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環境計画学専攻 環境意匠部門

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STUDY ON THE HOUSING RESETTLEMENT FOR DISASTER-AFFECTED COMMUNITIES OF TACLOBAN AND CEBU, PHILIPPINES

フィリピンのタクロバンとセブの災害の影響を受けたコミュニティのための住宅再定住プログラムに関する研究

ELIZAGA TROY DINO SALANG

学籍番号：1657001

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ELIZAGA TROY DINO SALANG

MA. Arch, B. Arch

Prof. JIMENEZ VERDEJO Juan Ramon	–	Principal Supervisor
Prof. KANEKO Naoshi	–	Associate Supervisor
Prof. SHIRAI Hiromasa	–	Associate Supervisor

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Abstract

It is normal for different types of calamities and disasters to occur in the Philippines. It is located along the path where most typhoons that build up from the Pacific Ocean would traverse. There is an estimate of twenty or more typhoons that pass through the Philippines every year. It is also located along the ring of fire; thus, the danger of earthquake is imminent. Other than the natural disasters, the Philippines also experience a lot of man-made disasters especially fire. The Philippine government is trying to address the issue of disaster risk management and mitigation. Together with other nations around the world, they defined the laws and the guidelines that should be followed not only to respond to disaster, but also to prevent or lessen its effects. A part of this comprehensive program of addressing disaster issues is the aspect of rehabilitation and recovery, where housing is one of the main concerns. The Local Shelter Planning (LSP) manual serves as the main reference in the planning and design of housing settlements. LSP likewise refers solely to the Economic and Socialize Housing Act, or BP220, for provisions on the built environment. This study looks into the various ways that housing settlement is addressed in four case studies with the intention of evaluating whether the existing guidelines is sufficient to attain the goal of "providing access to affordable disaster resilient housing located in safe zones and in areas where social services and public facilities are available for financing assistance to build their houses" (NEDA, 2020). Two types of resettlement projects were tackled in the study: temporary resettlement sites in Tacloban City, and four case studies of permanent settlements, one in Tacloban City and the others in Cebu City. Each site was evaluated according to their compliance with BP220, then each type of housing resettlement was evaluated according to the standards of UNHCR (for temporary resettlement sites) of the SPHERE standards (for permanent resettlement sites). The results show how inadequate BP220 when applied to temporary resettlements and permanent settlements which are water-based, or privately owned, or a community of cultural minorities. Furthermore, resettlement housing do not fully comply with UNHCR standards while permanent housing do not comply the SPHERE standards when the project is handled by the government.

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List of Abbreviations

BP	Batasang Pambansa (similar to Republic Act)
HLURB	Housing and Land Use Regulatory Board
HUDCC	Housing and Urban Development Coordinating Council
IRR	Implementing Rules and Regulations
LSP	Local Shelter Planning
NCDA	National Civil Defense Administration
NDCC	National Disaster Coordinating Council
NEDA	National Economic Development Authority
NDRRMOC	National Disaster Risk Reduction and Management Operations Centers
NDRRMF	National Disaster Risk Reduction Management Framework
NDRRMP	National Disaster Risk Reduction Management Plan
NHA	National Housing Authority
OCD	Office of Civil Defense
PD	Presidential Decree
RA	Republic Act
UNHCR	United Nations High Commissioner for Refugees

Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet the requirements for and award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

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CHAPTER 1

Introduction

CHAPTER 1: INTRODUCTION

1.1 Background

1.1.1 The Global Framework

A disaster is the occurrence of an extreme hazard event that impacts on vulnerable communities causing substantial damage, disruption and possible casualties, and leaving the affected communities unable to function normally without outside assistance (Benson & Twigg, 2007). The Philippines, an archipelago, is prone to geological and hydro-meteorological hazards due to its geographical and physical characteristics. The country places third in the World Risk Index of 2013. It is subjected to an average of 20 tropical cyclones per year and is highly vulnerable to disasters resulting from extreme natural events like tropical cyclones, monsoon rains, earthquakes, tsunamis, and volcanic eruptions. This is aggravated by a rapidly increasing population density, environmental degradation due to urbanization and industrialization, and climate change. From 1970-2013, the National Disaster Risk Reduction and Management Operations Centers (NDRRMOC) listed 856 tropical cyclones that entered the Philippine area of responsibility (PAR), 322, or 38%, of which were destructive. In the past 20 years, tropical cyclones claimed 17,119 lives and injured 51,068, with 5,198 still missing. It affected at least 24.8 million families or 122.1 million people and caused damages to agriculture, infrastructure, and private properties worth P354.7 billion. Aside from natural disasters, there are also man-made disasters such as crime, arson, civil disorder, terrorism, war, biological / chemical threat, and cyber-attacks.

Disaster risk reduction is an integral part of development. The importance of a risk-informed and risk-resilient environment is recognized by three (3) global policy frameworks and international agreements: (a) the Sendai Framework for Disaster Risk Reduction 2015-2030; (b) the United Nations (UN) Agenda 2030 for Sustainable Development Goals; and (c) the Paris Agreement within the UN Framework Convention on Climate Change. At the regional level, the Association of Southeast Asian Nations (ASEAN) community has ratified the agreement on disaster management and emergency response in support of the global policy frameworks.

As signatory or party to these global policy frameworks and agreements, the Philippines is committed to minimizing the loss of life and resources due to disasters. It

passed the Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121) and prepared the National Disaster Risk Reduction and Management (NDRRM) Framework and Plan as among the concrete steps towards safe, adaptive, and disaster-resilient Filipino communities.

