

Micro, Small, and Medium-Sized Enterprise Center in South Konawe Regency Using a Tropical Architectural Approach

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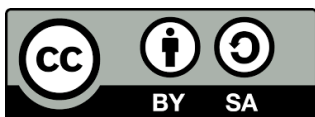
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ABSTRACT

Micro, Small, and Medium-Sized Enterprises (MSMEs) play an important role as a foundation for regional economic development and the improvement of community welfare. In South Konawe Regency, this sector continues to grow by utilizing local natural resources and cultural heritage, as reflected in various business activities, including fisheries, agriculture, traditional handicrafts, and regional specialty food and beverage products. Despite its significant potential, MSME actors remain dispersed and have not yet been integrated into a centralized facility, resulting in suboptimal management of business activities, marketing strategies, and enterprise development. The MSME center is planned to be developed in Batauga Subdistrict on a site area of approximately 2.6 hectares. The location is designated as part of a trade and service zone based on the Regional Spatial Plan (Rencana Tata Ruang Wilayah / RTRW) of Southeast Sulawesi Province. The design process employed a descriptive qualitative research approach by applying tropical architectural principles adapted to local climatic conditions, which are characterized by high temperatures, humidity, and rainfall. The design concept emphasizes natural ventilation through cross-ventilation strategies, optimal utilization of natural lighting, the use of locally available building materials, and an open spatial layout supported by extensive green areas.



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INTRODUCTION

Micro, Small, and Medium-Sized Enterprises (MSMEs) have become one of the most important economic sectors supporting inclusive economic growth, employment creation, and poverty reduction in many developing countries (Dasaraju & Tambunan, 2023; Endris & Kassegn, 2022; Kalaiselvi & Maithily, 2024; Mahfud, 2025). According to the World Bank (2022), MSMEs represent a significant proportion of businesses worldwide and contribute substantially to employment generation, particularly in emerging economies. Their flexibility, community-based characteristics, and ability to utilize local resources make MSMEs essential instruments for strengthening regional economic resilience. Therefore, the development of appropriate supporting infrastructure for MSME activities has increasingly been recognized as an important strategy for enhancing competitiveness, expanding market access, and

promoting sustainable economic development (Jurnalita, 2024; Mahesh et al., 2022; Rujitoningtyas et al., 2024; Sulaeman et al., 2024; Tariq, 2025; Zalviwan et al., 2024).

In Indonesia, MSMEs represent a dominant component of the national economic structure. Data from the Ministry of Cooperatives and SMEs indicate that MSMEs contribute significantly to employment absorption and national economic activity, involving millions of business actors across various sectors (Kadaba et al., 2022; Lembang et al., 2025; Mahfud, 2025; Rachmawati, 2026; Ulfah, 2026). The diversity of MSME sectors, including agriculture-based industries, fisheries, handicrafts, culinary products, and creative industries, demonstrates their role not only as economic drivers but also as entities that preserve local identity and cultural values. Previous studies have emphasized that MSMEs function as mechanisms for income distribution and regional economic empowerment because they are accessible to communities with varying levels of capital and educational backgrounds (Tambunan, 2008). MSMEs also serve as foundations for economic stability and welfare improvement due to their labor-intensive characteristics and adaptability (Haryono et al., 2026; Jagannarayan & Uma, 2024; Rachmawati, 2026; Sofiullah, 2025).

Despite their strategic role, many MSMEs continue to experience structural challenges, particularly related to business concentration, marketing facilities, production improvement, and access to integrated development spaces. In many regions, MSME activities remain dispersed across individual locations, limiting opportunities for collaboration, promotion, training, and consumer engagement. The absence of centralized facilities may reduce the effectiveness of business management and weaken the visibility of local products. Similar conditions exist in South Konawe Regency, where various MSME actors engaged in agriculture, fisheries, handicrafts, and processed local products possess considerable potential but remain fragmented and have not yet been supported by an integrated business development facility.

South Konawe Regency possesses significant local economic resources that can support MSME development. The region has advantages in agriculture, plantations, fisheries, and local processing industries, with many communities relying on these sectors as their primary economic activities. Local products, including agricultural products, marine-based commodities, weaving crafts, natural-material crafts, coffee, cocoa, pepper, and coconut-based products, demonstrate potential for strengthening the regional creative economy. However, this potential requires physical infrastructure capable of accommodating production, exhibition, marketing, education, and community interaction activities within a single integrated environment.

