BARANGAY HALL

Vernacular Identity in Post-disaster Community Rebuilding

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An explanatory document submitted in partial fulfilment of the requirements of the degree of Master of Architecture (Professional)
Unitec Institute of Technology, 2016
Abstract

The 2012 Typhoon Bopha devastated the Mindanao region in the Philippines; in particular is in Barangay Andap, New Bataan, Compostela Valley- a community that was fully wiped away as a result of the debris flow from the surrounding mountain ranges. Almost four years since the typhoon, the barangay is in the rebuild process. Although shelter has been provided, a place where the community can collaborate is yet to be explored.

The office of the smallest political and administrative unit in the Philippines, called the barangay hall, has a functional language that is apt in promoting community rehabilitation. Often times, it is adjacent and/or connected to a day care centre, health clinic and local church; thus, answering issues of civic administration, religion, health, and education. However, its formal characteristics are often products of the economy and are quite alienated compared to the country’s rich heritage. As a quintessential Filipino building, it only makes sense to apply the country’s rich pre-colonial heritage in its architectural treatment.

This design research aims to answer the question on how Filipino vernacular architecture can be applied in the design of a barangay hall, a typology that is highly associated with national identity, and utilise the design in reinvigorating a community that has been devastated and displaced by a natural disaster.

This study emphasises the lessons from Philippine vernacular architecture and their suitability in a design that is culturally adapted and geared towards developing national identity. Concurrently, it utilises disaster mitigation methods and environmental considerations in providing a sustainable and resilient development. This method of combining history, anthropology, and environmental science is used to inform the architecture of a barangay civic centre, which is composed of the barangay hall, the local chapel, and the public elementary school.
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Acknowledgements

To my parents, Marissa and Angelito, a pair of visionary architects in our small hometown in San Pablo City, Laguna, thank you for imparting your passion for architecture. Watching you toil all night on drawing boards as you manually draft on A2 tracing papers with your fragile Rotring pens is one of my most precious childhood memories. You have taught me hard work, perseverance, and patience. To my siblings- Aloysius Grace, Micah and Grehan- you have been my greatest support system, always happily telling me that I can finish what I started. Thank you for all your help and encouragements.

To my supervisor, Graeme McConchie, who patiently listened and critically assessed this project, from proposal to final outcome, thank you very much. Your great interest, appreciation, and care for my work helped me throughout this project.

To my office mentor, Semisi Fetokai Potauaine, who has always offered time and assistance, thank you very much. Your creative inputs and knowledge-both practical and theoretical- are highly appreciated.

A special thanks to my friends who helped as I prepare this document: Nathan Ganly, Henry Lukaszewicz, and Sudhir Chandra. Also to Pramod Nair, for proof reading this document and the emotional and tangible support.
Fig.1: Cesar Buenaventura, Bayanihan, 1968. Oil.

Bayanihan shows members of the community lifting a bahay kubo to transfer to a new location. It depicts the Filipino spirit of communal work towards achieving a particular goal.
Introduction

Since 2011, the Philippines has attracted international attention due to three major tropical cyclones: Typhoon Washi (2011), Typhoon Bopha (2012) and Typhoon Haiyan (2013). For all three, death tolls were higher than 10,000; and damages amounted to 3 billion pesos (NZ $280 million). For an archipelago located in the Pacific Ring of Fire and in close proximity to the equator, such natural phenomena are expected. But combining this location with the country’s current socioeconomic and political status, the risk is magnified leading to national state of emergency.

This is particularly examined in Barangay Andap, Compostela Valley, which was devastated by Typhoon Bopha in 2012. The whole barangay, located on the foot of the mountain ranges, was wiped out due to the debris flow brought by over precipitation. Houses, infrastructure, and public buildings were totally damaged; the once green and agricultural landscape is now covered by gravel, debris, and boulders. Three and a half years on since Typhoon Bopha, the community is undergoing rehabilitation and reconstruction. The people of Barangay Andap have returned, continuing their lives that were once interrupted by the disaster. Infrastructure, public buildings, and dwellings were rebuilt in the barangay. However, a place where the community can meet, unite and collaborate is yet to be explored.

The allotted space for the smallest administrative unit in the Philippines, called the barangay hall, is a typology to be investigated. Although it acts mainly as the office of a local barangay captain, it is also adjacent and/or connected to a day care centre, health clinic and local church. Its planning and layout answer issues of administration, education, healthcare and religion. There is an immense potential to transfer this language/typology in post-disaster rehabilitation, where camaraderie, solidarity, and national identity are influential ideologies.

Not surprisingly, the barangay is a traditional/indigenous concept. It originates from the Malay word balangay, which is the sailboat used by the early inhabitants of the country before the Spanish colonisation. These early inhabitants belonged to different tribes and societies, all with its own set of customs, traditions, and way of building. This traditional, also called vernacular, architecture perhaps will provide an answer to the quintessential question (particularly among Filipino architects): “Is there such a thing as Filipino architecture, one that is inherent to the Philippines and its people?”

Combining the inquiry on national identity and the opportunity presented by the rebuild process in devastated villages, this research attempts to answer how Filipino vernacular architecture can be applied in the design of a barangay hall that will foster community rehabilitation.

There are two main objectives in this research: first is to grasp an understanding of the architecture of the Philippines; and second is to apply this understanding in the design of a barangay hall/community centre during post-disaster rehabilitation process.

This research is divided into two parts. Part A-Questions unravels the questions on the barangay hall, the vernacular architecture in the Philippines, and the problem brought by a natural disaster, Typhoon Bopha, on a site, Barangay Andap, Compostela Valley. This is explained in the following chapters:

One- Barangay Hall: An Investigation seeks to provide an understanding of the barangay hall firstly by looking at its social function, history, and cultural importance; secondly, by identifying its architectural studies through studies of different barangay in the country. A case study will provide in depth functional, spatial, and formal analyses of this typology.

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Two- Philippine Vernacular Architecture: A Discussion provides a survey of the architecture in the Philippines prior to Hispanic colonisation. The primary sources of this part are derived from the writings of Winand Klassen and Gerard Lico on architecture in/ of the Philippines. In their books, the proverbial quest of Filipino architecture- its existence, characteristics, and impact on national identity- is present. This investigation is synthesised with the concept of vernacular architecture, as defined Paul Oliver in “Built to Meet Needs”. Precedent studies by Filipino and foreign architects in the Philippines are also included. The overall aim of this chapter is to present findings that can be considered as Filipino architecture, which will then be utilised in the formal exploration of the barangay hall.

Three- Typhoon Bopha and Barangay Andap: The Problem presents background information on the effects of a natural disaster on the chosen site. As explained earlier on, Barangay Andap in New Bataan, Compostella Valley, is one of the barangays fully wiped away by Typhoon Bopha in 2012. This part of the research looks at the timeline of the barangay: before, during, and after the disaster. The rehabilitation process will be discussed and will help identify insights on design issues and the importance of resilience in disaster risk management.

The second part of this research, Part B- Responses, presents the design solution to the problem, which is vernacular identity, through the barangay hall, in post-disaster rehabilitation. This is explained in the following chapters:

Four- Design Process presents the architectural issues and their applications on the site, as derived from studies in Part A. Design purpose, programme, and site analysis are specified and elaborated in this chapter. Design objectives/criteria deals with methods on how to assess the success of the design solution.

Five- Concept Design shows initial ideas as applied on masterplanning, building layout, building form, materials, and tectonic details. This chapter presents the design process and the rationale behind each stage.

Six- Developed Design shows the design development as it attempts to satisfy the architectural issues stated in Chapter Four. It presents the Barangay Complex masterplan- its public spaces, private footprints, and axis. It also presents the building design of the Barangay Hall, Church and Public Elementary School as they satisfy function, environmental issues, and formal considerations.

The conclusion critically reflects the design process and the design manifestation. This part will provide self-criticisms for further development and studies.

Scope and Limitations

The scope of the project deals with a specific natural disaster—debris flow, which is the surge of rocks and soil from the mountain slopes brought by over precipitation. It also deals with the rebuild stage of disaster management when villagers return to their devastated community; it does not deal with the emergency and temporary recovery stages, such as tent evacuation sites. A clear understanding of their difference, which will be elaborated in Chapter 3, is necessary to understand the design problem and proposed solutions.

Due to the wide topic of architecture in the Philippines, which has a hundred ethnic and indigenous groups/societies in all 7,107 islands, only a few examples of the vernacular have been included in this research for brevity and clarity. The project also deals particularly with the barangay hall and not any other typology in the Philippines. Although the design solution included the local chapel and the public elementary school, these building types are universal and may not add to the country's culture and identity inasmuch as the barangay hall would.

The primary issue found in this research is its nature as an off-shore project, which means relying mostly on books, publications and the internet. Although there have been no actual site visit done, personal experiences with the barangay hall, disaster and recovery, and aspects of Philippine culture, architecture, materials and construction methods have been crucial in the development of this research.
Research Question

Combining the inquiry on national identity and the opportunity presented by the rebuild process in devastated villages, how can Filipino vernacular architecture be applied in the design of a barangay hall that will foster community rehabilitation?
PART A QUESTIONS
Barangay Hall: An Investigation
Overview

The barangay is the smallest political unit in the Philippine government. Headed by an elected barangay captain, it serves as the main implementing unit of government programs, projects, policies, and community-wide activities. Aside from administrative duties, it also acts as a liaison between the higher government and the community: communicating needs, proposals, and public opinion with each other.

There are currently 42,029 barangays in the Philippines. The sizes range from at least 2,000 inhabitants household units to 5,000 inhabitants (urban barangay). Bigger barangays can further be divided into purok (districts closer to the barangay centre) and sitio (typically rural areas). It has three primary duties: legislative, judiciary, and executive. The legislative body, called the sangguniang barangay, is composed of the barangay captain, seven barangay kagawad (members), and the sangguniang kabataan (youth community). They oversee issues on tax and revenue measurements, funding of projects, and maintenance of the barangay and its facilities. The judiciary body has the barangay captain and lupong tagapamayapa (conciliation body). The body is composed of 10 to 20 members who only come to the barangay hall when necessary. The executive body includes the barangay captain, administration (secretary and treasurer), barangay tanod (unarmed brigade/watchmen), and other staff.

Based on the 1991 Local Government Code, the barangay should “be in the frontline of the delivery of administrative support services, particularly those related to the situations during and in the aftermath of manmade and natural disasters and calamities.” They are expected to save 5% of their revenues to be used in disaster-related activities. They are responsible in performing pre-emptive evacuation before, providing emergency measures during, and restoration of people’s livelihood after disasters.

