

BLITAR COFFEE HUB: A COFFEE DISTRIBUTION AND EDUCATION CENTER WITH A BIOMORPHIC ARCHITECTURAL APPROACH

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ABSTRACT

Blitar Coffee Hub is designed as a coffee distribution and education center that integrates economic, cultural, and community-based tourism functions. Originating from the significant potential of Arabica and Robusta coffee in Blitar, which has not been fully optimized in its distribution chain, this project provides an integrated hub that connects farmers, SMEs, tourists, and the community. The biomorphic architectural approach is applied to create organic spatial experiences inspired by natural forms, utilizing local materials such as bamboo, rattan, and wood as a manifestation of sustainability. The Coffee Hub is designed with three main functions: a post-harvest coffee distribution center, an educational facility that showcases the coffee journey from plantation to cup, and a tourism destination that also serves as an iconic architectural landmark of Blitar. Its presence is expected to strengthen Blitar's identity as a coffee city, enhance the competitiveness of local SMEs, and create an inclusive and sustainable public space.

Keywords: Biomorphic Architecture; Coffee Hub; Sustainability

INTRODUCTION

Blitar is one of the regions in East Java with significant potential for coffee production, particularly Arabica and Robusta varieties. The distinctive flavor characteristics of Blitar coffee are influenced by fertile volcanic soil and a tropical monsoon climate that supports sustainable coffee cultivation. Recent data indicate that coffee production in Blitar has remained relatively stable over the past five years, demonstrating its resilience as an agricultural commodity. In parallel, the growth of coffee-based small and medium enterprises (SMEs) and coffee shops in Blitar reflects an expanding market and increasing public interest in coffee consumption.

Despite this potential, the coffee distribution system in Blitar remains underdeveloped. Most coffee products are still sold directly by farmers without adequate post-harvest processing, branding, or integrated distribution mechanisms. As a result, the economic value of local coffee has not been fully optimized, and opportunities for strengthening the local coffee value chain remain limited. This condition highlights the need for an integrated facility that can bridge coffee farmers, SMEs, tourists, and the broader community.

The concept of a Coffee Hub offers a strategic solution by functioning as a centralized node that integrates coffee distribution, education, and tourism. In this context, the Blitar Coffee Hub is envisioned not only as a post-harvest distribution center, but also as an educational and recreational space that introduces the coffee production process from plantation to cup. Facilities such as a coffee museum, mini coffee garden, processing areas, cafés, and retail spaces are designed to support learning, social interaction, and economic activities simultaneously.

To strengthen its identity and environmental responsiveness, this project adopts a biomorphic architectural approach. Biomorph architecture draws inspiration from natural forms, systems, and processes, translating them into organic spatial configurations that promote harmony between the built environment and nature. In the Blitar Coffee Hub, biomorphic principles are reflected in building massing and façade designs inspired by coffee beans and leaves, as well as in the use of natural ventilation, daylighting strategies, and landscape integration.

The application of biomorphic architecture also supports sustainability through the use of local and environmentally friendly materials such as bamboo, wood, and stone, combined with modern materials to ensure structural efficiency and durability. By integrating economic, educational, cultural, and architectural aspects within a single facility, the Blitar Coffee Hub is expected to strengthen Blitar's identity as a coffee city, enhance the competitiveness of local SMEs, and provide an inclusive and sustainable public space for the community.

LOCATION DESCRIPTION

The Blitar Coffee Hub is located in the city of Blitar, East Java, Indonesia, a region situated at the southern part of the province and at the foothills of Mount Kelud. Blitar lies at an average elevation of approximately 156 meters above sea level and is characterized by fertile volcanic soil, making it suitable for agricultural activities, particularly coffee cultivation. The city is positioned about 160 km southeast of Surabaya, the provincial capital, and is accessible through regional road networks that connect Blitar with surrounding coffee-producing areas.

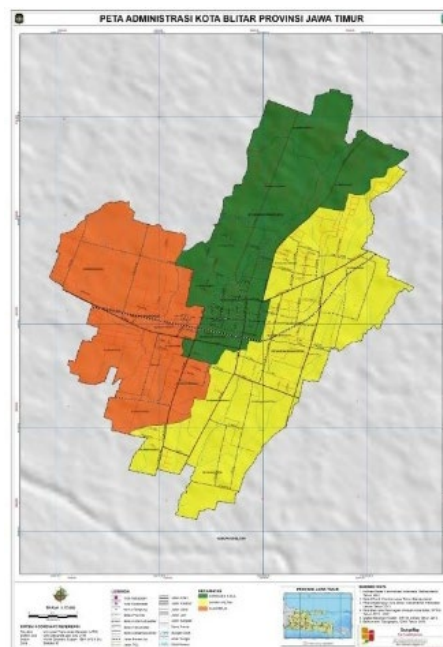


Figure 1. Administrative Map of Blitar City
(petatematikindo.wordpress.com, 2025)

