

STUDY ON SPATIAL ORGANIZING FOR SUSTAINABLE TOURISM DEVELOPMENT: APPLICATION IN THAI LAI VILLAGE, DA NANG CITY

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Abstract - Reconstructing Thai Lai Countryside with a focus on sustainable tourism development. The reconstruction of Thai Lai countryside focuses on reorganizing architectural landscape spaces while preserving cultural and historical values. Proposed solutions include improving landscape quality, enhancing infrastructure, and organizing spaces through models such as rest stops, agricultural outlets, outdoor zones, and riverside corridors. These are based on SmartCode and MCA principles to ensure effective planning and protect rural identity. Collaboration among the community, businesses, and government is essential for sustainable tourism. The plan aims to boost local economic conditions and transform Thai Lai into a model rural area, offering a scalable solution for similar regions and contributing to the sustainable cultural development of Hoa Vang.

Key words - Landscape Architecture; Cultural Landscape; Sustainable Tourism Development; Rural Tourism; Thai Lai Village

1. Problem statement

1.1. Rationale

Hoa Vang District is oriented to develop into a town by 2025, according to Resolution 1210/2016/UBTVQH13 and the planning policies of Da Nang City [1]. The development model is identified as an ecological urban area associated with the preservation of landscape and traditional culture [2], [3]. Thai Lai Village, located in Hoa Nhon Commune, is a typical example with the potential to develop rural tourism associated with culture, agriculture, and the natural landscape. However, this area has not yet effectively exploited its available advantages, leading to the loss of cultural and historical values, environmental degradation, and a decline in quality of life. Therefore, it is necessary and urgent to study the organization of landscape architecture spaces oriented toward sustainable tourism development in Thai Lai Village, aiming for sustainable socio-economic growth, alignment with the general planning objectives of the district, and the preservation of local identity.

1.2. Research objectives

Evaluate the current status of the study area.

Propose solutions for organizing the landscape and architectural spaces of Thai Lai Village in line with the trend of conservation-oriented tourism development.

Propose architectural management regulations specific to the Thai Lai Village area.

1.3. Research object and scope

Research object: Landscape and architectural space in Thai Lai Village.

Research scope: Thai Lai Village, Hoa Nhon Commune, Da Nang City.

Time frame: The period from 2030 to 2040.

Spatial scope: Within the boundaries of Thai Lai Village, Hoa Nhon Commune, Da Nang City.

2. Research content

2.1. Current Status Assessment of Thai Lai Village

Thai Lai Village is located in the center of Hoa Nhon Commune, Hoa Vang District, on the left bank of the Tuy Loan River, approximately 20 km southwest of Da Nang city center. The village consists of three hamlets: Go, Ngoai, and Tren. It borders Phuoc Hung Village to the north, Phuoc Thai Village to the east, An Tan Village (Hoa Phong) to the south, and Ninh An Village to the west. Thai Lai plays a central role in linking the economy, culture, and spatial relationships among these neighboring villages such as Phuoc Hung, Phuoc Thai, An Tan and Ninh An.

With natural advantages and improved transportation infrastructure, Thai Lai not only sustains agricultural development but also contributes to strengthening regional connections.

Economically, the Thai Lai Saemaul Cooperative provides modern agricultural products, integrates eco-tourism, and facilitates the exchange of goods, labor, and agricultural techniques with nearby villages, thereby forming a robust value chain.

Culturally and socially, Thai Lai and its neighboring villages preserve traditional festivals such as the Ky An Festival, Spring Festival, and the Village Festival, fostering community cohesion and cultural identity. In terms of infrastructure, local and inter-village transportation projects - such as concrete roads and the Bau Thoang bridges - enhance production capacity and support tourism development. With its focus on community-based eco-tourism, Thai Lai plays a vital role in shaping diverse rural tourism routes, contributing to the sustainable development of the entire Hoa Vang District.

