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Cultural Persistence in the Architecture of Sa'o Nggua: A Case Study of Traditional Lio Settlements in Nggela, Flores Island

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Abstract

This study investigates the persistence of cultural meaning in the traditional architecture of *Sa'o Nggua* within the Nggela settlement of the Lio ethnic group in Flores, Indonesia. Through a structuralist and ethnographic approach, the research analyzes spatial patterns, architectural typologies, and ritual calendars at both macro (village) and micro (house-cluster) scales. Findings reveal that the settlement exhibits a sectoral-concentric spatial configuration aligned with cosmological beliefs, where sacred–profane binaries structure both space and function. Despite modern pressures and environmental disruptions, architectural forms remain consistent—particularly the tripartite interior and symbolic roof—due to ritual obligations and local material abundance. Twelve annual rites form an eco-ritual feedback loop, ensuring house maintenance and agricultural productivity. The coexistence of Catholic worship and ancestral practices demonstrates a layered cultural resilience. Limitations include a lack of spatial quantification and gendered labor metrics. Future research should explore UAV-based mapping, longitudinal ethnography, and climate-adaptive potentials of indigenous construction techniques. Overall, *Sa'o Nggua* functions not merely as a shelter but as a living symbol of cultural continuity, ecological adaptation, and social cohesion in the face of change. This underscores the relevance of vernacular architecture as a model for sustainable and resilient built environments.

Keywords: *Cultural Persistence, Eco-ritual, Sa'o Nggua, Symbolic Spatial Structure, Traditional Architecture.*

1. Introduction

Architecture, deeply embedded within cultural practices, serves primarily as a shelter and a place for daily living. According to [1], [2]Buildings represent a tangible manifestation of shelter necessary for survival. Similarly, the Oxford dictionary defines a house as a building typically inhabited by a family, emphasizing its critical function for human habitation. Thus, housing, especially traditional dwellings, inherently reflects the lives, values, and customs of its occupants, shaped profoundly by socio-cultural practices[3]–[6].

Indonesia, renowned for its diverse cultural heritage, showcases an extensive array of traditional architectures, each characterized by unique regional attributes tied to local customs, environment, and community lifestyle [7][8]. Flores Island, located within East Nusa Tenggara Province, exemplifies this rich cultural architectural heritage. Traditional architecture in Flores is characterized by indigenous creativity, established through ancestral knowledge and maintained through generations. The communities here preserve their unique traditional settlements as expressions of collective cultural identity, societal bonds, and social governance structured around local customs and rituals.

The existence of traditional settlements in Flores responds to the fundamental human need for communal habitation. These settlements, constructed with distinctive architectural techniques and symbolic meanings, represent artistic and cultural expressions accumulated across generations. According to [9] Tradition involves continuous practices transmitted across generations with minimal alteration, symbolizing cultural persistence in the face of modernization pressures. Traditional Flores settlements, therefore, possess interconnected cultural spaces defined by specific aesthetic standards, spatial arrangements, and construction methodologies deeply rooted in customary laws and communal values.

Significantly, Flores Island hosts numerous indigenous ethnic groups with distinct architectural traditions, cultural practices, and settlement patterns. Prominent ethnic groups such as Manggarai, Riung, Ngadha, Nage-Keo, Ende, Lio, Sikka, and Lamaholot display diverse settlement characteristics reflecting their unique cultural identities and geographic contexts. Each community maintains robust adherence to ancestral customs, rituals, and spatial configurations inherent in their architectural practices. Despite modernization and socio-economic transformations, many of these traditional settlements still exhibit high resilience and cultural preservation.

A particular focus of this research is the traditional settlements of the Lio ethnic group within the Lio-Ende cultural region. These settlements, notably in areas such as Nuaone, Wologai, and Nggela, exhibit distinct geographical [10] and cultural peculiarities. The Lio settlements uniquely integrate cultural spaces, including symbolic buildings and sacred communal areas such as the Sa'o Nggua (main house), Sa'o Keda (meeting hall), Kanga (ceremonial arena), and Tubu Mbusu (stone monuments). These elements form cohesive cultural spaces reflecting the spiritual beliefs, communal rituals, and socio-cultural hierarchy of the Lio people.