The Philippine disaster rehabilitation and recovery framework also builds on these global policy frameworks and integrates key principles that will promote resilience and risk reduction in post disaster rehabilitation and recovery. The framework is also anchored on the country's national development goals to ensure a holistic and coherent approach to rehabilitation and recovery efforts.

1.1.2 The Philippine Setting

Disaster management in the Philippines started to be organized in 1941 with the establishment of the National Emergency Commission through Executive Order No. 335 by President Manuel L. Quezon. This function was eventually passed on to National Civil Defense Administration (NCDA) on 18 August 1954, when it was created through the Civil Defense Act of 1954. The Act was repealed in 1972 and the NCDA functions and personnel were then transferred to the newly established Office of Civil Defense (OCD).(Commission on Audit, 2013)

On 11 June 1978, Presidential Decree (PD) No. 1566 was promulgated to strengthen the capability of the OCD in disaster control, establishing the National Program on Community Disaster Preparedness with the OCD as the operating arm. It also served as the secretariat of the National Disaster Coordinating Council (NDCC), which preceded the NDRRMC. Most of the plans and programs then were focused on emergency preparedness and disaster response. In the mid-80's the needed reforms on PD 1566 were recognized, thus, the OCD, together with the civil society and other member-agencies of the NDCC, lobbied for the amendment of the disaster management law, or to even change it entirely. There was not much progress then, until typhoons Ondoy (international name: Ketsana) and Pepeng (international name: Parma) hit the Philippines in 2009. This droves home the need to enhance the Philippines' disaster management law. The times demanded something more than a reactive law, but a proactive one that emphasizes prevention and mitigation.

After more than three decades, PD 1566 was replaced by a new law: The Republic Act (RA) No. 10121, also referred to as "The Philippine Disaster Risk Reduction and

Management Act of 2010," which was enacted on 27 May 2010. RA 10121 represents a more bottom-up and participatory approach in disaster risk reduction. It also changed the view of disaster as a mere result of a physical hazard to a perspective that addresses the notion of vulnerability.

The Philippines is the first in Asia to enact its own law that explicitly and categorically addresses disaster risk reduction and management. It is the official embodiment of the paradigm shift from disaster relief and response to disaster risk reduction and management. The drafting of the implementing rules and regulations (IRR) proceeded at once. On 27 September 2010, the IRR was promulgated and took effect 15 days after its publication.

1.1.3 Disaster Rehabilitation and Recovery

As a result of RA 10121, the National Disaster Risk Reduction Management Framework (NDRRMF) was developed and became the basis for the National Disaster Risk Reduction Management Plan (NDRRMP) for 2011-2028. The framework lays down the broad DRRM goal of building safe, adaptive, and disaster-resilient Filipino communities working towards sustainable development, as well as specific goals in the four (4) thematic areas that comprise DRRM. These thematic areas are: (1) disaster prevention and mitigation, (2) disaster preparedness, (3) disaster response, and (4) disaster rehabilitation and recovery.

The main goal for Disaster Rehabilitation and Recovery is to restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities and reduce disaster risks in accordance with the "build back better" principle. The objectives of this area are as follows (NEDA, 2020):

1. To restore people's means of livelihood and continuity of economic activities and business.
2. To restore shelter and other buildings/installation
3. To reconstruct infrastructure and other public utilities
4. To assist in the physical and psychological rehabilitation of persons who suffered from the effects of disaster.

The National Economic Development Authority (NEDA) developed the Disaster Rehabilitation and Recovery Planning Guide which they published in 2020. The document

serves to provide guidance in the crafting of government pre- and post-disaster recovery procedures at the national and local levels. The document provides an overall framework and planning reference for the national, regional, and local levels to simplify post-disaster rehabilitation planning.

1.1.4 The Question of Housing Resettlement

Following the DRRP Guide, a Disaster Risk Reduction Management Council is created for every disaster event. The composition and role of the DRRM Councils in all levels of government differs depending on the geographical areas affected. For example, the National DRRMC is in charge when two or more regions are affected, or the Regional DRRMC is in charge if two or more provinces are affected.

Under the council is a committee on rehabilitation and recovery. This committee is made up of smaller committees or sub-committees representing the following: infrastructure, shelter, social services, livelihood, agriculture, and resource mobilization or support.

When it comes to shelter, there has not been any specific guidelines in terms of design of the housing units or layout of the community. The Habitat International Coalition – Housing and Land Rights Network came up with a document on standards on post-disaster resettlement and rehabilitation but the document focused more on the rights of the beneficiaries of resettlement and rehabilitation programs (Jeet Batra & Chaudhry, 2005).

On the ground, most of the resettlement and rehabilitation programs of the National Housing Authority (NHA) is marred by delays in their implementation (NEDA, 2017). In their assessment of the in-city resettlement program of NHA, the Commission on Audit identified the following causes for the delays in implementation: (a) the number of housing units to be delivered depended on the budget allocation for the year, (b) the vertical development implemented by NHA is not covered by the law for socialized housing[1] (Commission on Audit, 2017). These issues, therefore, are being monitored already by government agencies.

[1] According to the Commission on Audit, BP220 or the Socialized Housing Act, only houses and lot or homelots are covered in socialized housing, low-rise buildings (LRBs) and mid-rise buildings (MRB's) are not covered. This needs verification since the law clearly includes standards for multi-story buildings applicable to both economic and socialized housing.

