

Assessing the Applicability of Kriken's Urban Design Principles in the Benteng Kuto Besak Waterfront Heritage Area, Palembang

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ABSTRACT. The Benteng Kuto Besak (BKB) waterfront is a historic public space along the Musi River that integrates heritage, recreational, cultural, and commercial functions. This study assesses the applicability of Kriken's urban design principles to formulate site-specific directions for sustainable management of the BKB waterfront heritage area. A qualitative descriptive case study approach was employed using field observations, photographic documentation, brief informal field interviews, and document analysis, including the Palembang Spatial Plan (RTRW) and Government Regulation No. 38 of 2011. Kriken's nine principles (sustainability, accessibility, diversity, open space, compatibility, incentives, adaptability, density, and identity) served as the analytical framework for examining spatial conditions, activities, potentials, and problems. The findings reveal challenges related to limited green infrastructure, pedestrian and vehicular conflicts, informal commercial activities, road conditions, waste management, and heritage compatibility. Diversity is reflected primarily through the variety of functions, activities, and user choices rather than architectural stylistic variation. The resulting design directions emphasize pedestrian continuity, flexible open space management, heritage compatible interventions, improved vegetation and environmental management, organized vendor zones, and preservation of visual and cultural identity. The study demonstrates that Kriken's framework can be adapted to formulate site-specific urban design directions for historic waterfront areas in Indonesia.

Keywords: benteng kuto besak, kriken's urban design principles, waterfront heritage

ABSTRAK. Waterfront Benteng Kuto Besak (BKB) merupakan ruang publik bersejarah di tepian Sungai Musi yang mengintegrasikan fungsi warisan budaya, rekreasi, budaya, dan komersial. Penelitian ini menilai keterterapan prinsip-prinsip rancang kota Kriken untuk merumuskan arahan spesifik kawasan bagi pengelolaan berkelanjutan kawasan heritage waterfront BKB. Pendekatan studi kasus deskriptif kualitatif digunakan melalui observasi lapangan, dokumentasi fotografis, wawancara lapangan informal singkat, serta analisis dokumen, termasuk Rencana Tata Ruang Wilayah (RTRW) Kota Palembang dan Peraturan Pemerintah Nomor 38 Tahun 2011. Sembilan prinsip Kriken, yaitu keberlanjutan, aksesibilitas, keberagaman, ruang terbuka, kesesuaian, insentif, adaptabilitas, kepadatan, dan identitas, digunakan sebagai kerangka analisis untuk mengkaji kondisi spasial, aktivitas, potensi, dan permasalahan kawasan. Hasil penelitian menunjukkan tantangan berupa keterbatasan infrastruktur hijau, konflik pejalan kaki dan kendaraan, aktivitas komersial informal, kondisi jalan, pengelolaan sampah, serta kesesuaian heritage. Keberagaman terutama tercermin melalui variasi fungsi, aktivitas, dan pilihan pengguna. Arahan desain menekankan kesinambungan pedestrian, pengelolaan ruang terbuka fleksibel, intervensi yang selaras dengan heritage, peningkatan vegetasi dan pengelolaan lingkungan, penataan zona pedagang, serta pelestarian identitas visual dan budaya. Kerangka Kriken dapat diadaptasi untuk merumuskan arahan rancang kota spesifik bagi kawasan waterfront bersejarah di Indonesia.

Kata kunci: benteng kuto besak, prinsip rancang kota kriken, waterfront bersejarah

INTRODUCTION

Palembang City, as one of the oldest cities in

Indonesia, has a long history shaped by its interaction with the Musi River (Lussetyowati et al., 2025). From the era of the Sriwijaya Kingdom through the Palembang Darussalam Sultanate, this

river has played a crucial role in transportation, trade, and the development of civilization (Syarifuddin et al., 2022). One of the historical legacies that still stands majestically along the banks of the Musi River is Benteng Kuto Besak (BKB), a palace fortress inherited from the Palembang Sultanate, constructed in the 18th century (Syarifuddin et al., 2022). This area not only serves as a silent witness to past glory but also represents an important component of Palembang's identity as the "Venice of the East" (Asriana et al., 2024).