Persistency, defined by [11] as the continuation of voluntary actions despite challenges or adversities, provides a crucial theoretical lens for examining the cultural preservation of architectural traditions within Lio settlements. Persistency in this context embodies the community's resilience in maintaining cultural and architectural heritage despite natural disasters, material scarcity, and societal changes. This persistence is evident in how communities continuously reconstruct and renovate traditional buildings, preserving their cultural functions and symbolic meanings even amidst physical changes or damage due to events like fires or material decay.

Previous studies on traditional architecture within the Flores region primarily focus on the structural, spatial, and symbolic meanings of traditional dwellings and settlements. These studies employed various qualitative methodologies, including ethnography, comparative analysis, and historical readings, to understand the socio-cultural and architectural attributes of traditional communities. However, there remains a significant gap in the specific investigation of cultural persistence and its architectural implications, particularly in the context of the Sa'o Nggua traditional dwelling in Lio communities.

This research aims to explore deeply the concept of cultural persistence in the architectural traditions of Sa'o Nggua within the Lio ethnic settlements, particularly focusing on the Nggela Village in Ende Regency, Flores. Specifically, this study seeks to understand the sustained symbolic and practical meanings of cultural spaces, identify factors influencing their persistence, and conceptualize the relationship between architectural forms, cultural practices, and community resilience. By addressing these research objectives, this study contributes to the broader understanding of cultural sustainability in traditional architecture and provides a valuable reference for future preservation strategies in Flores and similar contexts globally.

2. Methods

This research aims to reveal the persistence of cultural meaning in the traditional architectural spaces of Sa'o Nggua within the Lio ethnic settlements, particularly focusing on the Nggela Village, Ende Regency, Flores. To achieve this, a qualitative and naturalistic approach was employed, supported primarily by Structuralist methods.

2.1. Research Design and Paradigm

This study adopts an inductive qualitative design, guided by Structuralism theory as developed by Levi Strauss. Structuralism is utilized because it effectively reveals patterns and structures behind human cultural practices and architectural symbolism, thus enabling a comprehensive understanding of architectural and social phenomena [12]–[14].

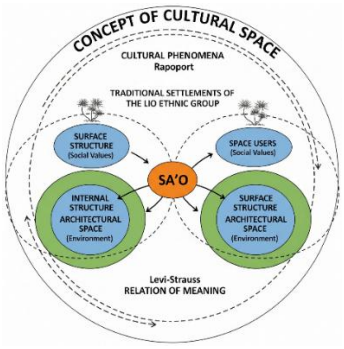

Fig 1. Theoretical Concept Diagram of the Relationship between Architectural Space and Users of Architectural Space

2.2. Research Location

The selected sites for this research include three traditional settlements within the Ende Regency:

a. Nuaone Traditional Settlement
b. Wologai Traditional Settlement
c. Nggela Traditional Settlement

These locations were selected due to their distinct cultural, architectural, and geographic characteristics, and their significant cultural persistence despite historical incidents such as fires or material decay.

2.3. Research Participants

Participants in this research consist of local inhabitants actively using cultural spaces within these traditional settlements. This group includes community leaders (Mosalaki), residents involved in traditional ceremonies, and community members with extensive knowledge about local customs and architectural practices.

