

Sustainable Preservation of Vernacular Architecture for Enhancing Urban Cultural Welfare in Vietnamese Ethnic Minority Communities

Nhu Thi Nguyen

VNU University of Social Sciences and Humanities, Hanoi, Vietnam

Nga Thi Khuat

Thuongmai University, Hanoi, Vietnam

The architectural heritage of Vietnam's ethnic minorities, particularly exemplified by the Hmong people, embodies centuries-old cultural values and traditions intricately adapted to their natural and social environments. This heritage, however, faces significant challenges from globalization, urbanization, and the rapid pace of modernization, which threaten the sustainability of traditional architectural practices and the cultural identity they support. This study explores the current state of traditional architectural practices among Vietnam's ethnic minorities, assesses the impacts of modernization, and identifies sustainable preservation strategies. By integrating modern needs with traditional values, this research aims to enhance urban social and cultural welfare by preserving the architectural heritage crucial for cultural diversity and socio-economic development. Through a mixed-methods approach involving qualitative data from interviews and focus groups, and quantitative data from field observations, this study provides a comprehensive understanding of these issues. The findings underscore the necessity of elevating awareness, enhancing state management, and integrating modern needs with traditional values for the sustainable preservation of ethnic architectural heritage.

Keywords: Cultural preservation, Ethnic minority, Sustainable development, Urban Cultural Welfare, Vernacular architecture, Vietnam.

Vietnam's ethnic minorities possess a rich architectural heritage, prominently represented by groups such as the Hmong, Thai, Muong, and Ede people. This heritage, shaped through centuries of ecological and societal adaptations, reflects a harmonious blend of cultural values and traditions. From earth-walled residences in highland terrains to communal structures fostering social and cultural exchanges, these architectural forms serve not only as physical shelters but also as enduring symbols of ethnic and cultural identity (Nguyen & Nguyen, 2024; Phung et al., 2024).

However, these distinctive architectural traditions face growing threats amid the forces of globalization, urbanization, and shifting socio-economic landscapes. Similar challenges are observed globally, where modernization often introduces new building materials and techniques that jeopardize traditional practices. These dynamics are compounded by the diminishing connection between younger generations and their cultural roots, risking the sustainability of this architectural legacy (Almansuri & Alkinani, 2023; Nguyen, 2023; Thi Quyet Nguyen et al., 2023; Pham & Truong, 2017; Shah et al., 2023).

The XIII Congress of the Communist Party of Vietnam underscored the critical importance of "protecting and promoting the good, sustainable values in the Vietnamese cultural tradition" (Communist Party of Vietnam, 2021). Within this framework, preserving the architectural and cultural values of ethnic minorities is identified as a fundamental task. This preservation not only safeguards cultural heritage for future generations but also unlocks its potential as a resource to enrich the material and spiritual lives of ethnic communities. Moreover, such efforts play a pivotal role in fostering socio-economic growth, reducing regional income disparities, and aligning with state strategies for developing ethnic minority areas (Nguyen & Nguyen, 2024).

Contemporary transformations have led to physical changes in ethnic minority living spaces, with the commodification of traditional homes for tourism and the shift to modern housing solutions contributing to a gradual dilution of intangible cultural values. These trends weaken the cultural identity and sustainable living practices embedded in vernacular architecture (Thi & Nguyen, 2021). For example, among the K'Ho ethnic group, urbanization and economic diversification have disrupted traditional practices and architectural forms, posing challenges to their cultural continuity (Nguyen & Nguyen, 2024).

Global parallels can be drawn, as highlighted by studies on green finance and sustainable development in Sub-Saharan Africa. Similar principles apply to Vietnam, where sustainable practices in agriculture and architecture can mitigate the cultural and environmental impacts of modernization (Edet et al., 2024). The need to balance traditional architectural values with contemporary development demands underscores the urgency of integrating these values into modern housing solutions to ensure cultural preservation and sustainable living practices.

Against this backdrop, the aims and objectives of this study are to investigate the current state of traditional architectural practices among Vietnam's ethnic minorities, with a focus on the Hmong people, to identify factors contributing to the decline of these cultural assets. The study also assesses the impact of modernization, globalization, and urbanization on preserving traditional architectural forms and cultural values. Additionally, it explores sustainable approaches and strategies for preserving and promoting the architectural heritage of ethnic minorities within contemporary socio-economic development. Finally, the study advocates for integrating traditional architectural values into modern housing solutions to ensure the continuity and revitalization of ethnic minorities' cultural heritage.

This inquiry aims to navigate the complex interplay between tradition and modernity, striving to protect and rejuvenate Vietnam's ethnic minorities' architectural and cultural legacies for future generations.

Literature Review

This analytical review explores the evolving discourse on the interplay between Vietnam's ethnic groups' architectural traditions and environmental sustainability, spotlighting the adaptive strategies of the Hmong, Muong, Thai, and Ede communities. The synthesis of research across these ethnic groups uncovers a multifaceted narrative on balancing cultural heritage with modernization's exigencies and environmental resilience.

Vernacular architecture and environmental sustainability. Do's (2021) exploration of the Hmong's earth-wall (*trình tường*) houses exemplifies how traditional construction methods, utilizing stone and earth, embody cultural values and offer climatic resilience, highlighting a symbiotic relationship between architecture and environment. This architectural response to environmental challenges contrasts markedly with Giang's (2018) findings, where the shift from traditional fokienia wood to modern materials among the Hmong in Dien Bien reflects a nuanced adaptation to deforestation, showcasing the environmental pressures reshaping architectural choices (Nguyen & Nguyen, 2024).

Similarly, Nguyen et al., (2011) emphasize the energy efficiency and environmental adaptability of vernacular designs, aligning them with sustainability imperatives. Subsequent research by Nguyen et al., (2022) and Na et al., (2024; 2022) extend this dialogue, focusing on thermal comfort and the use of local materials in ethnic minority housing, further cementing vernacular architecture's relevance in addressing climate challenges (Ed.daran & Malik, 2024; Nguyen & Nguyen, 2024).

