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Design of Mass Housing "Rumah Dara Gepak" as a Response To Urban Lifestyle

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Abstract*— The rapid growth of urban areas has significantly influenced lifestyle patterns and created a demand for housing that is efficient, adaptive, and locally grounded. This study aims to develop a design concept for mass housing in the style of Rumah Dara Gepak as a response to the dynamic lifestyle of urban communities. Rumah Dara Gepak, a form of traditional Indonesian architecture, embodies simplicity of form, spatial openness, and the use of natural materials that reflect local wisdom. Using a qualitative-descriptive approach and literature review, this research analyzes the architectural elements that can be adapted to contemporary mass housing design. The findings reveal that the application of modular principles, cross-ventilation, and the functional spatial layout typical of Rumah Dara Gepak enhances thermal comfort and spatial efficiency in both vertical and horizontal housing. Furthermore, the cultural values embedded in this traditional architecture contribute to strengthening local identity amid the homogenization of urban design. Therefore, mass housing design inspired by Rumah Dara Gepak not only provides a solution to land scarcity and housing demand in urban areas but also supports the preservation of Indonesia's architectural identity in the modern era.

Keywords—Design, Mass housing, urban lifestyle

I. INTRODUCTION

In traditional Javanese architecture, there are five fundamental roof typologies: panggang pe, a simple structure consisting of four main columns; dara gepak, also known as the kampung roof, commonly used in rural residential buildings; tajug, which is typically found in religious structures such as mosques and prayer halls; and joglo, a form reserved for the aristocracy or royal families [1]. Among these types, the dara gepak roof is the most prevalent in rural areas of Central Java, Yogyakarta, and East Java. Its simple construction and ease of assembly make it a cost-effective and efficient architectural form.

Etymologically, the term dara gepak originates from the imagery of a pigeon flapping its wings, which later inspired the design of the building's roof and façade. The roof structure consists of two opposing sloping planes that meet at the ridge, known as wuwung or bubungan, and in some regions referred to as tutup keong [2]. The distinctiveness of the Rumah Dara Gepak lies not only in its saddle-shaped roof but also in the presence of a wide emper or veranda that surrounds the house, serving as a transitional zone between indoor and outdoor spaces.

Typically, the structure includes four main columns with a span of approximately three meters, while secondary columns (kolom anak) are added according to the building's dimensions and spatial needs. The saddle roof, equipped with ventilation openings, helps reduce heat from direct sunlight exposure. Meanwhile, the wide overhanging eaves (overhang) significantly enhance indoor thermal comfort (thermal comfort) [3][4]. These architectural elements not only improve the building's climatic performance but also embody the harmonious integration of functional and aesthetic values in traditional Javanese architecture.

The transformation of the Rumah Dara Gepak design into mass housing is an urgent endeavor, as it has the potential to contribute meaningfully to the lifestyle of urban communities. Urban residents tend to adopt a fast-paced, straightforward, and efficient way of living — a characteristic that aligns with the architectural essence of Rumah Dara Gepak, which is minimal in ornamentation yet rich in cultural values. Housing, within the urban context, serves not only as a place for shelter but also as a social, spiritual, and cultural space; therefore, the demand for residential areas continues to rise along with population growth [5].

The process of transforming Rumah Dara Gepak into a mass housing model involves several key aspects: building typology, design symbolism, and thermal comfort systems. The typological transformation includes the reinterpretation of roof forms, spatial layouts, and material combinations adapted to modern construction techniques. The integration of symbolic design elements aims to preserve local wisdom and cultural intelligence within contemporary architectural expressions. Meanwhile, the thermal comfort system—encompassing temperature regulation, humidity control, natural lighting, and air circulation—plays a crucial role in ensuring a healthy and comfortable living environment [6]. Thus, this transformation is not merely a physical adaptation, but also a strategic effort to sustain traditional architectural identity amid the dynamics of modern urban life.

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II. METHODOLOGY

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The design method applied in this research is the Glass Box Design Method, a rational and systematic approach that considers all architectural aspects comprehensively throughout the design process [7]. Unlike intuitive or spontaneous design processes, this method emphasizes analytical reasoning and logical decision-making. The design workflow begins with problem identification and formulation, followed by the collection of primary and secondary data, analysis of internal and external factors, conceptual development, and visualization of the results through architectural drawings and design models [8]. This structured approach ensures that the design outcome is well-grounded, contextually responsive, and capable of addressing the identified issues effectively.