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Fig.2: Barangay organisational chart
History

The barangay originally came from the Malay word “balangay”, meaning sailboat. Some of the Austronesian groups who first settled in the Philippines are seafarers who chose to live near rivers and along the coastlines. The group of people from the same sailboat started an independent society ruled by princes/ monarchs/ chiefs. As there was no unifying political state governing the archipelago back then, the barangays were usually competing with each other. These societies, being excellent seafarers, also began trading with Indianised kingdoms in the Malay archipelago around 300-700 AD, bringing back influences of Hinduism and Buddhism. The titles of the head of the barangays vary, depending on the influence the society has or its geographical location: Rajah/ Sultan, title for Moro prince; Huangs, title for Chinese rulers; Lakans, title for rulers in Luzon region; and, Datus, title for rulers in the Visayas and Mindanao regions.

The arrival of the Spanish in 1521 started a series of wars against these barangays. In 1571, the Spaniards occupied two large societies in Luzon region: the Kingdoms of Maynila and Tondo. Other islands, each with its own ruler, were subsequently occupied by the Spanish. The Philippine archipelago was then politically unified by Spain. To exercise local administration, the traditional village organisation was retained by the Spanish. The existing barangay chieftains were appointed as “cabeza de barangay” (head of the barangay).

The Spanish practiced encomienda, wherein they appoint an indigenous leader (encomendero) to organise the locals; and in return the leader is awarded favours from the Crown. Instead of rebelling, the locals participated and helped in pacifying unrest/ civil wars. This system also institutionalised the role of upper class (principals), which became larger and more influential than the pre-conquest indigenous nobility, thus leading to an oligarchic system in the Philippines.

Philippines declared its independence from Spain in 1988, but the country was then immediately occupied by the United States of America until 1946.

The American occupation renamed the barangays into barrios that are then expanded into Rural Councils, where four councillors assisted the Barrio Lieutenant. The Rural Councils then became Barrio Councils, composed of a barrio lieutenant and six council members, all elected into the office. In 1974, during the third republic, former President and dictator Ferdinand Marcos changed the term “barrio” back into barangay. These terms were retained even after Marcos’ dictatorship was overthrown. In 1991, significant changes in the powers and responsibilities of the barangay system were passed. It is currently used and known as in The Local Government Code of the Philippines.

Fig.3: Rey A. Santiago, Butuan Boat (Balanghai). National Museum: Philippines.
The barangay hall is the seat of the local government for the barangay and where the office of the captain is located. As an administrative unit, it is also where various documents, such as certificate of residency, can be acquired. Health centres, local pharmacy, day care centres, library, and offices for other barangay workers can also be found in the barangay hall. It also acts as a local community centre, where temporary and permanent events are held. Medical missions, religious services, sports contests are often held at or close to the barangay hall.

The barangay hall has a strong civic presence, which can be attributed to its signage and the Philippine flag. The barangay hall can be a one or two-level structure, even more depending on the facilities it contains. Its form is hybrid and usually reflects the barangay’s economy. There can be a balcony, veranda, decorations, use of different exterior cladding; or it can just be a simple, unpainted reinforced concrete building.

The site planning may be informal, but with the civic importance of the barangay hall, it is typical to see it next to a school, the local chapel, and other local government buildings. A covered court, which is both used for sports and as an open auditorium, is another usual structure built around the barangay hall. The neighbourhood houses also react to the barangay hall’s social importance: houses within its vicinity usually open convenience stores, creating an informal market. As a prominent public building, it also acts as an unofficial transportation hub, where local form of transportation ie tricycles or jeepneys stops and waits for passengers.
Fig. 4: Exterior views of the barangay hall show hybrid forms and materials. From L-R: Brgy Rabanes, Zambales; Brgy Soom, Trinidad, Bohol; and, Brgy Mariki, Zamboanga.

Fig. 5: Interior views of the barangay hall being used as meeting room and library show polished concrete or tiled flooring and brightly painted interiors.
The barangay hall in Barangay 1-B, San Pablo City, Laguna, which has a total population of 4,523 inhabitants, is used as a precedent study to provide an understanding of the typology’s program, functional layout, and site planning. Since the research is an off-shore project, the chosen precedent is in the author’s barangay, thus providing insights through her personal experience.

The barangay hall is a two-level building located adjacent to the public elementary school and the local chapel. It has up to 15 staff, with three being full time workers (captain, secretary, treasurer). The ground floor is the administration office, housing the receptionist, secretary and the health worker. The administration space is also used to run a daycare centre for a couple of hours in the mornings, quite informally, as the chairs and chalkboards are all removed and taken back to the storage once class is finished. The kitchen and toilets are located behind the administration office. At the rear of the building is a storage area for both the barangay and the local chapel. It also acts as a temporary holding cell, before criminals, caught by barangay tanod, are transferred to the local police. The second floor is an added structure, less than five years old, and is now the captain’s office.

The ground floor has a veranda, where low-level concrete barriers are also used as seats for the public and barangay officials. The barangay tanod usually meet in the veranda before going for their watchmen duties around the neighbourhood. The veranda also provides a through access from the street into the elementary school. Designated parking spaces for barangay official vehicles are located on the street front.

The barangay hall is constructed of reinforced concrete all throughout and with corrugated iron roofing on trusses. Its ceiling height is of a normal house, about 2.4m, with no variety of the interior volume. The administration office is painted bright orange, while the captain’s office is left bare, with a smoothened concrete finish. One interesting architectural treatment is the gated street frontage, which counters the accessibility of the public building and the openness promoted by the veranda.

On the right of the barangay hall is the local chapel which has a simple, post-and-beam open structure and wide roof overhangs. This Catholic chapel is also fully gated and only used on Sundays. To accommodate large influx of worshippers, the street is often barricaded, and plastic chairs are provided to be used temporarily by the worshippers.

On the left of the barangay hall is the public elementary school, catering to Year I to VI, and with a total 559 students, based on 2014-2015 enrolment. Its main entrance, characterised by a pair of concrete post-beam structure, is along the barangay hall. The school sits on 0.8 hectare of flat ground and is composed of six elongated buildings, each with at least two class rooms. In the middle of the school grounds is a covered court, which is also used by the community for public events, such as sports, pageants, elections, meetings, etc. The principal’s office is located behind the barangay hall storage room.

The barangay hall, chapel, and public school, altogether act as a civic centre is in Barangay 1-B. It is an important transport hub in the community. The houses in front of the barangay hall also opened up small convenience stores, further enlivening the area through the informal market. Community events, such as town fiestas, basketball tournaments, beauty pageants, and Easter prayers to name a few, are held either on the street in front of the barangay hall or in the covered court of the public elementary school.
Fig. 6: Barangay 1-B site plan, floor plans, and sections

Fig. 7: View from the left showing the school gate and the barangay hall.

Fig. 8: Front view of the barangay hall and chapel.

Fig. 9: View from the right showing the chapel and the barangay hall.
2

Philippine Architecture: A Discussion
He who does not look back at where he came from will never reach his destination.
Architecture possesses the capability to reflect the essence of a time and a place like no other artefact. It not only embodies the collective cultural values of the society that made it possible, but also palpably manifests the society's creative response to environmental imperatives, the ecological milieu, power structures, and material deprivation.\textsuperscript{11}

The architecture in the Philippines undeniably mirrors the country's rich culture, history, environment, and heritage. Its prime location in the Pacific Ocean renders it suitable for trade routes, resulting in wealth of knowledge; and being an archipelago this knowledge is further spread and diversified.

Before it was called Philippines and claimed by explorers for Philip II, King of Spain, the archipelago had no unifying and governing political state. What it had was a number of competing maritime or upland agricultural societies ruled by princes/monarchs/chiefs, attributed to be part of the Austronesian migration. Their architecture is often referred to as native, folk, indigenous, or vernacular. They were primarily built to meet needs using traditional technologies. As defined by Paul Oliver:

> Vernacular architecture comprises the dwellings and all other buildings of the people. Related to their environmental contexts and available resources, they are customarily owner- or community-built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating the values, economies and ways of living of the cultures that produce them.\textsuperscript{12}

The first part of this chapter is a brief survey of Philippine vernacular architecture as evident in the mountainous regions (Cordillera architecture) and in the lowlands (bahay kubo). The formal and spatial qualities of these dwellings are analysed, exhibiting how function, local materials and construction methodologies answer the needs of these societies. This survey, also, aims to provide insights on the culture of the Philippines.\textsuperscript{13}

The second part of this chapter, called \textit{Lessons from Philippine Architecture}, presents pragmatic and formal findings from the survey. The formal findings—Clarity of Form, Floating Volume, and Space within a Space—include conceptual sketches/interpretations that can be applied in the design research.

The third part and last part of this chapter is the precedent study. Contemporary architecture in the country, designed by local and foreign architects, are analysed to further derive informants of the design. The precedents are chosen based on their sensitivity to the Filipino context and culture, as evident in their planning, function, material use, and environmental considerations. They are also chosen based on their aesthetic quality and how they satisfy (or further inform) the three discussed points in \textit{Lessons from Philippine Architecture}.

\textsuperscript{11} Lico, \textit{Arkitekturang Filipino}, preface.


\textsuperscript{13} Merriam-Webster defines culture as “the customary beliefs, social forms, and material traits of a racial, religious, or social group.”
Survey of Philippine Architecture: Cordillera Architecture

William Henry Scott’s “Cordillera Architecture of Northern Luzon” provided a masterly study of the dwellings of the mountainous groups in the Philippines, which have been around even before the Spanish colonisation.

The cordillera Scott was referring to is the landlocked and mountainous region in Luzon, now called the Cordillera Administrative Region and is composed of six provinces: Abra, Apayao, Benguet, Ifugao, Kalinga and Mountain Province.

Due to the mountainous and rugged terrain, a flat and grounded foundation was difficult to achieve. The solution was a pile construction that raised the main floor above the uneven ground surface. The piles were usually made of round logs 8-12 inches wide and were then buried about 2-3 feet into the ground. The massive posts either support the house cage, or the roof, or both.

Scott divided these dwellings into two strains- the northern (Isneg and Lower Kalinga houses) and the southern (Ifugao, Bontoc, Kankanay houses). His classification was not only based on the geographical demarcation of the region, but also showcased two main types of construction methodology.

Fig.10: Watercolor painting of an Ifugao woman by author, 2010

Fig.11: Map of the Mountain Province and Cordillera Central Region of Northern Luzon.
The northern strain was characterised by gabled roofs (usually the form of an inverted boat); three section, two level floor; and 2 sets of posts structure- one to support the roof, the other to support the floor. The prime example of this strain was the Isneg house which was mostly found in the province of Apayao.

The Isneg were slash-and-burn cultivators in the province of Apayao. Their agricultural technique meant that they practiced shifting cultivation, where they temporarily farm a land, then moving to a next land and abandoning the previous land for it to return to its natural vegetation. Their main staple was rice, which they abundantly produced; they also grew yams, taro sweet potatoes, tobacco, etc. Their agricultural cycle was guided by religious rituals and prayers to the 300 plus spirits they worship. They relied on omens that signal the start of specific activities related to swidden farming, such as clearing, planting and harvesting.14

The Isneg society did not have a unifying political authority governing all Isneg communities; they were rather concentrated in small autonomous villages living along the large rivers in the province. They engaged in small-scale ambushes, but not full-blown tribal wars. The Isneg, however, gained a notorious reputation for being head-hunters.

