

Innovative Approaches to Revitalizing Urban Riversides for Enhanced Leisure and Well-being

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Abstract: As societal priorities shift towards spatial quality and leisure pursuits, riverside sites offer significant potential for enhancing living environments and promoting leisure activities. This study delves into the relationship between the spatial qualities of riverside areas in old industrial cities and their capacity to foster leisure and human well-being, aiming to formulate design guidelines that preserve the unique characteristics of these sites. Noting the dearth of academic discourse on spatial qualities and design in this context, this research emphasizes the identification of key spatial features that can revitalize urban rivers as leisure destinations, which derives a set of design principles. These principles underscore the importance of diverse and distinctive spatial qualities in successful riverside regeneration, and highlight the role of high-quality spaces in promoting leisure and well-being. Finally, the research concludes with recommendations for creating impactful spatial qualities for future riverside regeneration projects.

Keywords: Riverside landscape; Spatial quality; Leisure activities; Wellbeing; Unique character; Diversity

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1. Introduction

1.1. Background and existing problems

As is known to all, ‘riverside urbanity’ means physical and visual connections with rivers, where everyone can enter through the ‘common land’ along the river ^[1]. Currently, riverside sites are used for various leisure activities. These places should simultaneously meet the demands of daily leisure activities and support the benefits of well-being at the same time. However, environmental quality is an important aspect of riverside sites used for industrial production. Moreover, there are some planning problems during the redevelopment of riverside sites in old industrial cities. In addition, studies on riverside regeneration are underrepresented in the current literature regarding the aspects of life and physical qualities ^[2]. Therefore, the general regeneration of riverside sites has been unable to completely satisfy people’s needs for leisure and well-being; it is essential to build a more meaningful and stronger character for riverside redevelopment.

1.2. Aim and objectives

This research aims to examine how the spatial quality of riverside sites in some old industrial cities can encourage leisure activities and human well-being and develop a set of design guidelines to ensure the individual character of riverside sites.

This study can bring a new dimension to the understanding of urban design concerning the successful use of public spaces. The importance is that the spatial quality of the riverside location can recall the memories of old industrial cities, connecting public services and social leisure activities, thereby encouraging ‘public involvement’ and well-being in urban areas ^[3]. At a larger scale, the regeneration of riverside sites in old industrial cities has been of great concern, and increasing attention has been paid to urban form. Cities are now focusing on rivers and riverside environments to enhance the quality of outdoor leisure activities. Creating different qualities of spaces in riverside sites to attract people, interactive spaces can be built to contain various leisure activities. Therefore, a good experience will be provided for the people who live and engage in leisure activities at riverside sites, benefiting society and human well-being. It is important to examine different aspects of the feelings and experiences of sites near rivers to achieve the goal of ‘social benefits’ and happiness from leisure activities at riverside sites.

2. Research Methodology

The method for this research is based on a review of the literature on how spatial quality can provide the potential for riverside sites for well-being and attachment to place, and a case study analysis to identify good practices and prove that riverside sites are good places to encourage human leisure activities.

To identify opportunities and design guidelines for riverside regeneration, previous theories and academic/official sources from responsible authorities have been referenced, good practices have been investigated and selected, and all the official data referenced are the latest data. The method is based on a qualitative approach, and charts and analysis pictures are provided to facilitate this approach.

2.1. Objective

- (1) The scale of the river itself
- (2) The importance of the river to the city
- (3) The varying topography of the river bank for leisure activities
- (4) At least one particularly unique spatial quality.

2.2. Scale

The scale of the river itself vastly influences the form of the city. The width of the river affects feelings on the riverside, the type of activities occurring on the bank or edge of the river, and also influences the street patterns and connectivity of the city. Width of the selected cases:

- (1) River Limmat: width of riverbed: 60m; width of floodplain: 70m.
- (2) River Wupper: width of riverbed: 25m, width of floodplain: 80m.
- (3) River Isar: width of riverbed: 50-60 meters, width of floodplain: 150m.

2.3. Importance of the river

Each river has a significant effect on the city, not just its historical meaning, but also the needs of today’s city life.