2.4. Data Collection Techniques

Several data collection techniques were systematically applied to gather comprehensive qualitative data:

a. Initial Site Visits (Pre-Research)
   Initial exploratory visits were conducted to understand field conditions, cultural practices, and architectural contexts of the selected settlements. These preliminary observations informed the subsequent methodological procedures and data-gathering strategies.

b. Architectural Documentation
Two-dimensional spatial and building documentation was conducted. This involved detailed recording of physical attributes including architectural forms, structural conditions, spatial layouts, and use of materials[15]. Documentation tools included photography, architectural drawings, and mapping.
c. In-depth Interviews
Semi-structured interviews were carried out with key informants including traditional leaders, elders, and long-term residents. The interviews aimed to capture insights regarding symbolic meanings, cultural practices, rituals, and changes in traditional architectural forms.
d. Observations
Field observations were systematically conducted to identify and document cultural and social activities within architectural spaces. Observational data included the use of spaces during ceremonial and non-ceremonial events, spatial behaviors, and community interactions with architectural elements.
e. Historical and Cultural Contextualization
Historical, geographical, and socio-cultural contextual data were gathered from existing literature and secondary sources to supplement primary data. This provided additional layers of understanding regarding the cultural persistence phenomenon.

2.5. Analytical Framework and Procedures

Analysis of data in this research employed a Structuralist approach characterized by two analytical layers: paradigmatic and syntagmatic analyses.

a. Paradigmatic Analysis
Paradigmatic analysis involved identifying and categorizing architectural elements, activities, and spatial arrangements based on specific theoretical criteria. This helped in discerning commonalities and variations in spatial practices and architectural features across different settlement types [16]–[18].
b. Syntagmatic Analysis
Syntagmatic analysis focused on understanding relational and sequential aspects of cultural practices and spatial use. It examined how different architectural elements and spatial configurations interconnect to form cohesive cultural meanings and symbolic expressions.

2.6. Analysis Stages

The analytical process was structured into distinct stages:

a. Stage 1: Identification and Description
1. Detailed identification and description of architectural and cultural elements within traditional settlements.
2. Identification focused on forms, spatial organization, and cultural functions.
b. Stage 2: Structural Analysis of Architectural Spaces
Examination of internal and external architectural structures and their symbolic meanings, considering their roles within settlement patterns and rituals.
c. Stage 3: Analysis of Spatial Users
1. Analysis of user behavior through observed ceremonial (ritualistic) and non-ceremonial (daily life) activities.
2. Interpretation of how these behaviors sustain or transform the cultural meanings of traditional architectural spaces.
d. Stage 4: Integration and Interpretation
Integration of structural and behavioral findings to conceptualize persistence, identifying factors influencing the maintenance and transformation of cultural meanings within architectural spaces.

2.7. Operational Definitions

To ensure clarity, key operational definitions guiding the research included:

a. Persistence: Continuous voluntary efforts to maintain cultural practices despite adversities [11].
b. Cultural Space: Spatial units with distinct cultural, symbolic, and social meanings.
c. Traditional Architecture: Buildings whose structures, functions, aesthetics, and construction methods are inherited through generations.
d. Sa'o Nggua: Traditional houses serving as the residences of community leaders in Lio settlements.