They had a traditional family and division of labor based on physical strength and gender was applied. The husband was involved in clearing the land, hunting, and defending the village; the wife reared children, prepared meals, and harvested rice. Living with extended family was normal. Also, the society permitted the husband to have multiple wives, but not the other way around.

Isneg architecture was mainly characterised by its boatlike design, particularly through its roof that implied an inverted hull. This can be attributed to the fact that their settlements were usually along the major rivers in the region.

The Isneg house, called the binuron, had an elongated floor plan, elevated from the ground by about 1.2 meters and supported by 15 wooden piles. It was a one-room dwelling, capable of accommodating multiple families. With measurements of 8 meters long, 4 meters wide, and 5.5 meters from ground to gabled roof ridge, it was considered as “the largest and among the most substantially constructed houses in the Cordilleras.” It utilised a post-bearer type of construction; next to the main floor joists were 30 cm wide benches elevated from the joist by about 10-15 cms.

There were two sets of posts in the house: the inner posts called sinit, which support the joist and the inner edge of the bench; and the outer posts called adixi, which support the roof and outer edge of the bench, resulting to “a house within a house or a space within a space.” This construction may seem redundant structurally, but it allowed flexibility of floor space.

The roof was gabled and bent like an inverted boat. As the rafters are bent into a shape like a Gothic arch, transverse bracing above the chambers were necessary—called pantud if vertical, sokar if horizontal. Because the roof and the floor are supported by different structures, the wall, called dindin, acted as a curtain wall. The roof, usually with a layer of thatch over, was constructed by interlocking bamboos. The bamboos were split into two and are placed over the rafters “in an alternating face-down-face-up arrangement, their sides interlocking together.” The arrangement created a wavelike structure that proved pivotal in keeping the room below weathertight.

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16 Lico, Arkitekturang Filipino, 36.
17 Klassen, Architecture in the Philippines, 39.
18 Ibid.
19 See note 13.

Fig 14: Section of an Isneg house, figures added for scale.
The southern strain was characterised by hip roof (pyramidal or conical) and having three levels of structures: the floor structure which supported the box cage, the box cage dwelling which supported the roof, and the roof was covered up until below the floor structure. A prime example of this strain was the Ifugao house which was mostly found in the province of Ifugao.

The Ifugao were known for their rice terraces. Carved out more than 2,000 years ago, the terraces were massive, with towering walls, and utilised a skilfully devised irrigation system. The Ifugao province was also one of the least influenced by the Spanish in the whole Philippine archipelago, enabling them to retain their culture, which valued kinship, family ties, religious and cultural beliefs.20

Their society was much more organised and their “social status was measured by the number of rice field granaries, family heirlooms, gold earrings, carabaos (water buffaloes), as well as, prestige conferred through time and tradition.”21 They had a legal system and an oral custom law; any other offences went through trials by the elders or by ordeal. Fines were paid upon offenses, with the wealthy subjected to greater fines than the poor.22

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21 Ibid.
22 Ibid.
Ifugao villages were located amid the rice terraces and were usually composed of twelve to thirty houses. They were usually located near springs and groves and were accessible through footpaths on the terrace walls. It was not uncommon to see single houses on the crests of hills or mountains. Village terraces were classified as center (for the wealthy inhabitants), border (lower, near the pond fields), and upper (near the mountain slopes). The arrangement of the dwellings related to the contour of the terrace where they were located. They may be in a row, spaced out, or clustered around an open space. The types of Ifugao dwellings depended on the social class of the residents: the rich lived in the fale, the poor lived in the abong, and there were also the communal houses for the unmarried boys, girls, and the elderly.

Fig.17: Photograph of an Ifugao fale.

Fig.18: Photograph of Ifugao fale scale model.

Fig.19: Ifugao village.
The Ifugao house was a three-level structure. The first level (daulon) was the space under the house consisting of the stone pavements, whose perimeter coincided with the edge of the eaves, posts, and bearers. The daulon was used as a place for weaving, carving, entertaining visitors, and other household tasks. It was also used as a social and cultural space, providing areas for weddings, wakes, and other religious rites and celebrations. A wooden cylindrical disk, called halipan, was placed on the four posts and was used to prevent rats from entering the house. The Ifugao house had these four posts onto which bearers are attached, which then supported three floor beams.

The second level consisted of the house cage- framing studs, floor joists, and walls. The space was typically a 4m x 4m square, although the size depended on family’s socio-economic status. It was primarily used as the family’s living room, bedroom and kitchen. The house was only used by the couple and their youngest child. The moment the child reaches a certain age, they sleep in the communal dormitories. The walls were about 12 mm thick, with shelves (patye) built on the sides from the wall header to the roof where household belonging were stored. The fale had a movable door (panto) hanged to a rattan vine. It was accessible by a wooden or bamboo ladder (tete) which was pulled inside at night for safety purposes. The fale had no windows, only a front door and a back door. Ventilation was achieved by having the first floor on stilts. A hearth was located on the right-hand corner of the house, and the heat and smoke rose up to an apex in the roof (where smoke escapes).

The third level was the roof structure, which was a steeply pitched hut made of hand-hewn timber and loosely thatched grass. The thatch was quite thick, thus providing insulation against the cold climate. This roof space also acted as an attic (pallah) where rice was stored on roof beams that were lined with stick mat (atag).

Fig.20: Section of an Ifugao house, figures added for scale.
Engineering principles, or vernacular ingenuity, can also be seen in the Ifugao house. It was constructed with precision, as the Ifugao have developed their own system of measurement relating to the parts of the body. They applied mortise and tenon and rabbetting in their construction. For members that cannot be connected by those, they used tying and pegging, using small woods as pegs and vines for tying. At the bottom of the hole where posts are to be erected, a flat stone was firmly positioned, which prevented the posts from sinking into the ground in case the soil was soft. The roots of the posts were also truncated outwardly, to further clamp into the ground. The stones in each hole also “acted as a roller which enabled the posts to move” during earthquakes.

Ornaments, resulting from various social, religious and political events, were also placed on the house.

Fig.21: Details of the Ifugao House.

Fig.22: Structural Frame of the Ifugao House.

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From the basic cubic form, additional posts are added to expand the area and include an additional room. Klassen describes the interior arrangement of a typical bahay kubo:

[the] dwellings have two rooms- the sala (combination living and dining room and bedroom) and the kitchen (kocina). The kitchen is an integral part of the house and not separated from the main house, as it is in most of the lowland houses of the north. Many residences have a third room, and a combined sleeping and storage room (sulod)."\(^{26}\)

It is mainly constructed from various materials: wood, rattan, cane, bamboo, anahaw, nipa, bark, or cogon. Nipa is a widely used material. One thing that can be noted in the bahay kubo construction is that the lumber is not converted into hewn timber. The curves and irregularities of the lumber remain and it is usually not possible to use carpentry skills such as rabbeting, grooving, etc. They are usually tied by strong organic ligaments, such as vines or rattan strings.

An extensive study of the Cebuano dwelling in Caticugan, Negros Oriental written by anthropologist Dr Donn V Hart discusses the quintessential dwelling typical in the lowlands, called the bahay kubo or nipa hut. On the bahay kubo, Klassen notes:

What impressed the first European writer and keen observer was, that the dwellings were made of wood, raised from the ground, entered by a ladder with a place underneath for the animals all characteristics quite different from contemporary European houses. But the interior which had “rooms like ours” may furnish some evidence for the opinion that it was not the Spaniards who introduced the partitioning of the Filipino houses into various rooms. That was apparently already done when the Spaniards arrived.\(^{24}\)

Structurally, the bahay kubo is on stilts that are usually 1 to 2 m from the ground. The bearers are lashed onto the posts, supporting the joists, which in turn hold up the slatted floor. The slatted floor allows for ventilation and easy cleaning, since the dirt just falls directly to the ground. Klassen notes its effectiveness:

One of the most efficient parts of the raised Filipino house is its floor construction. There is no better way for ventilating a dwelling space in a hot and humid climate than through gaps in the raised floorings.\(^{25}\)

Typically of cubed form, the four posts from the ground either go directly to the roof, or additional posts are lashed onto the ground posts. The roof is supported by four-corner rafters and two rows of minor rafters that carry a ridgepole. The rafters are covered by purlins and on which the nipa roof shingles are placed.

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25 Ibid., 57.
26 Ibid., 47.
Fig. 25: Bamboo nipa hut.
Fig. 26: Exterior of a Caticugan Dwelling, Negros Oriental.

Fig. 27: Foundation details for bamboo house posts.

Fig. 28: Nilopit walling details.

Fig. 29: Bahay Kubo Roof details.

A- haligi (ground post)
B- bangon (girder)
C- hanlag (floor joists)
D- balakanan (sill)
E- patobo (wall posts)
F- kondaco (corner wall posts)
G- sira or takop (window)
H- salog (floor)
I- brandilla (railing)
J- fenensa (lattice wall)
K- hagdanan (entrance ladder)
L- layang-layang (end rafter)
M- bongbong (outer ridgepole)
N- da-og (ridge rafter)
O- atop (nipa roofing)
P- silik (roof ridge)
Q- sandayong (roof valley)

A- patobo (wall post)
B- balakanan (wall sill)
C- logpit (horizontal stiffener)
D- iligan (vertical stiffener)
E- rattan lashing
F- nipa leaflets

A- katsu (roof rafter)
B- paluron (roof laths)
C- rattan lashing
D- buri midrib
E- nipa shingles
F- katsu (end rafter)
G- rattan lashing for end shingles
Lessons from Philippine Architecture

The lessons from Philippine vernacular architecture can be divided into two: pattern language (pragmatic) and form language (aesthetics). Klassen notes the importance of vernacular study:

Going back to the roots of architectural design and construction in primitive architecture can be informative for both the practical designing and building process, and the theoretical considerations as the underpinnings on which design decisions are based. 27

The first lesson on Philippine vernacular architecture is that it is functional and environmentally sensible. The examples answered cultural issues, particularly dealing with jobs, economy, social norms, family life, rituals etc. Filipino Architect Leonardo Concepcion states:

The basic form of architecture in the Philippines before the Spanish came was governed by two things: by the building’s functional use as shelter, and by the kinds of material available. We could call it a sort of handicraft architecture, because the builders have no formal training in the basic form of design. And yet, they were able to create something which is valid, something which was- and is- functional, a style that exists to this day.” 28

The agriculture-centred way of life in the Cordilleras means that their dwellings must include storage spaces or granaries. Their slash and burn lifestyle connotes continuous movement: their architecture is centred on dwellings that are easily built and replicated. The social norms, such as separation of parents to young adults in Ifugao, dictate the size of their dwellings. Importance of the community activities are seen in the provided public spaces; while the importance of privacy is seen in the separation of the main household to public spaces. Rituals and religion are shown in the decorations embedded in the houses, and how the natural environment is used as ritual spaces.