2.4. Diversity

The design of all cases is an attempt to create diversity in the spatial qualities of riverside sites. Consequently, the topography of the riverbank is important for building different stages of leisure activities. All cases have different stages, such as activities on the riverbank, floodplain, river edge, and river.

2.5. Unique characteristic

The design measures are very relevant and at least one particularly unique spatial quality has been presented in each case. Although it may not be transferable to all designs of riverside sites, it may provide some design guidelines and inspire the redevelopment of riverside sites in the future.

3. Good spatial quality encourages leisure activities

The spatial quality of the riverside site has a significant impact on the experience of urban environment. Public spaces on riversides have received increasing attention in recent years and have been conceptualized in two parts of the city: the topography and a place for leisure activities. Topography refers to the physical environment or spatial forms, and the space for activities focuses on social connection and human behavior that may contribute to the psychological aspect ^[4].

Riverside sites may encourage leisure activities and well-being through their spatial qualities or unique environmental characteristics. The subjective consciousness and psychological effects of people can also influence the judgment of the site and value of the river, which is mainly reflected in human behavior and leisure activities. These two proteins interact with and complement each other. A good illustration of this is illustrated in **Table 1**, which is similar to the one created by Stevens ^[5].

Table 1. Table of the reasons and theories of riverside activities created by Stevens

Environmental experience of leisure	Origin in broader theories of leisure and urbanity	Sources	Spatial context of the urban riverfront
Escape from the everyday	The theory of play as existing in a 'world apart'	Huizinga, 1970; Lyman and Scott, 1975; Cohen and Taylor, 1976	Across the river
Mixing with strangers	Theories of behavior in public space	Goffman, 1963; Sennett, 1971; Lofland, 1998	Pools (of uses) and flows (of people)
Consuming spectacle	'The society of the spectacle', city as theme park	Sorkin, 1992; Debord, 1994; Dodson and Kilian, 1998	The riverbank stage
Exploratory forms of bodily action	Theorization of the forms and objectives of play	Caillois, 1961; Borden, 2001	On the edge

Table 1 shows that the environmental experiences of riverside activities, the various reasons people come to riverside sites, and theories of leisure and urbanity are different. The environmental experience of leisure depends on the spatial context of the site, and the activities and behaviors depend on the quality of the riverside space.

Kondolf illustrated the different types of uses in different river widths (**Figure 1**); draft pictures can indicate these situations more vividly ^[6].

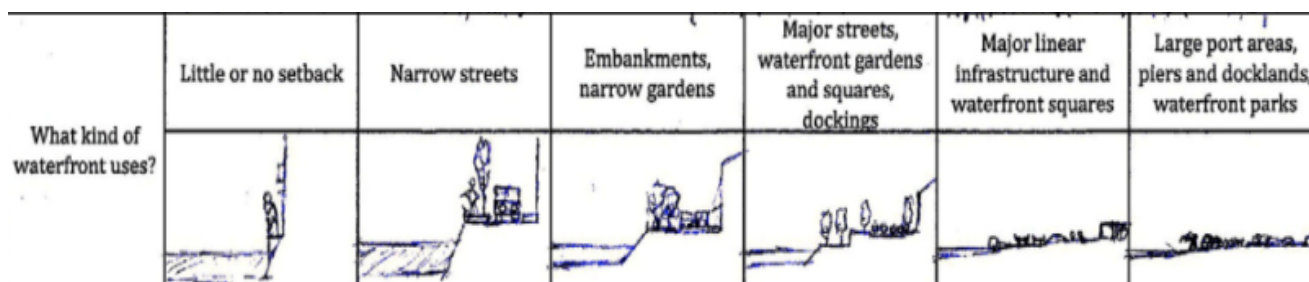


Figure 1. Different uses in different river widths

Linear parks and riverside squares begin to appear, and urban recreational systems can be derived as the riverbank becomes wider. This not only results from the river's width but also from the flood control measures and constraints of the embankment itself. After the urban regeneration of the riverside, the residential houses opposite to the river were demolished, and the remaining houses were facing towards the river. The demolition of the houses provided the riverside with a more open space. The river can be seen as the 'gate of the city'. The landscape of riverside sites is greatly enhanced, and citizens feel the well-being of the public space, reflecting the spatial quality of riverside sites ^[7].