However, along with rapid urban development, Palembang's waterfront areas are facing increasingly complex challenges (Salsabila et al., 2024). Population growth and economic activities have significantly transformed the riverfront landscape, often without adequate consideration for the preservation of historical and ecological values (Utomo et al., 2024). Land-use conversion, high-density settlements, and the lack of green open spaces have become pressing issues in the area (Azizah et al., 2021). On the other hand, historical buildings surrounding BKB, such as the Sultan Mahmud Badaruddin II Museum and the Monumen Perjuangan Rakyat, require special conservation and revitalization approaches to ensure their continued relevance to contemporary needs without compromising their authenticity (Rohmah et al., 2022).

The waterfront city concept promoted by the Palembang City Government through the RTRW (Rencana Tata Ruang Wilayah) 2012-2032 emphasizes the importance of organizing riverfront areas as multifunctional public spaces. However, its implementation continues to face several constraints, including:

1. Environmental degradation, domestic and industrial waste pollutes the Musi River, reducing the visual and ecological attractiveness of the area (Shafira et al., 2023);
2. Overlapping activities: areas intended for recreation are instead congested by unregulated street vendors, diminishing spatial quality and comfort (Santi, 2017);
3. Spatial disharmony: modern developments often disregard harmony with historic buildings,

resulting in visual fragmentation within the urban landscape (Zhu et al., 2022).

Previous studies, such as the research by (P et al., 2015) on the waterfront city of Palembang, reveal that stakeholder participation is a key factor in the success of waterfront development. Meanwhile, (Sabila & Damayanti, 2015) emphasize the importance of improving the quality of tourism services in the BKB area. However, existing studies on the BKB waterfront have primarily addressed tourism services, stakeholder participation, or physical waterfront characteristics. Limited attention has been given to the systematic assessment of the area through Kriken's nine urban design principles (2010) and their translation into site-specific design directions for a historic waterfront context.

This study seeks to address this gap by responding to the following research questions:

1. What are the physical, spatial, functional, and heritage characteristics of the BKB waterfront area and its surrounding cultural heritage assets?
2. How applicable are Kriken's nine urban design principles to the existing conditions and planning needs of the BKB waterfront heritage area?
3. What site-specific urban design directions can be formulated based on this assessment?

By analyzing the applicability of Kriken's nine principles (sustainability, accessibility, diversity, open space, compatibility, incentives, adaptability, density, and identity), this study aims to identify the physical, spatial, functional, and heritage characteristics of the BKB waterfront, assess the applicability of Kriken's nine urban design principles, and formulate site-specific urban design directions based on the assessment. The ultimate objective is to optimize the function of the area as a sustainable, identity-driven public space that continues to respect and preserve its historical heritage (Komariah et al., 2022).

The findings are expected to be relevant not only to the context of Palembang but also to other historic cities in Indonesia facing similar challenges in waterfront development. Furthermore, this study is

intended to serve as a reference for policymakers, urban planners, and local communities.

Literature Review

Waterfront

1. Waterfront City

Waterfront areas represent urban spaces where land directly interacts with water bodies and have the potential to function as vibrant public spaces (Purbasari et al., 2023) supporting social, recreational, cultural, and economic activities (Breen, 1994; Rizky Annisa Lestari, 2022). In historic cities, waterfront development also requires consideration of environmental quality, public accessibility, and the preservation of cultural identity.

2. Types of Waterfronts

As cities increasingly demand high-quality public spaces, waterfront areas have been widely developed for recreation, residential uses, commercial activities, and cultural centers (Sitompul et al., n.d.). Waterfront areas can be classified according to their dominant functions, including cultural, environmental, historical, mixed-use, recreational, residential, and working waterfronts (Breen, 1994, as cited in Arief Sumarto et al., 2022). Based on its existing characteristics, the Benteng Kuto Besak waterfront is most appropriately understood as a historical and mixed-use waterfront because it combines cultural heritage assets with recreational, commercial, cultural, and public activities.

3. Waterfront Principles

These principles aim to ensure that waterfront areas function not only in aesthetic and economic terms but also provide social, ecological, and cultural benefits to surrounding communities (Arief Sumarto et al., 2022). By adhering to these principles, waterfront development can create inclusive and sustainable spaces that are harmonious with natural environmental characteristics and responsive to local community needs (Pandani et al., 2024).

Previous waterfront planning literature emphasizes several recurring design considerations, including

land-use organization, public open space, vegetation, building form and massing, circulation, accessibility, and environmental management (Breen & Rigby, as cited in Arief Sumarto et al., 2022). These considerations provide contextual support for understanding the physical characteristics of waterfront areas; however, the analytical framework of this study is specifically based on Kriken's nine urban design principles.