Environmental sensibility is reflected on the materials and construction methodologies. The overhanging roofs made of thick thatch in the Ifugao fale provide insulation against the cold climate. Materials are all dependent on what is available and accessible. The pile system used in the Cordilleras is suitable for the rugged mountain terrace. The lowland houses, also on stilts and with slatted floors, promote natural ventilation in the humid climate. Klassen notes the relevance of the Filipino raised floor construction: “The ‘window to the ground,’ as the floor area is sometimes called, could also serve as a starting point for contemporary design.” 29

29 See note 24.
The second lesson deals with aesthetic and formal issues, such as the geometric arrangement of shapes, volume, and masses. Clarity of form, floating volume, and space within a space are the three formal concepts that are derived from the discussed examples of Philippine vernacular architecture.

The vernacular dwellings, particularly in the Cordilleras, are clearly defined compared to its context. In contrast with the natural environment of tall trees and rugged contour, their structures have formal clarity, separating itself from its context. This is evident in the overhanging eaves of the roof structure that almost cover the entire Ifugao house. Klassen describes this elevated volume as coming “very close to one of the primary shapes Le Corbusier spoke of, namely the pyramid.”

This basic and primal form, the pyramid, is evident in the history of architecture from past to present. Clarity of form is also evident in the Isneg house, whose roof structure is a strong resemblance of a boat hull. Perhaps it is homage to the boat and their seafaring culture; perhaps the boat is the only structure they know how to masterly build and they have replicated this way of building in their houses. Lico notes:

Significantly, for many Austronesian peoples, the house is much more than simply a dwelling place. Rather, it is a symbolically ordered structure in which a number of key ideas and cultural concerns may be represented. Thus, the Austronesian house may variously be seen as a scared representation of the ancestors, a physical embodiment of group identities, a cosmological model of the universe, and an expression of rank and status.

Klassen, Architecture in the Philippines, 41.
Contemporary example of the pyramid form is I.M. Pei’s Louvre Pyramid in Paris, France, completed in 1989.
Lico, Arkitekturang Filipino, 25.
Floating volume is another design concept observed from the discussed structures. Although varying in form, style, or construction methodology, the stilt construction is generally observed. The mass rests on minimum four posts, raising the volume from the ground and giving it a floating illusion. Klassen notes:

Vernacular residential architecture in the Philippines certainly shows the regional differences in from construction and meanings. But there are certain features that they have in common which are distinctively Filipino... first, the overall configuration of the Filipino house... as a “floating volume” raised above the ground.  

The volume of the house is much more emphasized by the pitched roof system, oftentimes with extended ridges and overhangs. The voluminous thatch roof is what Lico notes as “the most distinctive feature of the Austronesian vernacular architectural form”. Such as the case of the Ifugao house, whose house cage is covered entirely of the steep pyramid thatch.

Fig.31: Floating volume interpretation

See note 24.
Space within a Space is another design concept observed. It is primarily seen in the two set of post structures in the Isneg house, where a set of post holds the roof and another set holds the floor structure. Although its structural redundancy is questionable, what can be noted is how the roof serves as an overarching element dictating the size, form and spatial quality of the space underneath.

Looking at the lowland bahay kubo, the division of space is also noticeable. There is an internal arrangement of multi-purpose rooms. While it is not an entirely new concept, what can be noted is that issues of privacy/public use are reflected on the formal planning of the vernacular dwellings. Klassen notes:

One other characteristic ... is the “building within a building” principle or “space within a space” concept used ... As a design principle it is again a combination of the old and new ... explores the idea of a little house within a big house which can be found realised in small Japanese temples as well as in the aedicules of the Gothic architecture.⁴
Precedent Studies

Fig. 33: Leandro Locsin - Tanghalang Maria Makiling
Los Baños, Laguna, 1976

Fig. 34: Leandro Locsin - Philippine Pavilion
Osaka, Japan, 1970

Fig. 35: Sir Ian Athfield - Low-cost Housing Competition
Dagat-dagatan, Manila, 1975-1976 (Unbuilt)

Fig. 36: WORKSHOP - Study Center in Tacloban
Tacloban City, Leyte, 2010-2011
Leandro Locsin: Filipino Architect

Leandro Locsin is one of the most distinguished architects in the Philippines. Born in August 15, 1928, in Silay, Negros Occidental, Locsin moved to Manila to first study music in the University of Santo Tomas. Two years later, he shifted to study architecture in the same university. He then worked as a draftsman for Ayala & Company before embarking on his own as an architect. He received his first big break when he designed the University of the Philippines Chapel. He is one of the household names in Philippine architecture, having designed 33 public buildings, 75 commercial buildings, 6 hotels, 13 churches, more than 100 residences, etc. In 1990, he was awarded the National Artist of the Philippines for Architecture.

Locsin’s designs are monumental and usually made of concrete, but retain a buoyant quality. Klassen notes that “Locsin considered the floating quality a predominantly Filipino feature, expressed very convincingly in the country’s primary product of vernacular architecture, the nipa hut.” His buildings are also simplistic and geometrically straightforward, perhaps as homage to the vernacular tradition.

His works exemplify an amalgam of art and architecture during the time when Filipino architects “prided themselves in also being structural engineers … to convince their clients that they could do better and better-integrated job, for less money.” His works are deeply rooted in capturing the Filipino soul in architecture and incorporating vernacular influences in contemporary designs. Klassen states in his discussion of Philippine contemporary architecture that “if there is “Philippineness” in Locsin’s architecture, I believe it is this, a successful translation of a fundamentally native architectural feature into present-day buildings.”

35 Now known as Ayala Corporation, and one of the country’s largest conglomerate with investments in real estate, retail, banking, etc.
37 Further studies on the bipolarity of Locsin’s architecture can be seen from the postgraduate research done in the University of Tokyo, Japan. The paper involved a formal and spatial analysis of Locsin’s buildings, mostly done through the author’s site visits. It concluded by stating 4 manifestations of bipolarity: floating effect, grounded flight, enclosed openness, and alternation of opposite spatial characters. Only floating effect was discussed in this research for brevity. Caryn Paredes-Santillan, “A Study on Bipolarity in the Architecture of Leandro V. Locsin,” Journal of Asian Architecture and Building Engineering, vol. 8 (2009), 1-8. http://doi.org/10.3130/jaabe.8.1
38 Klassen, Architecture in the Philippines, 193.
39 Ibid, 199.
40 Ibid., 200.
The National Arts Center is a hub for aspiring young artists, composed of a secondary school, boarding house, cottages, etc. It is facilitated by the Cultural Centre of the Philippines and built on Mount Makiling in Los Baños, Laguna in 1976.

The square theatre, called Tanghalang Mariang Makiling, was designed by Locsin to be used as a performance space for the students and other artists. Eight concrete angled posts lift the massive, triangular roof from the ground. Being an open-air theatre, the posts are located on the outer ends of each side, creating a void in the middle. This construction highlights a floating quality, similar in Locsin’s other works. The triangular volume can also be seen as a man-made mountain peak, in contrast to the flattened mountainous site.

The red roof contrasts the white washed concrete. The gap between the concrete and the roof also separates the parts from each other. The design powerfully uses lines, not only to demarcate parts, but acts as a form of visual redirection. This is also evident in the gaps and lines on the angled posts.

Leandro Locsin: Tanghalang Mariang Makiling
Los Baños, Laguna, 1976

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Leandro Locsin: Philippine Pavilion,
Osaka, Japan, 1970

The 1970 Osaka Exposition in Japan had its theme as “Progress and Harmony for Mankind”. The interior layout is simple and well-suited for its programme, being composed of two open planned levels. What makes its enticing is its form, brought by a dramatic roof. In his book on Locsin, Nicolas Polites states that:

The dramatic roof sweeping up from the ground was intended to express the soaring prospects and future-oriented outlook of the Filipino people. The architectural message was that although Philippines is a young and developing country, it has a progressive spirit.\(^4\)

The formal characteristic of the pavilion shows the floating quality of Locsin’s building. It is not only achieved by the roof’s upward sweep, but also by the wide overhangs and the shadow it casts against the wall. Contrast in materiality, shown by the solid roof over glass curtain wall, also adds to this quality. Lastly, the pattern of the Narra, a Philippine hardwood, on the ceiling directs the observers’ eyes into the apex.

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Sir Ian Athfield: Low-Cost Housing Competition (First Prize)
Dagat-dagatan, Manila, 1975-1976 (Unbuilt)

In the 1970s, the Philippine government organised a competition for resettling of about 170,000 squatters cramped in an area less than 500 acres in Tondo, Manila to a nearby site, Dagat-dagatan, Manila. Implementation and actual construction, although supposedly backed financially by the World Bank, did not push through.

New Zealand architect Ian Athfield’s winning design shows an answer that not only features functional housing schemes arranged in an aesthetically pleasing manner, but also “recognizes the squatters’ need for a workplace” and community involvement. The design is focused on self-sufficiency and resilience by addressing the beyond-shelter needs of the neighbourhood. This is achieved by dividing the site into barangays, which has a primary meeting place composed of the barangay hall, elementary school, health centre, church, amphitheatre, and a local-energy centre. The barangays are further divided into housing zones (purok) that are orientated around the barangay meeting place. The purok consists of dwellings that are centred on a basketball court/meeting place and a sari-sari store (local dairy).

Athfield’s design recognises Philippines’ smallest political and administrative unit and its social relevance. The meeting place and its constituent buildings—church, school, hall—physically act as the pivot of the community. The masterplan shows the importance of a community hub, both in the barangay level and purok level, which are manifested through provision of buildings programmes or open spaces.

As a housing design competition, much emphasis is given on the proposed dwellings. The houses are designed to be simple and flexible enough to allow for development “as a result of continuing dialogue between the owner, neighbours and an advisory design team.” They are also intended to be built by the users and configured depending on the user’s needs. The houses are on stilts, to be made of just four poles and a roof, for ease of construction. They are arranged around a central courtyard where amenities, such as shower and kitchen, are located and can be shared with other household units. Sharing of furniture (such as refrigerators, television sets, etc) is encouraged as it shows cooperation in the neighbourhood.

The spatial layout of the dwellings presents an understanding between public and private spaces, multi-purpose uses, and shared facilities. Inclusion of courtyards shows the importance of open spaces, which can be emulated in this design research. Another item worth noting is the use of local material, easily sourced and replaced. The innovation in material use appeals to the vernacular tradition. The Coconut tree and its constituent parts were used throughout the design, given its abundance in the country. The timber will be used for framing, boards, joinery and furniture. The walls and roofs will use coconut sawdust plaster on expanded metal mesh.

Fig.43: Athfield’s design model.

43 Ibid., 84.
Fig.44: Plans and sections of different housing units.

Fig.45: Design Competition Masterplan.