4. Unique characteristics of riverside sites

Another point of the riverside site's potential is the unique environment. Jacobi pointed out the differences in leisure activities between riverside sites and traditional parks ^[8].

Table 2 shows the main differences. Most people believe that riverside sites are open, which increases human integration and promotes more activities, especially when there is easy access to linear parks. The other facilities are riverside locations; some facilities are set in the water, providing a unique experience, and some leisure activities, such as sunbathing, fishing, and swimming, occur near or in the water ^[9].

Table 2. Difference of riverside as leisure spaces

Main aspects mentioned
Open park
Greater movement and integration of people
Ease of access
Conservation of the watercourse
Reduced support and leisure facilities
Pedestrian thoroughfare

5. Good practice of urban riverside regeneration that encourages leisure activities and well-being

5.1. Topography and access to water of Wipkinger Park

Wipkinger Park is located in the Wipkingen district, approximately 2.7 kilometers from the old city of Zurich. The park lies on the north bank of the river limit and is surrounded by a large residential area and some old industrial factories.

Based on **Figure 2**, which shows the systematic analysis of satellite imagery and demographic data obtained from the official local website, a comprehensive insight into the diverse array of leisure activities prevalent at the site can be discerned.

During the peak periods of a typical summer weekend, the site had a maximum occupancy of approximately 400 individuals actively engaged in various leisure pursuits, as shown in **Figure 3**.

