



Tactical Urbanism to Support Riverbank Accessibility and Local Economic Activities in Benua Anyar

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Abstract

This study explores how tactical urbanism can serve as a low-cost and adaptive strategy for revitalizing riverbank environments in tropical cities, using Benua Anyar in Banjarmasin as a case study. The research aims to examine how small-scale, modular and reversible interventions can enhance accessibility, support local economies, and improve environmental quality in river-dependent communities. A design-based and participatory approach was employed, integrating spatial mapping and community engagement to identify key challenges and potentials within the study area. The analysis revealed three main zones, floating aquaculture units, riverside residential corridors and a culinary tourism cluster along with critical issues such as unsafe pedestrian paths, disorganized vending areas, waste accumulation, fragmented circulation and limited public spaces. At the same time, significant opportunities were identified in productive aquaculture, culinary tourism and strong socio-cultural connections to the river. In response, three tactical design prototypes were developed: a floating aquaculture deck, an elevated tourism-housing walkway and a structured culinary riverfront module. These interventions demonstrate how incremental, low-cost and community-driven strategies can improve mobility, organize economic activities and enhance environmental awareness. The novelty of this study lies in integrating tactical urbanism with community-based riverfront revitalization in a tropical context. The study concludes that tactical urbanism provides a flexible and context-responsive framework for sustainable riverbank development.

Keywords: Accessibility, Community-Based Planning, Riverfront Revitalization, Tactical Urbanism

1. Introduction

Rivers have long played an essential role in shaping the social and economic life of many tropical cities. In Indonesia, communities living along riverbanks still depend heavily on waterways for daily mobility, small-scale commerce, and cultural practices that have been passed down for generations (Mutia et al., 2024). This relationship remains visible in Benua Anyar, one of Banjarmasin's active river settlements, where aquaculture, riverside culinary businesses, and informal trading continue to support the local economy.

Over the past decade, however, rapid urban growth has created increasing pressure on traditional riverfront neighborhoods. Based on settlement mapping and neighborhood upgrading documents, particularly the Neighborhood Settlement Upgrading Plan developed under the National Slum

Upgrading Project (NSUP), riverbank areas such as Benua Anyar have experienced an estimated 25–35% increase in dense and informal housing expansion within the last 10–15 years. This growth has not been accompanied by adequate infrastructure provision, leading to declining environmental conditions. Water quality assessments show that sections of the river fall into lightly to moderately polluted categories, while unmanaged domestic waste accumulation in river-adjacent areas is estimated to reach 1–2 tons per day. In addition, seasonal flooding affects low-lying settlements approximately 3–6 times per year, particularly during peak rainfall and tidal cycles. At the same time, the proportion of households primarily dependent on river-based livelihoods has decreased by approximately 15–20%, indicating a gradual shift in local economic structures. These conditions reinforce problems such as deteriorating environmental quality, irregular settlement patterns, limited pedestrian access, and the weakening of river-based livelihoods (Julisa, 2024). They also reveal a mismatch between existing planning approaches and the dynamic realities of riverfront environments, as large-scale and capital-intensive projects often lack the flexibility to respond to tidal fluctuations, seasonal flooding, and informal activity patterns (Kilani, 2024).

In contrast, tactical urbanism offers an alternative approach that emphasizes incremental and low-cost improvements. Instead of waiting for long-term projects, tactical interventions make it possible to test ideas quickly, involve community members directly, and adjust solutions based on how people actually use the space (Lydon, 2015). This flexibility makes tactical urbanism especially relevant for places like Benua Anyar, where space is limited, environmental conditions change rapidly, and community networks already play an important role in managing the neighborhood.

Based on this context, the present study aims to explore how tactical urbanism can contribute to riverbank revitalization in Benua Anyar. Specifically, it examines existing spatial constraints and potentials, incorporates community aspirations, and develops prototype-based design strategies that can enhance access, strengthen local economic activities, and improve the overall environmental quality of the river corridor.