Heritage Conservation Context

Heritage conservation in historic urban areas requires the identification of cultural significance, protection of historic assets, integration with contemporary socio-economic development, and participation of relevant stakeholders. Conservation planning should ensure that new development does not compromise the historical, visual, and cultural values of heritage areas while allowing them to respond to contemporary urban needs (Adishakti, 2010; Anwar et al., 2025). In the context of the BKB waterfront, heritage conservation therefore provides an important contextual consideration for assessing compatibility, adaptability, and identity within the urban design framework.

Urban Design Principles by Kriken

Sustainable and heritage time-based oriented urban design requires a holistic approach that integrates physical, social, and cultural dimensions. John Lund Kriken (2010), in his book *City Building: Nine Planning Principles for the Twenty-First Century*, proposes fundamental principles that serve as guidelines for designing cities that are not only functional but also possess a strong identity and long-term sustainability. These principles emphasize the creation of vibrant public spaces, the integration of cultural heritage with modern development, and a strong focus on urban ecology and connectivity. By applying Kriken's urban design principles, an area can develop dynamically without sacrificing its historical character and environmental integrity. Accordingly, Kriken's nine principles are adopted in this study as the primary analytical framework for assessing the existing conditions and planning needs of the BKB waterfront area.

The following section elaborates on these principles:

Table 1. Analytical Framework of Kriken's Urban Design Principles for the Benteng Kuto Besak Waterfront Area

Urban Design Principles (Kriken, 2010)	Conceptual Focus	Assessment Indicators
<i>Sustainability</i>	Commitment to environmental ethics	Vegetation, surface permeability, drainage, waste management, and river edge ecology
<i>Accessibility</i>	Facilitating efficient and seamless mobility / Ease of movement	Pedestrian continuity, universal access, pedestrian-vehicle conflict, parking, and transit connectivity.
<i>Diversity</i>	Maintaining diversity and choice in land use (mixed-use development)	Diversity of functions, activities, users, time-based uses, and commercial-cultural-recreational activity
<i>Open Space</i>	Regenerating natural systems to create more livable cities	Green open space, shading, public plazas, river edge spaces, and recreational areas
<i>Compatibility</i>	Maintaining harmony of form and visual balance	Building scale, materials, signage, street furniture, and visual relationships with heritage assets
<i>Incentives</i>	Urban renewal and reinvestment	Revitalization mechanisms, investment opportunities, adaptive reuse, and public/private incentives
<i>Adaptability</i>	Capacity for positive change	Flexible plaza use, temporary activities, event spaces, and reversible interventions
<i>Density</i>	Designing compact cities supported by appropriate transportation systems	Intensity of buildings and activities and their relationship with transportation systems
<i>Identity</i>	Unique and memorable sense of place	Benteng Kuto Besak, the Musi River, the Ampera Bridge visual corridor, heritage landmarks, and local culture.

Source: Analysis based on Kriken, 2010

RESEARCH METHODOLOGY

Research Location

This research was conducted in the Benteng Kuto Besak area, located on St. Sultan Mahmud

Badaruddin, 19 Ilir Urban Village, Bukit Kecil District, Palembang City, South Sumatera, Indonesia. The study site covers an area of approximately 19.6 hectares. The Benteng Kuto Besak waterfront area possesses high historical value due to the presence of various cultural heritage assets and offers a prime visual orientation toward the Ampera Bridge.

The northern boundary of the study area is St. Merdeka, the western boundary is St. Rumah Bari, the eastern boundary is St. Palembang Darussalam, and the southern boundary directly borders the Musi River.

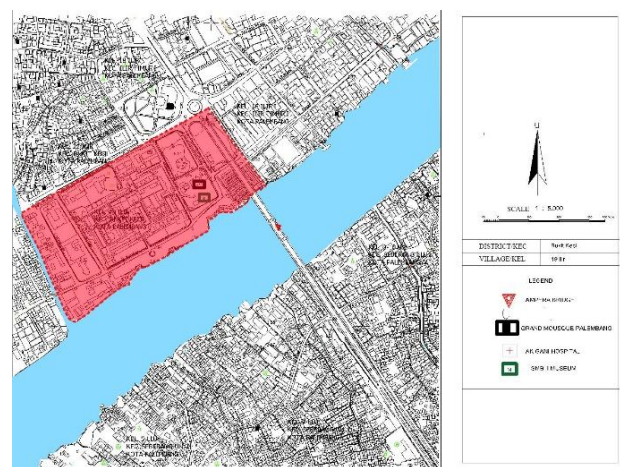


Figure 1. Palembang Waterfront Area (Research Location)

Source: Analysis, 2026

Research Stages

This study adopts a qualitative descriptive case study approach to evaluate the existing spatial characteristics, activities, potentials, and problems of the Benteng Kuto Besak waterfront area. The study area covers approximately 19.6 hectares and includes the BKB waterfront, its public open spaces, circulation system, and surrounding heritage assets.

