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The Contribution of Puputan Margarana Renon Square to the Development of Denpasar as a Sustainable City

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Abstract—This study examines the role of Puputan Margarana Renon Square in supporting Denpasar's development as a sustainable city through an urban architectural perspective encompassing urban form, urban structure, and urban function. Using a qualitative-descriptive approach, data were collected through field observations, visual documentation, and a literature review related to sustainable urban development and traditional Balinese architectural principles. The findings show that in terms of urban form, the square features a symmetrical configuration oriented toward the Bajra Sandhi Monument, reflecting the principles of *Asta Kosala Kosali* and *Tri Hita Karana*, which strengthen the visual identity and legibility of the city. From a structural perspective, the area comprises three key layers: an ecological structure formed by dense vegetation that functions as a green buffer and water infiltration zone; a circulation structure that supports sustainable mobility through pedestrian pathways and an integrated vehicular network; and a social structure that accommodates diverse community activities, including sports, cultural events, and traditional ceremonies. Functionally, Renon Square contributes to reducing local temperatures, improving air quality, enhancing social interaction, and reinforcing Denpasar's architectural character. The study concludes that Renon Square is a strategic public space that significantly contributes to the environmental, social, and aesthetic sustainability of Denpasar. Recommendations emphasize strengthening public space management to support future sustainable urban development.

Keywords: Public open space; sustainable city; Puputan Renon Square; environmental quality; community participation.

1. Introduction

Sustainable urban development has become a major global agenda and a central focus for many countries, including Indonesia. This concept emphasizes the balance between environmental, social, and economic dimensions in managing urban spaces (UN-Habitat, 2022). Within the framework of the Sustainable Development Goals (SDGs), particularly Goal 11 on Sustainable Cities and Communities, cities are expected to create environments that are safe, resilient, inclusive, and sustainable (UNDP, 2020). Amid rapid urbanization, major cities in Indonesia face significant challenges such as declining environmental quality, limited green open spaces, and reduced social functionality of public spaces (Firman, 2019). In this context, urban architecture plays a critical role in designing spatial structures that are not only functional but also environmentally and socially sustainable (Carmona, 2021).

Denpasar City, the capital of Bali Province, is experiencing considerable urban pressures caused by population growth and the expansion of tourism-related economic activities. Urbanization has contributed to increased land-use demands, spatial restructuring, and environmental stress within the city (Wirawan, 2021). Nevertheless, Denpasar is still

recognized for maintaining its unique spatial character, where local cultural values remain embedded within its urban structure. One of the most prominent elements representing this uniqueness is Puputan Margarana Renon Square, a major public space functioning as an urban landmark and a hub for social, cultural, and governmental activities. Public spaces of this nature are essential in sustaining urban livability, as Gehl (2019) argues that high-quality public spaces form the foundation of cities that prioritize human well-being.

In the context of urban architecture, Puputan Margarana Renon Square exhibits distinctive spatial form and structure. Its symmetrical layout with the Bajra Sandhi Monument at the center reflects the traditional Balinese architectural philosophy of *Tri Hita Karana*, which emphasizes harmony between humans, nature, and the divine (Suweta, 2018). This principle aligns with the concept of sustainable urban form (Jenks & Dempsey, 2005), which highlights the integration of ecological and social functions in urban spatial design. Renon Square serves as one of Denpasar's key green open spaces, improving air quality, regulating microclimate, and providing an inclusive environment for social interaction. Studies also show that green public spaces enhance mental well-being, thermal comfort, and urban ecological resilience (Beatley, 2011).

However, as the city continues to grow, the Renon area faces increasing pressure from commercial expansion, intensified traffic, and shifting land-use activities. Such transformations can threaten the long-term sustainability of public spaces if not managed properly (Shirvani, 1985). This situation raises an important question: how do the spatial form, structure, and functions of Puputan Margarana Renon Square contribute to Denpasar's sustainable urban development from an architectural perspective? While previous studies have examined Denpasar's cultural landscape and public space utilization, there remains a limited focus on how a single civic space particularly Renon Square operates simultaneously as an ecological regulator, socio-cultural node, and architectural landmark within the sustainable city framework.