In other countries, issues of community participation, communication, resettlement and the cultural appropriateness of recovery measures have been a recurring challenge and continue to cause housing reconstruction projects to fail with the supposed beneficiaries modifying or outright rejecting the housing provided or, in some cases, dismantling the houses and selling their components. All of these challenges must be adequately managed in order to have a successful reconstruction program (Denlay & Shrader, 2000).

1.1.5 BP220: Main Reference for Housing Resettlement

Resettlement housing, however, may be considered under socialized housing[2]. The Local Shelter Planning (LSP) Manual, therefore, is the only document that provides the guidelines affecting the built environment. These guidelines, however, are dependent on the provisions found in BP220 or the law that deals on socialized and economic housing (HUDCC, 2016). There are those who question the adequacy of BP220 or the LSP. One study, for example, points out that there are no criteria on access to existing social facilities (Ballesteros & Egana, 2013). There are, however, guidelines developed by UNHCR[3] which are applicable for temporary resettlement projects, and those developed by the SPHERE Project[4] which are applicable to permanent resettlement projects.

BP220 is the law that defines the level of standards and technical requirements for economic and socialized housing projects in both rural and urban areas. For socialized

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[2] Republic Act 7279, otherwise known as "an act to provide for a comprehensive and continuing urban development and housing program, establish the mechanism for its implementation, and for other purposes"

[3] The guidelines of UNHCR are applicable only for temporary housing because of they share the same characteristics are refugee camps.

[4] The Sphere Project, now known as Sphere, was created in 1997 by a group of humanitarian non-governmental organizations and the Red Cross and Red Crescent Movement. Its aim was to improve the quality of their humanitarian responses and to be accountable for their actions. The Sphere philosophy is based on two core beliefs: (1) people affected by disaster or conflict have the right to life with dignity and therefore, the right to assistance; and (2) all possible steps should be taken to alleviate human suffering arising out of disaster or conflict. The Humanitarian Charter and Minimum Standards put these core beliefs into practice. The Protection Principles inform all humanitarian action, and the Core Humanitarian Standard contains commitments to support accountability across all sectors. Together, they form The Sphere Handbook, which has developed into one of the most widely referenced humanitarian resources globally. In its handbook, SPHERE includes the minimum standards for shelter and settlement among the key response sectors together with WASH (water supply, sanitation, and hygiene), food security and nutrition, and health.

housing, the price ceiling for horizontal development is PhP450,000 and below, and for vertical housing is PhP400,000 and below.[5] For economic housing, the ceiling for both vertical and horizontal housing is between P450,000 and P1,700,000.[6] Some details of BP220 which are relevant to the study is outlined in Appendix A: Salient Provisions of BP 220.

Considering the goal of the housing and resettlement component of DRRM[7], the question is: are the guidelines of BP220 sufficient to attain this goal? Also, how does BP220 compare with the guidelines developed by UNHCR and the SPHERE Project?

1.2 Research Problem

The aim of this study, therefore, is to evaluate the guidelines of BP220 as applied to housing resettlements, on how these can achieve the goals of the general framework of post-disaster rehabilitation and recovery program. To do this, case studies will be presented, and the following components will be subjected to the evaluation according to their compliance with BP 220 as to site characteristic and shelter design. These components will be evaluated further according to the guidelines of UNHCR for the temporary housing resettlement projects, and the SPHERE Project for the permanent housing resettlement projects.

The study will determine if the communities that were planned and built following BP220 give access to affordable disaster resilient housing located in safe zones and in areas where social services and public facilities are available for financing assistance to build their houses.

More importantly, the following should be determined after the questions above have been determined for each case study: is there a need to modify BP220 or any relevant law or guidelines because of the evaluation of the case studies?

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[5] According to HLURB Memorandum Circular No. 02, Series of 2014 and HUDCC Resolution No. 2, Series of 2014

[6] According to HLURB Memorandum Circular No. 05, Series of 2009 and HUDCC Resolution No. 1, Series of 2009

[7] The goals of the housing and resettlement component of DRRM is for disaster-affected families to have access to affordable disaster resilient housing located in safe zones and in areas where social services and public facilities are available for financing assistance to build their houses.

1.3 Research Objectives

The main objective of the research is to determine if there is a need to modify BP220 after evaluating the cases presented so that the shelters and resettlement meet not only the criteria for the disaster and risk reduction management's rehabilitation and recovery program, but also international criteria specifically that of UNHCR for temporary resettlements and SPHERE for permanent resettlements.

1.4 Research boundary and the limits

Rehabilitation and recovery take three stages: emergency shelter, temporary shelter, and permanent shelter. This study will only evaluate the case studies of the last two stages, i.e., in the provision of temporary and permanent housing. In doing so, the site development plan and the shelter designs will be considered. However, the study will also include the process of selecting the beneficiaries. A typology study of the permanent shelters will also be made.

Part of the study will include an investigation into the livelihood of the affected communities before and after the housing resettlement.

1.5 Research contributions

The framework, as well as the procedures, in the total task of disaster risk reduction and management is very comprehensive. The system is in place although some refinements are required to fit the system into the local context. This is where this research will contribute. By presenting different contexts, the application of the system or guidelines can be evaluated on how it is able to respond to the different situations. There might yet be another level of guidelines to be developed, at the lowest level, where the grass roots are directly affected. It is hoped that in this research, an initial guideline can be made in the barangay level which can be applicable even if the extent of those affected by a disaster is wider in scope, i.e., either provincial, regional, or even international.