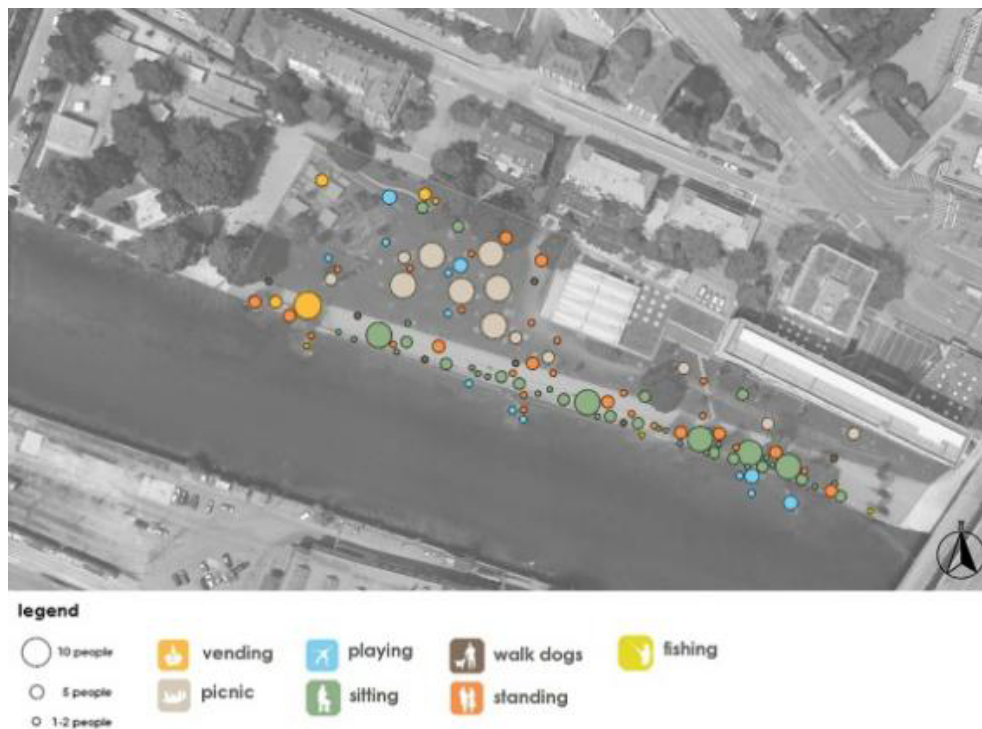


Figure 2. Satellite image and demographic data of Wipkinger Park

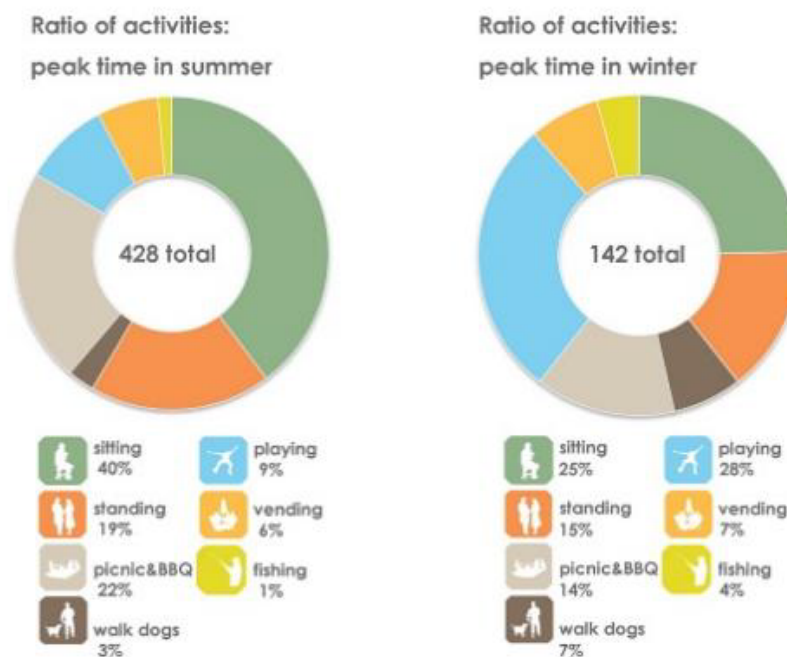


Figure 3. Data illustration of the diverse array of leisure activities at Wipkinger Park

Figure 4 shows the illustration of the topography and visual mapping of the Wipkinger Park site. The detailed visual mapping of the site reveals a discernible pattern: the preponderance of visitors congregates along the river's edge.

Notably, while specific leisure activities necessitate designated zones, such as picnicking on the central lawn or vending within designated park areas, the remainder of leisure activities are predominantly conducted along the river perimeter and beneath the canopy of the trees. The configuration and topography of a site exerts a significant influence on the types of leisure activities that occur within its boundaries. The most frequently visited areas are those that offer shade beneath the trees in proximity to the water's edge and riverside platform, where visitors can experience the refreshing breeze while simultaneously enjoying the picturesque river scenery. Additionally, the incorporation of conceptual kindergarten farms with animals in close vicinity to the site has proven to be a major attraction for both children and adults, fostering parent-child interactions and playful engagements.