Administratively, the selected site is located within an urban context that is surrounded by mixed land uses, including residential areas, commercial facilities, and public services. This strategic location allows the Coffee Hub to function as a connector between rural coffee production zones and the urban market. The site benefits from good accessibility, being directly connected to primary and secondary roads, which supports the distribution of coffee products as well as visitor circulation.

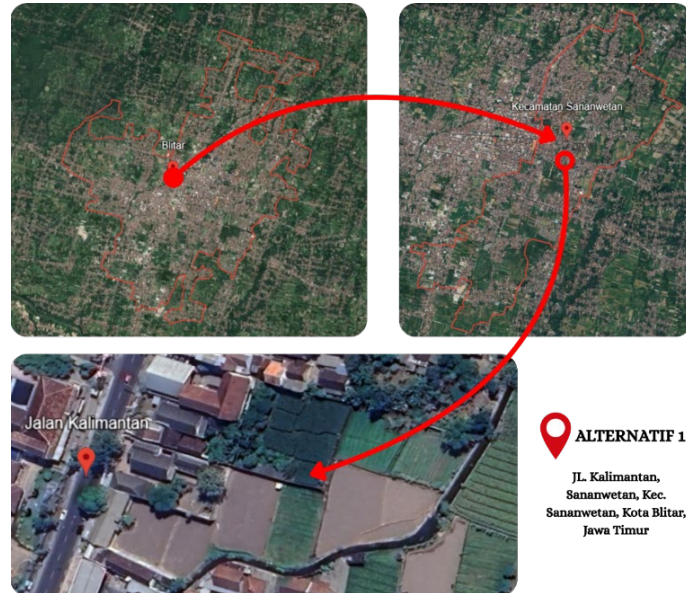


Figure 2. Alternative Site 1 Location (earth.google.com, 2025)

Climatically, Blitar experiences a tropical monsoon climate with relatively stable average temperatures ranging from 24°C to 26°C throughout the year. The region receives high annual rainfall, particularly during the wet season from December to March, while the dry season typically occurs between June and September. These climatic conditions are favorable for both Arabica and Robusta coffee cultivation and strongly influence the architectural design strategy, particularly in terms of natural ventilation, shading, and rainwater management.

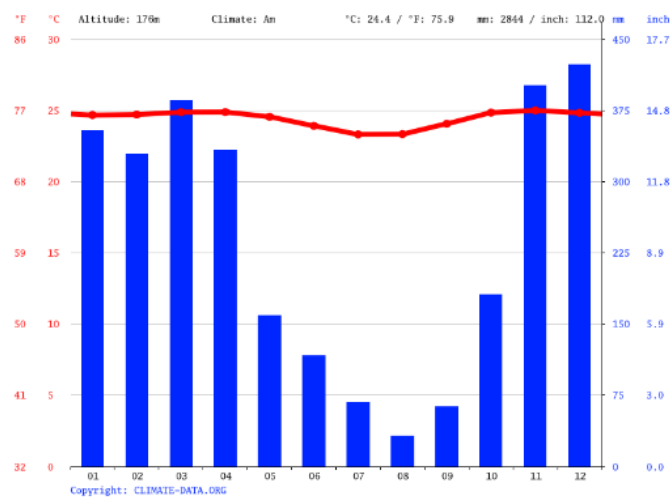


Figure 3. Monthly Climate Data for Blitar City (id.climate-data.org, 2025)

The site's environmental context and climatic characteristics support the application of a biomorphic architectural approach, allowing the building massing and landscape design to respond organically to natural conditions. The location is therefore considered suitable for the development of the Blitar Coffee Hub as a distribution, education, and tourism facility that integrates local agricultural potential with sustainable architectural design.

THE SITE ANALYSIS

The site analysis was conducted to identify the physical, environmental, and contextual factors influencing the design of the Blitar Coffee Hub. Key aspects analyzed include accessibility, surrounding land use, topography, climate, views, and environmental disturbances, which together inform the architectural response and site planning strategy.