Table 1. Summary of the current socio-economic conditions and regional infrastructure (Source: Author)

| Field | Content |
|---------------------------------------|---|
| Economics - Agriculture | <ul style="list-style-type: none">- Agricultural land area: 31 ha (18 ha for rice, 13 ha for other crops).- Rice production efficiency: 50 tons/ha; output: 180 tons/year.- Peanut production efficiency: 24 tons/ha; output: 312 tons/year.- Fruit tree area: 2.5 ha (jackfruit, grapefruit, rambutan, mango, etc.). |
| Livestock | <ul style="list-style-type: none">- Decreased due to price fluctuations and African swine fever.- Difficulty in herd restoration due to high breeding stock prices. |
| Community economic development | <ul style="list-style-type: none">- The Thai Lai Saemaul Cooperative was established, linking safe agricultural production with eco-tourism. |
| Restriction | <ul style="list-style-type: none">- The community lacks highly skilled human resources in tourism and high-tech agriculture.- Traditional culture is fading and increasingly difficult to preserve in the modern context. |
| Infrastructure | <ul style="list-style-type: none">- Intra-village traffic infrastructure is inconsistent, and the drainage system is weak.- There is a lack of homestay accommodations and distinctive tourism products.- Access roads to the village are small, with many narrow sections and limited car parking.- Infrastructure does not adequately meet tourism needs, and administrative procedures and planning remain complicated. |
| Environmental issues | <ul style="list-style-type: none">- Livestock barns do not meet hygiene standards, leading to negative impacts on environmental quality.- There is a lack of green space and public sanitation systems. |

2.2. General Overview of the Research Field






The conservation of traditional villages is increasingly recognized as essential to maintaining cultural identity while supporting rural development. Recent studies emphasize that preservation should go beyond physical structures to include community participation, spatial organization, and sustainable tourism development. However, in many cases - especially in Vietnam - research still tends to treat architectural conservation and tourism planning as separate efforts. This study aims to bridge that gap by integrating landscape design with cultural preservation in the context of Thai Lai Village.

2.3. Foreign research

The design of regeneration and sustainable tourism in a rural village in China - specifically Dongjingyu Village, Yangyang Township, Ji County - the research report “*Regenerating Landscape, Architecture and Environment: A Design-Based Research Approach for Integrated Tourism in a Rural Village in China*” [4], authored by Tiziano Cattaneo, Emanuele Giorgi, and Mingqing Ni.

The article published in GeoJournal of Tourism and Geosites, titled “*Local Potential and Sustainable Approaches in Master Plan Architectural Design: A Case Study of Pakseballi Tourism Village Development, Indonesia*” [5], focuses on master planning for Pakseballi Tourism Village using locally grounded and sustainable approaches.

Table 2. Summary of current status of architecture and landscape in Thai Lai village (Source: Author)

| Building | Description |
|---|---|
| Overview of current residential housing conditions | <div></div> <p>Regarding the main road into the village, the houses are mostly under two stories, and their architectural styles are inconsistent. There is no village gate. Some roads remain unpaved and lack proper drainage systems, and the landscape remains largely undeveloped.</p> |
| Traditional local architecture | <div></div> <p>The Thai Lai Communal House, built in 1811 during the Nguyen Dynasty, is a recognized city-level historical site and was restored in 2018. Traditional local houses, dating back about 150 years, reflect Central Vietnamese architecture with three main rooms, two wings, thick brick walls, and yin-yang tiled roofs. Many clan churches are deteriorated due to weathering and lack of restoration funds. The surrounding landscape is fragmented, with poor connectivity and unsuitable fencing materials like B40 mesh.</p> |
| Natural landscape | <div></div> <p>Khe Ngang is wide, and the landscape on both sides of the stream remains undeveloped. The water quality is not guaranteed, and there is no walking path, making access difficult.</p> |

2.4. Domestic research

2.4.1. Nam Dam Village



Figure 1. Nam Dam landscape seen from above (Source:[6])

Nam Dam Village (Ha Giang) is located near the Dong Van Stone Plateau and is actively developing community-based tourism linked to the preservation and promotion of Dao ethnic culture. Tourists can participate in activities

such as farming, traditional medicine preparation, cooking, and staying in local homes (homestays). The village retains traditional Dao house architecture, with clay walls, tiled roofs, and designs that harmonize with the natural environment.