Several previous studies have examined the relationship between architectural design and MSME development facilities. Utomo et al. (2021) explored the design of creative MSME centers by emphasizing tourism and educational integration, demonstrating that multifunctional spaces can support business development and visitor engagement. Meanwhile, Ridzal et al. (2023) examined MSME development strategies based on creative economy principles and highlighted the importance of strengthening local potential and innovation capacity. Research on tropical architecture has also demonstrated that passive design strategies, including natural ventilation, building orientation, shading systems, and material selection, can improve environmental comfort in tropical climates (Saliim & Satwikasari, 2022; Reksayana et al., 2023).

Although previous studies have provided valuable insights into MSME centers and tropical architectural implementation, several limitations remain. Existing MSME center studies generally emphasize economic functions, tourism integration, or educational facilities, while fewer studies examine the integration between MSME development needs and climate-responsive architectural approaches within specific regional contexts. Furthermore, architectural studies applying tropical concepts often focus on residential, educational, or public buildings rather than economic empowerment facilities that combine production, commercial, educational, and social functions. Therefore, a research gap exists regarding the design of MSME centers that simultaneously respond to local economic characteristics, tropical environmental conditions, and regional cultural identity.

The urgency of this research is strengthened by the need to provide a sustainable physical platform for MSME development in South Konawe Regency. Without adequate facilities, local business actors may experience difficulties in improving product visibility, expanding markets, conducting collaborations, and developing innovations. An integrated MSME center can function not only as a commercial facility but also as a learning environment, exhibition space, and social interaction area that supports community empowerment. Therefore, architectural planning must consider both economic functionality and environmental adaptation to ensure long-term usability.

This research introduces a design approach that integrates MSME development functions with tropical architectural principles within the context of South Konawe Regency. The novelty of this study lies in the formulation of an MSME center design concept that combines local economic empowerment, climate-responsive strategies, and regional identity within a single architectural framework. The design applies passive tropical architecture principles through building orientation, cross-ventilation strategies, natural lighting optimization, vegetation utilization, and consideration of locally available materials. These strategies aim to create comfortable spaces while reducing dependence on artificial environmental control systems.

The purpose of this research was to formulate an architectural design concept for an MSME Center in South Konawe Regency using a tropical architectural approach. Specifically, this study aimed to analyze site conditions, determine spatial organization, develop circulation and zoning strategies, and formulate architectural solutions that respond to local climatic characteristics and MSME activity requirements. The research employed a descriptive qualitative approach through field observations, literature studies, and comparative studies of similar projects to establish the foundation of the design concept.

The contribution of this research is expected to provide both academic and practical benefits. Academically, this study contributes to architectural discourse regarding the integration of economic development facilities and sustainable tropical design approaches. Practically, the proposed MSME Center design can serve as a reference for regional development planning by providing a facility that supports production activities, product promotion, entrepreneurship education, and community interaction. Through this approach, the MSME Center is expected to become an economic empowerment facility that reflects the local identity of South Konawe while responding effectively to tropical environmental conditions.

METHOD

This research employed a descriptive qualitative approach to formulate the design concept of a Micro, Small, and Medium-Sized Enterprise (MSME) Center in South Konawe Regency using a tropical architectural approach. The research object was the planned MSME Center located in Tinanggea Subdistrict, South Konawe Regency, Southeast Sulawesi Province. The research focused on the physical, environmental, and functional characteristics of the site, including land conditions, climatic factors, accessibility, surrounding environment, and MSME facility requirements. The sample was selected using purposive sampling, focusing on the proposed design site and relevant comparative objects representing MSME development facilities and tropical architectural applications. The research instruments included observation sheets, site documentation tools, architectural analysis guidelines, literature review matrices, and comparative study frameworks to identify design parameters.

Data collection was conducted through direct field observation, literature review, and comparative analysis of similar architectural objects. Primary data were obtained through site observations to identify existing conditions, including site boundaries, land configuration, environmental characteristics, accessibility patterns, solar orientation, wind direction, rainfall conditions, noise sources, and surrounding views. Secondary data were collected from scientific publications, architectural references, government documents, and other relevant sources to support the design framework and considerations.