Cultural preservation and modernization. The architectural traditions of the Black Thai and Hmong communities, as observed by Xuan Lam (2019) and Hoang (2024), underscore the cultural depth inherent in these practices. Despite modernization pressures, these groups exhibit a steadfast commitment to preserving their architectural heritage, as it is integral to their cultural identity. Nguyen and Nguyen (2024) discuss similar trends among the K'Ho, where traditional practices are being repurposed to align with tourism and urban development without fully abandoning their heritage. Doan Duc (2023) further explores how the Hmong, Muong, and Thai communities in Ha Giang successfully integrate traditional elements into contemporary designs, achieving a balance between modern functionality and cultural preservation. This harmonization highlights the potential for architectural adaptation strategies that respect heritage while accommodating modern needs.

Architectural diversity and cultural identity. The comparative analysis by Hoang and Nguyen (2023) of Black Thai and White Thai houses showcases Vietnam's ethnic diversity, emphasizing architecture as a central element of cultural identification. Such studies reveal the rich tapestry of Vietnam's ethnic architecture, offering

insights into how these communities preserve their identities through distinct spatial and structural designs (Nguyen & Nguyen, 2024).

Global context and sustainability. Expanding the lens beyond Vietnam, Nguyen et al., (2019), Ly et al. (2010), T. Q. Nguyen et al., (2023), Luu and Dinh (2015), and Le and Cao (2024) explore the sustainable attributes of vernacular architecture globally, advocating for its integration into eco-friendly design practices. These studies align with the global push for sustainable development, illustrating vernacular architecture's utility in cultural preservation and climate adaptation (Ed.daran & Malik, 2024).

Cultural transformation and policy implications. Nguyen and Nguyen (2024) illustrate the pressures of modernization on Vietnam's K'Ho ethnic minority. Traditional practices, such as the New Rice Celebration, are eroded by urbanization and economic shifts. Government interventions have proven to be both supportive and adaptive, advocating education and sustainable tourism as strategies to maintain cultural integrity (Nguyen & Nguyen, 2024). Similarly, Ed.daran and Malik (2024) emphasize the role of international frameworks like UNESCO in safeguarding cultural heritage, underscoring the need for robust legal mechanisms to protect such assets globally .

The evolving discourse around vernacular architecture in Vietnam reflects a convergence of cultural, environmental, and economic factors. While significant progress has been made in understanding the interplay between tradition and modernity, gaps remain in quantifying the environmental benefits of these practices and scaling them for broader adoption. Further research could explore integrating traditional architectural principles with advanced sustainability technologies to address both local and global challenges.

This review consolidates the body of knowledge on Vietnam's vernacular architecture, emphasizing its dual role in cultural preservation and environmental sustainability. By bridging traditional practices with contemporary needs, vernacular architecture emerges as a critical medium for fostering resilient, identity-affirming, and sustainable built environments. Future research must deepen this integration, leveraging vernacular traditions to inform global sustainable design practices.

Method

This study employs a mixed-methods approach, integrating both qualitative and quantitative research techniques to investigate the preservation and promotion of cultural values in the architecture of ethnic minority housing in Vietnam, with a particular focus on the Hmong people. The methodology is designed to provide a comprehensive understanding of the current state of traditional architectural practices among Vietnam's ethnic minorities and to identify sustainable strategies for preserving these cultural assets amidst modernization and socio-economic development pressures.

Data Collection: Qualitative Data

Semi-structured interviews were conducted with community leaders, architects specializing in traditional Vietnamese architecture, government officials, and members of the ethnic communities, especially the Hmong, Muong, Thai, and Ede communities. These interviews aim to gather insights into the challenges and opportunities in preserving ethnic architectural heritage.

Focus Groups were organized with residents from ethnic minority villages to discuss the impact of modernization on traditional housing and explore community attitudes toward the preservation of architectural heritage.

Field Observations were carried out in selected ethnic minority villages in Ha Giang and other regions known for their distinct architectural traditions. The observations focused on construction techniques, materials used, and the condition of traditional houses to assess the degradation and modifications made over time.

Sample

The study focuses on a sample population from the Hmong, Muong, Thai and Ede communities, selected based on their geographical diversity and the distinctiveness of their architectural heritage. Villages known for their commitment to maintaining traditional architectural practices are prioritized. The selection process involves consultations with local cultural departments to ensure a representative sample encompassing a range of preservation states – from well-preserved to significantly modernized communities.

Data Analysis

Qualitative data from interviews and focus groups are transcribed and analyzed thematically to identify common themes related to the challenges of preservation, community engagement, and the impact of external pressures.

Ethical Considerations

All participants are provided with informed consent forms detailing the study's purpose, their voluntary participation, anonymity, and the right to withdraw at any time. The research methodology adheres to ethical standards prescribed by the Vietnam Academy of Social Sciences, ensuring that the study respects participants' cultural sensitivities and privacy.

Results and Discussion

Diverse Architectural Vernacular Heritage of Vietnam's Ethnic Minorities: Traditions, Challenges, and Preservation

Ethnic minorities, in conquering nature and exploring life, have continuously created typical, distinctive cultural values that reflect their unique psychology, lifestyle, and character to survive and adapt to their living environment. The culture and architecture of Vietnam's ethnic minorities' housing (Fig. 1) are integral parts of the national cultural identity, encompassing material cultural values that include motifs, patterns, layouts, and arrangements in accordance with each ethnic group's customs, traditions, and practices.