2.4.2. Duong Lam Ancient Village

Duong Lam Ancient Village, Hanoi City: Duong Lam is a well-known ancient village located in Duong Lam Commune, Son Tay Town. It is one of the few remaining traditional villages in Vietnam that still preserves typical architectural and cultural features, along with agricultural production methods and lifestyles characteristic of the Northern Delta region.



Figure 2. The simple beauty of Duong Lam ancient village. (Source:[7])

3. Research methods:

3.1. Evaluation about Space access

At present, the street network lies at the core of urban issues, as it is not merely a system of transportation routes but also serves to interconnect various components of the city such as buildings, landscapes, and open spaces. In the analysis of street networks, two primary elements - links and nodes - are defined differently depending on the analytical method employed [8].

3.1.1. Space Syntax Method

Space Syntax is a technical tool for spatial analysis developed by Professor Bill Hillier, Julianne Hanson, and colleagues to provide appropriate design solutions related to spatial organization, helping to optimize traffic flow and improve accessibility to create a more connected living environment [9].

The analysis produces data on Integration and Choice, thereby determining the potential for destination-oriented movement (moving to) and movement through space (moving through) [10].



Figure 3. Extracted map of the Thai Lai village study area showing the spatial integration index of Da Nang City, analyzed using a radius of $R=n1200$. (Source: Author)

Accordingly, the traffic routes surrounding Thai Lai Village demonstrate high accessibility and play a significant role in regional connectivity. National Highway

1A and Truong Chinh Street (located 8.1 km from the village) serve as major transportation arteries, linking the central gateway with neighboring areas and facilitating both passenger transport and inter-regional traffic. Hoang Van Thai Street and Ba Na–Suoi Mo Street (3.9 km away) connect the city center to the Ba Na Hills tourist area, featuring high-quality infrastructure and running through a semi-mountainous region with rich natural landscapes.

The Tuy Loan River is also an important component of local transport, linking villages within Hoa Vang District to the urban center and enhancing the cultural value of the river while supporting traditional agricultural production. Additionally, the Hoa Nhon Intersection (6.8 km away) is a strategic junction connecting National Highway 14B with nearby expressways. This intersection plays a vital role in regulating traffic flow, enhancing regional connectivity, and supporting economic development and freight transportation.

3.1.2. MCA Method

MCA (Multiple Centrality Assessment) is a method for analyzing transportation networks introduced by Professor Sergio Porta in 2006 [11]. MCA prioritizes the assessment of travel costs based on distance and helps evaluate the significance of nodes within a transportation network through key indicators such as Betweenness, Closeness, Straightness, and Efficiency.

In the analysis, 62,133 traffic routes were evaluated. The result showed that location point A, marked in green, had an index value more than one standard deviation above the mean, indicating a highly accessible point. This makes it a suitable location for organizing the main transportation hub for villages within Hoa Nhon Commune.

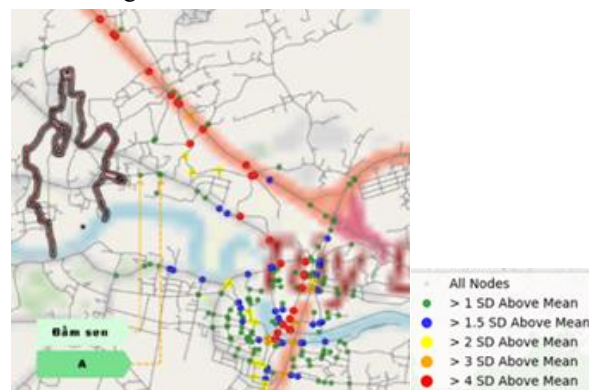


Figure 4. Standardized map of connection nodes, highlighting major transportation intersections in Da Nang City, based on 62,133 traffic routes. (Source: Author)

Using the Thai Lai Communal House as the center point and applying a 4 km radius, the analysis included 4,816 traffic routes and a combination of values for indicators b (Betweenness), c (Closeness), and s (Straightness). The results demonstrated very high accessibility indices from internal roads to external connectors, particularly along Nhon Son Road, with values exceeding 2. Among these, Quang Xuong Road exhibited the highest centrality values and was identified as the village's main access route. Therefore, the axis along this road is determined to be the primary transportation corridor for the village.