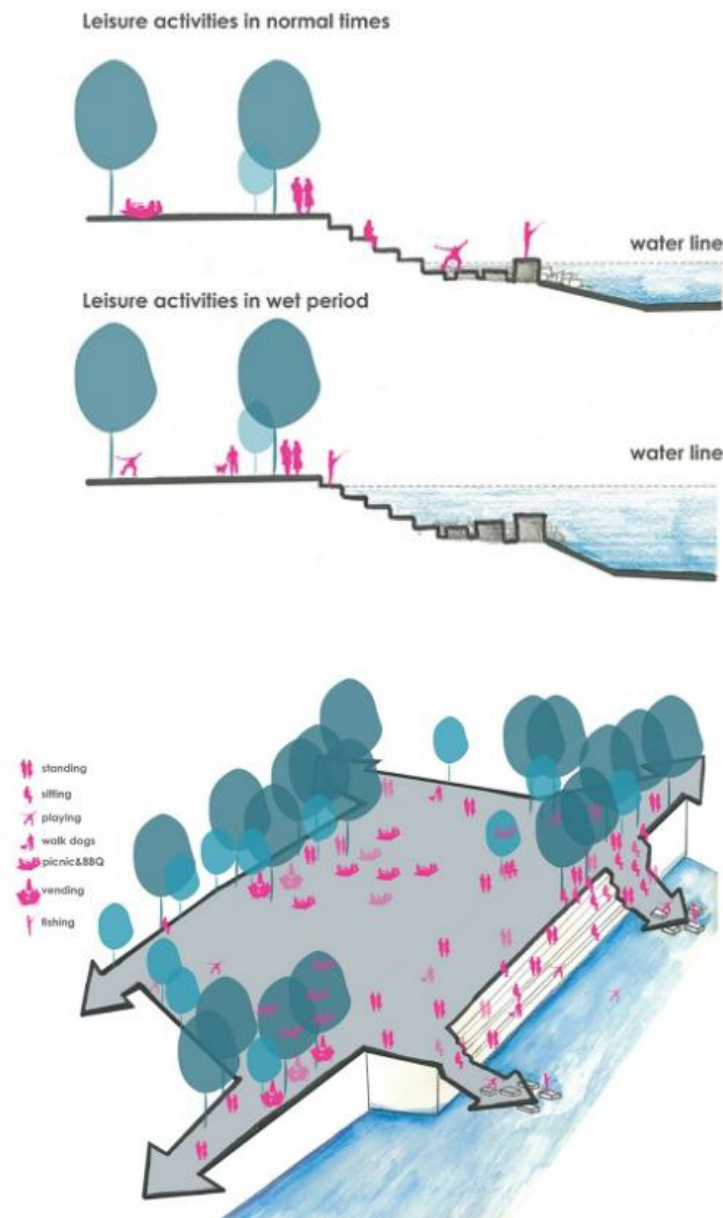


Figure 4. The illustration of the topography and visual mapping of Wipkinger Park

5.2. Topography and access to water of Park Beer-sheva-ufer

Park Beer-sheva-ufer is a linear public space along the river Wupper. Because the width of the riverbed is only 25m, it is not possible to build a promenade path parallel to the river. In addition, the famous suspension railway passes over the river, and there are some industrial and water pipes near the bank, which provides a very strong scenery of the industrial atmosphere. **Figure 5** shows the satellite image and demographic data of Wipkingen Park.

Based on the figure above, the most popular area of the site is the grassy stepped region near the water. Visitors prefer to sit on flat surfaces near water, accessible by stairs, and engage in activities on softer grassy areas. The abundance of greenery, compared to hard structures, encourages this behavior. Trees near buildings create enclosed spaces, while steps, balconies, and suspension railways offer river views. This narrow riverside park showcases diverse spatial features, inspiring riverside design redevelopment. **Figure 6** shows the illustration of the topography and visual mapping of Park Beer-sheva-ufer.

Due to the presence of submerged steps and stones within the water, children have the opportunity to engage in water play, while individuals who are unable to access water at other locations can experience it here. In addition, the pathway along the riverbank is a popular location for dog walking. The shading provided by the riverbank creates varying light conditions within the berm area, which contributes to its unique environmental characteristics.