1.6 Structure of the study

This thesis is organized into seven chapters. Below is the content for each chapter:

Chapter 1: Introduces the research issues along with the goals for the study. It outlines the research questions, objectives and limitations, and the contributions to the development of the society.

Chapter 2: Presents similar studies done on the topic and presents how the researchers tackled the problems. Their methodologies are evaluated according to how they can be useful in the current study and how they help form the theoretical framework of the study.

Chapter 3: Presents the methodology used in the research.

Chapter 4: Presents the first case study which is the housing resettlement after the super typhoon Haiyan in Tacloban City, Leyte. Data will be presented and analyzed within the chapter.

Chapter 5: Presents the second case study which is the housing resettlement after a fire in Sitio Panting, in Barangay San Roque, Cebu City. Data will be presented and analyzed within the chapter.

Chapter 6: Presents the third case study which is the housing resettlement after a fire in Alaska, Barangay Mambaling, Cebu City, which resulted in two separate sites with different characteristics. Data will be presented and analyzed within the chapter.

Chapter 7: Presents findings from the data analysis from the three case studies and consolidates the thesis and providing recommendations for future research.

CHAPTER 2

Review of Related Literature

CHAPTER 2: REVIEW OF RELATED LITERATURE.

2.1. Literature Review

Since the start of the information age, it has been more convenient to make studies on the breadth of disaster and risk management spectrum, from disaster prevention to rehabilitation and recovery. This section presents studies related to the latter subject, particularly on housing resettlement.

In their annual report in 2003, ALNAP (Active Learning Network for Accountability and Performance) [8] mentioned that "temporary shelter and housing interventions were evaluated as significantly less successful than other sectoral initiatives" among humanitarian response (ALNAP, 2003). The poor evaluation is due to the amount of possible problems that may be encountered in temporary shelter and housing interventions such as shortage of human resources, logistical problems, bureaucratic and institutional problems, and difficulties in coordinating the multitudes of organizations (Verby et al., 2007), land acquisition problems, particularly for the relocation villages (ACARP, 2007), and lack of road access (Oxfam International, 2006).

In Aceh, Indonesia, for example, several factors led to the failure of the housing reconstruction program including inadequate strategic and operational management planning, satellite office planning, insufficient time allowed for community mobilization and difficulties in the resolution of land issues. In addition, the unavailability of skilled manpower, poor coordination and problems with logistics, materials sourcing and supplies negatively affected housing reconstruction delivery and quality(ACARP, 2007);(Kennedy et al., 2008);(Ophiyandri et al., 2010)

A study made in Malaysia for the post-disaster permanent housing provision of a flood-prone area (Roosli & Collins, 2016) seeks to know how to better support humanitarian responses through post-disaster resilient house construction in flood prone areas. Their method is desk research and interview with field staff and their findings include organizational and procedural changes. However, another study on two housing projects for

[8] ALNAP is a global network of NGOs, UN agencies, members of the Red Cross/Crescent Movement, donors, academics, networks and consultants dedicated to learning how to improve response to humanitarian crises.

the rebuilding of Sri Lanka after the tsunami incident in 2004 was able to categorized the problems encountered into four: design flaws, administrative issues, cultural misunderstandings, and implementation (Dombek, 2016).

2.1.1 Planning and Design

For temporary shelters, the UNHCR has established standardized designs for the shelters to use (UNHCR, 2016). Their shelter catalogue is divided into four types: global shelter design, emergency shelter design, transitional shelter design, and durable shelter solutions. They have shelter that were specially designed for other countries like Myanmar, but they have no designs for the Philippines. Instead, UNHCR made use of the global shelter design for the Philippines.

Their design for durable shelter solutions may be used also for permanent housing shelters in the Philippines since these are up to Code. The only feature that should be changed, however, is the flat roof. Like all tropical countries, a flat roof does not work well in the Philippines.

The Humanitarian Shelter Working Group came up with their recovery shelter guidelines (Hodkin et al., 2014). They have a more extensive experience in providing shelter in different parts of the world. They observed that there is a dynamic informal land market in the Philippines because of the complicated and lengthy legal process in securing tenure.

They also identified the types of shelters that should be used depending on the area for resettlement. For high-risk areas, they recommended the following: tents, makeshift shelters, damaged houses, repaired houses, and emergency shelter replacements. For low-risk areas, they recommended the following: emergency shelter, damaged houses, non-damaged houses, repaired houses, evacuation center, bunkhouses, tents.

Their projects in Tacloban City for the Typhoon Haiyan can be found in their shelter project report for 2013-2014 (Shelter-Cluster, 2014). It can be noted that they adopted the vernacular system of construction for these shelters. There is danger, however, when vernacular architecture is treated as something static. Adhering to this is considered as an indication that the designers do not know how to handle resettlement planning and would eventually fail (Rapoport, 2005).

Vernacular architecture should be treated as something that is evolving. Resettlements should be built upon the values and aspirations of the communities rather than any aesthetic preferences of designers or visual evidence of vernacular form alone. (Silva, 2012).

2.1.2 Project Administration

Having an agency at the national level and corresponding agencies at the local levels is needed to make sure that the coordination and support to the rehabilitation and recovery effort is efficient. This is one of the important lessons in the cases of Japan, Gujarat and Bam. In these cases, the strategies were built upon the previous experiences in disaster, and were put into effect using legislative acts (World Bank, 2014).