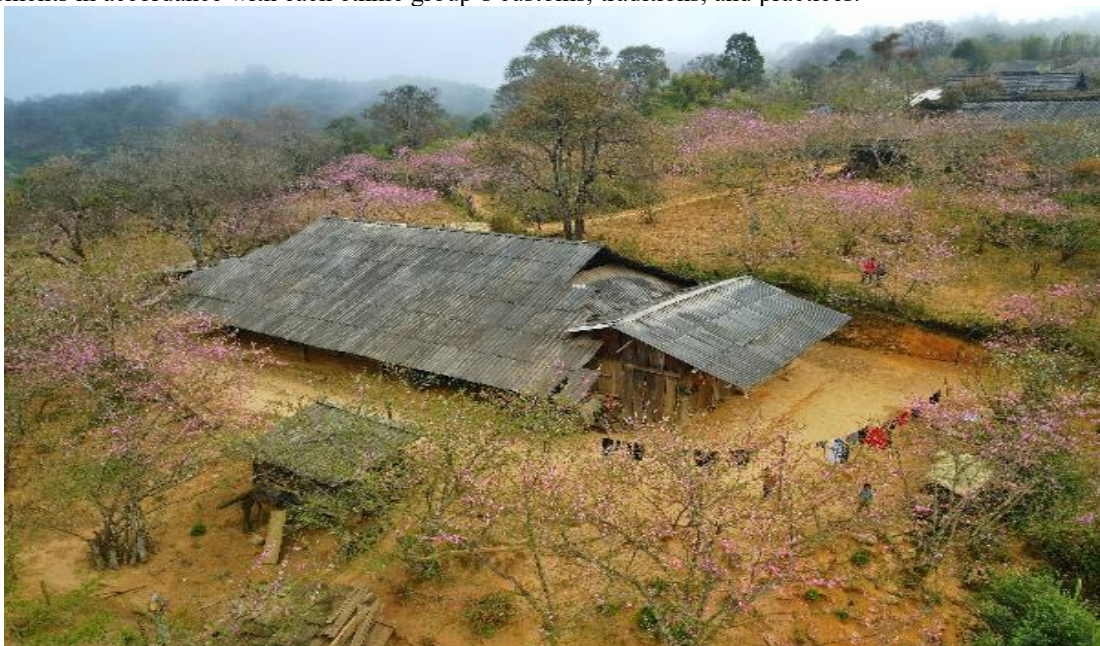


Fig. 1: A springtime dwelling in Cao Bang province

Source: authors

The culture and architecture of the housing of ethnic minorities also contain spiritual culture, expressing the desires and aspirations for a prosperous, sufficient life of each ethnic group in a developing, changing society today. Discussing the culture and architecture of the housing of ethnic minorities refers to the methods and ways of choosing terrain and house orientation for each ethnic group, creating unique, distinctive features to differentiate the housing of one ethnic group from another. Each ethnic group, in the course of their life, chooses an appropriate area and terrain for labor and production, preserving and enhancing the cultural values of their housing. The cultural and architectural value of the housing of ethnic minorities is an important constant that cannot be mixed with any other ethnic group. The cultural architecture of the housing of ethnic minorities, though not as elaborate or ornate as that of the Kinh people, still exudes national characteristics, deep traditional values, and subtlety in every line and pattern. Preserving and enhancing the cultural and architectural values of the housing of Vietnam's ethnic minorities today is an overall method and measure of the party committees, local government at all levels, and the active, proactive nature of the ethnic minorities in transmitting and implementing programs, projects for the conservation of the culture of ethnic minorities to promote socio-economic development, improve the quality of life of ethnic minorities, aiming for a wealthy people, a strong country, democracy, equity, and civilization. Accordingly, the content of preserving and

enhancing the cultural and architectural values of the housing of Vietnam's ethnic minorities today needs to focus on Preserving and enhancing the house design suitable for the soil and climatic conditions of each area, living region, convenient for exchange and trade activities. Preserving and enhancing the way of arranging household items of each ethnic group. Preserving and enhancing the use of materials in constructing traditional houses of ethnic minorities.

The Hmong ethnic group

When examining the cultural fabric of Vietnam's ethnic minorities, the architectural practices of the Hmong people stand out as a pivotal element. The architecture of Hmong traditional houses serves as a physical shelter and a manifestation of their cultural identity. In Hmong villages, a noticeable consistency in architectural design underscores a collective adherence to a specific blueprint. Characterized by their single-story construction and modestly pitched roofs, Hmong dwellings reflect a harmonious blend of functionality and tradition. Despite variations in size, these structures universally incorporate a tripartite layout complemented by dual entrances and a minimum of two windows, maintaining a connection to their cultural heritage.

The spatial organization within Hmong houses is meticulously planned. The division into three main compartments facilitates distinct domestic functions: the left for culinary activities and the couple's private quarters, the right dedicated to warmth and hospitality, and the central space reserved for ancestral veneration and communal gatherings. The bedrooms for the couple and children are arranged separately. The Hmong typically sleep on wooden platforms or bamboo mats. This layout not only delineates the physical spaces but also embodies the social and spiritual values of the Hmong community.

Moreover, selecting a housing site among the Hmong is imbued with cultural significance, emphasizing the interplay between auspiciousness and environmental harmony. The construction process, particularly wall erection, is governed by cultural norms restricting access to the construction site, underscoring house-building's communal and sacral aspects. Erecting the walls is a meticulous process among the Hmong people, with regulations such as strangers, especially women, not being allowed into the area where the walls are being erected. To erect the walls, the people use wooden molds that are 1.5 meters long and 0.45 to 0.5 meters wide. They fill the molds with soil during wall construction and compact it firmly. The soil must be free of tree roots, large stones, and weeds. Several strong young men from the village are mobilized to help with the process, continuing from one mold to the next until completion. After erecting the walls, the homeowner selects an auspicious day, by the owner's age, to go into the forest to cut down trees for the main pillars and the roof ridge. Utilizing wooden molds for wall construction, the community engages in a collective effort, showcasing the communal spirit and technical ingenuity in utilizing natural materials to create durable and comfortable living spaces.



Fig. 2: A Hmong ancient house in Thien Huong village in Dong Van, Ha Giang

Source: Doan Duc, 2023

The defensive stone fences encircling Hmong homes not only provide protection but also symbolize the robustness and resilience of the Hmong cultural identity (Fig. 2). To have a complete stone fence surrounding the house and land of about 200 to 300 square meters, the homeowner and relatives spend months gathering broken stones around the house to build the fence. Stones of different sizes and shapes are tightly fitted together to form a

solid and smooth wall without the need for any adhesive material. The meticulous assembly of stone fences and the symbolic wooden gate adorned with red paper represent a fusion of aesthetic considerations with practicality, creating a welcoming yet fortified domestic environment.