This research aims to analyze the architectural role of Puputan Margarana Renon Square in supporting Denpasar's development as a sustainable city. The analysis focuses on three key aspects of urban architecture: urban form, urban structure, and urban function. Understanding these aspects is expected to contribute to the development of theoretical and practical knowledge related to sustainable tropical urban design rooted in local cultural values (Frick, 2020). Furthermore, the results of this study are intended to serve as recommendations for urban planners and policymakers in Denpasar in designing spatial planning strategies and public space management aligned with sustainable city principles. To provide clarity and coherence, this paper is structured into four main sections: an exploration of the study context and theoretical foundations, a description of the research methodology, a presentation of results and discussion, and a concluding section with practical recommendations. Thus, this research not only provides academic insights but also offers practical implications for fostering a greener, more inclusive, and culturally grounded urban future for Denpasar City.

2. Methods

This study employs a qualitative–descriptive research approach, focusing on three key dimensions of urban architecture: the form, structure, and function of public space. This approach was selected because it provides a comprehensive understanding of the interrelationship between physical space, social functions, and ecological values within an urban environment (Creswell, 2014). The qualitative method enables the researcher to interpret urban spatial phenomena through direct observation, visual documentation, and contextual analysis of the environmental and cultural factors that shape public space design.

Data for this study were collected through field observations, literature review, and on-site documentation. Field observations were conducted over a four-week period, with visits scheduled three times per week during morning (06.00–08.00), afternoon (15.00–17.00), and evening (18.00–19.00) sessions to capture variations in user activity, microclimate conditions, and spatial utilization. The analysis was conducted by examining three primary dimensions of urban architecture as outlined by Carmona (2021):

(1) **Urban Form Analysis**: examining spatial configurations, visual orientation, and the underlying design principles.
(2) **Urban Structure Analysis**: assessing the relationships among spatial elements and their associated systems of circulation, ecology, and social activity.
(3) **Urban Function Analysis**: evaluating how the public space contributes to the ecological, social, and aesthetic dimensions of the city.

The findings from these three dimensions were subsequently synthesized to evaluate the extent to which Puputan Margarana Renon Square supports Denpasar's vision of becoming a sustainable city, in accordance with the principles of sustainable urban morphology and green urban design. Analytic procedures followed a multi-step process. First, all visual and textual data were organized into thematic categories. Second, photographs and field notes were coded using descriptive and pattern coding, allowing the identification of recurring spatial behaviors and

ecological characteristics. Third, coded data were synthesized through comparative mapping, producing an integrated interpretation of how form, structure, and function operate within the square. The findings from these three dimensions were subsequently synthesized to evaluate the extent to which Puputan Margarana Renon Square supports Denpasar's vision of becoming a sustainable city, in accordance with the principles of sustainable urban morphology and green urban design.

3. Results and Discussion

Urban Form

Puputan Margarana Renon Square is a primary element within Denpasar's public space system and exhibits distinctive architectural characteristics. In terms of form, the square features a symmetrical and centralized (radial–centralistic) configuration, with the Bajra Sandhi Monument serving as the vertical focal point. This spatial arrangement reflects the principles of *Asta Kosala Kosali*, a foundational concept of traditional Balinese architecture that emphasizes harmony between humans, nature, and spiritual values (*Tri Hita Karana*). The aerial view of Puputan Margarana Renon Square can be seen in the figure below.

Figure 1. Top View of Puputan Margarana Renon Square
Source: Google Earth, 2025

The symmetrical form and spatial order of the Renon area demonstrate a cohesive integration between traditional values and modern urban design principles. Its clear geometric pattern enhances the city's legibility, in line with Lynch's (1960) theory of The Image of the City, which highlights the importance of landmarks and visual orientation. The Bajra Sandhi Monument serves as the primary landmark, reinforcing Denpasar's identity as a culturally rooted city.

Visually, the spatial form of Renon also functions as a transitional zone connecting the surrounding administrative, residential, and educational areas. Within the context of sustainable urban architecture, such an orderly and open spatial configuration strengthens both ecological and aesthetic functions, as it facilitates natural airflow, optimal daylight penetration, and a harmonious visual relationship between people and their environment.

Urban Structure

Renon Square is a key element in the spatial structure of Denpasar. According to the Denpasar City Spatial Plan (RTRW) 2021–2041, the Renon area is designated as part of a strategic **green corridor** that connects the city center with the Sanur district. Its spatial structure is integrated with surrounding governmental, educational, and residential functions. Based on spatial analysis, the structure of Renon Square can be understood through three primary layers:

(1) Ecological Structure:

The dense vegetation surrounding the square forms a natural green belt that functions as a pollution buffer, a shading system, and a water infiltration area. This ecological layer serves as an environmental counterbalance to the denser urban zones around it.