This was not the case in Sri Lanka, where there was no pre-existing institutional framework or policy to guide them through the aftermath of the tsunami in 2004. There were no clear demarcation of responsibilities and many issues on coordination and communication arose. Without sufficient community participation, a buffer zone along the coast was established. This affected the livelihood options for those who were forced inland. The granting of exemptions on the buffer zone also raised suspicions of possible corruption. As a result, some projects which were donor-driven were abandoned. The shift in policy and the lack of data on housing and reconstruction plans resulted in confusion and delays in reconstruction (Jayasuriya et al., 2006).

In the case of Japan, they emphasized on community involvement in the planning for housing reconstruction. They established a zone for reconstruction because of this. They also prepared a regional and local recovery plans, for both State and local governments, following the framework of their national plan (World Bank, 2014).

In Gujarat, India, people preferred to go back to the disaster zone for an in-situ construction instead of going to a relocated settlement site even if the latter is safer. Because of this, they were not granted building permits. This made it more difficult for self-build initiatives. This was the result of not having a consensus with the community in relocation, materials to be used in construction or house design (Barenstein, 2006).

2.1.3 Cultural Considerations

Researchers Catherine Brun and Ragnhild Lund assert the houses "were all based on a blueprint model with standardized costs and practicalities and not much developed in cooperation with the people [of a] particular area, grossly negating different understandings of what a house should be like, according to cultural practices and traditions." (Blaikie, 2015) Some of these issues are evident in the two case studies addressed later in the paper: a Muslim community in the Southern Province and a Hindu community in the Eastern Province. Both of these communities are ethnic minorities in Sri Lanka, and thus required specific considerations that are unique to these people (Dombek, 2016).

In Japan, the temporary housing units (TH) and temporary housing areas (THA) for disasters are designed in advanced. This, however, is causing them problems in controlling the occurrence of "kodukushi" or "death caused by loneliness". Although the advanced planning is still recommended for its merits, a more "human-centered approach" was recommended in the planning stages instead of the "technocratic approach" (Bris & Bendito, 2019)

In some cases, it is the materials and the technology used which were not appropriate to the people's cultural sensitivities or to the local weather. This resulted in the rejection of the housing units provided. (Barenstein, 2006)

2.1.4 Program Implementation

There are many ways in which the design of the shelter may be made. It may be pre-designed or designed only when needed. It may also be done with or without the participation of the beneficiaries. Also, there may only be one design for the whole resettlement site, or an array of option may be presented to the beneficiaries or the organizers.

For the post-earthquake housing reconstruction in Gujarat[9], India, five alternative reconstruction approaches were adopted:

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[9] The earthquake in January 26, 2001, was India's most severe natural disaster for almost 300 years. At least 20,000 people were killed and over 167,000 were severely injured. An estimated 344,000 houses were destroyed, and over a million damaged. More than 7,600 villages and towns were damaged, and over 300 villages flattened; hospitals, health centers, schools and water and irrigation systems collapsed. Although 21 of Gujarat's 25 districts

- The owner-driven approach. This approach enables the community to take on the building work by themselves, with financial, technical, and material assistance from outside sources.
- The subsidiary approach. In this approach, the agency provides materials and technical help within the framework of government assistance.
- The participatory approach. Here, the agency involves the home-owners in the planning, design and reconstruction of the house but takes the lead in the housing reconstruction as a whole.
- The contractor-driven in-situ. In this approach, a professional builder or contractor is tasked to design and build the houses. In this approach, the houses are rebuilt in-situ, or in their original location.
- The contractor-driven ex nihilo approaches. In this approach, a professional builder or contractor is also tasked to design and build the houses. The only difference is that the houses are built on a new site.

Although the whole project was successful in general, the subsidiary approach had the most satisfactory rating from the beneficiaries. This is followed by the government-supported owner-driven approach and the participatory approach in consecutive order (Barenstein, 2006).

The reconstruction of the houses in Bam, Israel, is an example where different options were presented for the project. Although the designs themselves have their merits, the project failed fully because the transfer of technology failed. Although the construction of the houses were done by the locals, the quality of the work was substandard mainly because of the lack of full knowledge of the construction technique (Gharaati, 2006).

In their annual report for 2003, ALNAP highlights the practice of self-construction supported by external agencies as a good practice for temporary shelter and housing interventions (ALNAP, 2003). The use of the participatory approach is also supported by a study which tackles the housing reconstruction after natural disasters in Indonesia (Abe et al.,

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sustained some level of damage, over 90% of deaths and an estimated 85% of assets lost were in Kachch, the state's largest, and also one of its poorest, districts (Barenstein, 2006).

2018). The study was done through a survey and points out that the participatory approach helps in disaster awareness. The satisfaction level for their new shelter is not high, however, which indicates that community participation may be better applied during the planning stage and not only in the rebuilding stage.

Using a case study approach to tackle the importance of community participation in post-disaster housing projects, Davidson, et al explored how the projects are organized, and what roles certain stakeholders play (Davidson et al., 2007). They associated the extent of participation of the beneficiaries with the overall performance of the project. The result highlights different categories of community participation as follows: “empowerment” (where members have a genuine power in up-front decision-making processes), “informing” (where users were not involved in the formal decision-making process, even if users had a positive opinion of the project’s outcomes), and “consulting” (which is top-down approach to project management).

2.2. Conceptual Framework

In this study, the provision of temporary resettlement housing and permanent resettlement housing will be evaluated. These are evaluated according to their compliance with the economic and socialized housing law (BP220). The temporary resettlement housing will also be evaluated according to the standards of UNHCR, while the permanent resettlement housing will be evaluated according to the standards of SPHERE.