The selected site is accessible through a primary urban road that connects directly to major activity nodes within the city of Blitar. This condition supports efficient circulation for visitors, service vehicles, and coffee distribution logistics. Pedestrian access is accommodated through existing sidewalks, allowing the site to function as a public-oriented facility. Vehicular circulation is organized to separate public, service, and operational flows in order to minimize conflicts between visitors and production activities.

The site is surrounded by mixed urban functions, including residential areas, commercial activities, and public facilities. This context supports the development of the Coffee Hub as a transitional space that links urban life with agricultural production. The surrounding environment also provides opportunities for community engagement, while requiring design strategies that mitigate noise and visual disturbance from adjacent urban activities.

The site is characterized by relatively flat topography, which facilitates building construction and accessibility. Existing drainage patterns follow the natural slope of the land and are integrated into the site planning through permeable surfaces and rainwater management systems. These strategies help reduce surface runoff and support sustainable water management, particularly during the rainy season.



Figure 4. Environmental Link Analysis (Author, 2025)

Blitar's tropical monsoon climate significantly influences the design approach. High solar intensity and heavy rainfall during certain periods require effective shading, roof design, and natural ventilation strategies. Building orientation and massing are arranged to maximize cross-ventilation and daylight while minimizing heat gain. Overhangs, green buffers, and vegetated areas are introduced to enhance thermal comfort and microclimatic conditions (Figure 5).

Visual analysis indicates that the site has favorable views toward surrounding green areas, which are utilized as part of the spatial experience for visitors. Public spaces are oriented to capture these views, while service and technical zones are positioned away from primary visual corridors. Noise levels originating from adjacent roads are mitigated through landscape buffers, building setbacks, and vegetation, ensuring acoustic comfort within public and educational spaces (Figure 6).

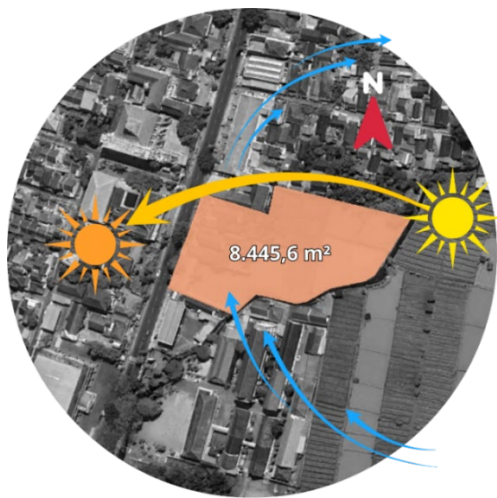


Figure 5. Climate Analysis (Author, 2025)



Figure 6. Noise and Air Pollution Analysis (Author, 2025)

Overall, the site analysis demonstrates that the selected location provides favorable physical and environmental conditions for the development of the Blitar Coffee Hub. The findings support a biomorphical architectural approach that responds to climate, landscape, and urban context, while accommodating the functional requirements of coffee distribution, education, and tourism.

CONCEPTUAL APPROACH AND WARFARE THEME

The design of the Blitar Coffee Hub is based on a conceptual approach that integrates functional efficiency, environmental responsiveness, and symbolic representation through a biomorphical architectural theme. This approach aims to create an architectural form that not only accommodates coffee-related activities, but also communicates the identity of Blitar as a coffee-producing city.

The biomorphical concept is derived from natural elements associated with coffee, particularly coffee beans and coffee leaves, which symbolize growth, productivity, and local culture. These organic forms are translated into building massing, façade articulation, and spatial flow, resulting in curved and fluid geometries that contrast with rigid conventional architectural forms. The application of biomorphical principles allows the building to visually express its function while establishing a strong and recognizable landmark.

From a functional perspective, the conceptual approach emphasizes the separation and integration of different activity zones within the site. Public functions such as exhibitions, cafés, and educational spaces are arranged in accessible and open forms, while semi-public and service zones related to coffee processing and distribution are positioned in more controlled areas. Organic circulation patterns are applied to guide visitors through a sequential spatial experience, reflecting the coffee journey from plantation to consumption.



Figure 7. Building Mass Concept (Author, 2025)

Environmental considerations play a central role in shaping the form theme. Building orientation, mass composition, and roof design are developed to respond to the tropical monsoon climate of Blitar. The biomorphic roof forms support natural ventilation, daylight penetration, and rainwater management, while overhangs and shading devices reduce heat gain. Landscape elements are integrated as transitional spaces that enhance microclimate quality and strengthen the relationship between built form and nature.

Material selection further reinforces the conceptual approach. Local natural materials such as bamboo, wood, and stone are applied to façades, interiors, and outdoor spaces to emphasize sustainability and local identity. These materials are combined with modern construction systems to ensure structural performance, durability, and functional efficiency.