This analytical exploration into Hmong housing architecture reveals a complex tapestry of cultural expression, environmental adaptation, and communal solidarity. The architectural principles underlying Hmong dwellings serve as a testament to their rich cultural heritage, reflecting broader themes of identity, belonging, and sustainability within Vietnam's ethnic minority communities.

The Muong ethnic group

The Muong ethnic group's architectural practices, particularly their stilt houses, reflect their harmonious integration with nature and the symbolic dimensions embedded in their living spaces. Constructed from an array of natural materials, including wood, bamboo, rattan, and thatch, these structures are emblematic of the Muong's resourcefulness and deep-rooted connection to their environment. The distinct turtle shell-shaped roofs are not merely functional in design but also carry cultural significance, echoing the group's reverence for nature.

Pillars, whether round or square, with diameters ranging from 16 to 25 cm and elevated approximately 2.5 meters above ground, serve a dual purpose (Fig. 3). Beyond safeguarding the dwelling from wildlife and facilitating ventilation, these pillars elevate the house to a realm that transcends the mundane, offering a physical and symbolic threshold that separates the human habitat from the untamed nature below.



Fig. 3: A 100-year-old stilt house in Lap Thang village, Thach Lap commune, Thanh Hoa province
Source: Quynh Tram, 2021

In a vivid depiction of cultural expression, the gable ends of these houses feature carved wooden panels illustrating five-pointed stars and the sun. This iconography is a testament to the Muong people's aspirations for divine protection and prosperity, embodying a celestial guardianship that oversees the household. Such adornments do more than decorate; they embed the living space within a cosmological framework, reinforcing the cultural lineage and the communal ethos that venerates celestial bodies.

The stilt house's spatial organization, governed by the principle of odd numbers in the arrangement of rooms and staircases, signifies a cultural affinity for growth and prosperity. This numerological consideration extends to the architectural layout, where the altar's placement at the periphery of the domicile not only designates a sacred space but also delineates the hierarchical sleeping arrangements across generations, from the elders to the youngest members.

Using wood or bamboo crafted into plank-like formations, floor construction further illustrates Muong's adeptness at creating durable and comfortable living spaces from available resources. The singular staircase, adhering to the cultural preference for odd numbers, accentuates the household's unity, leading from the communal space beneath the stilt house to the private quarters above.

Underneath the stilt house, a multifunctional area serves as a repository for firewood, a storage space for corn and rice, and a shelter for agricultural tools, encapsulating the agrarian lifestyle of the Muong people. The kitchen, an essential household domain, is integrated into this architectural ensemble by adding a secondary stilt structure, facilitating a seamless connection between culinary practices and the broader living space.

The Thai ethnic group

Unlike the stilt houses of the Muong people, the architectural embodiment of the Thai ethnic group's tradition presents a vivid narrative of environmental symbiosis and cultural perpetuity, distinctively illustrated through their stilt houses. Constructed predominantly from eco-friendly materials like wood, bamboo, rattan, palm, reed, thatch, and nipa, these structures showcase a deep-rooted connection to nature. The meticulous preparation of wood, a cornerstone of the stilt house's structural integrity, highlights the community's commitment to sustainability and durability. The selection of high-quality, termite-resistant timber for critical architectural elements such as pillars, rafters, beams, and joists underscores the intricate blend of craftsmanship and environmental stewardship. The wood for the pillars is usually large trees, cut down in the winter to avoid termites. This communal labor, underscored by Man On and Sung Dinh (2023), not only fortifies the structural foundation of these homes but also reinforces social cohesion within the village community.

The Thai stilt house, emerging from a millennia-long tradition, encapsulates a comprehensive lifestyle philosophy of "Eating sticky rice. Drinking tube wine. Wearing traditional clothes. Living in stilt houses." This ethos, deeply ingrained in the Thai identity, portrays the stilt house as a dwelling and cultural hallmark. Its architecture, a harmonious integration of function and aesthetics adapted to the mountainous terrain, symbolizes the Thai people's resilience and cultural pride.

The architectural layout, requiring three to five compartments and extensions, with adherence to odd numbers for windows, doors, and staircases, reflects a cosmological significance attached to numbers. Two staircases at either end of the house also have an odd number of steps, 9 or 11, where the "*tang chan*" (right staircase) is for women, and the "*tang quan*" (left staircase) is for men. The division of the house into three distinct levels serves practical purposes while encapsulating the Thai's cosmological views, with each level representing different aspects of domestic life and spiritual beliefs (Fig. 4-5). The house is divided into three floors: the first floor is the underfloor (*lang*) used for storing firewood and agricultural tools; the second floor is the living floor (*han huon*) for family activities; and the third floor is the attic (*khu huon*) for storing valuable items. Hence, the Thai ethnic people have the saying, "A house with an attic, a floor with pillars."



Fig. 4-5: A typical Thai ethnic group house

There are two floor plan types for the traditional Thai stilt house: one with an integrated kitchen inside the house and another with a separate kitchen connected to the main house at the end (the main house still has a kitchen, but it's mainly used to keep warm in winter). The main house typically has a floor plan of 3 compartments, three compartments – 2 extensions, or four compartments. Each compartment ranges from 2.7 to 3.2 meters wide. However, there are also houses with larger compartment sizes, over 3.5 meters. The Thai stilt house has only one main staircase located at the end, leading up to a small porch in front of the house. If the house has a separate kitchen, then only one common staircase is used, and from the porch, there is a path down to the kitchen or into the main house. There is usually a water jar on the porch for washing feet before entering the house.