Fig.46: Section through Barangay Center.
WORKSHOP: Study Center in Tacloban
Tacloban City, Leyte, 2010-2011

In 2010, Ivar Tutturen, Trond Hegvold and Alexander E. Furunes (students at the university NTNU in Norway) built a study centre in collaboration with local NGO Streetlight. The organisation has been working with the community of the seawall slum in Tacloban city in keeping the children off the streets and in schools.

The primary aim of the project is to use architecture as a means of empowering the parents to improve the learning conditions of their children. The process involves having various workshops, games and testing on site with the end-users. The families are an essential part of the centre’s architecture—children participated in design workshops, mothers are responsible for design and building of the school’s interior, and fathers are employed to construct the building itself. The project promotes community building and the Filipino concept of bayanihan, which refers to cooperation in the society. As per GR Ang:

Bayanihan is an indigenous Filipino trait … As anthropologists stress, bayanihan is a practical response to both individual and community needs which, under certain circumstances, would be difficult to achieve if people with meagre means did not organize themselves and pool together their resources.

The structure has a relatively simple rectangular form. It has bi-fold/sliding doors, fronting to the sea on the north and solid walls with smaller windows on the south. It has a large mono-pitched roof that allows for a mezzanine space to be created.

It has a concrete foundation wall that is about a metre high. Timber structures are then used throughout. It uses bamboo for doors and windows, and banig (hand woven mats) for walls. The materials were sourced from surrounding areas to strengthen local business. The bamboo, wooden screens, and louvres allow natural light and ventilation into the space. Timber was left as it is and is not painted, allowing for a more natural aesthetics.

The layout allows for multiple functions; it can actually be considered as a multi-purpose hall. Its simplicity and choice of material also add to its aesthetic value. The design shows high sensitivity to its context as evident in its pragmatic and formal design. Its seaside location is incorporated by having large bi-fold doors that allow extensive vista of the water. Cross ventilation is encouraged by the timber screens, while the wide overhangs provide shading from the sun and rain protection. Materials local to the context are used, instead of injecting foreign supplies in the design and construction.

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Fig. 48: Plan.

Fig. 49: Front view.

Fig. 50: Entry.

Fig. 51: Mezzanine learning space.

Fig. 52: Bi-fold doors opening to the sea, using timber and bamboo materials.
Typhoon Bopha and Barangay Andap:
The Problem
Natural Disasters and Philippines

Philippines

Around 19 tropical cyclones/typhoons enter the Philippine area of responsibility yearly due to its location in the Pacific Ring of Fire. The disaster risk is further aggravated by the socio-cultural challenges the country experiences such as “poverty, ethnic and religious conflicts and other social problems.”

Although these challenges are not unusual, being the twelfth most populous country in the world with more than 100 million people and rapidly growing, aggravates the situation. UNICEF states that the intensity of these disasters “is felt by 27.6 million Filipinos who are among the poorest and marginalised [as] they are often trapped in a seemingly never-ending cycle of disaster, displacement and rebuilding.”

The Philippines is an archipelago in South East Asia, located in the western Pacific Ocean and bordered Taiwan to its north, Vietnam to its west, Indonesia to its South, and the island-nation of Palau to its East. It consists of 7,107 islands that are categorised under three main geographical divisions: Luzon on the north, where the capital Manila is located; Visayas, the group of islands on the middle; Mindanao and on the South.

Being located on the equator, the Philippines has a tropical climate that is usually hot and humid, with the temperature ranging from 21°C to 32°C. There are three seasons: tag-init (summer, from March to May), tag-ulan, rainy (June to November) and tag-lamig (cool dry, from December to February). The two trade winds prevailing in the Philippines are called Amihan (north easterly) and Habagat (south westerly). Amihan brings cool breeze and no rain. Habagat brings humidity and frequent rain fall. From July to October, Philippines experience torrential rain and thunderstorms.

Its location on the Pacific Ring of Fire and proximity to the equator makes it susceptible to a number of earthquakes and typhoons. A CNN report on the disaster-proneness of the country states:

The Philippines is covered in mountains, which drop sharply to coastal areas, increasing the risk of devastating landslides. Storm surges are also a risk along the populated coasts. Despite the frequency of violent storms, many of the buildings are not built to withstand a heavy battering from strong wind and rain. Over the last decade, the Philippines has consistently ranked in the top five most disaster-hit countries -- along with China, the United States, India and Indonesia -- according to the Center for Research on the Epidemiology of Disasters, or CRED.

Disaster: Key Information

The International Federation of Red Cross and Red Crescent Societies defines a disaster as “a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community’s or society’s ability to cope using its own resources.” It is best explained by the following equation:

\[
\frac{(VULNERABILITY + HAZARD)}{SOCIETAL \ CAPACITY} = DISASTER
\]

Hazard is defined as a threat, which refers to both man-made ie war, industrial accidents, and natural events ie typhoon, earthquake, flooding. Vulnerability is a concept developed by anthropologists, geographers, and disaster specialists, which talks about “various physical, social, economic and environmental factors that lead a community to a certain level of weakness such that a

\[46\]


\[47\]


\[48\]


\[49\]


\[50\]

Ibid.
hazard leads to a level of destruction from which the community cannot recover without external intervention.”
Societal capacity refers to the policies and programmes in the community that are made to reduce both vulnerability and the hazard's damaging potential. It also relates to a society’s access to resources such as infrastructure, housing, employment, education, information, etc. This definition explains why recovery periods differ for each society, with disaster risk more magnified in least developed economies.

**Disaster Management Phase**

The United Nations Office for the Coordination of Humanitarian Affairs identifies the four phases in disaster management cycle: preparedness, response, recovery and mitigation. Preparedness involves the readiness against disasters, such as warnings and evacuations. When a disaster hits an area, response is the next step, concentrating on saving lives and giving provisions that are focused on safe and sanitary conditions. This response operation involves construction of temporary evacuation centres and can last for several months. The next part is the recovery, during which rebuilding, rehabilitation and reconstruction occur with the main objective of self-sufficiency and a resilient community. This is also tied up with the last phase, mitigation, where programmes aimed for reducing vulnerabilities are conducted as training for another disaster impact.

**Rehabilitation to Resilience**

These definitions lead to questioning the roles of recovery and mitigation, and what it actually does for the society. Lizzaralde et al reckons that the process of reconstruction is actually for “improving people’s access to resources that have been lost and developing access to the basic resources that people probably did not have even before the disaster.” Recovery and mitigation can be seen not only as reconnection to what was lost, but also as opening new opportunities for the community. It acts as a bridge towards restoration and progress; while encouraging the community and incorporating risk reduction programmes and policies.

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53 Lizzaralde, Rebuilding after Disasters, 5.
Barangay Andap, New Bataan Compostela Valley

Before Disaster

The chosen site is located in Barangay Andap, New Bataan, Compostela Valley. It has a total land area of 55,315 hectares, where at least 50% is covered by natural forestry. Geographically, New Bataan is within the Augusan-Davao basin, meaning it has sloping, rolling and mountainous areas. It has several bodies of water which flows from the mountain ranges, into the deep.

Barangay Andap is one of the largest barangays in the municipality. It encompasses the steep hills and mountain ranges on the south of New Bataan, bordering the Municipality of Maragusan. To its north is the town area, where the Municipal Hall of New Bataan is located. National highways and provincial roads pass through the flat middle portion between mountain ranges. Mayo River flows from the mountain parallel with the national road and crosses the barangay at one point. Barangay Andap is a remote village, mostly covered by secondary growth forest. Mount Pandadagsaan, one of the highest mountains in the Philippines, is located in Barangay Andap. The lowlying areas are covered with fruit bearing trees, such as coconuts, bananas, bamboo, etc.

Dwellings in the barangay are clustered and scattered along the national highway. Single houses are also common. From the paved national highway, there are gravelled access roads to get into the interior sitios/puroks, where there are more clusters of houses or agricultural fields. Entrance to the barangay area is marked by a sign on the side of the road. Prominent structures along the highway include the barangay centre, chapel, local elementary school, local high school and a private resort. The barangay centre has the barangay hall, COOP building, barangay pharmacy, barangay stage, and the covered court. Based on 2010 census, Barangay Andap has a population of 7,550 and total of 1,574 households.

Typhoon Bopha

The municipality of New Bataan is under the Type IV Climate condition, which means that rainfall is more or less evenly distributed throughout the year and with no pronounced dry season. The Mindanao region is not generally hit by typhoon as it has the same latitude as the Marianas and Caroline Islands of the Pacific Ocean, where typhoons usually originate. The typhoons then follow a north-westerly direction, thus sparing the region.

However, Mindanao was hit in 2012 by typhoon Bopha, with winds travelling at 260 km per hour. It affected 6.2 million people- displacing 925,412, killing 1,146, and with 834 missing. About 233,163 houses were totally or partially damaged, costing the country about $1 billion in damages.

Compostela Valley is one of the most devastated provinces: with 710,199 people affected, 651 deaths, 488 injured and 428 missing. New Bataan has the most deaths in province; and out “of the 16 barangays of New Bataan, Barangay Andap suffered the most from the typhoon.” The torrential rain and the debris flow left 70 dead, 63 injured, and 281 missing. The entire barangay was almost wiped away, fully damaging properties, destroying crops and agriculture, leaving behind only debris, rocks, and mud deposits. OCHA reports that the
barangay is “buried under 25-30 million cubic meters of rock debris from avalanches. Stretching for 13km and with a depth of up to 9m, it will require an estimated three million dump trucks to move rubble.”

According to official government reports, the debris flow is “climatological in nature” and is triggered by the excessive rain on the headwaters of Mayo River. Instead of following the natural course of the river, the construction of a bridge at Sitio Pagsilaan resulted in water diversion towards the barangay centre. Aside from being located on the foot of the mountain ranges, the flash flooding is also attributed to “high drainage density, steep slopes, thin soil cover in the headwaters, high surface run-off, geology of the area nature of river channel and the improper construction of waterways, roads and bridges along active river channel.”

**After Disaster: Temporary Relief**

The survivors of typhoon are moved to tent evacuation sites on a plateau near their original residence. Even though the site is supposed to be temporary and only for six months, they stayed there for more than a year. This research originally looked at these tent evacuation sites and proposed to develop a community building, in the form of the barangay hall, with the intention of making the evacuation centre an official community. However, further research on disaster management shows the original proposal not feasible. Land ownership, subdivision, infrastructure, political administration, and funding are real issues that cannot be dismissed.

**After Disaster: Recovery and Permanent Rehabilitation**

Four years on since the typhoon, Barangay Andap is still in the recovery stage. Community resilience is an important factor to be considered, both socially and architecturally, given that the barangay’s location at the foot of the mountain ranges suggests that such disaster is likely to be repeated.