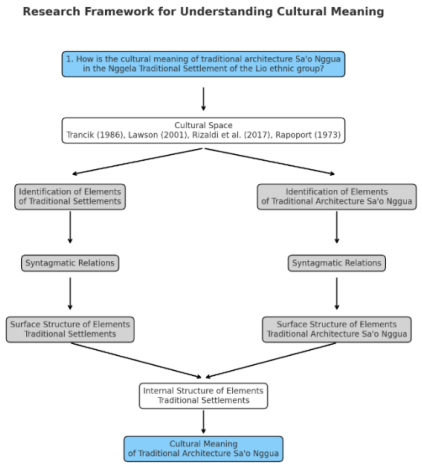

Fig 2. Research concept diagram to answer the first question

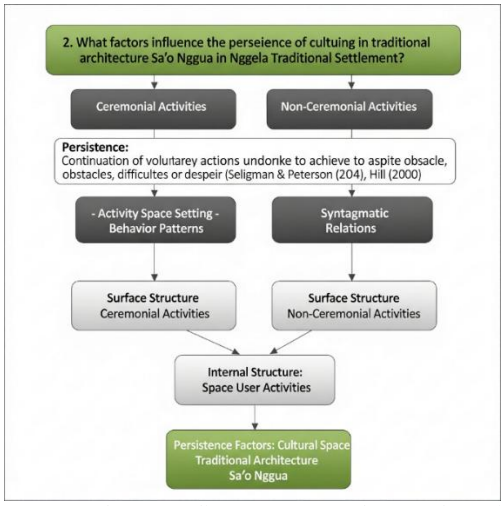

Fig 3. Research concept diagram to answer the second question

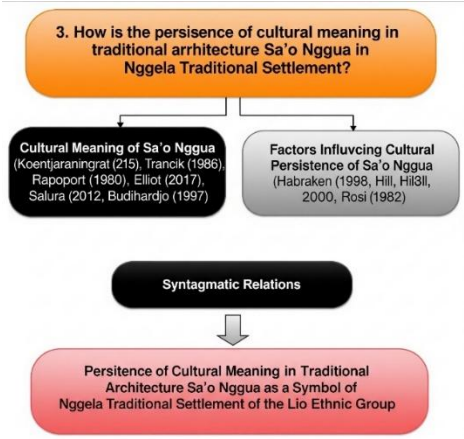

Fig 4. Research concept diagram to answer the third question

2.8. Research Flowchart

A structured flowchart outlining the research process was developed, clearly indicating phases from initial field reconnaissance through data collection, analysis, and interpretation, ensuring a transparent and systematic approach.

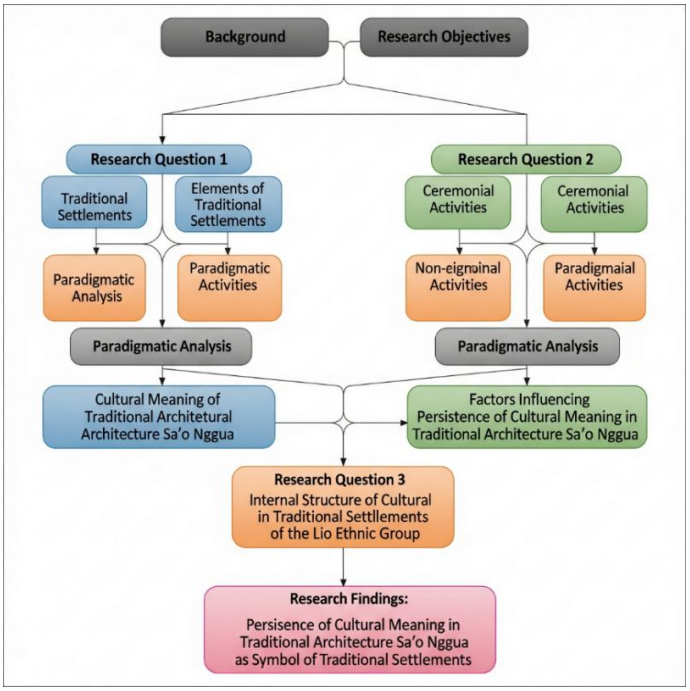

Fig 5. Research Concept Framework Diagram

3. Result and Discussion

3.1. Surface-Structure Analysis at the Settlement (Macro) Scale

Field mapping identifies three functionally distinct belts that radiate from the sacred core of Nggela, as in Figure 6.

a. Sacred Core, cluster of ritual houses (Sa'o Nggua), kanga megaliths, and the puse nua civic-religious node.
b. Conventional Settlement & Service Belt, mixed masonry/ timber dwellings, church, market, and clinic aligned to the single asphalt access road.
c. Tentative Productive Belt, a rotational patchwork of forest, gardens, swidden, and coastal strip whose function oscillates between profane and sacred according to the ritual calendar.