The data were analyzed using qualitative descriptive analysis, consisting of site analysis, environmental analysis, spatial analysis, and architectural concept formulation. The collected information was systematically analyzed to determine design strategies related to zoning, circulation, building orientation, mass arrangement, natural ventilation, natural lighting, and material selection. The validity of the findings was maintained through data triangulation by integrating observation results, literature findings, and comparative studies of similar buildings. The design formulation applied tropical architectural principles through cross-ventilation strategies, natural lighting optimization, vegetation utilization, and consideration of local materials to develop a sustainable MSME development facility.

RESULTS AND DISCUSSION

Research Location

The design location for the Micro, Small, and Medium Enterprises (MSME) Center is in Tinanggea Subdistrict, South Konawe Regency, Southeast Sulawesi Province. This location was selected based on its role as a center of government and one of the centers of economic activity in South Konawe Regency. In addition, this area has a good level of accessibility because it is connected to the main road network and is located near residential areas, government facilities, and various centers of community activity, making it strategic for supporting the development of MSME activities.



Figure 1. Administrative map of South Konawe Regency

Source: Petatematikindo, 2015



Figure 2. Design site location

Source: Author's analysis, 2026

Table 1. Site Location and Boundary Description of the MSME Center Design Area

Site Location	Jl. Poros Tinanggea, Ngapaaha Village, Tinanggea Subdistrict, South Konawe Regency.
Site Area	2.6 hectares
Site Boundaries	
North	Directly bordered by the large Lapmham Mbatono field
East	Jl. Abdullah Silondae; bordered by Bank BNI South Konawe and Tinanggea Post Office
West	Jl. Poros Tinanggea; directly bordered by Tinanggea Community Health Center (Puskesmas)

Site Location	Jl. Poros Tinanggea, Ngapaaha Village, Tinanggea Subdistrict, South Konawe Regency.
South	Jl. Poros Tinanggea; Tinanggea Subdistrict Office and Nurul Huda Grand Mosque

Source: Author's Analysis, 2026

Site Processing

1. Sun Orientation, Wind Direction, and Rainfall

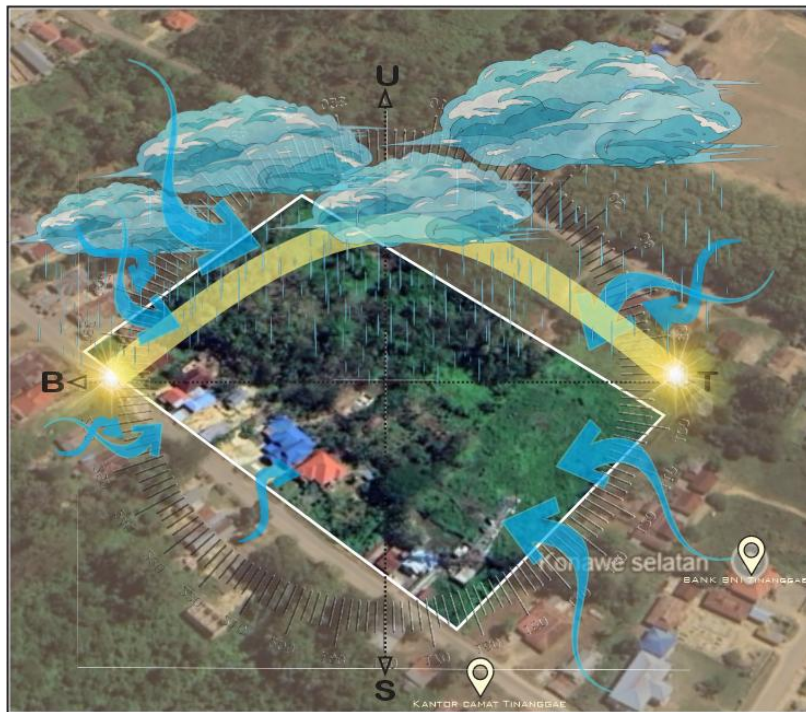


Figure 3. Sun orientation, wind, and rainfall analysis

Source: Author's analysis, 2026

The response to sun orientation on the site was implemented by designing the building mass elongated on an east–west axis to reduce direct sunlight exposure on the building's sides. In addition, the building applies passive tropical architecture strategies through the use of overhangs, cross-ventilation, voids between building masses, and porous materials to improve thermal comfort in a hot, humid climate. A sloped roof is also applied as a response to solar radiation intensity and high rainfall, providing more optimal protection for the building.