Figure 5. Satellite image and demographic data of Park Beer-sheva-ufer

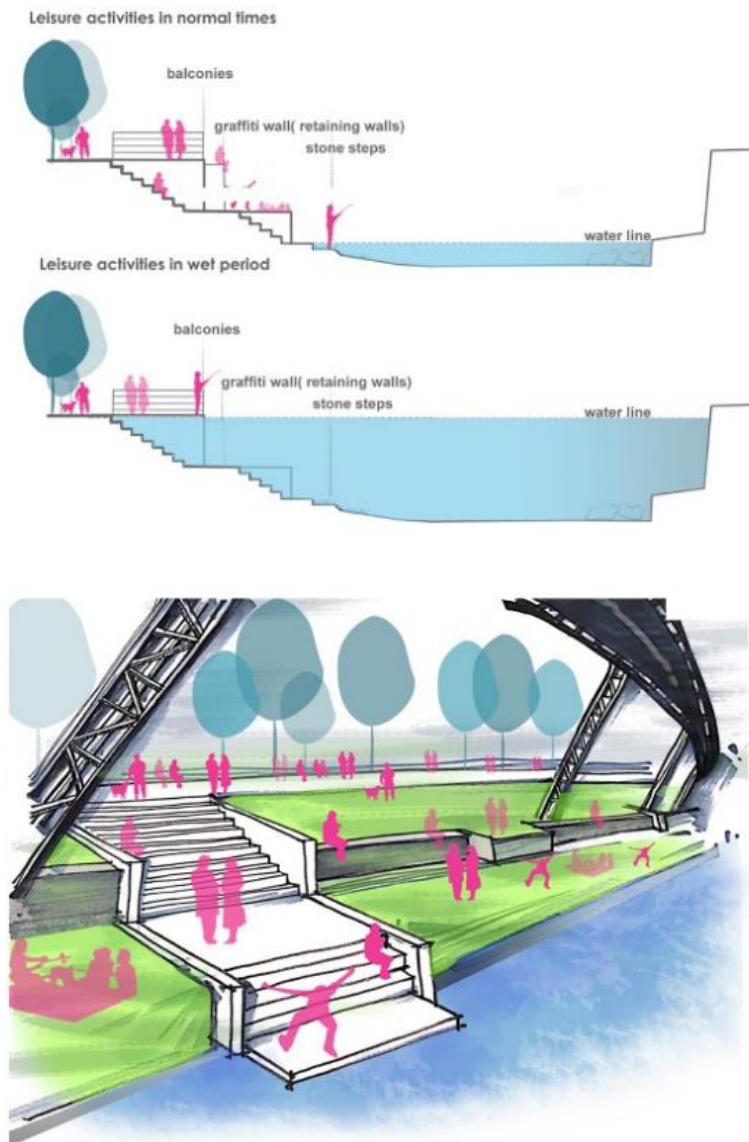


Figure 6. The illustration of the topography and visual mapping of Park Beer-sheva-ufer

5.3. Unique spatial quality for leisure of Flaucher Park

Flaucher Park is the most popular site near the Isar River, which has a large gravel beach, flood meadows, and natural river landscapes. There are two children's playgrounds and a football playground in the park, and the Hellabrunn Zoo is not far from the site. The park attracts people from everywhere in the country to get close to natural water and has sunbaths or grills on gravel beaches.

Based on straightforward visual analysis (**Figure 7**), it is evident that individuals tend to engage in leisure activities on gentle slopes and gravel beaches near the water. Gravel beach, which is a distinctive feature of the entire site with no comparable alternatives along the waterfront, emerged as the most frequented area. Notably, the dynamic population primarily conducts activities around the site, particularly in the water and along the park paths. Conversely, static and seated populations concentrate on gravel beaches and under tree shades, engaging in leisure pursuits such as barbecuing, sunbathing, and resting.