3.2. Sociological investigation into the urgency of landscape architecture

The survey revealed that 36.6% of respondents were residents of Thai Lai Village; 41.5% were professionals in the fields of planning and architecture; and 22% were working in tourism.

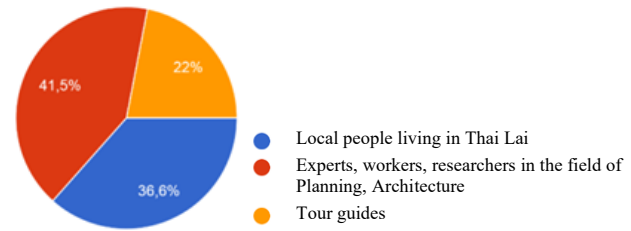


Figure 5. Pie chart illustrating the composition of survey respondents in the study area. (Source: Author's survey results)

To verify the reliability of the survey scale, data were analyzed using SPSS software with Cronbach's Alpha test. The results showed Cronbach's Alpha values of 0.93 for the necessity level and 0.92 for the level of impact, both above the 0.8 threshold. Additionally, all Corrected Item-Total Correlation values were greater than 0.3. These results confirm that the scale used in the survey is statistically reliable.

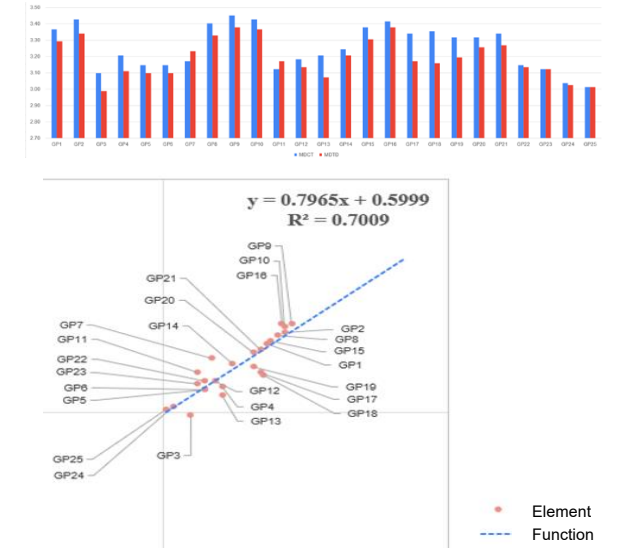


Figure 6. Chart identifying key value factors (Source: Author's survey results)

Survey data shows that all proposed solutions received consensus regarding their necessity and impact. The project should focus on the most prominent factors - GP2, GP9, GP10, and G16 - followed by secondary yet important factors such as GP1, GP8, GP15, and GP21.

4. Proposal to organize landscape architecture space towards sustainable tourism development

4.1. Organizing landscape architecture space for the entire area

4.1.1. General plan

The village is oriented toward development following a model that combines historical and cultural continuity with high-tech agriculture, modern infrastructure, and

green architecture. This model emphasizes both self-management by local residents and cooperation with local businesses. Community-based rural tourism is integrated with the village's existing characteristics, creating a tourism route that includes visits to revolutionary heritage sites ("red addresses"), participation in traditional festival rituals, agricultural experiences on green farms, and nature exploration through outdoor activity zones. This approach aims to balance cultural continuity and preservation responsibilities while fostering a strong and autonomous village community.