2. Study Literature

2.1. Tactical Urbanism

Tactical urbanism refers to a set of small-scale, low-cost, and rapid interventions aimed at improving urban spaces before long-term decisions are made (Arifin & Yusuf, 2020). Rather than relying on large and permanent construction, this approach uses temporary installations such as modular walkways, pop-up seating areas, or community-built structures as a way to experiment with new ideas in real environments (Lydon, 2015). Because these interventions are flexible and easy to modify, they allow planners and residents to evaluate what works and what does not, creating a cycle of learning through direct practice (Sintang, Florentina, & Ikhsan, 2024).

In many cities, tactical urbanism has become an effective tool for responding to everyday urban issues ranging from mobility barriers and lack of public space to socio-economic challenges faced by informal communities (Mohankumar, Rajalingam, Venkatesan, Saravanan, & Yasmin, 2020). Its emphasis on adaptability makes it particularly suitable for tropical regions, where environmental conditions such as heavy rainfall, rising tides, and rapid ecological shifts require design solutions that can respond quickly (Allostath, 2023).

For river-based communities, tactical urbanism offers opportunities to introduce incremental improvements, such as safe pathways, viewing platforms, and shaded rest areas that can enhance accessibility and public engagement without disrupting existing livelihoods (Alrahaheh & Khwaileh, 2024). This makes the concept especially relevant for areas like Benua Anyar, where space is limited and daily activities depend heavily on the river.

2.2. Riverfront Revitalization in Tropical Cities

Revitalizing riverfronts in tropical regions presents a distinct set of challenges. Cities located in hot and humid climates must manage high rainfall intensity, fluctuating water levels, erosion along riverbanks, and dense informal settlements (Sintang et al., 2024). Traditional revitalization models, which often prioritize monumental waterfront structures, may not be appropriate for environments where communities rely on flexible, everyday interactions with the river.

Recent studies point to the need for approaches that balance ecological resilience, cultural identity, and economic livelihoods (Lincoln & Guba, 1985). Instead of imposing heavy construction, many tropical cities are experimenting with nature-based and adaptive solutions such as floating gardens, modular markets, elevated walkways, or lightweight shading systems that can withstand environmental fluctuations while supporting local activity (Mutia et al., 2024).

In Southeast Asian contexts, revitalization efforts that integrate both ecological restoration and community participation tend to show stronger long-term outcomes. Such approaches respect the layered functions of rivers as transport routes, social spaces and economic hubs. For communities like Benua Anyar, which maintain a culturally rich river-based way of life, this balance is crucial.

2.3. Community-Based Planning

Community-based planning (CBP) focuses on getting local residents, community groups, and grassroots organizations actively involved in shaping their physical and economic environments. Unlike traditional top-down planning, CBP views communities as co-creators, decision-makers, and caretakers of urban spaces. This approach is based on the idea that people living in an area have valuable insights, cultural knowledge and practical experience that outside planners might miss.

Over the past twenty years, CBP has become more important, especially in developing countries. Here, formal planning systems often struggle with rapid urban growth, informal neighborhoods, and limited resources (Healey, 2019). Community-led processes create a stronger sense of ownership, legitimacy, and sustainability in urban projects (Jackson, 2025). By incorporating local voices, CBP helps reduce conflicts, promotes social bonds, and leads to outcomes that better reflect community needs and daily life.

In waterfront and riverbank areas, community-based planning plays a crucial role because of the close links between livelihoods, culture, and ecology. River communities often rely on traditional fishing methods, small-scale trade, water transport, and cultural practices tied to the river. In many Indonesian river settlements, such as Banjarmasin and parts of Kalimantan, planning that leaves out community input often fails. These efforts neglect river-dependent lifestyles, local knowledge of the area, and established social networks (Julisa, 2024). When paired with tactical urbanism, CBP becomes even stronger. Tactical projects are participatory and flexible, making them well-suited for communities that may lack experience with formal planning (Alrahahleh & Khwaileh, 2024). Through small experiments like testing temporary walkways, community gathering spots, or floating gardens residents can witness the impact of changes firsthand, share feedback, and help improve solutions.