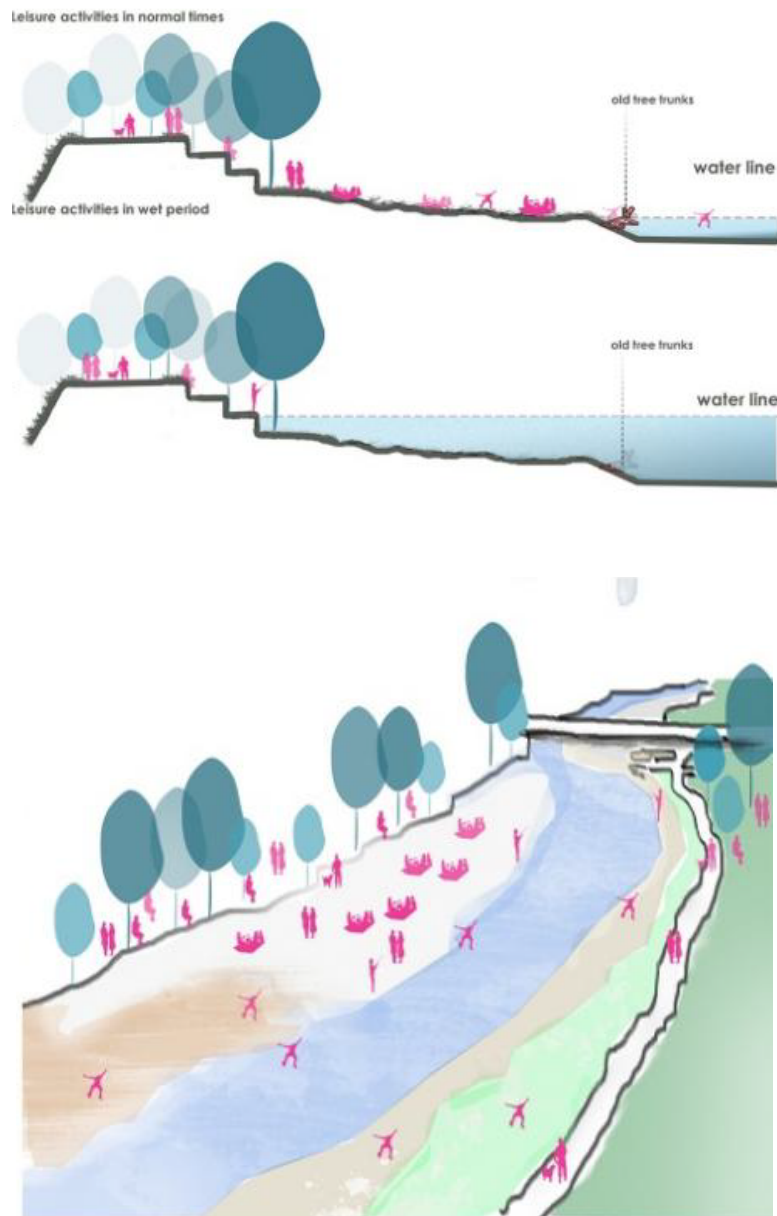


Figure 7. The illustration of the topography and visual mapping of Flaucher Park

Given the shallow nature of the river, the ecological islands and facilities within it serve as leisure spaces. These islands and structures in the river impede water flow, creating dynamic effects that attract individuals to playful activities. Furthermore, an examination of the satellite imagery and visual mapping reveals that the white color of the gravel beach is a notable feature that significantly influences the identity and spatial quality of the riverside site, as shown in **Figure 8**. This unique coloration is a key factor that attracts individuals to distinctive and one-of-a-kind leisure destinations.