The implementing rules and regulation of BP220 cover a comprehensive field, however the study will focus only on two aspects of the law: those that relate to site characteristics, and those that relate to shelter design. The site characteristics will include the following: project location, parks and playgrounds requirement, area for community facilities requirement, community facilities allocation, minimum lot areas, minimum lot frontages, length of block, road right of way, setback requirements along main public road, water supply, electrical power supply, drainage system, sewage disposal system, and garbage disposal system. Shelter design will include the following: shelter components, minimum level of completion, and setback/yard. The salient provisions of BP220 related to these two aspects are outlined in Appendix A: Salient Provisions of BP 220,

The UNHCR Standards are categorized into four: country, urban program, refugee camp/settlement, and returnee area. This study will focus only on the standards for refugee

camp/settlement. However, there are a total of 71 indicators in this category, divided into 22 areas. The study will, therefore, further focus only on the following areas which are related to housing resettlement: water, sanitation, and shelter. This narrows down the number of indicators to 14. The indicators are outlined in Appendix I: UNHCR indicators used in the study.

The SPHERE standards have six areas: planning, location and settlement planning, living space, household items, technical assistance, security of tenure. While all of these areas are considered in the study, some indicators were excluded because they are not applicable. This is outlined in Appendix B: Inclusion/Exclusion of SPHERE standards.

Figure 2.1 shows the conceptual framework in a diagram form.

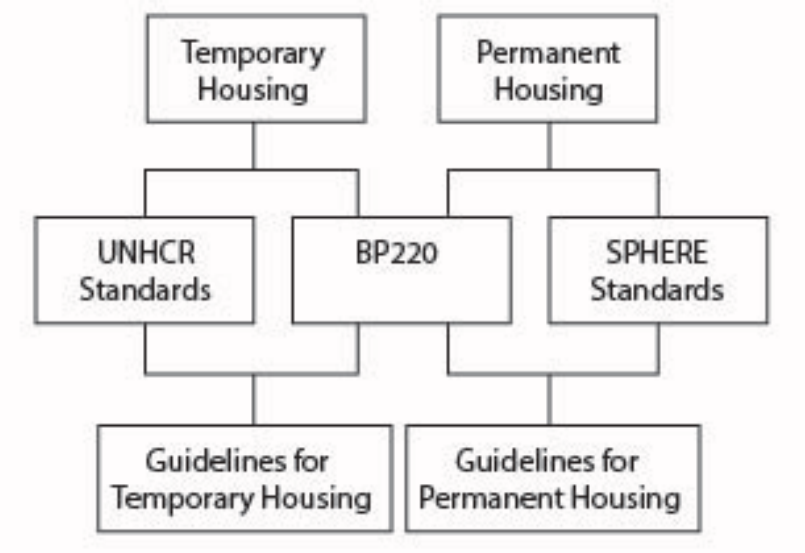

Figure 2. 1: Framework Diagram

CHAPTER 3

Methodology

3.1 Research Environment

3.2 Research Subjects/Respondents

3.3 Research Instruments

3.4 Research Procedure

CHAPTER 3: METHODOLOGY

3.1 Research Environment

The selection of the case studies is constrained by time and financial resource. The study covered only Tacloban city in Leyte and two barangays in Cebu City, Cebu.

The case study in Tacloban city could have been paired with another case involving a typhoon of nearly the same magnitude and geographic scope. The ideal would be the Typhoon Ruping which devastated Cebu City in 1990 but there are very few data that can be gathered about that event. Although the relocation for housing resettlements in Tacloban is assigned in multiple sites, the focus of the study will be on eight sites of the temporary settlements and two sites for the permanent settlements. This is because, these were the only sites that were finished during the fieldwork.

In Cebu, however, the study area is defined by the boundaries of the community being resettled. The three communities in Cebu were chosen for the case study because of the availability of materials for analysis. There is also the fact that these communities suffered the same type of disaster.

Below is the list of communities considered in this study. A more detailed presentation of each one if incorporated to the sections where each community is discussed.

1. The temporary and permanent resettlement program for Typhoon Haiyan in Tacloban City.
2. The resettlement and recovery program for the fire victims of Sitio Panting, San Roque, Cebu City.
3. The resettlement and recovery program of the fire victims of the Bajau communities in Barangay Mambaling, Cebu City.

3.2 Research Subjects/Respondents

Appendix B shows the standards of SPHERE, indicating which ones were included or excluded in this study. The reasons for exclusions are summarized below (Sphere-Association, 2018):

1. There were no pre-agreed technical and performance standards prior to the start of the project.
2. Privacy issues. Respondents voluntarily or involuntarily suggested not replying to these questions.
3. Data could not be determined. This either because there were no records kept, or the sources could not provide the data for some other reason.

It is interesting to note that all the criteria for planning have been excluded for the first reason cited above, and all the criteria for security of tenure had been excluded for the third reason.