A main house typically has six rows of pillars (rarely, some smaller houses have only four rows of pillars). To expand the interior space, homeowners sometimes employ the technique of hiding pillars. The staircase leading up to the house is made of wood, usually with 7 or 9 steps. The floor of the house is typically raised from 1.8 to 2.2 meters above the ground. The traditional house's floor was initially just compacted earth. However, many houses

have cement or concrete floors, which are convenient for living, storing farming tools, or other family assets. The compartments and extensions are divided into separate functional areas on the house floor. For the Thai people, the ancestral altar is usually placed in the innermost compartment, facing the same direction as the house's main beam and facing the door. It is rare for some families to place the altar parallel to the house's width. The house floor is usually divided into two levels. The area between the central and porch pillars is a step higher than the rest of the house by about 7 to 10cm (called "*dang*"). The upper "*dang*" is usually reserved for guests in front of the house. The lower "*dang*" is behind the house, where kitchen items and agricultural products are kept. Bedrooms and other sleeping areas are also typically arranged within the boundaries of these "*dang*" and on both sides of the house extensions.

In this constructed landscape, the Thai stilt house stands as a testament to architectural ingenuity. The elevated floor safeguards against dampness and wildlife. The robust construction endures the harsh mountainous climate, preserving these structures across generations. As described, the sustainable use of natural materials speaks to a legacy of environmental harmony and community collaboration, with each house forming a nucleus around which communal and familial life orbits.

The traditional Thai stilt house is positioned within a carefully curated natural tableau, surrounded by vegetable gardens, fruit trees, or fish ponds and enclosed by eco-friendly bamboo and rattan fences. This proximity to water sources and the utilization of natural defensive measures like stone embankments further exemplify the Thai's adeptness in crafting a living environment that is both protective and porous to the natural world.

The spatial organization within the stilt house, including the decision to integrate or separate the kitchen space, illustrates a nuanced understanding of domestic functionality and social interaction. The singular staircase leading to a communal porch underscores the importance of communal space in Thai architecture, facilitating social interaction and a transition from the external environment to the interior sanctum.

Ede Ethnic Group

In the verdant tapestry of Vietnam's Central Highlands, the architectural landscape is punctuated by the iconic Rong house, serving as a linchpin of communal life and a beacon of unity for the ethnic groups that inhabit this region. This structure starkly contrasts with the communal houses of the Kinh people in the Northern Delta, which embody a different constellation of cultural values and social organization. Through the analytical lens of Hoang and Nguyen (2023), a detailed examination unfolds, revealing how architectural forms are intrinsically linked to the cultural identity and communal ethos of their creators.

At the heart of village dynamics in the Central Highlands, the Rong house emerges as the quintessential communal space strategically positioned to enhance communal cohesion. Hoang and Nguyen (2023) explore its architectural nuances, emphasizing its construction from natural materials and its signature curved roof, which stand as testaments to the environmental harmony and traditional craftsmanship of the Central Highlands' ethnic communities. The absence of metal in its construction and reliance on sophisticated joinery underscores a remarkable ingenuity, showcasing a rich heritage of architectural creativity deeply entwined with the region's cultural fabric. The architectural



Fig. 6: The Rong house

Source: Nguyen, Thuc Hao, 2023

choice in the Rong communal houses is a profound expression of their respective environmental contexts and social realities. The Rong house (Fig. 6), usually about 10 meters long, 4 – 6 meters wide, and 15 – 16 meters tall, with its thatched roof derived from the forest's bounty, is a harmonious adaptation to the ecological resources of the Central Highlands.

The house is often built on a spacious plot of land facing North-South, cool in the dry season, warm in the rainy season, and avoiding the harsh sunlight from the West. The floor is made of wooden planks or bamboo slats, with fireplaces at both ends for warmth during winter days and for festival ceremonies. Both sides are woven with bamboo, rattan, or bamboo slats, creating a unique and eye-catching pattern. The main door is located in the middle of one wall, with a secondary door to the right of the main door. The staircase, carved from large trees, usually has 7 or 9 steps. Additionally, the Central Highlands people decorate with buffalo horns and carve intricate eight-pointed stars, simple geometric shapes, birds, and human figures on the central pillar with exquisite detail. The structure of the Rong house in the Central Highlands involves pillars connected in a post-and-lintel system, supporting the entire floor and roof with a base consisting of 10 to 14 lifting pillars, including eight main pillars and 2 to 6 auxiliary house pillars where the staircase is located.

Another unique aspect of the Rong house structure in the Central Highlands is the two roofs forming a narrow-angle at the top but creating two elliptical curves missing about 1/8 of the circle at the bottom. This design rationale suggests that when the wind blows into the roof, it creates a pathway similar to blowing across a bottle, significantly reducing the wind load on the roof. However, if the width of the Rong house is increased further, the elliptical gap between the two roofs narrows, meaning the wind load on the roof increases. These architectural features not only address practical concerns, such as reducing wind load, but also carry symbolic meanings, representing sacred spaces and the soul of the community.

The role of these structures in fostering community solidarity is paramount. The Rong house, as a communal nucleus, facilitates gatherings and ceremonies, cementing social bonds and collective identity. These spaces are not merely physical entities but vessels of communal memory and identity, embodying the spirit of unity and collective life.

Diverging from the communal living arrangements prevalent among other ethnic groups, the Ede people's unique architectural expression is manifested in their elongated houses, accommodating multiple (20 – 30) clan families under one roof. Their house is very long; for every newly formed family, one additional room will be added to the main house (in one direction), and it will continue to stretch out, possibly up to 30 rooms. This distinctive form of architecture, as noted by Hoang and Nguyen (2023), symbolizes not only the Ede people's communal living practices but also their adaptive architectural strategies, adding room for each new family unit and thus extending the house linearly. This practice illustrates a unique approach to community living and architectural expansion, reinforcing the centrality of family and clan within the Ede cultural paradigm.

The Rong house, therefore, is not merely an architectural artifact but a complex symbol of sacred space, community strength, and the enduring spirit of the Central Highlands villages. Positioned at the village's heart, it encapsulates the soul of its people, reflecting a deep connection to history, culture, and the natural environment. Through the detailed structural and decorative elements of the Rong house, the Central Highlands communities articulate their identity, values, and aspirations, crafting a living testament to their rich cultural heritage and collective spirit.