2. Noise

High-noise sources come from the south and southwest due to the main arterial road and residential areas. Moderate-noise sources come from the east, originating from vehicles and residential areas. The north and west directions are classified as low-noise because of the lack of residential areas and the presence of some trees that can filter noise entering the site.



Figure 4. Noise analysis

Source: Author's analysis, 2026

3. Views In and Out

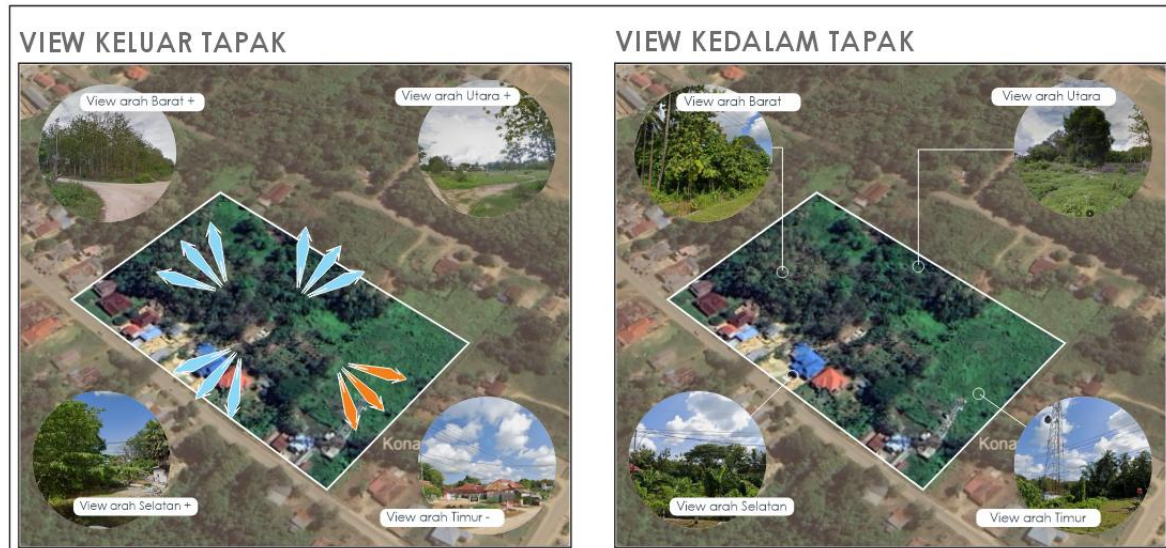


Figure 5. Analysis of views into and out of the site

Source: Author's analysis, 2026

The eastward view is less favorable because it directly faces residential areas and Jl. Abdullah Silondae.

The southward and westward views contain vegetation and a small amount of residential area, which is quite favorable for building openings.

The northward view contains some trees and a direct line of sight toward the field; openings are very much needed on this side of the building.

4. Accessibility



Figure 6. Accessibility analysis

Source: Author's analysis, 2026

The response to accessibility on the site was carried out by placing four-wheeled vehicle entry and exit access on the east and west sides of the site and applying a one-way circulation system to smooth vehicle flow and reduce the potential for congestion within the area. In addition, motorized-vehicle access is separated from bicycle and pedestrian paths to reduce congestion at the entrance area, creating circulation that is safer, more comfortable, and more efficient for all users of the MSME Center.

5. Zoning

Structured spatial zoning was designed to optimally support the function of the MSME Center by applying tropical architecture principles, such as responding to the hot and humid climate, utilizing cross-ventilation and natural lighting, and arranging a spatial hierarchy to improve user comfort and efficiency.



