



Exploring indigenous practices in Northern Philippines and their environmental implications for sustainable green architecture

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Abstract

This study aims to explore the policy implications of documented indigenous practices in vernacular housing in Northern Philippines towards sustainable green architecture. The research is grounded on the need to address the growing concern for environmental degradation and how indigenous knowledge can be used as a solution. The study utilized qualitative research methods including interviews, observations, and archival analysis to gather data. Results reveal that traditional housing practices of the *Itawes*, *Ibanag*, and *Malaweg* promote sustainable architecture, which emphasizes the use of locally sourced materials, passive cooling and ventilation systems, and climate adaptive practices. However, these practices are threatened by modernization, lack of policies and regulations, and limited awareness of their environmental and cultural significance. This study underscores the need for policy reforms that support the integration of traditional practices into contemporary sustainable architecture. The documentation of indigenous practices also serves as a resource for educators and policymakers in developing sustainable, culturally sensitive designs that address environmental challenges.

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Introduction

The concept of sustainability has gained significant attention in the field of architecture and design, as it aims to create buildings and structures that are environmentally responsible, economically viable, and socially beneficial. In this pursuit, traditional practices of indigenous people can serve as a valuable resource in creating sustainable architecture.

The Northern Philippines is home to various indigenous groups that have long practiced sustainable building methods, utilizing locally available materials and techniques that have been passed down through generations. However, these traditional practices are at risk of being lost due to the increasing influence of modern building practices.

One recent study by Yang *et.al* (2020) explored the potential of incorporating indigenous knowledge and practices into contemporary green architecture in China. The study examined traditional building materials, techniques, and design principles used by the Miao and Dong ethnic groups in southwestern China and assessed their environmental performance and cultural significance. The researchers found that many of the traditional practices, such as the use of bamboo, timber, and earth as building materials, and the incorporation of natural ventilation and lighting strategies, could be adapted to contemporary green architecture to create sustainable and culturally relevant buildings.

Another study by Zhai *et.al* (2019) examined the potential of integrating traditional ecological knowledge (TEK) into green building design in Canada. The study drew on the knowledge and practices of Indigenous peoples in the Canadian Arctic, who have developed innovative building techniques that are adapted to the harsh climate and ecosystem of the region. The researchers found that the incorporation of TEK in green building design can lead to more effective and sustainable buildings that are well-suited to their local environment and cultural context.

While there have been studies conducted on incorporating traditional practices of indigenous people into sustainable green architecture, there are several gaps that can be identified in the context of the Philippines. Firstly, there is limited research on specific indigenous practices. While there have been some studies that have examined indigenous practices in the Philippines, many of these studies have been broad in scope and have not delved into specific practices in-depth. More research is needed to explore specific traditional practices, such as building materials, design principles, and construction techniques, and their potential application in sustainable green architecture. Secondly, there is limited research on policy implications. While the importance of incorporating traditional practices into sustainable green architecture is increasingly recognized, there is limited research on the policy implications of doing so. More research is needed to identify policy barriers and opportunities for incorporating traditional practices into sustainable building codes and standards in the Philippines.

Addressing these gaps can help to develop a more comprehensive understanding of the potential of traditional practices in creating sustainable green architecture in the Philippines, and ensure that sustainable architecture is inclusive, culturally sensitive, and economically viable.

Hence, this research aims to document the traditional practices in vernacular housing of the indigenous people in the Northern Philippines and their relevance to sustainable green architecture. The study will examine the building materials, techniques, and design principles used in traditional architecture and analyze their environmental impact, cultural significance, and policy implications.

The findings of this research can contribute to the development of sustainable green architecture by providing insight into the traditional practices of indigenous people and their relevance to modern building practices.

By incorporating these practices into contemporary architecture, architects and designers can create sustainable structures that are culturally relevant and environmentally responsible. Furthermore, the documentation of traditional practices can also serve as a means of preserving cultural heritage and promoting cultural diversity, as the traditional practices of indigenous people are an important part of their cultural identity. By recognizing and valuing these practices, this research can contribute to the preservation and promotion of cultural heritage while also promoting sustainable and responsible architecture.