For Benua Anyar, the community's deep connection to the river makes CBP an essential framework for planning. The local economy relies on fisheries, riverside food businesses, tourism, and cultural activities, so any intervention must fit into their daily routines and economic needs. Additionally, the presence of active youth groups, informal leaders and local vendors provides a solid base for community involvement. Community-based planning ensures that revitalization efforts do not push away existing users but instead uplift and include them in the riverbank development process (Bailey, 2024). As a result, CBP promotes more inclusive, resilient, and culturally relevant planning essential in tropical river environments facing environmental challenges, climate risks, and social complexities.

3. Methods

This study applies a qualitative and design-based methodological framework to understand the spatial, environmental, and socio-economic conditions of the Benua Anyar riverfront and to formulate tactical urbanism interventions. The study area is geographically focused on selected riverbank zones within Benua Anyar, specifically RT 001–RT 006 and RT 012, which represent key clusters of aquaculture activities, residential settlements, and culinary riverfront development. These locations were selected based on preliminary spatial mapping and local planning documents, which identified areas with the highest intensity of river-dependent activities as well as critical issues related to accessibility, environmental degradation, and informal spatial development. Four main methodological steps were carried out (1) spatial observation and mapping, (2) community engagement, (3) environmental and socio-economic assessment, and (4) prototype development. Each step builds upon the previous one, enabling a systematic transition from data collection to design intervention.

3.1. Spatial Observation and Mapping

The research began with direct field observations to document the physical configuration of the riverbank. This included identifying circulation paths, public activity zones, the condition of housing clusters, and the placement of aquaculture units. Observations were complemented by aerial imagery and drone-assisted mapping, which helped generate a clearer picture of elevation differences, the alignment of river edges, and how homes and economic spaces relate to the water.

The purpose of this stage was to understand how people move, gather, work, and interact with the river on a daily basis. By mapping these patterns, the research was able to pinpoint specific gaps such as broken pathways, unsafe edges, or underutilized spaces that later informed the design prototypes. This figure visualizes key activity clusters such as aquaculture cages, residential walkways, and culinary nodes.

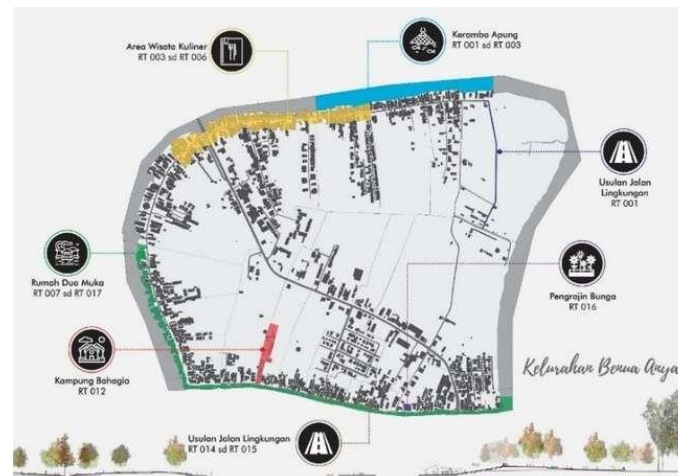


Figure 1. Spatial Distribution of Activities and Riverfront Zones

Source: Authors, 2025

The spatial map illustrates the concentration of daily activities along the river edge and highlights the distinct zones that define the socio-economic structure of the Benua Anyar waterfront. The aquaculture zone along the northern edge forms a productive cluster dominated by floating fish cages that directly interact with the water surface. Meanwhile, the culinary corridor to the west hosts visitor movement and informal economic activities, making it a potential anchor for river-based tourism. The mapping also reveals fragmented pedestrian connectivity along the riverbank, with several discontinuous segments and areas that lack safe and accessible circulation routes. This diagnostic mapping serves as the analytical basis for the design prototypes presented in the results section, ensuring that proposed interventions align with real spatial conditions and community needs along the waterfront.