Contemporary Efforts in Preserving Architectural Cultural Values Among Vietnam's Ethnic Minorities

In recent years, under the management of the State and the determined involvement of the political system at all levels, significant achievements have been made in preserving and promoting the cultural values of the architecture of houses of ethnic minorities. The Communist Party of Vietnam has noted, "Many tangible and intangible cultural heritages have been preserved and restored. Many customs and practices of ethnic minorities have been researched, collected, and revived. Activities related to beliefs, religions, and cultural and spiritual life of the people have received attention" (Vietnam Communist Party, 2014). The political system at all levels, especially cultural officers, has thoroughly implemented and performed well in propaganda and education to enhance awareness and responsibility for preserving and promoting the culture of the architecture of houses of ethnic minorities. There is a continuous renewal in the content, form, and measures to preserve and promote the architectural culture, such as investing funds and supporting households that wish to maintain their traditional houses. Ethnic minorities actively and proactively preserve and promote the values of their traditional houses, using them carefully in all conditions and circumstances. They regularly restore and repair deteriorating or damaged parts, coordinating with skilled forces and architects in designing and preserving essential parts of the house.

The cultural values in the architecture of houses of ethnic minorities are always preserved and promoted at all times and places. The richness and diversity of the architectural culture of ethnic minorities have contributed to

making Vietnamese culture more vibrant and vital, serving as an essential resource for the country's socio-economic development.

In the current period, facing the trend of opening up and extensive international integration and the downsides of the market economy, many traditional houses of ethnic minorities no longer retain their original purity and simplicity, blending and resembling the houses of the Kinh people. Household items are purchased and invested more lavishly and modernly, especially the materials of traditional houses of ethnic minorities, which are made from readily available construction materials in the market, even concrete, no longer using precious woods or bamboo for flooring. A portion of the houses of ethnic minorities is severely degraded due to economic difficulties, lacking the funds for upgrades, repairs, or new construction. This also somewhat affects the preservation and promotion of the cultural values of the architecture of houses of ethnic minorities in Vietnam today. The requirements and tasks of Vietnam's current socio-economic development are very high, especially in resolving the harmonious relationship between economic development and ensuring social equity and progress, stable and sustainable development in various sectors and fields; along with this, many traditional cultural values, including the architectural culture of houses of ethnic minorities, are facing the risk of being diminished, forgotten, and adulterated. Resolution number 33-NQ/TW has affirmed, "The effectiveness of preserving and promoting the value of cultural heritage is not high, and the risk of diminishment has not been prevented" (Vietnam Communist Party, 2014). Therefore, preserving and promoting the cultural values of the architecture of houses of ethnic minorities is an objective necessity, posing challenges for all entities, forces, and ethnic minorities to continuously apply flexibly and creatively the Party's policies and directions on culture to local realities.

The cultural value of the architecture of a house is not only a communal living space or gathering place but also a living museum of the material and spiritual culture of ethnic minorities. However, over time, the cultural value of residential architecture has been fading, influenced by globalization, expanding foreign relations, international cooperation, and the increasing needs of ethnic minorities. Many houses are at risk of becoming commercialized, no longer retaining their traditional uniqueness in every detail and pattern. A segment of ethnic minorities has not fully realized the importance of preserving and promoting the cultural architecture of housing, which is still simplistic in thought and practice. As a result, many houses have been demolished and replaced with neat, clean, modern houses made with new advanced technology materials. There are also houses that have been built a long time ago and passed down through generations, but due to the difficult life, lack of resources, and economic constraints to redesign or repair some degraded items of ethnic minorities. Additionally, in the political system at all levels, especially at the grassroots political system, officials in charge of culture have not done well in propaganda and education among ethnic minorities; there are signs of reluctance, not being detailed and specific in grasping the situation of housing architecture of ethnic minorities. From there, advise and propose to higher levels according to the characteristics, situation, requirements, and tasks in each area.

The role and responsibility of organizations and forces in mobilizing resources to support and help ethnic minorities preserve and promote the cultural value of housing architecture has not been well played out. The grassroots political system has not been actively involved or decisive, lacking innovative thinking and approaches suitable for the characteristics, psychology, and traditional customs of ethnic minorities. The effectiveness of implementing some programs and projects of higher levels on preserving and promoting the cultural identity of ethnic minorities has not been good. There are still many poor households, and the life of a part of the population, especially in remote, distant, and secluded areas, is difficult. The traditional houses of Hmong, Thai, Muong, and Central Highlands people have been commercialized and serviced, not truly becoming a cultural value for generations to learn and remember. Some houses are too modernly decorated, not fitting the cultural space of ethnic minorities. Tourists have not found traditional cultural values in the houses of ethnic minorities; instead, they focus mainly on business and economic activities. The preservation and promotion of cultural heritage values have not been highly effective, and the risk of disappearance has not been prevented. The mass media system develops without scientific planning, wasting resources, and management not keeping up with development. Some media agencies show signs of commercialization, deviating from their principles and purposes. The mechanism and policies on economy in culture, culture in economy, and mobilizing and managing resources for culture are not specific or clear. The system of cultural institutions and the physical and technical infrastructure for cultural activities are still lacking and weak; some places are degraded, lack synchrony, and have low usage efficiency. This reality has, is, and will pose many problems for the preservation and promotion of the cultural identity of ethnic minorities in general and the cultural architecture of housing, in particular among ethnic minorities in Vietnam today.

Challenges and Strategies for Conservation and Preservation of Vernacular Architecture

The conservation and preservation of vernacular architecture in Vietnam's ethnic minority communities face numerous challenges amid rapid urbanization and modernization. These challenges threaten the sustainability of traditional architectural practices and the cultural identity they support.

Rapid urbanization is one of the primary challenges. The swift pace of urban development often prioritizes modern infrastructure over traditional architecture. This results in the displacement of historic structures to make way for new developments, leading to the erosion of cultural landscapes and the loss of intangible cultural heritage (Thi & Nguyen, 2021). Modernization pressures further exacerbate this issue. The allure of modern building materials and techniques poses a significant threat to traditional practices. Younger generations, influenced by contemporary architectural trends, may perceive traditional methods as outdated, leading to a decline in the use of traditional construction techniques and materials (Pham & Truong, 2017). Additionally, economic constraints severely hinder preservation efforts. Many ethnic minority communities, already facing economic hardships, struggle to allocate funds for the maintenance and restoration of traditional structures. This financial pressure results in the deterioration and eventual abandonment of heritage buildings (Hoang & Nguyen, 2023).