Materials and methods

Study Site

The study was carried out in the towns of Abulug, Enrile, and Rizal, which are primarily inhabited by selected indigenous peoples. Specifically, the *Malaweg* reside in Rizal (Cabrera-Ramos, 2020), the *Itawes* in Enrile, and the *Ibanag* in Abulug, all of which are situated in the province of Cagayan. Cagayan is a vast region characterized by plains and valleys, bordered by mountains and intersected by rivers and creeks, the largest of which is the Cagayan River. More than a quarter of its total land area consists of flat to nearly level land, such as alluvial plains, river deltas, low wetlands, mangroves, and beaches. The Cordilleras, the northern mountains of the Sierra Madre range, contain steep and very steep land, comprising approximately 10.44% and 24.73%, respectively, of the total land area.

Research Design

This study made use of a variety of qualitative research methods, such as ethnography, participant observation, and in-depth interviews, which are well-suited for exploring complex social phenomena, such as traditional practices and their cultural context. These methods allow researchers to gather rich, detailed data that can be analyzed in-depth and provide a nuanced understanding of the practices and their significance. Moreover, document analysis was conducted to examine historical records, traditional designs, and other written sources relevant to the

traditional practices in housing of the indigenous people in the Northern Philippines. This mixed-method approach can provide a comprehensive understanding of the practices, their cultural significance, and their relevance to contemporary architecture.

Data Collection

Additionally, key informant interviews were conducted with cultural studies experts, including community chiefs and individuals with practical understanding of house construction methods and practices. Focus groups explored the beliefs and practices of the IPs. There were eight to twelve participants in each focus group. Interviews and focus groups were conducted in the local language and in Tagalog, which is spoken by most respondents. Interviews and focus groups were recorded and transcribed non-verbatim.

Results and discussion

Archival Analysis of the Vernacular Houses in Cagayan

The *Ibanag*, *Itawes*, and *Malaweg* call their vernacular houses as “*balay*”. Lico (2013) noted that *balay* takes a variety of form in the Malayo-Polynesian and Oceanic languages. In the Philippines, reflexes of this term (*Isneg, baláy; Cebuano, baláy*) refer to a “house” while in Malay languages, the term *balai* signifies a “public meeting house.” It is interesting to note that for the *Ibanag*, the *balay* implies more than just a house. Gatan (1981) explains that the *balay* emanates from the very *mabbalay* which means to solidify. This suggests that the *Ibanag* couple (*tangabalay, sangabalay*) is an institution that is unbreakable. This goes true also for the *Itawes*.

In the exploration of the vernacular houses of the different indigenous people of Cagayan, Jose Honorato Lozano painted his expression of the typical house in a town in Cagayan in 1847 (Carino, 2002). It is unknown if in which part of Cagayan these houses are found but the parts and certain elements in Lozano’s expression can be seen in how the indigenous people of Cagayan described their vernacular houses he labeled as “*Casa de un Pueblo de Cagayan*” or House in a Town of Cagayan.

In summary, Lozano characterized the houses in Cagayan in terms of the materials used and its parts. The houses in Cagayan consists of a “batalan” which connects two buildings usually quadrilateral in shape—from a bigger (main) to a smaller one (kitchen). This depiction is consistent with how the respondents narrate the framework of their vernacular houses. In terms of the housing materials, nipa is used in roofs and walling while bamboo and wood in floorings and framework. What fascinated Lozano in the house of Cagayan is the presence of an elevated storage room that is higher than the house. Lozano even described these building as “aerial houses” because of its elevation from the ground. He concluded that the houses in Cagayan are designed to adapt with its environment and to the needs of the people (Carino, 2002).

Lozano’s depiction of the houses in Cagayan is one of the very few colonial texts and documents that pertain to vernacular architecture in Cagayan aside from dictionaries that contain housing terms. Meanwhile, Dacanay (1988) has mentioned the Itawes house in his listings of ethnic houses. It is interesting to note that he described the Itawes house as “twin houses”. This too was used by Gatan (1981) when describing the Ibanag houses. This tells us that the houses of the Ibanag and Itawes possess similar structures. They were called “twin houses” because there are seemingly two houses attached by a bridge. Gatan (1981) described the original Ibanag house by two batalags (batalan in Tagalog), one in front and the second at the rear of the house bridging the main house to the kitchen.