3.2. Community-Based Planning and Engagement

Community engagement played a central role in shaping the direction of the research. Focus group discussions (FGDs) were conducted as the primary method to capture local knowledge and community perspectives. A total of 24 participants were involved in the FGDs, consisting of local residents (10 participants), fish farmers (5 participants), youth representatives (4 participants) and riverside vendors (5 participants). Participants were selected using purposive sampling to ensure representation of key stakeholder groups directly involved in river-based activities. The FGDs were conducted in two sessions, each consisting of 6–8 participants, allowing for more focused and in-depth discussions. Each session lasted approximately 60–90 minutes and was facilitated using semi-structured guiding questions covering themes such as accessibility, environmental conditions, economic challenges, and tourism potential. Participants raised recurring issues, including unstable walkways, lack of lighting, informal vending arrangements, and waste buildup. At the same time, they expressed clear aspirations to strengthen their local economy and to attract visitors without losing their identity as a river-based community (Valchovska & Watts, 2016). To ensure data reliability, triangulation was applied by cross-checking FGD findings with field observations and spatial mapping results. In addition, follow-up informal interviews were conducted with selected participants to validate key insights and confirm the consistency of responses.

The mapping activity further supported the interpretation of community input by illustrating how residential clusters, aquaculture units, circulation paths, and economic zones are spatially distributed along the river. This integration of participatory data and spatial analysis enabled the identification of priority intervention areas, particularly within RT 012 as a representative micro-scale case.



Figure 2. Community-Identified Potentials and Aesthetic Practices

Source: Authors, 2025

As illustrated in the figure, the distribution of activities forms a series of functional nodes that reflect the daily rhythm of the community. These nodes form the basis for identifying suitable locations for tactical interventions such as temporary pedestrian decks, modular platforms, and structured activity points. The spatial relationships shown here also indicate where connectivity is weak and where community-driven improvements can have the highest impact (Norskov, Chrysocou, & Milenkova, 2014).

3.3. Environmental and Socio-Economic Assessment

Environmental and socio-economic assessments were conducted to complement spatial and participatory data by providing a broader understanding of the conditions shaping the river corridor. The environmental assessment focused on key parameters, including water quality conditions, waste accumulation, tidal fluctuations, flood-prone areas and riverbank stability. These observations were based on direct field surveys conducted across selected zones (RT 001–006 and RT 012) and supported by secondary data from local planning documents. The socio-economic assessment examined livelihood structures, income-generating activities, and the level of dependence on river-based economies. Data were collected through informal interviews, field observations, and documentation of daily activities.

Particular attention was given to aquaculture production, riverside culinary businesses, and small-scale informal trading as the primary economic drivers of the area.

To structure the findings, the collected data were synthesized into an environmental and socio-economic assessment matrix, which categorizes key vulnerabilities and potentials across different components. This matrix serves as an analytical tool to link observed conditions with appropriate tactical urbanism interventions.

Table 1. Environmental & Economic Assessment Matrix

Component	Findings	Tactical Urbanism Relevance
Water quality	Waste buildup in RT 001–003	Supports floating gardens & waste nodes
Mobility	Discontinuous pedestrian paths	Supports temporary walkways
Economy	Culinary & aquaculture clusters	Supports pop-up markets & demo decks
Public space	Limited shaded communal space	Supports micro-nodes & seating

Source: Authors, 2025

The matrix highlights the interconnection between environmental constraints and socio-economic dynamics, demonstrating that many of the identified issues require flexible and incremental solutions rather than large-scale redevelopment. By linking each problem to a potential tactical intervention, this approach enables a more targeted and context-responsive design strategy.

3.4. Prototype Development

The final stage involved translating the integrated findings from spatial analysis, community engagement, and environmental-socio-economic assessment into tactical design prototypes. Instead of proposing fixed, long-term redevelopment plans, the prototypes were conceptualized as flexible and modular interventions that can be tested, adapted, and incrementally developed based on community feedback and changing environmental conditions.