Primary data were obtained through two field observation visits conducted on weekday and weekend conditions, photographic documentation, and brief informal field interviews with three visitors and one guide from the Sultan Mahmud Badaruddin II Museum. The visitors were approached on site and asked open ended questions regarding their activities, accessibility,

comfort, and perceptions of the BKB waterfront area. In addition, the museum guide was consulted as a key informant due to the guide's familiarity with the historical background and use of the BKB area. The interviews were conversational in nature and were used to complement the field observations rather than as the primary source of research data. Secondary data consisted of the Palembang RTRW, relevant river and cultural heritage regulations, and supporting academic literature.

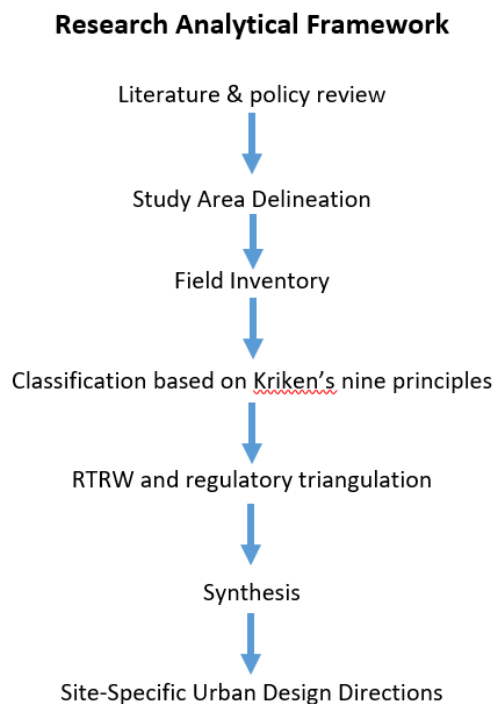


Figure 2. Research Analytical Framework
Source: Analysis, 2026

The analysis was conducted in four stages. First, existing spatial conditions and activities were inventoried, including circulation, open spaces, landuse activities, heritage assets, environmental conditions, and public space use. Second, the findings were classified according to nine analytical categories derived from Kriken's urban design principles: sustainability, accessibility, diversity, open space, compatibility, incentives, adaptability, density, and identity. Each principle was translated into site-specific observable indicators to ensure consistency between theory and field analysis. Third, field findings were triangulated with planning and regulatory documents, particularly the

Palembang RTRW and Peraturan Pemerintah Nomor 38 Tahun 2011, which were used as a regulatory benchmark for assessing conformity between existing conditions and officially designated spatial functions. Finally, the synthesis of field evidence, Kriken's principles, and regulatory requirements was used to formulate site-specific urban design directions for the BKB waterfront heritage area.

RESULTS AND DISCUSSION

Identification of Physical Conditions and Spatial Typology of the Area

Area Structure

The BKB waterfront exhibits an organic spatial configuration structured by a predominantly linear road network. The southern edge is defined by the Musi River, while the northern and lateral boundaries connect the waterfront with the surrounding urban fabric. Comparison with the Palembang RTRW 2012-2032 indicates that the observed road hierarchy and spatial organization generally correspond with the designated spatial structure of the area. This spatial structure provides the physical basis for assessing Accessibility, Density, and Identity in the subsequent Kriken-based analysis.



Figure 3. Map of the Benteng Kuto Besak (BKB) Area, Palembang
Source: RTRW Kota Palembang 2012-2032

Road Corridors and Accessibility

The waterfront area of Palembang is structured by both primary and secondary road corridors. The area's primary corridors are accessible via secondary arterial roads, namely St. Merdeka, St. Dr. A.K. Gani, and St. Palembang Darussalam. Meanwhile, the secondary corridor that forms the area's internal spatial structure is St. Sultan Mahmud Badaruddin. Along this road, the Benteng Kuto Besak plaza is located and functions as an open space. The secondary road corridor that shapes the internal spatial structure of the area is defined by several elements, including the roadway, greenway, shade trees, plant hedges, building setback lines, and surrounding buildings. This configuration is consistent with the RTRW Kota Palembang 2012-2032.