Building Methods and Practices

In general, the design of the houses is well-tailored to the geographical setting. The Ibanag, Itawes and Malaueg vernacular houses are elevated from the ground. The participants of the study reasoned that this design feature keeps the floor dry during rainy seasons and to protect their belongings when the river swells. In Southeast Asia and the Philippines, stilt houses are very common. Aside from providing flood protection, there is strong evidence that the vernacular stilt-house was developed from the rice-

growing culture in the warm, humid tropical region. It is thought to have originated from granary architectural typology and later evolved into houses. Rice, products, and valuables are stored in the attic beneath the roof, while living space is located in the middle. It is a direct response to natural forces, inventive use of resources, and demonstration of beliefs in supernatural powers through ornaments placed on the roof (Widodo, 2012).

Furthermore, the bamboo floors and bamboo walls have easy access to ambient air providing natural ventilation. The cogon roofing material and bamboo mat ceilings are excellent solar and sound insulators, creating a conducive place to rest, sleep and do some recreational activities. Underneath the elevated floor is another multi-functional space to keep their animals, farm tools and to be their food-processing area. The vertical clearance from ground to floor is usually between 2m and 5m because these people are proximate to the river where perennial flooding is expected. Meanwhile, the walling of the houses virtually makes the house a penetrable basket. Windows of the awning-type have a nipa or palm window lid that can either slide from side to side or be pushed out by a pole that serves also as support when not in use. There are usually no ceilings or room divisions. However, if required, room partitions are quite low and do not reach the underside of the roof or the ceiling, if there is any, to allow for free circulation of air within the house.

The structural framework of the vernacular houses is no longer reflected to modern homes to a great extent. If anything, there is a current trend toward adopting inhospitable to the environment western architectural styles. A concrete floor, brick or concrete block wall, and an iron sheet or tiled roof are typical features of modern homes nowadays (Barretto-Tesoro, 2015). Without significant consideration for the tropical climate, foreign Western-style architecture models were embraced in the 20th century (Brody, 2001) forcing the need for air conditioning for enclosed buildings, which were primarily made of concrete and had glass windows.

Because new buildings' flat roofs without eaves weren't constructed to withstand the monsoon during the rainy season, their façade rapidly became speckled with watermarks. The preference for foreign architectural styles is still popular despite these disadvantages. However, because of relatively high energy prices and an increase in environmental consciousness, many of today's designers and engineers are re-examining the design elements of Filipino vernacular houses such that of the Bahay Kubo and its method of addressing climatic difficulties in a straightforward but effective manner (Lanaria, 2021, Rashid & Ara, 2015, Lacanilao, 2010, Rivera-Lutap, 2010).

As regards the housing materials, the majority of ethnic houses in the Philippines follow a common pattern of resource use. For instance, people in the lowlands use bamboo, nipa, and cogon to stay cool, while people in the highlands use solid, tightly-fitting planks to help retain heat. The typical ethnic home is a multipurpose one-room building that is airy, light, and comfortable while still being sturdy and structurally sound (Clariza, 2010).

Firstly, the Malaueg vernacular house is entirely made of *bulu* rafts or what can be equated as the mother of Forlales' Cubo (Santiago & Rosenbloom, 2022). Meanwhile, most parts of the Ibanag and Itawes houses are composed of boho and bayog as well. The Ibanag house makes use of *bayug* poles to reinforce the center of the flooring and for their house's girt and rafters. The "*binattak*" or sometimes called "*batalan*", a bridge connecting the main house to the cooking area, is made of bamboo rafts. The stairs were also made of bamboo poles. Bamboo railings were optional for the Ibanag then. At times, the Ibanag house include railings made of bamboo as well.

With the recent recognition of Forlales' Cubo, there's no denying that the use of bamboo in house construction is indeed and will always be one for the books. Aside from its abundance and environmental benefits, the Malaueg, Ibanag, and Itawes houses have benefitted for so long from the durability,

flexibility, and aesthetics that the bamboo offers. Because all construction materials are generally lightweight and flexible, Itawes vernacular house is resilient to earthquakes. On the other hand, it has less resiliency to destructive typhoons that are prevalent in the northern part of the country.