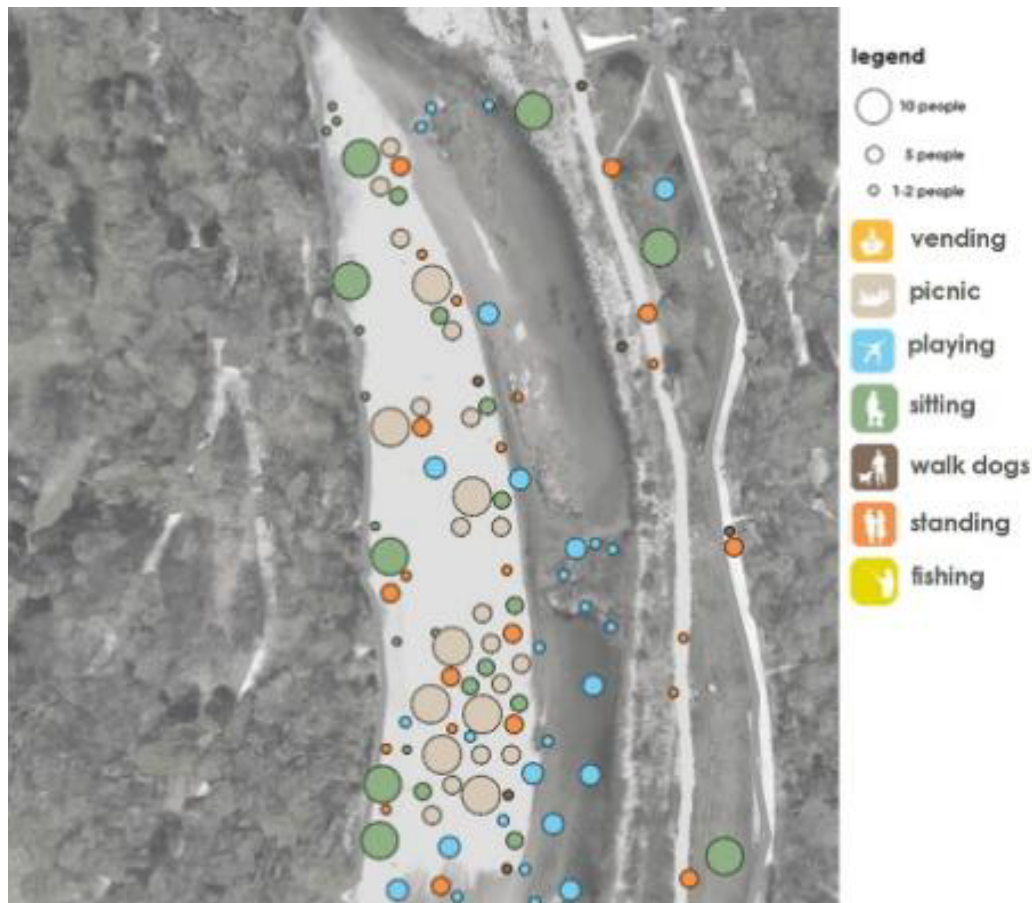


Figure 8. Satellite image and demographic data of Flaucher Park

6. Design principles from cases

Some areas in riverside sites have a blurred function, so-called ‘empty patches’; these sites may be flooded during wet periods but may still have value as ‘ambiguous places’ that people can use as they like^[10]. Therefore, not only do spatial qualities meet human demands, but people can also determine the function of the site.

Prominski emphasized that riverside sites are good educational areas that provide opportunities for leisure activities to contact nature^[11]. People can access water and see the water flow, and know about flood control and water management; this has educational value. The educational function of riverside sites can serve as a foundation for the general development of citizens.

In the planning and development of riverside environments, it is imperative to prioritize the seamless integration of these spaces with the broader urban public realm to enhance both accessibility and spatial connectivity. The incorporation of dynamic and adaptable boundaries can significantly enrich user engagement by facilitating diverse patterns of movement and interaction. Emphasis on natural elements not only contributes to the aesthetic appeal of the site but also supports ecological functionality. Additionally, the creation of visual dynamics through deliberate design interventions fosters spatial interest and orientation. To establish a distinctive sense of place, it is essential to reflect the local cultural context, historical narratives, and chromatic identity. Finally, the provision of attractive amenities, alongside clearly articulated functional zones, is critical to meeting the varied needs of visitors, particularly during peak periods typically characterized by increased use from families and children during temperate daylight hours.

7. Conclusion

Urban riverside sites frequently necessitate an integrated approach that combines various stages of connectivity, thereby linking the city's public spaces into a cohesive leisure space system and facilitating the exchange of activities between the riverbank. Leisure activities serve as a vital force that animates riverside sites, and the quality of these spaces is of paramount importance because they constitute the everyday environment for the majority of individuals. The successful regeneration of riverside areas can present opportunities for daily leisure pursuits and enhance the overall quality of urban life. Both locals and tourists are inclined to engage in leisure activities within these spaces as their connection with spatial quality continues to deepen and broaden.

Riverside spaces with distinct identities and characteristics are crucial for fostering a sense of belonging and encouraging interactions between people and rivers. The quality of these spaces directly impacts the quality of life of residents, providing them with places for leisure and relaxation. It is not just designers who shape the character of these sites; the way people use and interact with them plays a significant role. In recent years, efforts to regenerate urban riverside areas have focused on creating multifunctional and multilevel spaces that cater to the needs of both residents and urban development. This approach, which emphasizes unique spatial qualities and diverse leisure opportunities, is likely to continue in future projects, further enhancing the well-being of communities and promoting interactions with the river environment.

Disclosure statement

The authors declare no conflict of interest.

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