Addressing these challenges requires a multifaceted approach. Enhancing policy and governance is crucial. Government support is essential for the preservation of vernacular architecture. Developing and implementing robust policies that prioritize heritage conservation can provide a protective framework. Incentives for maintaining and restoring traditional structures, such as grants and tax benefits, can encourage community participation in preservation efforts (Communist Party of Vietnam, 2021).

Increasing public awareness about the value of vernacular architecture is also vital. Educational programs that highlight the cultural and historical significance of traditional buildings can foster a sense of pride and ownership among community members. Engaging local communities in preservation projects ensures that efforts are culturally sensitive and sustainable (Xuan Lam, 2019). Furthermore, combining traditional architectural knowledge with modern sustainability practices can ensure the relevance and continuity of vernacular architecture. Using eco-friendly materials and energy-efficient designs that respect traditional aesthetics can create a harmonious blend of old and new. This approach not only preserves the cultural heritage but also promotes environmental sustainability (Nguyen et al., 2019).

Comprehensive documentation of traditional architectural practices is vital for preservation. Research initiatives that record construction techniques, materials, and cultural significance can serve as valuable resources for future restoration projects. This knowledge base can also support educational programs and raise awareness about the importance of vernacular architecture (Do, 2021).

Lastly, international collaboration can bring new perspectives and resources to preservation efforts. Collaborating with international organizations and experts in heritage conservation can provide valuable insights and technical support, enhancing local capabilities to protect vernacular architecture (Nguyen et al., 2022).

Therefore, tackling the obstacles associated with the preservation of vernacular architecture necessitates a diverse strategy that integrates policy backing, community involvement, environmentally conscious methods, and global cooperation. Vietnam can guarantee the future generations' access to its rich architectural legacy by putting these strategies into practice.

Conclusion

In conclusion, this study highlights the urgent need to preserve the architectural heritage of Vietnam's ethnic minorities amidst the challenges posed by globalization and urbanization. Our research reveals a pressing need for innovative approaches that balance tradition with the demands of modern living. Communities exhibit a strong dedication to maintaining their cultural identity through architectural integrity, demonstrating the importance of preserving cultural heritage in urban development.

The study underscores the necessity of elevating awareness, enhancing state management, and integrating modern needs with traditional values for the sustainable preservation of ethnic architectural heritage. These efforts are pivotal not only for protecting cultural diversity but also for fostering national unity and sustainable socio-economic development.

We propose several strategies to address these challenges, including increasing public awareness, enhancing government policies and support for preservation, and developing sustainable practices that integrate modern living

needs with traditional architectural values. These strategies are essential for ensuring that the cultural and architectural heritage of ethnic minorities is preserved and enhanced, contributing to the overall social and cultural welfare in urban areas.

Overall, this study contributes to the broader discourse on urban social and cultural welfare by providing valuable insights into the preservation of cultural heritage. The findings serve as a reference for policymakers, urban planners, and researchers, highlighting the need for a holistic approach to urban development that respects and incorporates cultural and architectural values.

Author Contributions

Nhu Thi Nguyen conducted the literature review, analyzed and interpreted the data, and prepared the manuscript. *Nga Thi Khuat* contributed to the data analysis and interpretation, edited the manuscript, and provided supervision throughout the research process. Both authors have read and approved the final manuscript.

References

- Almansuri, D. s., & Alkinani, A. S. (2023). Place Identity and Urban Uniqueness: Insights from the AlRusafa Area, Old Baghdad, Iraq. *ISVS e-journal*, 10(12), 791-807. <https://doi.org/10.61275/ISVSej-2023-10-12-53>
- Communist Party of Vietnam. (2021). *Document of the 13th National Party Congress*. Hanoi: National Political Publishing House
- Do, T. (2021). *Unique walled house architecture of the H'Mong people*. Communist Newspaper. Retrieved Mar 25th, 2024 from <https://dangcongsan.vn/van-hoa-vung-sau-vung-xa-bien-gioi-hai-dao-vung-dan-toc-thieu-so/tu-truyen-thong-toi-hien-dai/doc-dao-kien-truc-nha-trinh-tuong-cua-nguoi-mong-584410.html>
- Doan Duc. (2023). *Maintain and develop ancient and modern architecture in Ha Giang province*. Architecture Magazine of Vietnam Association of Architects. Retrieved Mar 20th, 2024 from <https://www.tapchikientruc.com.vn/chuyen-muc/duy-tri-va-phat-trien-kien-truc-xua-va-nay-o-ha-giang.html>
- Ed.daran, D., & Malik, Z. (2024). The The International Legal Framework Governing the Protection of Cultural Heritage. *FWU Journal of Social Sciences*, 18(3), 35-43. <https://doi.org/10.51709/19951272/Fall2024/4>
- Edet, I. V., Udo, E., Jack, A. E., & Abner, I. P. (2024). Green Finance and Sustainable Development Nexus in Sub-Saharan Africa. *FWU Journal of Social Sciences*, 18(2), 78-90. <http://ojs.sbbwu.edu.pk/fwu-journal/index.php/ojss/article/view/2812>
- Hoang, H. L. (2024). Maintain and develop the traditional architectural space of the Black Thai ethnic group. *Architecture Magazine of Vietnam Association of Architects*, 2023(11), 75-79. <https://www.tapchikientruc.com.vn/chuyen-muc/duy-tri-va-phat-trien-khong-gian-kien-truc-truyen-thong-dan-toc-thai-den.html>
- Hoang, T. H., & Nguyen, Q. M. (2023). Decoding the genes of Vietnamese architectural culture: Part 1. *Architecture Magazine of Vietnam Association of Architects*, 2023(1), 11-17. <https://www.tapchikientruc.com.vn/chuyen-muc/giai-ma-gen-van-hoa-kien-truc-viet-nam-ky-1.html>
- Le, V. A., & Cao, D. S. (2024). Study on Vietnamese Design Methods of Traditional Vernacular Architecture and Discussion on Their Technical Origins. *International Journal of Architectural Heritage*, 18(4), 622-651. <https://doi.org/10.1080/15583058.2023.2177211>
- Luu, T. H., & Dinh, N. D. (2015). A study on passive design strategy of vernacular houses in Hoi An, Vietnam. *Journal of Science and Technology - University of Danang*, 2015(11), 89-93. <https://jst-ud.vn/jst-ud/article/view/3399>
- Ly, P., Birkeland, J., & Demirbilek, N. (2010). Applying environmentally responsive characteristics of vernacular architecture to sustainable housing in Vietnam. *Sustainable Architecture & Urban Development*, 4, 287-306. https://www.irbnet.de/daten/iconda/CIB_DC22717.pdf
- Man On, & Sung Dinh. (2023). *The stilt house of the Thai ethnic group*. Ethnicity and Development Newspaper. Retrieved Mar 17th, 2024 from <https://baodantoc.vn/ngoi-nha-san-cua-nguoi-thai-1688112853105.htm>
- Minh Giang. (2018). *Transforming the traditional house architecture of the H'Mong people in Dien Bien*. DienBien Radio and Television. Retrieved Mar 22nd, 2024 from <https://dienbientv.vn/tin-tuc-su-kien/van-hoa/201812/bien-doi-kien-truc-nha-o-truyen-thong-cua-nguoi-mong-dien-bien-5613735/>
- Na, L. T. H., Long, N. T. H., & Phuc, V. D. (2024). Proposing Solutions for Rural Housing Architecture to Adapt to Climate Change of Tien Giang Province in Vietnam. Proceedings of the Third International Conference on Sustainable Civil Engineering and Architecture,
- Na, L. T. H., Park, J.-H., Jeon, Y., & Jung, S. (2022). Analysis of vernacular houses in southern Vietnam, and potential applications of the learned lessons to contemporary urban street houses. *Open House International*, 47(3), 533-548. <https://doi.org/10.1108/OHI-12-2021-0276>