Meanwhile, nipa palm (*Nypa fruticans*) also known as mangrove palm is a trunkless plant that grows in soft mud and slow moving tidal and river water. One of the vastest nipa areas in the country is found in the estuaries of three rivers—the mighty Cagayan from its western bank the Abulug, and the Pamplona in the north western end of Cagayan Province. From the vast nipa vegetation, the Ibanag of Abulug, who are known for their weaving prowess, found a living out of making nipa shingles which they also commonly use for the roofing of their houses. To date, the Ibanag of Abulug still use nipa shingles for their houses because of its cost-effectivity, availability, good thermal insulation, light weight, and wind resistance. Durability of nipa shingles can also be increased if properly harvested, treated, stored and double-layered.

In Itawes houses, Cogon Grass is the counterpart of Nipa Palm. Cogon Grass (*Imperata cylindrica*) is a variety of tall grass that is native to Asia and grows in tropical lands such as the Philippines. With its seed's ability to be dispersed through air, Cogon can propagate almost anywhere which is why it is widely available in the entire country. Cogon is also mainly used for the roofing of the Itawes house. Just like the Nipa Palm, Cogon offers heat absorption and wind resistance. However, unlike the nipa palm, no weaving is done with the preparation of the cogon roofing. Rather, it is put up through thatching where cogon is clipped in between the girts or tied to the girt of the roof.

Policy Implications

As sustainability becomes increasingly important in modern architecture, it is important to examine how indigenous practices can inform sustainable design principles. The policy implications that could arise from incorporating indigenous practices into sustainable green architecture are the following:

Incorporating traditional practices into building codes and standards: The adoption of building codes and standards that incorporate traditional practices can help to ensure that sustainable green architecture is culturally sensitive and contextually appropriate. For example, the use of indigenous building materials, such as bamboo or rattan, can be encouraged in building codes, along with traditional design principles, such as natural ventilation and lighting.

Establishing training programs for architects and builders: To ensure that traditional practices are effectively incorporated into sustainable green architecture, training programs can be established for architects and builders. These programs can include training on traditional construction techniques, the use of indigenous building materials, and sustainable design principles that are appropriate for the local context.

Providing financial incentives for sustainable green architecture: The adoption of financial incentives, such as tax breaks or subsidies, can help to encourage the adoption of sustainable green architecture, including the incorporation of traditional practices. For example, builders or architects who incorporate traditional practices into their designs could receive financial incentives from the government or other organizations.

Encouraging research and development of sustainable building materials and techniques: To promote the use of traditional practices in sustainable green architecture, research and development of sustainable building materials and techniques can be encouraged. This can include research on traditional materials, such as bamboo or rattan, and the development of new materials that are environmentally sustainable, culturally sensitive, and economically viable. By addressing these policy implications, the government and other organizations can help to promote the adoption of traditional practices in sustainable green architecture. This can lead to a more culturally sensitive and sustainable built environment that is economically viable and inclusive of the perspectives and voices of the indigenous communities.

Conclusion and recommendation

In conclusion, the documentation of the traditional practices of indigenous people in northern Philippines provides a valuable resource for the development of sustainable green architecture. The incorporation of traditional practices, such as the use of natural materials, design principles, and construction techniques, can help to create a more culturally sensitive and sustainable built environment that is economically viable and inclusive of the perspectives and voices of the indigenous communities.

However, there are several gaps in the existing literature that need to be addressed to fully realize the potential of traditional practices in sustainable green architecture in the Philippines. These include the need for more specific research on indigenous practices, the economic feasibility of such practices, engagement with indigenous communities, and policy implications. To address these gaps, it is recommended that future research on the integration of traditional practices into sustainable green architecture should adopt a community-based participatory approach that engages with indigenous communities directly.

Overall, the documentation of traditional practices of indigenous people in northern Philippines provides an important foundation for the development of sustainable green architecture in the Philippines. However, more research and policy action is needed to fully realize the potential of traditional practices in creating a sustainable built environment that reflects the values and perspectives of the indigenous communities.

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