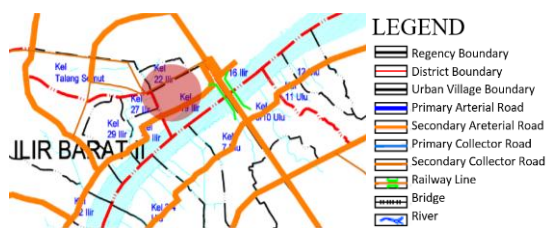


Figure 4. Road Corridor Map of the Benteng Kuto Besak (BKB) Area, Palembang

Source: RTRW Kota Palembang 2012-2032



Figure 5. Existing Road Corridor Conditions in the BKB Area

Source: Author Documentation and Google Earth, 2025

Vehicular movement was relatively unobstructed during the weekday observation. However, during the weekend field observation, increased pedestrian and vehicular activity resulted in localized circulation conflicts around the BKB Plaza. In addition, although the road surface is predominantly constructed using paving blocks, many sections remain uneven and utilize inconsistent materials, indicating insufficient maintenance treatment in the BKB area. Overall, the condition of road access reflects a lack of proper

treatment, characterized by uneven surfaces and non-uniform paving materials. Meanwhile, pedestrian circulation within the BKB area and along St. Palembang Darussalam, pedestrian movement also appeared congested during the observation, particularly along the connections toward the nearby traditional market area.

From Kriken's Accessibility perspective, the area benefits from strong connectivity to the surrounding urban network. However, the quality of internal pedestrian movement remains only partially satisfactory due to pedestrian-vehicular conflicts, uneven pavement, and discontinuities in the pedestrian environment.

Building Blocks and Spatial Character

The study area consists of several distinct building blocks separated by roadways, green strips, and physical boundaries. Several blocks exhibit distinct forms and spatial characteristics and form, particularly in the heritage buildings. Geometric configurations observed in the area include square, rectangular, and trapezoidal forms, reflecting the unique spatial composition of the site. The variation in block configuration and the presence of heritage buildings create a spatial context in which new physical interventions need to maintain visual and morphological compatibility.

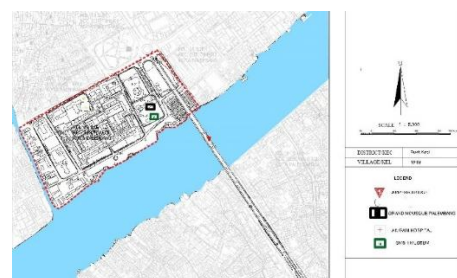


Figure 6. Building Block Map of the BKB Area, Palembang

Source: RTRW Kota Palembang 2012-2032

Open Space and Public Activities

Open space is a crucial element in the Benteng Kuto Besak waterfront area in Palembang, as one of the primary objectives of this waterfront development is to provide open spaces that support community activities and function as nodes and edges within

the area (RTRW Kota Palembang 2012-2032). Although the BKB waterfront contains a substantial civic open space in the form of the BKB Plaza, field observations indicate that vegetated and shaded areas remain relatively limited. During the late afternoon observation, intensive street vendor activity coincided with overlapping uses of the plaza and visible litter at several locations, resulting in a visually cluttered public space environment. The BKB Plaza functions as a focal public space connecting several access routes, while the vegetated strip along the Musi River forms a linear river edge open space system. The BKB Plaza functions as a focal public space connecting several access routes, while the vegetated strip along the Musi River forms a linear river edge and open space system.



Figure 7. Green Open Space (RTH) Map of Palembang
Source: RTRW Kota Palembang 2012-2032

In addition to green open spaces, the Benteng Kuto Besak waterfront area also includes paved plazas surfaced with paving blocks, ceramic tiles, or granite tiles. These plazas serve several primary functions, as outlined below.

Table 2. Activities in the BKB Plaza

Function	Illustration	Kriken Relevance
A venue for socio-cultural activities within the city or urban area, frequently hosting cultural performances, bazaars, art festivals, ceremonial events, and collective prayers.	Cultural Performances in Palembang 	Diversity, Identity
A place for the expression of local culture. During Indonesia's Independence Day celebrations, Palembang City often organizes cultural and artistic events at the BKB plaza, such as decorated boat	Bidar Boat Race on the Musi River 	Diversity, Adaptability

competitions, traditional bidar boat races, and performances of local arts.