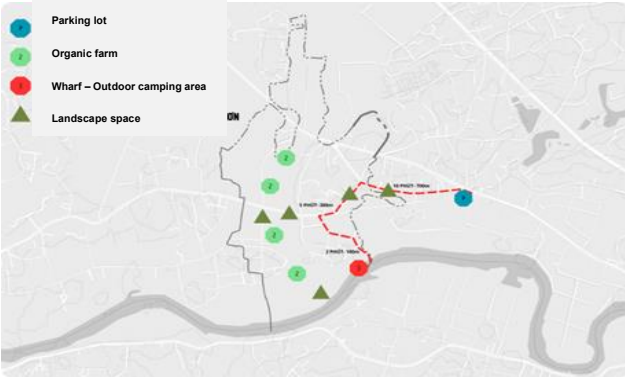


Figure 7. Determining the connection point in Thai Lai village area (Source: Author)

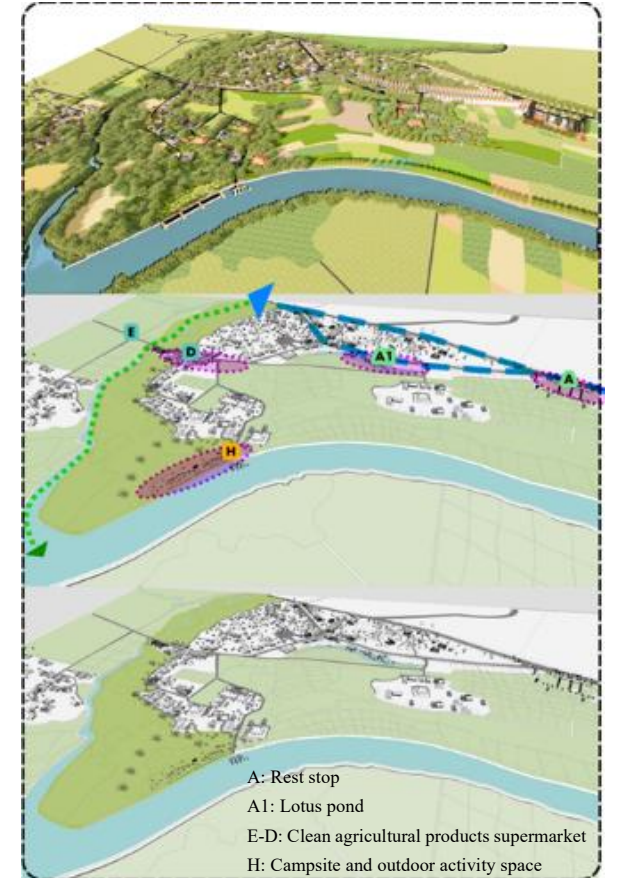


Figure 8. Organization of overall landscape architectural space of the entire area (Source: Author)

4.1.2. Residential architectural space

Residential spaces must be adapted to accommodate functions that support tourism while maintaining cultural

identity and traditional architectural styles. This transformation should enhance the uniqueness of the village to attract visitors. Housing should integrate tourism services with agricultural production through multifunctional design. Residential compounds should feature low-level landscaping to ensure clear views and visual harmony with neighboring properties, using consistent architectural language.

4.2. Historical cultural area

The tourism-oriented model emphasizes preserving the spatial structure and architectural form of the village communal house. Efforts should focus on the conservation and restoration of historical and cultural buildings, including ancient houses and clan churches, using traditional techniques. The surrounding landscape and cultural spaces of heritage sites must also be protected.