The final handbook of Typhoon Bopha Humanitarian work in Compostela Valley by OCHA identifies the four cluster of developments done after Typhoon Bopha- Livelihood, Social Services, Resettlement and Infrastructure. Livelihood focuses on the programmes currently being implemented to train, upskill, and provide a source of income for the inhabitants, such as cash for work programs and seed distribution to farmers. Social services deals with health, nutrition, food, protection, and education.

Resettlement focuses on shelter rebuilding in the barangay and in neighbouring towns. Although government agencies declared some parts of the barangay to be a “no build zone” and for people to be evacuated to different parts of the municipality, many have still returned to rebuild the devastated village. OCHA states that “out of the 31,713 totally damaged houses, there have been 1,644 interventions from the government and NGOs.”

Infrastructure, debris clearance, road rehabilitation and bridge reconstruction are prioritised; rebuilding of school buildings, health facilities and other government structures are still on going. The local chapel, which was fully devastated by the typhoon, has been rebuilt with an entirely new facade. A monument called Andap ng Liwanag, meaning shimmer of light, is installed next to chapel as a remembrance to the people who perished in the typhoon.

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63 See note 51.
65 Ibid.
66 UN Office for the Coordination of Humanitarian Affairs Philippines, Typhoon Bopha (Pablo) Humanitarian Handbook Compostela Valley.
67 Ibid., 46.
Fig. 54: Chapel.
Fig. 55: Barangay Hall.
Fig. 56: Typical house.
Fig. 57: Entrance sign.
Fig. 58: Large boulders.
Fig. 59: Rocks covering the road.
Fig. 60: Debris flow.
Fig. 61: Tent schools.
Fig. 62: Chapel front view.
Fig. 63: Chapel.
Fig. 64: Temporary barangay hall.
Fig. 65: Temporary classroom.

Fig. 66: Temporary classroom.

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Fig. 78: Typhoon Bopha Memorial.
PART B RESPONSES
Design Process
Design Purpose

In any rehabilitation, one should not disregard man’s immediate social unit- his community. Perhaps we can say that in any disaster, the geographical community plays a more important role than man’s immediate genealogical ties. It can be that some of his relatives were badly affected, missing, or worse, have been killed. The next person he can depend on will be the neighbours, or friends, or acquaintances. Collectively, they can start physically rebuilding their lives and emotionally supporting each other, having once shared a life-changing event. The word “community” itself can be traced to the Latin word “communis”, referring to “things held in common”.

The barangay, both as a geographical and political unit in the Philippines, has an immense potential to be used in the aftermath of a natural disaster. It is mandated by law to be the forefront in any calamity, even providing preemptive evacuation beforehand. The barangay captain, kagawad, tanod, and other workers are tasked to provide immediate response, mobilise aids and services, and enact government policies. Even after disasters, they work on implementing risk reduction methods and vulnerabilities-reducing programmes.

On how architecture assists in community resilience, the barangay hall may provide some answers. Although it does not have a specific type or style and often a product of economy, there is a functional language and spatial requirements that can be translated. As discussed in chapter One, the barangay hall has formal characteristics that seem to be products of the economy. It can also be considered as vernacular- a product of local knowledge and easy buildability, albeit with “modern” materials that are not just thatch, timber, and stone.

In times of disasters, community-unifying ideologies are prevalent: solidarity, camaraderie, and national identity. This research project argues the opportunity reconstruction presents in fostering these ideas through the design of the barangay hall. Also, since this typology is a traditional/indigenous concept, it also serves as part of the country’s identity. To derive its formal characteristics from Philippine vernacular architecture is a plausible solution.

Design Programme

In light of the natural disaster, the project proposes a masterplan of a resilient barangay complex that fosters community rehabilitation. The barangay hall will be the focal point and the dominant public building. Following the site plan of a typical barangay hall discussed in chapter One, a local chapel and a primary school will be included in the design. Outdoor communal spaces, such as a basketball court and a central plaza will be added in the program. These spaces answer issues of governance, religion, and education that are usable before, after and during disasters. The barangay complex, as a public centre, aims to encourage among its inhabitants and act as a place of refuge in times of calamities.

Programme Requirements:
- Barangay Hall, catering to 15 staff
- Local Chapel, catering to 100-150 people
- Public Elementary School, catering to at least 500 people (students and staff)
- Open Spaces for barangay events- town fiesta
- Open Spaces for sports- basketball court
- Spaces for future expansion: market stalls, transport hub
Design Objectives/ Criteria

The design purpose emphasises the importance of community in developing community resilience. The design programme is initiated with the master-plan of a barangay complex and continued with the design of individual buildings. But how will the design be measured? What are the objectives and criteria used in judging the appropriateness of the design?

The research problem deals with three main issues: social/spatial response, environmental/disaster resilience, and national identity. The following objectives are set to satisfy these three issues:

**National Identity**

- Incorporate the concepts derived from the studies of Philippine vernacular architecture in the formal design of the buildings
- Utilise local materials and incorporate vernacular construction knowledge

**Social Response**

- A civic facility for community administration and governance that encourages access, liaison and communication between the public and government
- A Catholic chapel that provides for the religious needs of the community
- A public elementary school that incites play, creativity, and kinship
- A plaza/open space where daily interaction can occur as well as providing for community events
- Flexible and adaptable interior and exterior spaces, suitable for varying activities

**Environmental/ Disaster Resilience**

- Site and building planning that incorporates existing site condition of being covered with rocks and large boulders
- Security of facilities and their ability to withstand anticipated future disasters (landslides, flooding)
- Design suitable to a tropical climate, emphasising sun shading and rain protection
- Encourage ventilation and lessen heat retention in building form, details, and material choices
- Sustainable material choices—local, available, and easily sourced and replaced
- Water collection and recycling
Site Analysis

The chosen site is the existing Andap Elementary School, located on the east of the provincial road, which runs in the middle of Barangay Andap. The 160m x 66m rectangular site has a total area of 1.06 hectares. It has a gently sloping topography and an existing access road on the south. The site is centrally located in the barangay- the original barangay hall and local chapel are within 200m radius. Across it are dwellings; and further on the west is Mayo River.

The site used to have six rectangular primary school buildings, which were badly damaged by the Typhoon. It also used to be surrounded by coconut trees and the site itself used to have few mature trees in the middle. The trees were mostly destroyed by Typhoon Bopha; the green landscape now covered with rocks of varying sizes.

The site’s position is conducive in maximising ventilation, one of the main aspects to be considered in building in a tropical climate. The shorter ends of the rectangular site sits on the north-south axis and its longer ends on the east-west axis. As discussed in Chapter 3- Philippines, the two trade winds in the Philippines come from the east and the west. Further information on site locality is also explained in Chapter 3.
Fig. 77: Partial terrain map of Barangay Andap, highlighted is the barangay's center.

Fig. 78: Figure and ground of central Barangay Andap before the Typhoon. In red is the chapel and blue is the barangay hall. Highlighted in grey is the site, Andap Elementary School.
June solstice
December solstice
Northeast wind (Amihan)
Southwest wind (Habagat)
9am
12nn
3pm
5:27pm
5:44am
5:55 pm
Fig. 79: Site analysis, showing footprint before Typhoon Bopha, contours, connection with context (in blue), sun shading and prevailing winds

Fig. 80: Spatial relationship of the school buildings. Core open space occurs at the end of the site, surrounded by the buildings.

Fig. 81: Privacy/ separation/ buffer brought by trees at the front of the site. Access is directed by the paved road and restricted by the trees.
Fig. 82: Context cross section. Site is highlighted in yellow. Not to scale.

Fig. 83: Context long section. Site is highlighted in yellow. Not to scale.
5

Concept Design
**Masterplan**

**Programme and Public-Private Gradient**

Privacy gradient—from public to private—is applied on the site based on the programmes. Public areas are closer to the main road, while the other end of the rectangular site is a more private space. Overlaps in the gradient generate connection points that are considered as potential public gathering spaces in the site.

The barangay hall is placed closer to the road. As the main public building in the complex, it is required to exhibit visual prominence, sort of a symbolism to the barangay's values and aspirations. Also, being the forefront of emergency relief, it must be easily accessible from the any parts of the barangay. The chapel is located in the same public realm as the barangay hall, as it is another point of refuge of the largely Catholic population. The primary school is a relatively private program, with its occupants being mainly students and teachers. It is proposed to be located on the end of the site.

**Access and Axis**

Access into the civic centre is from the main road. Instead of providing gateways, this access is left unmarked, allowing for uninterrupted influx of users. It is designated to be a public open space, which acts like a buffer shielding the civic centre buildings from the residential area and the noise brought by the vehicle traffic on the main road. This buffer zone is tied up with the open spaces generated from the privacy gradients overlaps.

A linear axis is created, derived from the programme requirements privacy gradient overlaps. It is also highly influenced by the rectangular form of the site. The axis acts as the main thoroughfare, as one moves from the main road to the public school area. It is also envisioned to be a usable event space that can cater to different town activities, thus it is not delineated by landscape structures, but are left as open and multi-purpose as possible.
Building Outline and the Environment

A spatial diagram representing the programmes has been laid on site. The bubbles roughly indicate the size of the programmes and their connections with each other. These bubbles are roughly translated into long and narrow building form, which is most suitable in a tropical climate. They are positioned to run along the north-south axis and allowing for winds from the east and west to fully pass through the buildings. The buildings are laid out on the edges of the site, bounding the space and further emphasizing being “in” the civic centre. This also emphasizes the main axis/public open space.

Levels and Surface: Rocks, Green, Pavement

The main public open space is generated by determining the space contained by the Barangay Hall and the Chapel. This open space is paved, for ease of access and flexibility in use. The paving, however, does not fully cover the whole public space; it gradually bleeds into the public buffer zone, which is to be left covered with rocks and boulders brought by the typhoon. This “road-rock-pavement” gradient also allows the users to experience the development in the site, architecturally, through changes in surface.

Given the Barangay Hall’s importance as a civic space, it is elevated from the main public space. This creates a platform, which can be used for public gathering, and is placed in the middle of the site. Steps are allotted between the stage and the school’s threshold, further emphasising the latter’s privacy. The school’s central playground is grassed.
Buildings: Pragmatic

Function and Planning

The spatial layouts examined in the barangay hall and in the examples of Philippine vernacular architecture show functional flexibility. Each space is multi-purpose and are configured to answer to the programme’s needs, particularly in anticipated natural disasters. The same open plan sensibility will be applied in the building design, although there are some non-negotiables to be implemented. This approach can be likened to designating “served” and “servant” spaces, as popularised by architect Louis Kahn. Served spaces refer to the parts of the building that are continuously used; servant spaces contain elements that are briefly used and purely for the building to be sustained. The multi-purpose rooms are the served spaces, while the corridors connecting them are the servant spaces.

A bubble space diagram has drawn for each of the three building types, identifying the core/multi-purpose/ served spaces, and the non-negotiable/ servant spaces.