A place for urban social interaction, where residents gather and engage with family and relatives.



Diversity, Open Space

A space for sports and recreation. On weekend mornings, activities such as group aerobic exercise (healthy heart exercise), jogging, leisurely walking, and cycling are frequently held at the BKB Plaza.



Diversity, Adaptability

A venue and object for education, research, and training related to the study of the natural environment.



Identity, Diversity

Source: Analysis, 2026

Identification of Cultural Heritage Assets in the BKB Waterfront Area

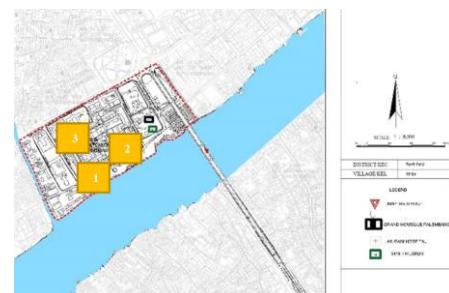


Figure 8. Location of Restored Heritage Buildings in the BKB Waterfront Area
Source: Analysis, 2026

At first point, Benteng Kuto Besak was constructed in 1780 during the reign of Sultan Mahmud Badaruddin I and originally served as the royal palace of the Palembang Darussalam Sultanate. In 1821, the fortress, which is recognized as one of the few major fortifications in Indonesia built by local rulers, came under the control of the Dutch colonial military. At present, Benteng Kuto Besak is administered by Regional Military Command II/Sriwijaya (Kodam II/Sriwijaya). This designation is also stipulated in the RTRW 2004 RDTRK Pusat Kota 2025, which classifies the Benteng Kuto Besak area as a conservation zone or cultural heritage area utilized for tourism purposes (Zinaida, 2020).

At the second point, the Sultan Mahmud Badaruddin II Museum is located. This museum is one of the major cultural institutions in Palembang City, South Sumatra, Indonesia. It was established in the former residence of the 19th-century colonial resident of South Sumatra. The building also functions as the Palembang City Tourism Office. Architecturally, the structure is a two-storey masonry building designed in a style that blends European architectural influences with tropical Indies architecture, with a strong emphasis on the traditional Rumah Bari (Limas) architectural style characteristic of Palembang.

The combination of colonial and local architectural characteristics contributes to the visual identity of the heritage setting and highlights the importance of Compatibility when introducing new design elements within the waterfront area.



Figure 9. Benteng Kuto Besak
Source: PagaramPos, 2025



Figure 10. Sultan Mahmud Badaruddin II Museum
Source: Author Documentation, 2025

At the third point, the Monumen Perjuangan Rakyat (Monpera) functions as an important landmark within the Benteng Kuto Besak waterfront area. The monument was established to commemorate the struggle of the people of Palembang during the Second Dutch Military Aggression and incorporates a distinctive symbolic architectural character (Sartikah, 2024). Its form, proportions, access points, and decorative elements were deliberately designed to represent historical events and local

cultural meanings, including the symbolism of the five-petaled jasmine flower, the date of Indonesian independence, Batang Hari Sembilan, and the struggle of the people of South Sumatra. As a result, Monpera contributes not only as a historical monument but also as a significant component of the visual and cultural identity of the BKB waterfront area.



Figure 11. Monumen Perjuangan Rakyat
Source: Gatra.com, 2022

Based on this description, it can be concluded that the Benteng Kuto Besak waterfront area in Palembang City is surrounded by numerous cultural heritage buildings.

Applicability of Kriken's Urban Design Principles to the BKB Waterfront Area

The applicability of Kriken's nine urban design principles was assessed by comparing field evidence with the site-specific indicators established in the analytical framework. The observed conditions were subsequently triangulated with the Palembang Spatial Plan (RTRW), relevant river management regulations, and heritage planning considerations. Based on the strength of the available evidence, the principles were classified into three levels: Highly Applicable, Applicable, and Partially Assessable. Highly Applicable indicates a strong correspondence between the principle and the observed spatial conditions; Applicable indicates clear relevance supported by field evidence; and Partially Assessable indicates that the principle is relevant to the study area but cannot be comprehensively evaluated using the available qualitative data. The assessment and resulting site-specific urban design directions are presented in Table 3.