3.3 Research Instruments

Appendix C specifies the materials needed for analysis as well as the unit of analysis for those standards which were included in the criteria set. In summary, the following instruments will be needed to gather the data:

1. Survey on the following:
    a. Whether the affected population have access to available sufficient, safe and affordable energy supply to maintain thermal comfort, prepare food and provide lighting.
    b. Whether the affected people whose shelter and settlement assistance reflect their needs and priorities and contributes to a more durable solution
    c. Whether the shelters are culturally acceptable
    d. Whether the household have received appropriate technical assistance and guidance
2. Maps, particularly the following:
    a. Hazard maps showing shelters and/or settlement sites are located in areas with no or minimal known natural or man-made threats, risks and hazards
    b. Vicinity map showing shelters and/or settlement sites have safe access to essential services within an acceptable amount of time or distance.
3. Technical drawings, particularly the following:

a. Development plan of the settlement site showing sufficient usable surface area to carry out private and public outdoor activities appropriate to the context.

b. Floor plans and plot plans of shelters showing adequacy of living space in carrying out daily activities.

4. Interviews, particularly on the following:

    a. To local authorities to confirm their degree of involvement in programs defining construction standards and in the monitoring of construction activities

3.4 Research Procedure

Field works were organized to conduct surveys, interview key people, and to request documents including maps and drawings. The field work was scheduled in separate occasions, and usually visited more than once. Below were the various field works conducted for this study:

Tacloban City:

- October 31 to November 9, 2014 (J.R Jimenez Verdejo, J.A. Pulido Arcas and T.D. Elizaga)
- December 19 to December 26 of 2014 (J.R Jimenez Verdejo, S. Funo, R. Inoue and K. Mabuchi)
- February 14 to March 1, 2015. (J.R Jimenez Verdejo)
- August 2 to September 4, 2015. (J.R Jimenez Verdejo, S.Funo, R. Inoue and K. Mabuchi)

Sitio Panting, San Roque, Cebu City:

- July 5th to 10th, 2019. (JR Jimenez Verdejo, Kento Masuoka)
- December 13th to December 20th, 2019. (Earnest Calalang, Kento Masuoka).

Mambaling, Cebu City

- May 3, 2017 (Katsura, Hoang, Troy, Khang, Uryuta, Suan)

- August 24 – 31, 2017 (Katsura, Hoang, Uryuta, Tsutsumi)
- September 18 – 25, 2017 (Katsura, Hoang, Uryuita)
- November 30 to December 12, 2017 (Katsura, Hoang, Takada)
- September 25 to October 13, 2018 (Katsura)

The review of documents included, mainly, the UNHCR emergency handbook, which provides the camp planning standards for planned settlements. The comparative assessment was done by comparing the standards defined in the UNHCR handbook with those observed during the on-site fieldwork.

CHAPTER 4

Case Study 1: Tacloban City

CHAPTER 4: CASE STUDY 1: TACLOBAN CITY

4.1 Overview of the Study Area: Tacloban City

Tacloban City is in Leyte, an island of the eastern Visayas region of the Philippines. The Jesuits were the first to evangelize Leyte although there were no records indicating the date when they started (dela Costa, 1959). When they were expelled in 1768, the Augustinians took over and established the "visita" of Tacloban under the jurisdiction of the parish of Palo in 1770. When the Moro invasions was no longer a threat, commercial activity in Tacloban flourished until it became an independent municipality and later became the provincial capital in 1830. The Augustinians transferred the administration of the parish of Tacloban to the Franciscans in 1843.

Tacloban took a prominent role in retaking the Philippines from Japanese occupation in 1942. General Douglas McArthur, together with the combined Filipino and American troops, liberated Leyte first in 1944. They landed in Tacloban and made it the temporary seat of Commonwealth Government as well as the temporary capital of the Philippines until the country was fully liberated.

Chartered as a city on June 12, 1953 (Republic of the Philippines, 1953), it was eventually declared as a highly urbanized city on October 4, 2008, (Republic of the Philippines, 2008).

Tacloban became the center of attention of the whole world when the super typhoon "Haiyan" swept through the Philippines and made a landfall in Tacloban in November of 2013. The storm surges that resulted from the typhoon caused massive destruction throughout the city. This, however, was not the first time that Tacloban encountered such a catastrophe. A typhoon in November of 1912 also swept through the central part of the Philippines and caused extensive damage to Tacloban (The Washington Herald., 1912).

Unlike the rest of the case studies where the details of the site are already presented in the overview portion, for Tacloban City, the details of the sites will be incorporated in the later part of the report. This is because there are multiple sites for both temporary housing and permanent housing that presenting them here will disrupt the focus of the study.

4.2 The Disaster: Typhoon Haiyan (November 2013)

4.2.1 Disasters leading to Typhoon Haiyan

The Philippines gets more than its fair share of both natural and human-induced disasters year after year. This is one reason the Filipinos became known for being “resilient”, since they go through consecutive and sometimes even overlapping crises in any given year, trying to move on, hoping to get more lessons from the last. The Philippines typically gets 20 tropical cyclones a year. The year 2013, however, was particularly harsh. There were 25 recorded typhoons during this year.

Among the challenges in disaster during 2013 are the TS Auring and tropical depression (TD) Bising which came on January 2013 affecting 5,454 families in at least five regions. There was also the siege of Marawi by the Moro National Liberation Front (MNLF) who took almost 200 hostages. In October 11, TY Santi (international name: Nari), caused flashfloods and mudslides, killing 15 persons, and injuring 32. Four days later, a strong earthquake hit Bohol on 15 October, killing 220 and affecting 671,000 families or more than 3.2 million persons. Hundreds more were injured. The earthquake toppled centuries old churches to the ground and damaged 78,229 houses (15,933 totally; 62,296 partially), 41 bridges, and countless roads in the Visayan region.

