterfront public spaces (Author, 2024)

Features of Public Spaces		Waterfront Public Space
Water Attraction	Unpolluted water body & well-maintained environment.	
	The expanse of water provides chances for engaging activities.	
Accessibility	Physical accessibility: pathways, cycling lanes, ramps for disabled access, etc.	
	Visual accessibility: openness, panoramic views, landscapes.	
	Symbolic accessibility: affordability of dining options, locally owned shops, vendors, absence of restrictive access measures.	
	Providing multi-level promenade for pedestrians only to maximize ease accessibility and enhance various activities.	
Public Amenities	Public amenities that are well-maintained to ensure safety include; seating areas, moveable furniture, shading structures, digital elements, public toilets, waste bins, adequate lighting features, parking facilities, piers, splendid colors etc.	

Activities and Uses	Diverse spatial configurations to accommodate various uses, spanning from passive to active engagement.	
	Implementing a flexible design with open spaces to facilitate the emergence of different activities.	
	Incorporating contextual activities and uses, such as cultural events and community projects.	
	Providing different kinds of water activities as part of new experience.	
Identity	Repurposing valuable urban elements: introducing meaningful new functions to historical structures, incorporating artifacts or materials from the past in the design of urban waterfront.	
	Incorporating public spaces on the ground floor of buildings with welcoming facades.	
	Adhering to contextual architectural styles.	
	Integrating contextual activities and uses such as cultural events and community projects.	
	Promoting the uses of connecting bridges over the Nile to be vital. It provides places for people to sit, for street entertainers to perform, and for artists to create.	
Maintenance and Management	Sustaining public facilities, infrastructures, and activities.	
	Forming collaborations among municipal entities and community organizations to ensure the collective operation of public spaces for the mutual benefit of all.	

RESULTS

After applying the different features of waterfront public spaces that draw the main components of the proposed multi-functional design framework on the Egyptian local case study of Mamsha Ahl Misr in Cairo and The Touristic Path in New Alamein, it achieved all features with providing insights into how the promenades can serve as community assets, and foster social cohesion, economic growth, and urban sustainability. After applying the multi-functional design framework, the promenade of Mamsha Ahl Misr didn't achieve one correlation of the identity's features that didn't reutilize and benefit from the connecting bridges over the Nile River. The project has six bridges over the Nile through the three different phases of the promenade. With reference to the previously mentioned international case study, Plage-Seine River in Paris, it could be highlighted how that project made use of the connecting bridges over the Seine River and how it presented various activities. Those bridges played an important role in connecting both sides of the Seine, offering different amenities and providing ample space for visitors to fully appreciate the surroundings and have different experience occurring on those bridges.

While after applying the multi-functional design framework on The Touristic Path in New Alamein city, it has better water attraction feature as the Mediterranean Sea plays a significant role towards attracting the users for its beauty. On the other hand, The Touristic Path of New Alamein city played very important role in the last couple of years by revitalizing the city and enhancing a new image for New Alamein. It hosted many festivals during the last summer as a feature to represent the city by a new touristic image towards the globe which plays a significant role to highlight the identity of Egypt towards the other countries.

CONCLUSIONS

Building on the place making approach, insights from successful waterfronts, and case studies, a set of theoretical approaches can be developed to serve as benchmarks alongside empirical frameworks for the Multi-Functional Design Framework. These approaches are outlined through key points that formulated the features the Multi-Functional Design Framework that will be used for assessing the waterfront public spaces.

The goal of this study is identifying an approach that integrates the multifunctionality of public spaces with the regeneration of urban waterfronts through analyzing international case studies; and exploring how cities addressed similar challenges and how residents responded to interventions aimed at resolving these issues. The study applied the proposed framework on international and local case studies, considering river and sea waterfront, to check if there will be any differences to be considered in the Multi-Functional Design Framework. The Multi-Functional Design Framework will be used for assessing the waterfront public spaces to enhance a better image for the city.

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