Through this conceptual approach and biomorphic form theme, the Blitar Coffee Hub is envisioned as an integrated architectural environment that unites distribution, education, and tourism functions. The design promotes sustainability, enhances spatial experience, and reinforces the cultural and economic value of coffee within the urban context of Blitar.

DESIGN THEME

The design theme of the Blitar Coffee Hub is Biomorphich Architecture, which emphasizes organic forms inspired by natural elements and processes. This theme is selected to reflect the intrinsic relationship between coffee cultivation, the natural environment, and local cultural identity. By adopting biomorphich principles, the architectural design seeks to create a harmonious integration between the built environment and its surrounding landscape.



Figure 8. Illustration of Design Theme (Author, 2025)

The biomorphic theme is primarily expressed through building massing and spatial organization derived from the forms of coffee beans and coffee leaves. Curved and fluid geometries are applied to soften the building profile and to generate a dynamic spatial experience. These forms are intended to symbolize growth, continuity, and sustainability, aligning with the narrative of the coffee production cycle.

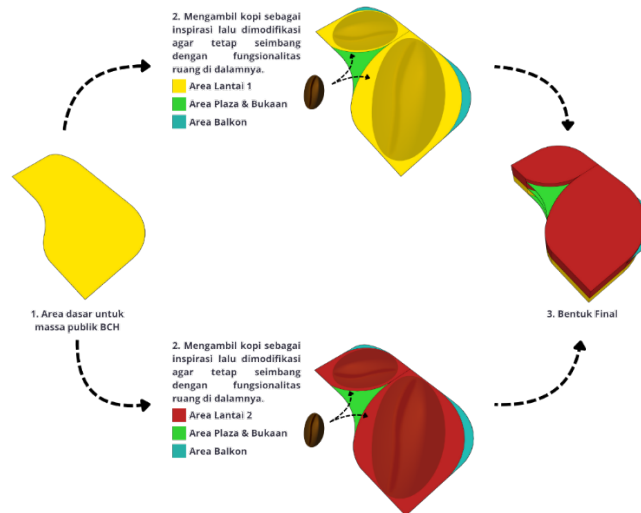


Figure 9. Concept of Public Mass Form (Author, 2025)

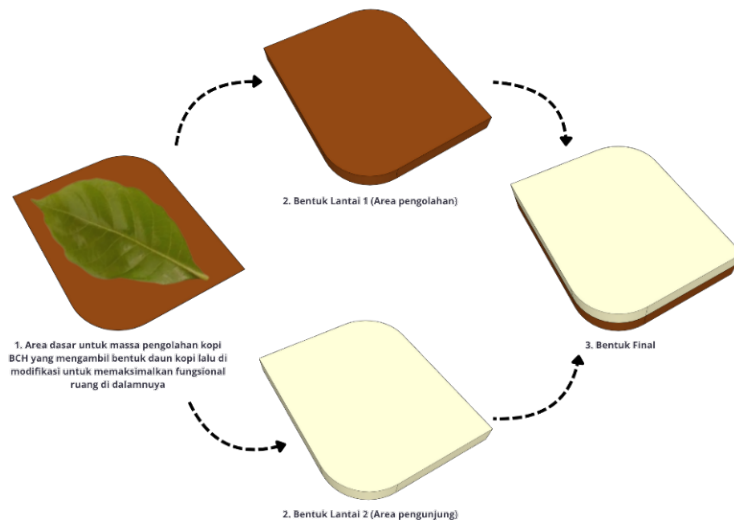


Figure 10. Concept of Coffee Processing Mass Form (Author, 2025)

In addition to form, the design theme is implemented through environmental responsiveness. Natural ventilation, daylight optimization, and shading strategies are incorporated to enhance thermal comfort and reduce energy consumption. The integration of landscape elements, such as green buffers and open courtyards, supports microclimate improvement and strengthens the visual connection between interior and exterior spaces.

Material selection also reinforces the design theme. Local and sustainable materials, including bamboo, wood, and stone, are combined with modern construction systems to achieve both aesthetic quality and structural performance. This material strategy highlights local resources while supporting environmentally responsible design.