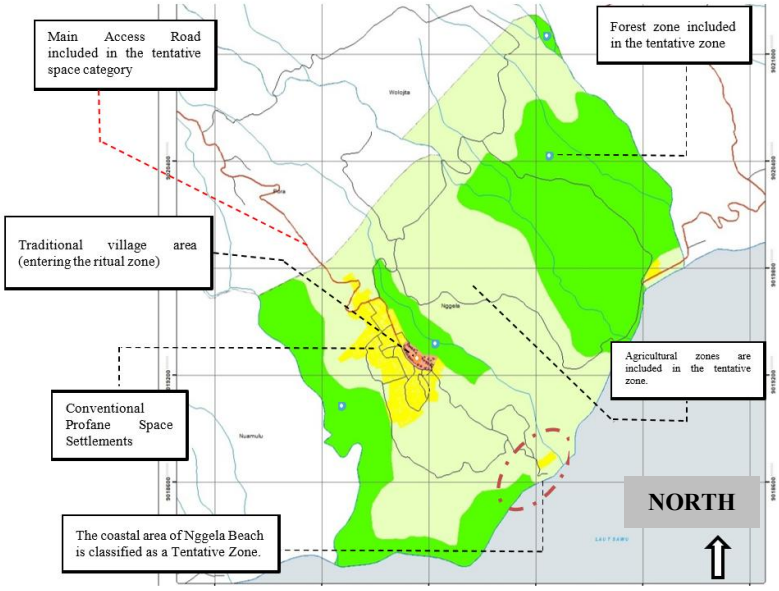

Fig 6. Sacred core of Nggela

This radial ordering confirms a **sectoral pattern** at the village scale, where elemental nodes (mountain, coast, horticultural mosaic) are linked conceptually and physically by the road network. The road, therefore, acts as both infrastructural spine and *ritual vector* guiding processions from forest to sea, as in Figure 7. The finding supports Rapoport's proposition that vernacular landscapes often materialise cosmological axes.

Fig 7. infrastructural spine and *ritual vector* guiding processions from forest to sea

3.2. Binary Zones and Functional Oppositions

Triangulating landscape observation with interview data yields three experiential zones, as in Table 1.

Table 1. Triangulating landscape observation

Zone	Constituent Elements	Role in Village Life	Transition Triggers
Mystic	Mt Kelibara, primary forest, ravines, Sawu Sea	Source of ancestral power; origin–destination of cleansing rites	Ritual seasons (Joka Ju, Loa Telo)
Profane	Conventional housing, public facilities	Everyday dwelling, trade, worship (Catholic)	None
Tentative	Sacred core, gardens, selected forest patches	Alternates between sacred & profane	Calendar of 12 annual rites

The **tentative zone**—mutable according to agricultural and cosmological time—demonstrates spatial flexibility within a rigid belief framework. Such liminality resonates with Habraken's idea of "support" allowing users to adapt within an immutable structural order.

3.3. Surface-Structure Analysis at the House-Cluster (Micro) Scale

Detailed site survey, as in Fig. 8, shows that fifteen primary Sa'o Nggua and twenty supporting houses encircle the puse nua and keda kanga in a boat-shaped (lambo) plan. This establishes a **concentric pattern** within the macro-sectoral frame. The spatial syntax concentrates ritual energy and symbolically "contains" the community: sacred > residential > fence (kopokasa) > profane.