Figure 7. Zoning analysis
Source: Author's analysis, 2026

6. Mass-Arrangement Pattern Analysis

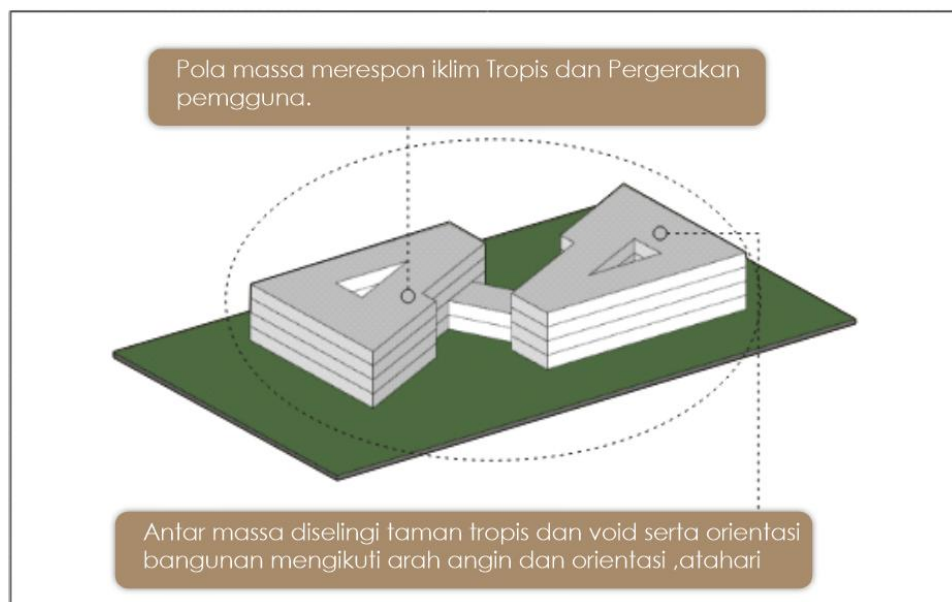


Figure 8. Mass-arrangement pattern analysis
Source: Author's analysis, 2026

The building-mass arrangement was designed to create a harmonious relationship between outdoor and indoor spaces, taking into account efficiency, adaptation to the tropical climate, and the integration of MSME activities.

Building Form and Appearance

1. Basic Building Form

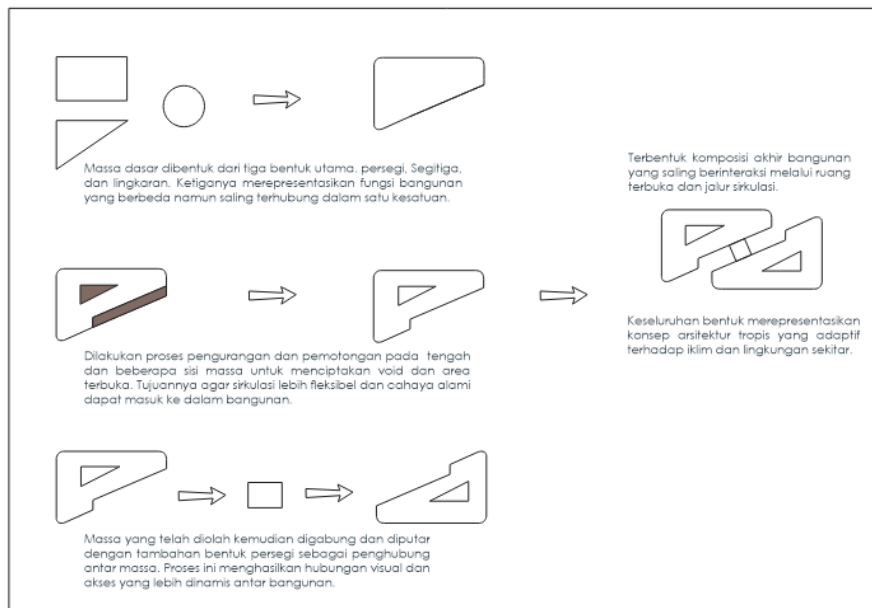


Figure 9. Basic building form

Source: Author's analysis, 2026

Strategically located in the city-center area, the design site has a trapezoidal geometry surrounded by main arterial roads. The zoning concept for the land was obtained through the integration of zoning analysis, climatic parameters, and accessibility. The main mass of the complex is divided into two independent building masses designed to face the street. The basic form and layout configuration of the two buildings are the result of geometric adaptation to the site shape, based on the full sequence of site-analysis stages.

Building Appearance

A form transformation inspired by the icon of business management represents the spirit of growth, structured management, and improved MSME competitiveness. This concept is translated into architectural form as a symbol of an economic-empowerment center that encourages MSMEs to develop sustainably and provide a positive impact on the regional economy.