Table 3. Applicability of Kriken's Urban Design Principles and Site-Specific Design Directions for the BKB Waterfront Area

No	Kriken Principle	Observed Evidence	Assessment Indicator	Degree of Applicability	Regulatory/Planning Reference	Site-Specific Design Direction
1	Sustainability	Limited vegetation and shading, predominantly hard surfaced plaza areas, visible litter, and environmental management issues along the waterfront.	Vegetation, surface permeability, drainage, waste management, and river edge environmental quality	Highly Applicable	Palembang RTRW 2012-2032, Government Regulation No. 38 of 2011 concerning Rivers	Increase shading vegetation and permeable surfaces, improve waste and drainage management, and strengthen the ecological function of the river edge.
2	Accessibility	Strong connection to surrounding urban roads, but pedestrian & vehicular conflicts, uneven pavement, and congested movement were observed around the BKB Plaza.	Pedestrian continuity, universal access, pedestrian & vehicular conflicts, parking, and connectivity	Highly Applicable	Palembang RTRW 2012-2032	Establish pedestrian priority circulation, improve pavement continuity and universal access, and provide clearer separation between pedestrian and vehicular movement.
3	Diversity	The plaza accommodates recreational, cultural, social, religious, commercial, tourism, and educational activities at different times.	Diversity of functions, activities, users, and time-based uses	Applicable	Palembang RTRW 2012-2032 and existing tourism/public space functions	Maintain the diversity of activities through flexible spatial zoning and accommodate different user groups without compromising public space accessibility
4	Open Space	BKB Plaza functions as a major civic open space, but vegetated and shaded green spaces remain limited; intensive activities occasionally overlap within the plaza	Green open space, shading, public plaza, river edge space, and recreational functions	Highly Applicable	Palembang RTRW 2012-2032	Maintain the plaza as a flexible civic space while increasing shaded green areas, seating, permeable surfaces, and river edge landscape quality.
5	Compatibility	BKB, Sultan Mahmud Badaruddin II Museum, Monpera, and other heritage elements establish a distinctive architectural and visual setting	Building scale, materials, signage, street furniture, and visual relationships with heritage assets	Highly Applicable	Cultural heritage regulations, Palembang spatial planning documents	Ensure that new physical interventions, signage, paving materials, street furniture, and landscape elements are visually compatible with the surrounding heritage context
6	Incentives	Several public facilities, road surfaces, and supporting infrastructure require improvement and revitalization, but the study does not examine investment mechanisms, financing schemes, or public-private incentives.	Revitalization mechanisms, reinvestment opportunities, adaptive reuse, and public/private incentives	Partially Assessable	Relevant planning and heritage management policies	Encourage targeted reinvestment in public facilities and heritage-sensitive revitalization; further studies should examine financing mechanisms and public-private incentive schemes
7	Adaptability	The BKB Plaza accommodates different activities according to time and occasion, including sports, cultural events, social gatherings, religious activities, and informal commercial uses.	Flexible plaza use, temporary activities, event spaces, and reversible interventions	Applicable	Existing public space and tourism functions	Introduce flexible and time-based space management, including temporary event zones and designated vendor areas that can adapt to changing activities.
8	Density	Concentrations of visitors, pedestrians, vehicles, and commercial activities occur during certain periods, particularly around the plaza; however, quantitative visitor counts, carrying capacity, and building intensity data are unavailable.	Intensity of users, activities, buildings, and their relationship with transportation and public space capacity	Partially Assessable	Palembang RTRW 2012-2032	Conduct quantitative assessments of visitor concentration, activity intensity, spatial carrying capacity, and transport demand before determining density-related interventions.

Source: Analysis, 2026

Table 4. Degree of applicability classified into three categories

No	Degree Principles	Kriken Principles
1	Highly Applicable	Sustainability, Accessibility, Open Space, Compatibility, Identity
2	Applicable	Diversity, Adaptability
3	Partially Assessable	Incentives, Density

Source: Analysis, 2026

The assessment indicates that Sustainability, Accessibility, Open Space, Compatibility, and Identity have the highest applicability to the BKB waterfront because these principles directly correspond to the most evident physical, environmental, and heritage related conditions identified during the field survey. Diversity and Adaptability are also applicable, particularly in relation to the variety and temporal flexibility of activities occurring within the BKB Plaza. In contrast, Incentives and Density are classified as Partially Assessable. Although both principles remain relevant to future waterfront management, the present study does not include detailed information on investment mechanisms, financing arrangements, visitor counts, building intensity, or spatial carrying capacity. Therefore, further quantitative and institutional assessments are required before these two principles can be evaluated comprehensively.