A qualitative descriptive analysis was employed to explore the interrelationships among various design elements and to provide a holistic and systematic interpretation of the architectural phenomena under study. The deductive method was then used to draw conclusions, allowing for a feedback loop between the identified problems and the resulting design solutions [9].

To enhance the validity and reliability of the study, several control measures were implemented. Data collection was conducted in a structured and well-documented manner to ensure accuracy and consistency. A triangulation approachwas adopted by combining multiple data-gathering techniques, including field observation, precedent and literature studies, and in-depth interviews. Field observations were carried out on several Rumah Dara Gepak dwellings in residential areas of Tulungagung Regency to understand their spatial, structural, and contextual characteristics.

The field identification process involved recording and redrawing building dimensions, identifying material types, and analyzing the surrounding landscape conditions. Secondary data were obtained through documentary research, which included reviewing residential building standards and architectural reference documents such as Architect Data. Additionally, interviews with key informants—including cultural experts and professional architects—were conducted to deepen the understanding of both philosophical and technical aspects of the design.

After completing the triangulation process, an overlay analysis was performed by synthesizing all data sources into a comprehensive descriptive framework. The final stage produced a complete architectural design concept, presented through drawings of plans, elevations, and sections, as well as interior and exterior designs, site plans, layout plans, and animated visualizations that illustrate the overall architectural proposal.

III. RESULT

A. Spatial Analysis

The spatial analysis was conducted to generate design recommendations for the interior layout that respond effectively to the functional and cultural needs of the inhabitants. This process resulted in a clear zoning system that organizes spatial hierarchy, circulation flow, and activity distribution within the dwelling. The proposed layout design can be categorized into four primary zones as follows:

1. Public Zone

This area includes the living room and terrace, functioning as a transitional space between the exterior environment and the interior. The terrace, which serves as a distinctive feature of the Rumah Dara Gepak, is preserved and reinterpreted as a multifunctional area for relaxation while simultaneously improving natural airflow and ventilation. The living room adopts a flexible design concept, allowing it to serve multiple purposes—such as hosting guests, accommodating family gatherings, or functioning as a communal lounge.

2. Semi-Public Zone

The dining room serves as the social core of the house, connecting the living area, bedrooms, and kitchen. An open-planlayout is implemented to enhance spatial continuity and visual openness, creating a sense of spaciousness. Lightweight partitions or semi-transparent dividers are used to subtly define spaces while maintaining flexibility and fluidity of movement.

3. Private Zone

This zone consists of two bedrooms positioned on the western side of the house to maintain thermal comfort and optimal natural lighting. Each room measures approximately 3 x 3 meters, providing sufficient space for rest and personal activities while maintaining spatial efficiency.

4. Service Zone

The service zone encompasses the kitchen and bathroom areas. The kitchen maintains a visual and functional connection with the dining area, separated only by a kitchen island that defines boundaries without obstructing interaction. The bathroom is placed adjacent to the bedroom for ease of access and circulation efficiency.

Through this systematic spatial organization, the transformed Rumah Dara Gepak concept for mass housing aims to preserve traditional architectural values while accommodating the practical demands and dynamic lifestyle of modern urban communities.

B. Design Concept

Based on the results of the preceding analysis, the design concept is formulated by integrating principles of cultural preservation, spatial efficiency, and environmental adaptability within the tropical context. The concept consists of the following key components:

1. Preservation of Nusantara Architectural Identity

The Rumah Dara Gepak embodies the essence of Indonesian vernacular architecture through its simple saddle-shaped roof and timber structural system. These traditional elements are retained as distinctive visual characteristics that reflect the authenticity of local culture and serve as a symbol of architectural continuity.

2. Transformation Toward Modern Design

Traditional materials such as red brick, timber, and clay roof tiles are reinterpreted using modern construction technologies. This combination enhances structural efficiency, durability, and environmental performance while maintaining the aesthetic integrity of the original vernacular form.