The prototype development process followed an iterative design framework consisting of four stages: (1) problem identification, (2) spatial interpretation, (3) prototype formulation and (4) community validation. This iterative cycle ensured that each intervention responds not only to physical constraints but also to local practices and socio-economic needs. Three prototypes were developed: a floating deck for aquaculture interaction, an elevated walkway for residential and tourism circulation and a structured riverfront culinary activation module. Each prototype was strategically positioned based on priority areas identified through mapping and community input, particularly in zones with high activity intensity and critical accessibility issues. The design of each prototype was guided by three key criteria: (1) low-cost and modular construction, (2) adaptability to fluctuating river conditions and (3) compatibility with existing community activities and spatial patterns.

The resulting prototypes function as exploratory design solutions that demonstrate how tactical urbanism principles can be applied in riverbank contexts while maintaining flexibility and community relevance (Wardhani & Wastunimpuna, 2025). This approach bridges qualitative insights and spatial design, positioning tactical urbanism as both an analytical and intervention framework in riverfront contexts.

4. Result and discussion

4.1. Synthesis of Spatial Constraints and Potentials

Spatial mapping, environmental assessment, and community engagement collectively indicate that the most critical activities and challenges in Benua Anyar are concentrated along the river edge, particularly within selected study areas in RT 001–006 and RT 012. Two primary zones emerge as key focal points: (1) the floating aquaculture belt (RT 001–003) and (2) the riverfront culinary cluster (RT 003–006).

These zones represent the core socio-economic structure of the riverfront, where production, exchange, and daily activities are directly linked to the river system.

Consistent with the findings from the environmental and socio-economic assessment, the main constraints identified along the riverbank form an interconnected system rather than isolated issues. Discontinuous pedestrian circulation and unsafe access points reduce spatial connectivity, which in turn limits access to economic nodes and restricts visitor movement. Environmental degradation, particularly waste accumulation, and unstable river edges further diminishes the usability and attractiveness of the riverfront. In addition, the lack of structured public space and organized vendor layouts results in inefficient use of space and limits opportunities for economic expansion.

However, these constraints coexist with significant potentials identified through both spatial mapping and community-based engagement. The presence of productive aquaculture systems, established culinary clusters and wide water surfaces provides opportunities for adaptive and water-based interventions. Moreover, strong community participation and dependence on river-based livelihoods indicate a high level of social embeddedness, which supports the implementation of participatory and incremental design strategies.

These relationships are further clarified through the environmental and socio-economic assessment matrix, which connects specific constraints with corresponding tactical intervention potentials. This matrix-based analysis enables a more structured understanding of how spatial problems can be addressed through targeted small-scale solutions. To synthesize these findings, the constraints and potentials are summarized in Table 2.

Table 2. Summary of Constraints And Potentials Along the Riverbank

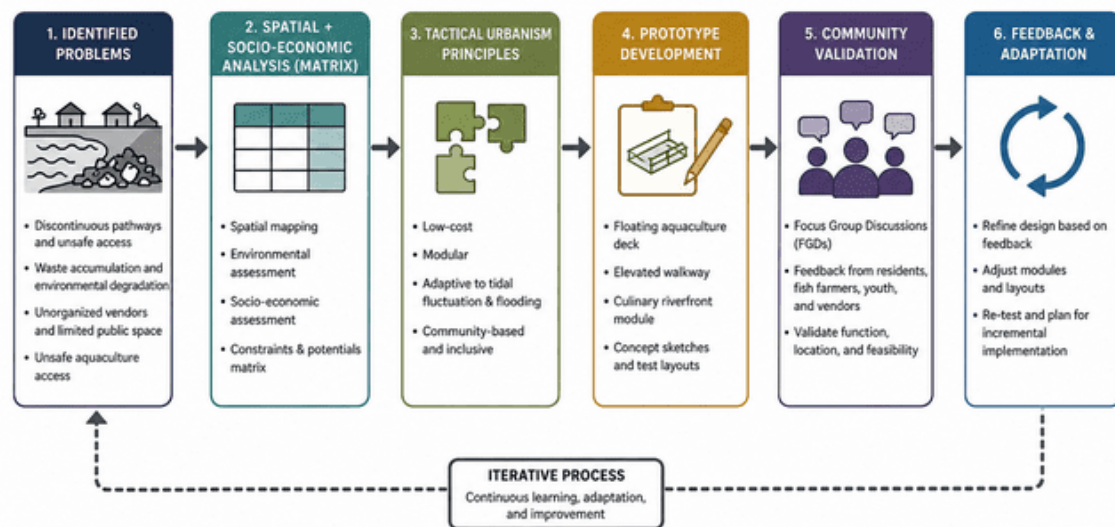
Component	Constraints	Potentials
Accessibility	Narrow and disconnected pathways; unsafe edges	Wide water area that allows floating walkways; activity nodes
Economy	Unorganized vendor distribution; limited space	Strong aquaculture base; established culinary waterfront
Environment	Waste buildup, unstable edges	Possibility for floating gardens and eco-education platforms
Public Space	Lack of shaded areas and viewing decks	Cultural river-based activities, high visitor flow