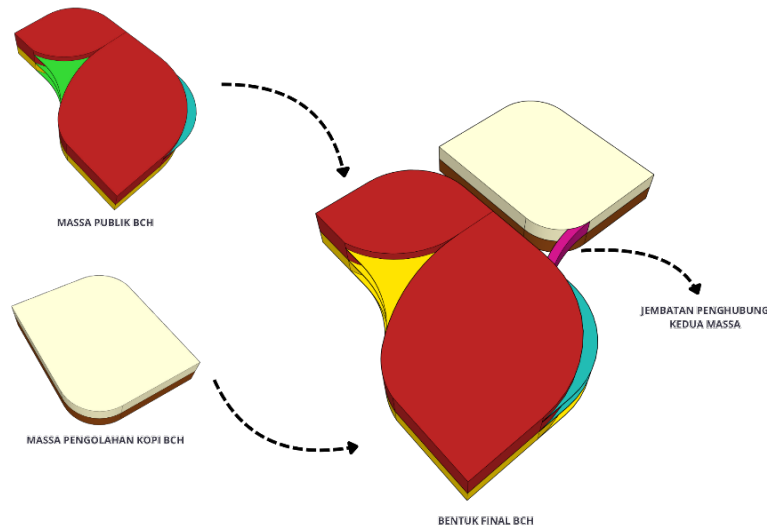


Figure 11. Final Form Concept (Author, 2025)

Overall, the biomorphic design theme enables the Blitar Coffee Hub to function not only as a distribution and educational facility, but also as an architectural landmark that represents the ecological, cultural, and economic significance of coffee in Blitar.

IMPLEMENTATION OF CONCEPT IN DESIGN

The implementation of the biomorphic concept in the design of the Blitar Coffee Hub is realized through the integration of form, spatial organization, environmental strategies, and material selection. The design translates abstract natural inspirations into functional architectural elements that support distribution, education, and tourism activities.



Figure 12. Final Design (Author, 2025)

The biomorphical concept is first implemented in the building massing. The overall mass composition is developed from organic forms inspired by coffee beans and leaves, resulting in curved and flowing geometries. These forms are arranged to create a dynamic composition while maintaining clear functional zoning. Public spaces are positioned in visually expressive masses, while service and operational areas are integrated into more compact forms to ensure efficiency.

Spatial organization reflects the narrative of the coffee production process. Circulation paths are designed to guide visitors through a sequential experience, starting from introduction and exhibition areas, continuing to processing and educational spaces, and concluding in café and retail zones. This spatial sequence enhances visitor understanding of coffee production while maintaining smooth movement and spatial clarity.

Environmental responsiveness is a key aspect of the concept implementation. Building orientation and openings are designed to maximize natural ventilation and daylight penetration, reducing reliance on artificial lighting and mechanical cooling. Biomorphical roof forms and overhangs function as shading devices and support rainwater management, responding effectively to the tropical monsoon climate of Blitar. Landscape elements are integrated to create transitional spaces that improve microclimate conditions and provide visual comfort.

Material application further reinforces the design concept. Local materials such as bamboo, wood, and stone are utilized for façades, interior finishes, and outdoor elements to emphasize sustainability and local identity. These materials are combined with modern structural systems to ensure durability, safety, and construction feasibility.

Through the implementation of the biomorphical concept across multiple design aspects, the Blitar Coffee Hub achieves an integrated architectural solution that aligns form, function, and environmental performance. The design supports sustainable development while strengthening the cultural and economic role of coffee within the urban context of Blitar.

CONCLUSION AND SUGGESTIONS

The design of the Blitar Coffee Hub demonstrates how architectural intervention can support the integration of economic, educational, and tourism activities related to local coffee production. By applying a biomorphical architectural approach, the project responds to environmental conditions, local identity, and functional requirements within a single integrated facility. The design emphasizes organic forms inspired by coffee-related natural elements, resulting in an architectural expression that strengthens Blitar's image as a coffee-producing city.

The implementation of the biomorphical concept is reflected in building massing, spatial organization, environmental strategies, and material selection. Natural ventilation, daylight optimization, and the use of local and sustainable materials contribute to improved environmental performance and user comfort. In addition, the spatial sequence enhances visitor understanding of the coffee production process, from cultivation and processing to consumption and distribution.

As a design-based study, this project provides a conceptual framework for developing coffee-related facilities that integrate distribution, education, and tourism. However, further studies are recommended to evaluate the technical performance of the proposed design, including structural systems, energy efficiency, and environmental impact assessments. Future research may also explore the application of similar architectural approaches in other agricultural-based regions to support sustainable local economic development.

Overall, the Blitar Coffee Hub is expected to function as a sustainable public facility that promotes local coffee value, supports small and medium enterprises, and enhances community engagement through architecture that is responsive to both nature and culture.

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