E-D: Clean agricultural products supermarket

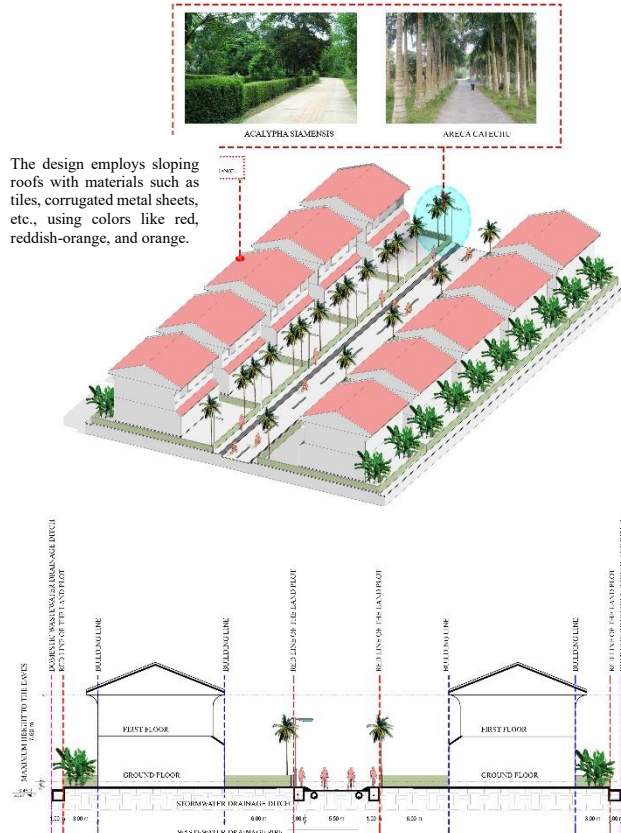


Figure 9. Simulation of the main traffic route of Thai Lai village (Source: Author)

Cultural heritage should be combined with experiential activities such as traditional festivals, craft village demonstrations, and immersion in local ways of life. The community cultural house should be integrated with an exhibition space serving as a center for village history, displays of agricultural tools, and other community-based cultural activities.

Internal village roads should be organized to connect settlements within the commune and include spaces for agricultural product sales along building façades. This would form an engaging and continuous walking route that links culture, commerce, and tourism.

4.3. Ecological and agricultural production zones

Model applied in the direction of tourism: promoting the protection of the natural environment and maintaining existing agricultural lands. Aiming to develop an organic agricultural production model integrated with tourism experiences. Establishing tourism networks for experiencing crop fields and fruit gardens, combined with eco-lodges. Clean agricultural supermarkets allow visitors to experience local products, farming practices, seeds, and more. School farms are combined with hands-on educational programs for visiting students to learn about the agricultural and ecological environment. Ecological and community farms allow visitors to participate in “a day as a farmer” by engaging in farming activities, harvesting produce, and understanding the local organic production process.



H: Campsite and outdoor activity space



Figure 10. Simulation of outdoor camping space and inland waterway wharf. (Source: Author)

4.4. Economic and tourist service area

The model is applied with a focus on tourism by organizing space efficiently, creating visual highlights, and enhancing the existing environment. Locally available materials should be used, with consistent forms and colors

that harmonize with nearby historical and cultural tourism sites. The development strategy includes offering local products, culinary experiences, accommodation, and complementary services and amenities.



A: Rest stop

Mini square

Figure 11. Simulation of stopover and top view
(Source: Author)

5. Conclusion

The project focuses on analyzing the current conditions and proposing solutions for organizing the landscape architecture of Thai Lai Village, with the aim of fostering sustainable tourism while preserving the village's cultural and historical identity.

Spatial analysis tools such as Space Syntax and Multiple Centrality Assessment (MCA) are applied to identify strategic traffic axes, functional zones, and central points for spatial planning. Additionally, a sociological survey was conducted to understand the practical needs of residents and the perspectives of tourists, especially as conveyed by tour guides.

The proposed solutions are grounded in principles that integrate landscape architectural planning with sustainable tourism development, ensuring long-term viability through thoughtful zoning. The main functional areas include cultural and historical zones, ecological and agricultural production zones, economic service zones, and tourism service areas. By combining rural tourism with educational experiences, hands-on agricultural activities, and eco-tourism, the model supports environmental conservation,

promotes the rural economy, and safeguards the historical and cultural essence of the village.

These recommendations not only provide a strategic direction for sustainable rural tourism but also help position Thai Lai Village as a distinctive and appealing destination, contributing to the broader development goals of Hoa Nhon Commune and Hoa Vang District.

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