Source: Authors, 2025

This finding reinforces the argument that riverfront environments in tropical contexts should be approached as dynamic socio-ecological systems, where land–water interactions, informal economies, and community practices must be considered simultaneously (Mutia et al., 2024). In such contexts, large-scale and capital-intensive redevelopment approaches may be less effective, as they often overlook local adaptability and disrupt existing livelihoods. Therefore, the synthesis of constraints and potentials provides the analytical basis for the development of tactical prototypes. By linking specific problems to spatially grounded opportunities, the study establishes a clear transition from diagnostic analysis to design intervention.

4.2. Prototype-Based Interventions

The prototype-based interventions were developed as a direct response to the constraints and potentials identified through spatial mapping, community engagement, and environmental-socio-economic assessment. Following the iterative design framework outlined in Section 3.4, each prototype translates specific problems into spatial solutions that are modular, adaptive and context-responsive. The environmental and socio-economic assessment matrix serves as the primary analytical basis for linking identified issues with corresponding tactical interventions. Each prototype is therefore not an isolated design, but a targeted response to specific spatial and socio-economic conditions.

**Figure 3.** Iterative Tactical Urbanism Design Framework*Source: Authors, 2025*

The framework also reveals that effective riverfront interventions require a direct translation of site-specific constraints into targeted, small-scale design strategies. This relationship is further elaborated in Table 3.

Table 3. Linking Constraints to Tactical Design Interventions

Identified Issue	Spatial Impact	Proposed prototype	Tactical Strategy
Discontinuous pathways	Limited mobility	Elevated walkway	Modular connectivity system
Waste accumulation	Environmental degradation	Floating eco-platform	Environmental awareness node
Unstructured vendors	Inefficient space use	Culinary module	Organized micro-economy
Unsafe aquaculture access	Low productivity & safety	Floating deck	Productive + educational space

Source: Authors, 2025

The table demonstrates that each spatial and environmental issue can be directly linked to a specific tactical intervention, reinforcing the logic of a problem-driven design approach. Rather than applying generalized solutions, the proposed prototypes respond to localized conditions, ensuring that interventions remain context-sensitive and functionally relevant.

Furthermore, the alignment between identified constraints and tactical strategies highlights the effectiveness of using a matrix-based analytical framework. This approach enables the integration of environmental, spatial, and socio-economic considerations into a cohesive design process, supporting incremental and adaptive riverfront revitalization.

4.2.1. Prototype 1: Floating Aquaculture Interaction Deck

The first prototype responds to safety and accessibility issues identified in the aquaculture zone, particularly within RT 001–003. Existing *keramba* units are currently accessed through narrow and unstable wooden planks, which become hazardous during rainfall and high tide conditions. This not only limits daily operational activities but also restricts opportunities for expanding aquaculture into educational or tourism-based functions.

The floating aquaculture interaction deck is designed as a modular platform that adapts to tidal fluctuations while providing a stable and accessible interface between residents, fish farmers, and visitors. By introducing a more structured access system, the intervention improves safety, enhances operational efficiency, and opens possibilities for multi-functional use. From an analytical perspective, this prototype transforms a single-purpose productive space into a hybrid socio-economic node. It aligns with the assessment matrix, where issues of unsafe access and limited economic diversification are addressed through adaptive and low-cost spatial interventions.