Figure 2. Vegetation in Puputan Margarana Renon Square
Source: Suryada, 2025

(2) Circulation Structure

Pedestrian pathways are provided within the square, commonly used for jogging, while a vehicular circulation route surrounds the perimeter of the square, connecting various urban functions ranging from governmental offices to residential areas. This well-organized circulation system reflects the principles of sustainable mobility and supports accessible, integrated urban movement.

Figure 3. Jogging Track in Puputan Margarana Renon Square
Source: Suryada, 2025

(3) Social and Activity Structure:

The square functions as a multi - activity space accommodating sports, cultural events, family recreation, and traditional ceremonial activities. This flexible spatial structure supports social sustainability and fosters a strong sense of community attachment to the public space. Thus, the square serves not only as a physical public space but also as a symbol of Denpasar's socio-ecological sustainability.

Figure 4. Visitor Activites in Puputan Margarana Renon Square
Source: Suryada, 2025

Urban Function

Puputan Margarana Renon Square performs three primary functions within the framework of a sustainable urban system:

(1) Ecological Function

As a green open space covering approximately 13.8 hectares, the square plays an essential role in maintaining urban air quality and regulating the city's microclimate. Data from the Denpasar Environmental and Forestry Office (DLHK, 2023) indicate that the average temperature in the Renon area is about 1.8°C lower than that of dense commercial zones in West Denpasar. The vegetation within the square also helps reduce carbon emissions and enhances rainwater infiltration capacity, thereby contributing to climate change mitigation and strengthening the city's overall environmental resilience.

Figure 5. Public Green Spaces in Puputan Margarana Renon Square
Source: Suryada, 2025

(2) Social and Cultural Function

The square functions as an inclusive public space utilized by people of all ages and social backgrounds. Morning exercise activities, national ceremonies, and traditional Balinese cultural events make this area a central hub of social and cultural life in the city. Its expansive open layout, well-connected pedestrian access, and strong visual linkage to the monument create a democratic and participatory atmosphere—an essential principle in sustainable urban architecture (Gehl, 2019).

Figure 6. Activities Done by Visitors in Puputan Margarana Renon Square
Source: Suryada, 2025

(3) Spatial and Architectural Aesthetic Function

Visually, Renon Square serves as a focal point and an architectural landmark of Denpasar City. The Bajra Sandhi Monument functions as a vertical element that balances the surrounding expanse of horizontal open space. The arrangement of vegetation, the symmetrical garden layout, and the clear visual axes express the orderliness of tropical architectural design rooted in local cultural values. This aligns with the concept of biophilic urbanism, which emphasizes the integration of natural elements into the structure of the city.

Figure 7. Bajra Sandhi Monument in Puputan Margarana Renon Square
Source: Suryada, 2025

The findings indicate that Puputan Margarana Renon Square plays a strategic role in supporting Denpasar's sustainability through its urban form, structure, and function. Its symmetrical layout with the Bajra Sandhi Monument as the central focal point enhances city legibility and reflects traditional Balinese architectural principles. The spatial structure consists of an ecological layer of shading vegetation and water infiltration areas, a circulation system of pedestrian paths and surrounding vehicular routes that promote sustainable mobility, and a social layer that accommodates sports, cultural events, recreation, and ceremonial activities. Functionally, the square contributes to reducing local temperatures, strengthening social interaction, and reinforcing the city's architectural identity. Overall, Renon Square serves as a key public space that supports Denpasar's environmental, social, and architectural sustainability.

4. Conclusion

This study concludes that Puputan Margarana Renon Square plays a significant role in supporting Denpasar's development as a sustainable city through its environmental, social, and architectural contributions. Its symmetrical configuration and central orientation toward the Bajra Sandhi Monument reflect a harmonious integration of traditional Balinese architectural principles with contemporary urban design concepts that strengthen city legibility and identity. Structurally, the vegetative belt, pedestrian pathways, and integrated circulation system demonstrate the square's role as an ecological buffer, a node of sustainable mobility, and a vibrant social interaction space. Functionally, the square contributes to lowering local temperatures, providing an inclusive public environment, and reinforcing Denpasar's architectural character. Overall, Renon Square is not merely a green open space but a key urban element that enhances residents' quality of life and supports the vision of a green, inclusive, and sustainable city.

However, this study has limitations. The research relies on qualitative observations limited to a specific time period, which may not capture seasonal variations or long-term ecological changes. The focus on a single case study also restricts the generalizability of the findings. Future research should include longitudinal environmental measurements, comparative studies with other public spaces, or mixed-method approaches integrating quantitative data such as thermal comfort assessments or user surveys to deepen understanding of sustainable public space development.

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