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Environmental Issues

The building form will be highly influenced by the tropical country’s environmental issues, such as continuous sun exposure, similar temperatures both day and night, heat and humidity, and strong monsoons. Translating these issues into architectural forms, the design must consider sun and rain shading and ventilation. Anticipating future flooding and landslides, it is also a must to raise the building platforms and/or have an upper floor level.

The following design guidelines are used in the design for the tropics:

• Long and narrow buildings orientated on east-west, allowing for easy passage of natural ventilation and using natural trade winds
• Shading masonry walls from the sun lessens its heat intake, which will be uncomfortable when released at night
• Raised platforms in preparation for flooding and also allows the ground to breathe
• Ground floor planning are projected sacrificial spaces, which will be buried under by flooding. Upper stories are to be provided.
• Maximising air movement- with hot air raising, it is important to provide ventilation in the roof space or at the upper wall
• Moveable louvres and screens allows continuous ventilation
• Pitched roof for ease of rain water movement; flat roofs must be avoided to eliminate drainage problems
• Wide eaves and overhangs for shading and rain protection will also encourage the outdoor experience
Buildings: Form

With regards to the proposed buildings, concerning their design mainly on a pragmatic approach, such as environmental sensibility and function before, during, and after any calamity, are inadequate as it does not provide justice to the rich heritage of Philippine society and architecture.

The barangay hall is a quintessential Filipino structure or a community space, one that has been around even before the country’s colonisation. To relate its architecture to Philippine vernacular architecture is highly acceptable. Opposite to the modernist abstraction of form, the design approach leans more on critical regionalism, where the geographical and cultural contexts play important roles in shaping its architecture. It does not necessarily mean using just native materials or traditional forms, as new materials and current building technologies will be applied.

The design of the barangay hall, chapel, and primary school will provide a linkage between the vernacular and the contemporary languages of architecture. It will incorporate the three lessons from Philippine Architecture discussed in Chapter Two—clarity of form, floating volume, and space within a space—all applied in the contemporary context. It is also an attempt in unfolding Filipino architecture. Guided by Klassen:

“If we are to arrive at an architecture which is truly Filipino, our architects must be able to express some aspects of our values and aspirations, of Filipino meanings through a significant architectural form. Native building materials and new ones can only modify this form. Secondly, this form can be derived from native motifs, shapes and patterns, but they must be sufficiently transformed into the abstract language of a new architecture; otherwise, they will only be facile imitations, and kitsch.”

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Clarity of Form

As evident in the Chapter Two, the roof is one of the formal drivers of Philippine vernacular architecture. A study of different roof forms show that breaking the roof volume highly affects its formal clarity. Flat and mono-pitched roof are subtle in providing form. Low and medium pitched roofs are better, but are still subtle in form giving. The most successful is the high pitched roof that is almost like a flattened pyramid. Its form is primal, basic, and instinctive, similar with studied examples of Philippine vernacular architecture.

Fig.97: Roof study to derive clarity of form
Floating Volume

The floating volume is achieved by elevating the building platform and putting the mass on stilts. Stilts allow ease in difficult terrain, and in the case of future typhoon, the elevation provides a place of refuge amidst water overflow.

The difference in stilt height has a great influence on floating volume. A combination of different heights will be used to provide texture and rhythm throughout.

Shade and shadow is an important aspect to be considered in achieving a floating volume. How far the stilts are from the building edge generate shading: too close to the edge will make the mass appear as one whole, too far renders the form looking unstable. Careful execution should be done when intertwining the stilts heights with shade and shadow.
Space within a Space: Repetition and Rhythm

This formal characteristic can be seen in the internal planning of each building. It is evident in the division of rooms, in the clarity or ambiguous separation of spaces. But it can also be interpreted in the repetition of patterns, components, units, etc.

The study of Philippine vernacular architecture shows that decoration is not primary component in building design. What they have are structural components that are repeated throughout the building. They themselves act as decorations; the buildings beauty is in its strength and its details.

The structural frame of the Ifugao house is used as the primary concept, deriving from it the main frame that can be used in building design. The frames are then repeated with an emphasis in rhythm.

Fig.100: Frame development from the Ifugao fale section
Material Palette

The vernacular is deeply rooted on the utilising local and readily available materials and their ease of construction. Proposing to use local materials in the Philippines is a more practical approach than injecting new and foreign resources, as the former can be easily sourced and replaced. By providing a local materials palette, the design outcome becomes more geared towards reality. Aside from showing more sensitivity to the local context, material choices affect the design’s aesthetics, particularly its colour and texture.

As examined in Chapter One, a barangay hall is constructed of reinforced concrete, steel, and corrugated iron roofing. Concrete walls and floors are not insulated, they are either painted or left with a smooth finish. The structural qualities of these materials are considered in the design and dictate the spatial layout and scale of the buildings.

Another usable local construction material is the cocolumber, which is the timber from coconut trees. The high-density timber can be used as a structural material for construction posts, beams, joists, trusses, rafters etc. The low-density cocolumber can be used for non-structural uses, such as veneer, panels, screens, etc. Its abundance in Compostela Valley makes it a prime driver in the design.
Fig. 101: Materials Palette

- Cocolumber piles
- Cocolumber planks
- Bamboo
- Banig (woven mat from leaves)
- Woven rattan
- Dried nipa leaves
- Concrete hollow blocks
- Steel sections/reinforcement
- Corrugated roofing
Developed Design
The design outcome is a masterplan of a civic centre and its constituent buildings—barangay hall, chapel, and primary school. The parameters discussed in Chapter 5.1 set the overall masterplan design. Another guide used is the art of relationship, as mentioned by Cullen:

“there is an art of relationship just as there is an art of architecture. Its purpose is to take all the elements that go to create the environment: buildings, trees, nature, water, traffic, advertisements and so on, and to weave them together in such a way that drama is released ... we discover a pliability in the scientific solution and it is precisely in the manipulation of this pliability that the art of relationship is made possible. As will be seen, the aim is not to dictate the shape of the town or environment, but is a modest one: simply to manipulate within the tolerances.”

This art of relationship is tied with three forms of manipulation: “Concerning Optics, Concerning Place, and Concerning Content”. In Concerning Optics, he explained the importance of serial vision, the series of structures one see as one enters a town and the experience he derives from them. In Concerning Place, he talked about the experience of being in the place and issues of physical enclosure. In Concerning Content, he talked about “the fabric of towns: colour, texture, scale, style, character, personality and uniqueness.” 71

The proposed masterplan uses this art of relationship in the planning of a central public open space, which acts as the unifying element tying all three programmes together. It starts from the access into the buffer zone, into the plaza, and culminates in the school’s private open space. The buffer zone and the plaza presents a sense of being in the site by being bordered by the surrounding buildings and walkways. The elementary school is also bound by its buildings, but this is much more emphasised through a gateway which borders the plaza and the school proper.

The formation of the plaza’s pavement is derived from the site’s context before the typhoon. Lines were drawn from the outline of the structures previously located on the site and in the locality; they were then related with the site boundary, the river, the mountain ranges and the main town centre further in the north. The pavement bleeds into the buffer zone, which is left as it is, containing the rocks and boulders brought by the typhoon. This approach intertwines the past with the present, done architecturally through surface changes. It also connects the new pavement and the plaza development into the context.

On the left is the local chapel, and on the right is the barangay hall. The roof of both buildings are angled to frame the entrance into the school proper. The local chapel is only elevated from the plaza by 0.5m, making it more accessible than the other structures. The barangay hall is elevated by 1.0m, further establishing its civic importance. The elevation allows two things: wide access steps into the barangay hall and a platform that can be used as a stage. The wide steps is located closer to the main road; the platform is located in the middle of the site, suitable for addressing audiences in the rectangular plaza.

From the platform, steps leading to the school’s threshold are provided. The school is highly elevated from the site public area, and this change in level creates privacy and reduces noise. On the left of the threshold is the school library and teachers’ office/administration area. On the right are two double-storey class room building. Further ahead is the one-level kindergarten building. The schools are orientated towards a central playground, which is the considered as the common denominator among the elementary students.

The rocky surface brought by the typhoon is arranged to act as a mitigating landscape feature, one that will withstand or lessen the effect of any future landslide and flooding. They are designed to surround the civic centre from the south, where the contour level is at its highest. As a mitigating feature, the research acknowledges its limitations, particularly as one cannot fully foresee the strength of a disaster.

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1. Plaza
2. Chapel
3. Barangay Hall
4. Platform
5. School Gate
6. Library/Office
7. Kindergarten
8. Classroom
9. Playground
10. Future Development (Commercial Space/Transport Hub)

Fig. 102: Developed masterplan.
Barangay Hall

The proposed barangay hall is positioned along the southern boundary of the site, giving it a prominent view from the main road as people come from the northern town.

The ground floor level contains two rooms: the administration office, which is also for document control and nurse station; and the captain office, which is also used as a meeting room. A large walkway connects the two, which can also be used as waiting area or reception.

The second floor consists of two large multi-purpose rooms, which can be used as day care centre, training spaces, etc. It is also envisioned to be a refuge area in case of natural disaster, when the ground floor is fully submerged with water. All rooms are open planned, allowing for flexible use of space. The interior post-beam construction carries the structural load, allowing for the interior walls to be moveable panels.

A block of servant spaces- toilets, kitchen, storage, staircase- are located on southernmost side. They are separated from the building to delineate their pragmatic difference and also to encourage journey within the building. The layout of this block is repeated on each level for ease of familiarity and services connections.

The staircase is emphasised as an uninterrupted vertical circulation. It also breaks the rigidity of the spatial planning- the full height at the stairway expands the volume. Fenestrations at the upper end of the staircase allows natural light in.
The second floor overhangs from the ground floor, creating outdoor covered spaces. Aside from the side environmental uses (maximising shade and rain protection), the overhang and series of posts provide a poetic entrance into the barangay hall, thus emphasising its civic importance. The covered spaces can be used for special events, such as medical missions, public speeches, and elections; while their daily function includes being the assembly area of barangay tanod or outdoor waiting area for the public.

The second floor’s raised volume— with some parts of it held by posts, and the other held by the ground floor— shows an interesting play with height, shade and shadow. While the ground floor rooms opens up to the plaza, engagement with the main road is done by the open corridor on the west, next to the administration office. The corridor is meant to invite people into the building.

Fig.105: View of the Barangay Hall platform into the plaza.
The form shows a high pitched roof that almost covers the second floor, providing clarity of form similar to the studied examples of vernacular architecture. A repeated structural frame is used to carry the roof. The structural frame extends to the ground, and is used in marking walkways and corridors. Because of the frame’s wide span, they subtly separate the barangay hall from the main public open space.

The L-shaped roof has gables on both ends, with the tip of the gable protruding forward. Although the form is familiar, this protrusion also acts as a framing form, directing the eyes to the ground level, where the plaza, elementary school gateway, and basketball courts are located. The high pitched roof also allows for future addition of levels, which will be very useful when using the barangay hall as a disaster refuge building.
The material palette examined in *Chapter 5* is applied in the barangay hall design. The servant block is made of reinforced concrete blocks in between structural steel posts. This makes it strong, rigid, and private. The core spaces of the barangay hall also utilise steel framing, reinforced concrete flooring, and some portions as reinforced concrete walls. Cocolumber will be used for both structural and aesthetic purposes. It can be used as screens, veneers, and wall panel framing.