Figure 4. Floating Aquaculture Interaction Deck

Source: Authors, 2025

4.2.2. Prototype 2: Riverside Tourism and Housing Deck

The second prototype addresses fragmented pedestrian circulation and safety risks observed along the residential river corridor in RT 003–006 and RT 012. Existing walkways are uneven, narrow, and frequently affected by water level fluctuations, creating unsafe conditions for both residents and visitors.

The elevated walkway is proposed as a continuous circulation system that connects residential areas, docks, and economic nodes. By elevating the structure above typical water levels, the design ensures usability during seasonal flooding and tidal variations.

This intervention not only improves physical accessibility but also strengthens spatial connectivity between living spaces and economic activities. As identified in Table 3, improved mobility directly supports local economic development by increasing visitor circulation and enhancing access to culinary and aquaculture zones.



Figure 5. Riverside Housing and Tourism Deck

This figure shows a raised platform connecting homes, docks, and communal nodes. The walkway improves mobility, reduces safety risks, and enhances the visitor experience by offering a clear circulation route. The structure also reinforces the visual identity of the river settlement, inviting more tourist exploration. Phased construction allows the community to gradually adopt the design without requiring large, upfront funding.

4.2.3. Prototype 3: Culinary Riverfront Activation

The third prototype focuses on reorganizing the culinary riverfront area, particularly within RT 003–006, where informal vendor activities are concentrated. Despite its popularity, the area currently lacks spatial organization, resulting in circulation conflicts, limited seating, and reduced user comfort.

The culinary activation module introduces modular kiosks, shaded seating areas, and clearly defined circulation paths. This intervention aims to create a more structured yet flexible environment that supports both vendors and visitors.

Rather than eliminating informal practices, the design formalizes them spatially. This reflects an inclusive approach to urban development, where existing economic activities are enhanced rather than displaced. As indicated in the assessment matrix, the combination of strong culinary potential and spatial inefficiency can be effectively addressed through modular and incremental interventions.



Figure 6. Culinary Riverfront Potentials

Source: Authors, 2025

The figure illustrates a reorganized riverfront corridor where vendors operate within defined zones using movable kiosks. Shaded seating areas oriented toward the river improve visitor comfort and encourage longer stays, while clearer pathways reduce conflicts between pedestrians and vehicles. This spatial restructuring not only enhances economic potential but also strengthens the cultural identity of Benua Anyar as an active river-based destination.

5. Conclusion

This study examines how tactical urbanism can provide adaptive and community-driven solutions for revitalizing riverbank environments in tropical contexts, using Benua Anyar as a case study. The findings demonstrate that key challenges such as unsafe circulation, environmental degradation, and unstructured economic activities are not solely caused by physical limitations, but by the absence of flexible and context-responsive planning approaches. Through the integration of spatial analysis, environmental and socio-economic assessment, and participatory engagement, the study reveals that riverfront areas function as dynamic socio-ecological systems. These insights informed the development

of three tactical prototypes that address safety, accessibility, and economic resilience while remaining adaptable to environmental conditions.

The main contribution of this research lies in demonstrating how tactical urbanism can be operationalized through a structured, matrix-based and design-oriented framework that links site-specific constraints to targeted spatial interventions in a tropical river context. From a policy perspective, the study suggests that riverfront revitalization strategies should incorporate incremental and community-based approaches alongside formal planning mechanisms. Rather than relying solely on large-scale redevelopment, local governments can adopt tactical interventions as pilot projects to test, refine, and scale context-sensitive solutions.

Overall, the study concludes that tactical urbanism offers a viable and context-responsive framework for riverbank revitalization. By integrating local knowledge, adaptive design strategies, and participatory processes, it is possible to enhance accessibility, strengthen local economies, and improve environmental conditions in a manner that is both practical and sustainable. The approach presented in this study can serve as a reference for similar riverfront communities across Indonesia and other tropical regions. Future research may explore the scalability of these interventions and their integration into formal urban planning systems.

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