3. Adaptive and Flexible Spatial Organization

The interior layout adopts an open-plan concept to support fluid circulation and promote social interaction among residents. Living, dining, and sleeping areas are spatially interconnected, allowing flexibility of function and a sense of openness within a compact footprint.

4. Response to the Tropical Climate

Building orientation and openings are designed to optimize natural ventilation and daylighting. Large apertures, cross-ventilation strategies, and the presence of a wide terrace act as passive cooling features that reduce heat gain and enhance thermal comfort throughout the day.

5. Integration of Softscape and Hardscape

Landscape design harmoniously blends natural and built elements. Shading vegetation—such as mango, coconut, or small trembesi trees—is combined with hardscape features like stone pathways and natural paving materials to achieve a balanced and visually cohesive environment.

6. Sustainability Principles

The sustainable approach emphasizes the use of locally sourced materials, maximization of natural light, and reduction of artificial energy consumption. This strategy supports environmental responsibility and strengthens the ecological and cultural resilience of the Rumah Dara Gepak as a model for modern mass housing design.

Fig. 1. Floor plan

The floor plan illustrates a single-story house measuring 10 meters by 8 meters, designed with an *open-plan* layout to create a spacious impression, ensure effective air circulation, and optimize functional efficiency. The design adapts the traditional principles of *Rumah Dara Gepak* to contemporary residential needs.

At the front of the building lies a 1.5-meter-wide terrace, serving as a transitional area between the exterior and interior. This semi-open social space accommodates both guest reception and relaxation. Beyond the terrace is the living area, which connects seamlessly to the dining space without solid partitions, enhancing flexibility and visual continuity.

The central portion of the layout contains the dining and kitchen areas. The kitchen features a linear countertop and a kitchen island, creating a visual boundary without hindering communication. Its proximity to the living space increases domestic efficiency and reinforces the open character of the plan.

On the right side of the plan are two bedrooms, each measuring approximately 3.2 x 3.2 meters. Both rooms face south toward the terrace, ensuring adequate natural light and ventilation while maintaining privacy and comfort. Between the two bedrooms lies a bathroom (1.7 x 2 meters), strategically positioned for easy access from all parts of the house without disrupting privacy.

Fig. 2. Perspective

Fig. 3. Facade

This image shows the front elevation of a house designed in the Rumah Dara Gepak style, a traditional architectural form from South Sumatra, Indonesia. The design reflects a harmonious blend of local cultural wisdom and modern residential needs.The most distinctive feature is the wide, steeply pitched hip roof, designed to protect the building from tropical sun and rain. The reddish-brown roofing material gives the structure a warm, natural appearance that integrates well with the surrounding greenery.

The façade highlights a spacious veranda with carved wooden railings, providing a comfortable transitional space between the exterior and interior. The use of wood for columns, window frames, and decorative elements emphasizes traditional craftsmanship, while the clean white plastered walls introduce a modern, efficient touch. Ventilation panels above the windows and wide openings demonstrate attention to natural airflow and thermal comfort, in keeping with tropical architectural principles. The two central columns forming an inverted "V" shape serve both as a structural and aesthetic element, characteristic of the Rumah Dara Gepak style.

Overall, this design represents a contemporary reinterpretation of traditional Indonesian architecture, preserving its local identity while adapting it to the functions and efficiency of modern housing — making it a culturally rich and sustainable model for urban mass housing development.

IV. Conclusion

The design of mass housing inspired by the Rumah Dara Gepak concept represents a thoughtful effort to integrate local architectural identity with contemporary urban living needs. Through the preservation of traditional forms such as the steep hip roof, open veranda, and wooden ornamentation this design not only maintains the essence of Nusantara architecture but also revitalizes it in a modern context. By combining traditional materials (wood, clay roof tiles) with modern construction technologies, the design enhances efficiency, durability, and environmental sustainability. Spatial flexibility, natural ventilation, and climate-responsive orientation reflect an adaptive approach to tropical living conditions. Overall, this research and design proposal demonstrate that architectural modernization can coexist with cultural preservation. The Rumah Dara Gepak reinterpretation serves as an innovative model for sustainable and culturally grounded mass housing, contributing to the continuity of Indonesia's architectural heritage in the face of urban growth and modernization.

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