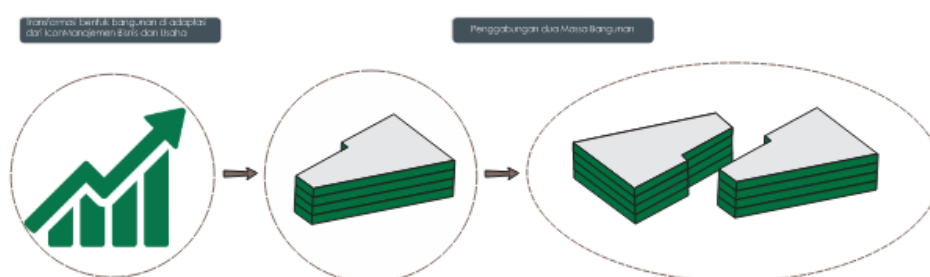


Figure 10. Building-appearance form analogy

Source: Author's analysis, 2026

The transformed building mass is then split into two volumes to create a clearer division of functions, while forming a connecting space that serves as an area for interaction and circulation between buildings.

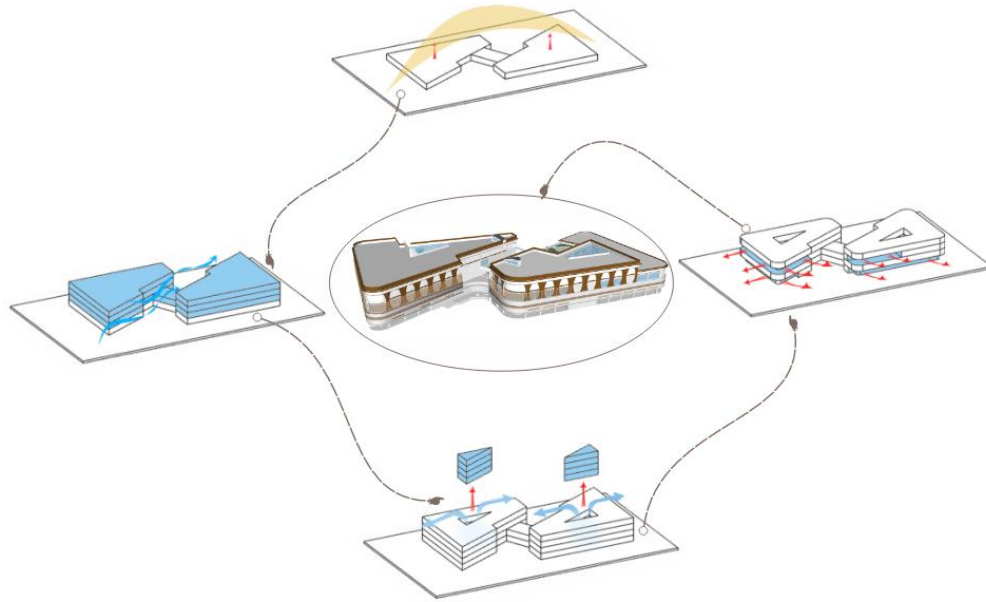


Figure 11. Building-appearance form transformation

Source: Author's analysis, 2026

The development of the building's appearance was derived from the results of the site analysis, taking into account the Tropical Architecture concept, through stages that include increasing the number of building floors, introducing a void at the center of each building mass, and reducing certain sides of the building with the aim of maximizing air circulation entering the building.

Application of the Contemporary Architecture Concept

The design concept for the Micro, Small, and Medium Enterprises (MSME) Center in South Konawe Regency, using a Tropical Architecture approach, aims to create a built environment capable of adapting to local climatic conditions. The concept was implemented through the optimization of natural cross-ventilation, the use of voids to connect air circulation, and the arrangement of building masses elongated along an east–west axis to minimize direct sunlight exposure. This strategy aims to reduce the load on artificial cooling while maximizing natural lighting, so that electricity consumption during the day can be reduced.

The selection of building materials prioritizes the use of local materials with high resistance to the characteristics of a coastal tropical climate. This approach represents an application of the principle of sustainability as well as an effort to optimize the region's resource potential. Accordingly, the MSME Center is expected not only to function as a facility for developing the community's economic activities, but also to serve as a representation of contextual, environmentally conscious tropical architecture that reflects the identity and local wisdom of South Konawe Regency.

Design Results

The design results for the Micro, Small, and Medium Enterprises (MSME) Center in South Konawe Regency, using a Tropical Architecture approach, are directed toward realizing a facility capable of optimally supporting local economic activity through the provision of functional, comfortable spaces responsive to tropical climatic conditions. The design was carried out with attention to optimal site processing, a structured zoning arrangement among production, commercial, educational, and public-space areas, as well as the provision of open space that functions as a medium for social interaction, promotion of local products, and improvement of environmental quality.