- Nguyen, A.-T., Tran, Q.-B., Tran, D.-Q., & Reiter, S. (2011). An investigation on climate responsive design strategies of vernacular housing in Vietnam. *Building and Environment*, 46(10), 2088-2106. <https://doi.org/10.1016/j.buildenv.2011.04.019>
- Nguyen, A. T., Truong, N. S. H., Rockwood, D., & Tran Le, A. D. (2019). Studies on sustainable features of vernacular architecture in different regions across the world: A comprehensive synthesis and evaluation. *Frontiers of Architectural Research*, 8(4), 535-548. <https://doi.org/10.1016/j.foar.2019.07.006>
- Nguyen, T. N. T., & Nguyen, Q. T. (2024). Cultural Transformation and the Evolution of Festivals: The Impact of Modernization on the K'Ho Ethnic Minority in Vietnam. *Journal of Underrepresented and Minority Progress*, 8(2), 62-88. <https://doi.org/10.32674/p41bwp41>
- Nguyen, T. Q. (2023). Confucius' conception of the political being and its significance for building the political being in present-day Vietnam. *IKENGA International Journal of Institute of African Studies*, 24(2), 1-23. <https://doi.org/10.53836/ijia/2023/24/2/003>
- Nguyen, T. Q., Khuat, H. T., & Ho, T. P. (2023). Vernacular solutions for small houses in Ha Tinh City towards sustainable and adaptation to climate change. *E3S Web of Conferences*, 403, 06011. <https://doi.org/10.1051/e3sconf/202340306011>
- Nguyen, T. Q., Nguyen, V. T., & Nguyen, T. P. (2023). Ho Chi Minh's thoughts on the education of the young Vietnamese generation today. *Perspektivy nauki i obrazovania*, 62(2), 562-577. <https://doi.org/10.32744/pse.2023.2.33>
- Nguyen, V. T. A., Park, J.-H., & Jeon, Y. (2022). The spatial and environmental characteristics of Vietnamese vernacular houses in Vietnam's French colonial public buildings. *Open House International*, 47(1), 122-134. <https://doi.org/10.1108/OHI-04-2021-0078>
- Pham, T. L., & Truong, N. L. (2017). Modern Architecture in Vietnam or Vietnamese Modern Architecture? *Docomomo Journal*, 2017(2), 75-81. https://www.docomomo.pt/wp-content/uploads/2019/04/DocomomoJournal57_2017_PTLoanTNLan.pdf
- Phung, A. T., Nguyen, Q. T., & Le, C. Q. (2024). Changing trends of the peasantry under the impact of the current rural urbanization process in Vietnam. *ISVS e-journal*, 11(2), 39-47. <https://doi.org/10.61275/ISVSej-2024-11-02-03>
- Quynh Tram. (2021). *Awakening the value of stilt houses of the Muong ethnic group in Lap Thang (Thanh Hoa)*. Ethnicity And Development Newspaper. Retrieved Mar 27th, 2024 from <https://baodantoc.vn/danh-thuc-gia-tri-nha-san-cua-dan-toc-muong-o-lap-thang-1640072877987.htm>
- Shah, A. A., Chandrasekara, D. P., & Naeem, A. (2023). Preserving the Past and Shaping the Future: An Articulation of Authenticity of Heritage within Urban Development. *ISVS e-journal*, 10(12), 447-466. <https://doi.org/10.61275/ISVSej-2023-10-12-31>
- Thi, H. L. V., & Nguyen, T. Q. (2021). Adaptive reuse of local buildings in Sapa, Vietnam for cultural tourism development towards sustainability. *IOP Conference Series: Earth and Environmental Science*, 878(1), 012032. <https://doi.org/10.1088/1755-1315/878/1/012032>
- Vietnam Communist Party. (2014). *Resolution No. 33-NQ/TW on Building and developing Vietnamese culture and people to meet the requirements of sustainable development of the country*. Hanoi
- Xuan Lam. (2019). *Housing architecture of the H'Mong people*. Cao Bang Newspaper. Retrieved Mar 20th, 2024 from <https://baocaobang.vn/-31404.html>