Cross-ventilation is achieved by the building shape and location, and enhanced providing openings on floors and screen on the walls. Shading is provided by the wide floor and roof overhangs, which also enhance the indoor-outdoor flow in the building. The high pitched roof also allows for easy water runoff, and can be utilised for water recycling.
Chapel

Philippines is one of the only two Catholic countries in Asia. Christianity, brought by the Spanish colonisation, is an important aspect of Filipino culture. Christian holidays such as Christmas, Lent and Holy Week, and All Soul’s Days are widely observed in the country. Town fiestas, in honour of the Virgin Mary and local patron saints, are also celebrated at least once a year. The fiesta involves procession of the saint’s image around the town, street dancing, parades, food festivals, carnivals, etc.

The chapel is positioned on the northern edge of the site, opposite to the barangay hall. Because of its function to the general Filipino population and not just to the locals of Barangay Andap, it is the first building seen on the site. It is also closer to the main road than the barangay hall.

The chapel has a simple, rectangular plan, composed of the main entrance, central nave, stage, and side aisles. A high-pitched roof resting on repeated structural A-frames covers the chapel. The large overhang acts as the walls. Similar to the design of the Isneg house, the roof structure is independent from the nave’s post-beam structure. Walls are not necessary; moveable panels can be used which will allow flexibility in the number of people accommodated. This also amplifies the relationship of the church and the plaza, which is intended to accommodate large gatherings. The chapel’s orientation allows for large congregations to spill into the plaza when necessary.
Entrance to the chapel is clearly marked by an exposed roof structure and an offsetted nave structure. This junction is intended to create a seamless flow into the chapel space, by slowly introducing a sense of enclosure. One main argument against the design is its seeming lack of engagement with the main road, which can be attributed to the strong rectangular form. However, this is done intentionally to gravitate the public into the open space, referred in the masterplan as the axis. Rotating the chapel disengages it from the plaza; while breaking its volume counters the clarity of form derived from vernacular architecture.
Public Elementary School

The latest public elementary school caters to 418 students, based on the information from the Department of Education. Catering from kindergarten to grade school (Grade I to Grade 6), each level has an average size of 59 students. Design guidelines identified each class to have a maximum of 32 students and an allocated space of 2 sqm/pupil. Therefore, each year level should have a minimum of 2 sections/classrooms, about 65-70 sqm floor area each.

The proposed elementary school sits on the end of the masterplan, giving it privacy compared to the barangay hall and the chapel. Entrance to the elementary school is marked by a simple post-beam gateway, delineating it from the other buildings in the masterplan. The school buildings are arranged to create a playground in the middle, catering to the primary occupants, whose ages will be from 5 to 12.

The spatial planning of the elementary school buildings utilises the served and servant spaces concept discussed in Chapter 5. The class rooms are the served spaces, while toilets, storage, hallways and corridors are the servant spaces.

On the left of the entrance, located on the northern side of the site, is the library and the teachers’ office/administration building. A communal deck attaches the two rooms together, creating a social space for the children and the adults.

Two double-storey classroom buildings, catering to Grades 1 to 6, are located on the southern part of the site, alongside the barangay hall. Each level has 3 classrooms, each orientated towards the playground. This playful planning will hopefully foster the children’s imagination, literally breaking the classroom boxes by skewing the angles.

A one-level kindergarten building is located opposite the school entrance, and composed of two classrooms with toilet blocks in the middle. The kindergarten building will have a large outdoor deck with wide roof overhangs for shading. This deck will not only be used as a semi-outdoor play space, but also can be used as the stage for school events, as it is directly opposite the playground/open space.

Next to the kindergarten building is the canteen, which is intended to be wide open, except for the pantry/storage. As the most accessed facility in the school premises, this openness prepares it for continuous influx of people.

Similar to the barangay hall and the chapel, environmental considerations are reflected in the school buildings’ form, details, and materiality. The pitched gable roofs are for easy rain water run-off and provides water recycling opportunities. Cocolumber screens, pivot doors, moveable panes, are used extensively for natural ventilation. All buildings are on stilts - elevated from the ground in anticipation of flooding.

Fig. 110: View of all buildings in the school proper and the central playground.
Conclusion

The aim of this design research was to answer the question on how Filipino vernacular architecture can be applied in the design of a barangay hall, a typology that is highly associated with national identity, and utilise the design in reinvigorating a community that has been devastated and displaced by a natural disaster. The design process used in this research project combined architectural history, anthropology, and environmental science in providing the masterplan of a barangay civic centre and its constituent buildings.

The first part of the process involved unpacking the barangay—its history, social relevance, and architectural typology. The spatial layout and formal characteristics concluded its hybrid form that is highly influenced by the economy. This part may not have offered formal solutions, but it presented the programme and the relevance of the barangay hall in Philippine society. This also presented a potential—one that is geared towards discovering what Filipino architecture is—given that the barangay hall is a typology seen everywhere in the country.

The barangay hall’s potential toward’s discovering Filipino architecture led to the second part of this research, where anthropology and history were the main research methodologies used. In learning about Philippine architecture, the focus was directed mainly on the vernacular, particularly by studying the different societies before Spanish colonisation and their way of building. The lessons from Philippine vernacular architecture showed its suitability in a contemporary design that is inherent, culturally adapted, and geared towards developing national identity.

The rebuild of Barangay Andap after Typhoon Bopha provided an avenue to solve the research question. But it was not an easy task: the disaster brought its own puzzle pieces. The third part of the process involved understandings of disaster management, risks, vulnerabilities, and resilience: definitions that are paramount in providing appropriate design solution. Undergoing a site visit during Barangay Andap’s rebuild process would have been helpful, although there are a number of available publications from various humanitarian groups documenting the progress. The social issues discussed from these publications were also crucial in further establishing the need for a barangay hall, or a community centre where issues can be dealt with collectively.

The design solution presented incorporated thoroughly involved the above discussed process. The formal qualities of the buildings in the civic centre presented an interpretation of the vernacular; the layout and planning showed sensitivity to disasters, context, and environmental issues. The developed design was able to answer the design objectives, but it is only a possibility—there are many more imaginable solutions.

One recommendation on furthering this research will be to look at the wider scope of Philippine architecture and include the foreign influences and contemporary designs in the country. Second recommendation is to further narrow the design program by highlighting the design of the school proper, as it also answers social issues and can be seen as part of the building blocks in rebuild process. The third recommendation will be to translate the research project into a humanitarian architecture, where community engagement, undergoing site visits, sourcing materials and labour, are paramount in the design process. The list can go on, but what this research project was able to achieve is successfully highlighting the importance of the past and its potential in being informants of a design that is meant to answer contemporary issues.

The introduction to this research asks the classic question among Filipino architects: is there such a thing as Filipino architecture? There is Philippine vernacular architecture, for sure. And as this design research has established, using the vernacular tradition in crafting Filipino architecture is an appropriate start. It is not intended to be the only solution, it is intended to contribute towards the development of Filipino architecture.
Bibliography


List of Figures & Sources

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Figure 2. Barangay organisational chart.


Figure 6. View from the left showing the school gate and the barangay hall. Reproduced from Google Street View (accessed May 9, 2016).

Figure 7. Barangay 1-B site plan, floor plans, and sections.

Figure 8. Front view of the barangay hall and chapel. Reproduced from Google Street View (accessed May 9, 2016).

Figure 9. View from the right showing the chapel and the barangay hall. Reproduced from Google Street View (accessed May 9, 2016).

Figure 10. Watercolor painting of an Ifugao woman by author, 2010.


Figure 12. Photograph of an Isneg house, note the interlocking bamboo roof. Reproduced from: https://s-media-cache-ak0.pinimg.com/236x/fd/24/37/fd2437b3c6514980dc550cab73713744.jpg (accessed May 8, 2016).

Figure 13. Photograph of an Isneg house, note posts carrying either the roof or the house frame. Reproduced from: http://www.retrato.com.ph/retratooimages/Midsize/PE/PE00709b.jpg (accessed May 8, 2016).


Figure 17. Photograph of Ifugao fale scale model. Reproduced from: http://4.bp.blogspot.com/-DrX14QQO51c/

Figure 19. Photograph of an Ifugao fale. Reproduced from: https://www.univie.ac.at/ksa/apsis/ethno/ifugao/ifugao5g.jpg (accessed May 8, 2016).


Figure 24. Photograph of the bahay kubo, with bamboo walls and nipa roof. Reproduced from: http://2.bp.blogspot.com/-GdUj9znYyPA/TgXrgwRzEyI/AAAAAAAAABU0/QSRXwdSeJaU/s1600/bahay%20kubo.jpg (accessed May 8, 2016).

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Figure 36. WORKSHOP - Study Center in Tacloban Photograph of construction process

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Figure 50. Disaster management phase by UNOCHA. Reproduced from: http://www.unocha.org/publications/asiadisasterresponse/ (accessed May 8, 2016).

Figure 51. Entrance sign. Reproduced from: http://3.bp.blogspot.com/-QV-8WdnCZYI/URh9H46vZiI/AAAAAAAAGK8/

Figure 56. Barangay Hall. Reproduced from: http://www.zamboanga.com/z/images/d/d1/Barangay_Hall_Andap_New_Bataan.JPG (accessed March 1, 2016).


Figure 58. Debris flow. Reproduced from: http://www.panoramio.com/photo/84154936 (accessed March 1, 2016).


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Figure 63. Chapel front view. Reproduced from: http://www.unicef.org/philippines/ongoing-mass.jpg (accessed March 1, 2016).

Figure 64. Tent schools. Reproduced from: http://newsinfo.inquirer.net/files/2013/06/Unicef-schools.jpg (accessed March 1, 2016).


Figure 69. Tent city evacuation site. Reproduced from: http://abscbnnewsml.blob.core.windows.net/images/evac-1.jpg (accessed April 16, 2015).

Figure 70. Evacuation site structures. Reproduced from: http://abscbnnewsml.blob.core.windows.net/images/evac-2.jpg (accessed April 16, 2015).


Figure 73. Chapel Front. Reproduced from: https://mlacinstitute.files.wordpress.com/2013/12/andap1.jpg?w=595 (accessed May 8, 2016).


Figure 76. Site location map.
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Appendix:

Final Design Presentation
VIEWS, L-R, T-B: Chapel Exterior View, Chapel Interior View, Entrance to Barangay Hall from Administration Area, Entrance to Barangay Hall from Stage, School View from Library, Classroom
SERIAL VISION: L-R, T-B: Barangay Complex from Road, Chapel and Barangay Hall, School Gate, School Playground.
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