The building was designed to accommodate a variety of main functions, including production areas, workshops, MSME retail, exhibition space, culinary areas, and management and support facilities, connected through an efficient, comfortable, shaded, and pedestrian-friendly circulation system. The application of Tropical Architecture principles is realized through building orientation that takes into account the direction of sunlight and wind, the use of vegetation as shade, the use of openings to optimize cross-ventilation and natural lighting, and the selection of local materials that support the principle of sustainability.

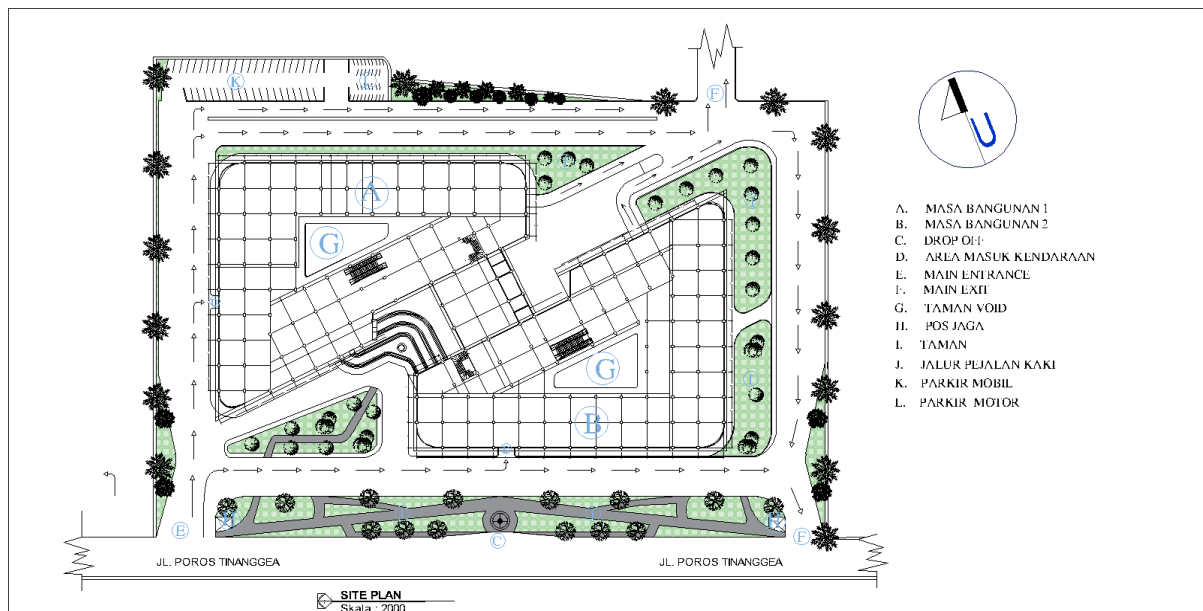


Figure 12. Site plan

Source: Author's analysis, 2026

CONCLUSION

Based on the research findings, the study concluded that the Micro, Small, and Medium-Sized Enterprise (MSME) Center in South Konawe Regency was formulated through a tropical architectural approach that integrated economic functions, environmental responsiveness, and local identity. The design process considered site analysis, zoning arrangements, circulation systems, and spatial organization to develop a functional facility that supports MSME activities. The application of tropical architecture principles was reflected through building orientation, cross-ventilation strategies, natural lighting

optimization, vegetation integration, and the selection of sustainable local materials. These strategies were intended to create comfortable and environmentally responsive spaces while accommodating production, commercial, educational, exhibition, and community interaction functions within the MSME Center. The proposed design is expected to contribute as an economic empowerment facility that supports local MSME development while representing the characteristics and potential of South Konawe Regency.

Future research is recommended to evaluate the proposed MSME Center design through simulation-based assessments and post-occupancy studies after implementation. Further studies may examine thermal comfort performance, energy efficiency, user satisfaction, and the effectiveness of spatial organization in supporting MSME activities. In addition, future researchers may explore the integration of digital technologies, sustainable building systems, and participatory design approaches involving MSME actors and local communities to develop more adaptive and context-responsive economic facilities. These developments may expand the application of tropical architectural principles in supporting sustainable regional economic development.

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