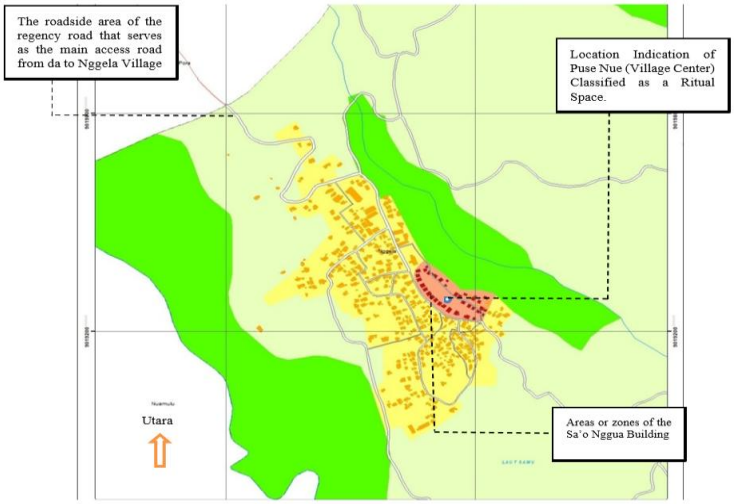

Fig 8. Orientation of the traditional village of Nggela with ritual spaces outside the traditional settlement.

Table 2 documents thirty-two binary or ternary relationships—e.g., road ↔ *Sa'o* ↔ ritual, soil ↔ construction technique, vegetation ↔ roofing. Collectively, they form a **relational mesh** in which each component (human, artefact, landscape) derives meaning from its opposite or complement. This validates the structuralist reading adopted in the methodology.

Table 2. Elements that make up a micro space

No	Element	Relationship to	Products from established relationships	Image
1	One Nua (Village area)	▪ Sa'o Nggua; ▪ Keda kanga; ▪ Puse nua; ▪ Space Users; ▪ Vegetation.	▪ The spatial space that forms a boat-shaped footprint pattern ▪ Ritual activities that connect users of the space with God Almighty	 North View

No	Element	Relationship to	Products from established relationships	Image
2	Puse Nua (Village center)	▪ Sa'o Nggua; ▪ Mosalaki; ▪ Anadarinia; ▪ Ana angga.	Mystical space and; Profane space	 Northwest view
3	Keda Kanga	• Sa'o Nggua; • Room users (Mosalaki,Anadarinia).	▪ Traditional rituals ▪ Mystical spaces and profane spaces	 Northwest view
4	Sa'o Nggua (Traditional house)	▪ Puse nua; ▪ Keda kanga; ▪ Mosalaki; ▪ Wunukoli; ▪ Anadarinia.	▪ Customary zone of the Deko Ghale region ▪ Customary zone of the Bhisu One region ▪ Customary zone of the Mbiri region ▪ Region of Ata Mangu Lau Laja Ghawa	 Northwest view
5	Rate (Grave)	▪ One nua; ▪ Puse nua; ▪ Keda kanga.	▪ Sacred artifacts and sacred zones ▪ Religious rituals.	 North view
6	Road	▪ Sa'o Nggua ▪ Keda Kanga ▪ Puse nua ▪ Primary users of traditional spaces (Mosalaki,anadari nia)	Circulation space for users of the main room and passive users.	 North view
7	Kopokasa (Traditional fence)	▪ One nua ▪ Sa'o Nggua ▪ Keda kanga ▪ Puse nua ▪ Mosalaki ▪ Anadarinia	Distinguishing between ritual and profane spaces	 North view

4. Conclusion

This study demonstrates that the Sa'o Nggua architecture of the Lio people in Nggela is more than a shelter—it embodies cultural symbolism, ritual continuity, and ecological adaptation. Spatial layouts at both macro and micro scales are governed by cosmological principles and ritual logic, reinforcing the sacred–profane duality. Despite environmental and modernization pressures, architectural forms and ritual cycles persist due to strong social norms, ecological resource availability, and community obligations. The ritual calendar supports agricultural sustainability and structural maintenance, fostering what Hill terms "will-based persistence." However, the

study has several limitations, including the absence of spatial quantification[19], a lack of gendered labor data[20], and reliance on a single-year observation. Future research should include high-resolution spatial mapping, gendered time-use analysis, and multi-year ethnographic studies. Comparative analysis across other settlements, assessments of tourism's cultural impacts, and modeling traditional systems for climate-resilient architecture are essential to deepen our understanding of architectural persistence and adaptive cultural resilience.

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