Site Specific Urban Design Directions for the BKB Waterfront Area

Based on the applicability assessment of Kriken's nine urban design principles, several site-specific urban design directions are proposed for the Benteng Kuto Besak (BKB) waterfront area. These directions respond to the physical, environmental, functional, and heritage related conditions identified during the field observations while supporting the preservation of the area's historical character and visual identity. The proposed directions are as follows:

1. Improving pedestrian priority circulation and universal accessibility by enhancing pedestrian continuity, repairing uneven pavement, reducing pedestrian & vehicular conflicts, and providing clearer connections between the BKB Plaza and surrounding urban elements.
2. Managing the BKB Plaza as a flexible public space by accommodating recreational, cultural, social,

religious, and commercial activities through appropriate spatial and time-based zoning, including designated areas for street vendors.

3. Strengthening green and environmental infrastructure through additional shade vegetation, permeable surfaces, improved drainage, effective waste management, and enhancement of the ecological quality of the Musi River edge.
4. Applying heritage compatible physical interventions by ensuring that paving materials, signage, street furniture, landscape elements, and future development remain visually compatible with Benteng Kuto Besak, the Sultan Mahmud Badaruddin II Museum, Monpera, and other heritage assets.
5. Preserving the visual and cultural identity of the waterfront by protecting important visual relationships among Benteng Kuto Besak, the Musi River, the Ampera Bridge, and surrounding landmarks, while maintaining cultural and educational activities that reinforce the area's sense of place.
6. Supporting targeted revitalization and further capacity assessment by improving public facilities and infrastructure while conducting further studies on investment mechanisms, visitor capacity, activity intensity, building density, and spatial carrying capacity to strengthen the application of the Incentives and Density principles.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The BKB waterfront is characterized as a historical and mixed-use waterfront combining civic open space, cultural heritage assets, recreational activities, commercial uses, and strong visual relationships with the Musi River and the Ampera Bridge. The assessment of the Benteng Kuto Besak (BKB) waterfront demonstrates that Kriken's nine urban design principles have different degrees of applicability to the existing physical, environmental, functional, and heritage conditions of the area. **Sustainability, Accessibility, Open Space, Compatibility, and Identity were identified as highly applicable** because they directly correspond to the main conditions observed in the study area, including limited vegetation and shading,

pedestrian & vehicular conflicts, uneven pedestrian surfaces, intensive use of the public plaza, and the strong visual and cultural relationship among Benteng Kuto Besak, the Musi River, the Ampera Bridge, and surrounding heritage assets. **Diversity and Adaptability were considered applicable**, particularly because the BKB Plaza accommodates recreational, cultural, social, religious, commercial, and tourism activities that vary according to time and user groups.

In contrast, **Incentives and Density were classified as partially assessable**. Although both principles are relevant to the future development of the BKB waterfront, the present qualitative study does not provide sufficient data on investment mechanisms, financing arrangements, visitor numbers, building intensity, or spatial carrying capacity. Based on the overall assessment, the proposed site-specific urban design directions emphasize pedestrian priority circulation and universal accessibility, flexible management of public spaces and street vendors, improvement of green and environmental infrastructure, heritage compatible physical interventions, preservation of visual and cultural identity, and targeted revitalization of public facilities. These findings indicate that Kriken's framework can be adapted as an analytical basis for formulating context sensitive urban design directions for historic waterfront areas.

Recommendations

Based on the findings, future development of the BKB waterfront should prioritize the improvement of pedestrian continuity, universal accessibility, shading vegetation, permeable surfaces, drainage and waste management, as well as flexible management of the BKB Plaza and designated street-vendor areas. Physical interventions, including paving materials, signage, street furniture, landscape elements, and supporting facilities, should remain compatible with the surrounding heritage context and maintain important visual relationships among Benteng Kuto Besak, the Musi River, the Ampera Bridge, and other cultural landmarks.

From an institutional perspective, the local government and relevant stakeholders should integrate these site-specific directions into future

planning and revitalization programs while maintaining the heritage character of the area. Communities and local vendors should be involved in the management and monitoring of public space activities to maintain accessibility, cleanliness, and social functions. Investors and private sector actors should follow heritage-sensitive planning and design requirements when supporting revitalization initiatives. Further research is recommended to quantitatively assess visitor capacity, activity intensity, building density, spatial carrying capacity, and investment mechanisms to strengthen the application of the Density and Incentives principles.

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