Two months after the Zamboanga siege, and less than a month after Santi and the Bohol earthquake, and before millions of Filipinos could bounce back, the country would be visited by the strongest typhoon the modern world has ever seen: Typhoon Haiyan.

Measured by wind speed, Typhoon Haiyan, known locally as Typhoon Yolanda, was considered as the strongest storm recorded at landfall, with sustained wind speeds of 315 kilometers per hour. The magnitude of damage it made is great but in relation to housing it totally destroyed 230,407 house units in Tacloban and partially damaged 191,230 house units (Opdyke et al., 2017). Apparently, it was low tide in Tacloban when the typhoon made landfall. The damage would have been greater if it had been otherwise (Kinghorn, 2018)

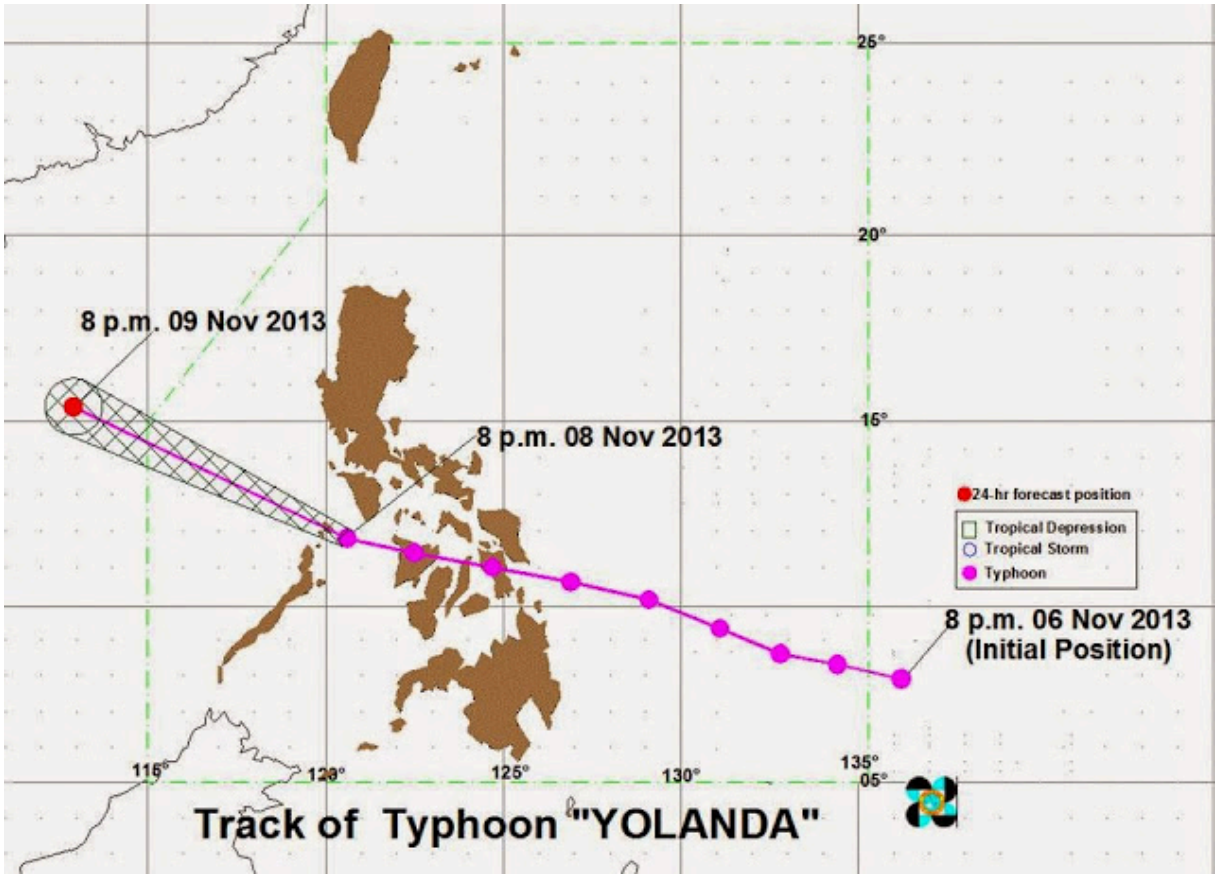

Figure 4. 1: Track map of typhoon Yolanda [Source: JICA]

4.2.2 Damage in the Visayan Region

In Guiwan Town, the southern tip of Samar Island, where Typhoon Haiyan first landed, the fierce storm destroyed everything from wooden houses to concrete structures. In Ormoc City, Leyte Island (population 190,000), where the typhoon passed, the strong wind caused all the wooden houses to collapse in this city. Batayan Island (population 130,000), which is famous as a tourist destination in the north of Cebu Island, had its houses and trees destroyed as well.

According to NDRRMC's announcement at 6:00 am on November 11, 2013, the number of victims of typhoon Haiyan reached 9.6 million people (2 million households) in 41 states, mainly in the Visayas region, of which 610,000 people (128,000). Households) evacuated. 430,000 live in 1444 shelters and 180,000 live outdoors. As of the 13th of November, the total number of houses that were completely or half destroyed is about 150,000, but this figure does not include figures such as Samar Island, Leyte Island, and Bantayan Island.

The damage to roads and communications system made it difficult to distribute relief goods to affected communities. It was reported that Palo Town (population 62,000), located south of Tacloban City, which suffered catastrophic damage, received no assistance as of November 12. It was on the 13th, the sixth day after the disaster that the government's relief supplies arrived in Ormoc, Leyte Island.

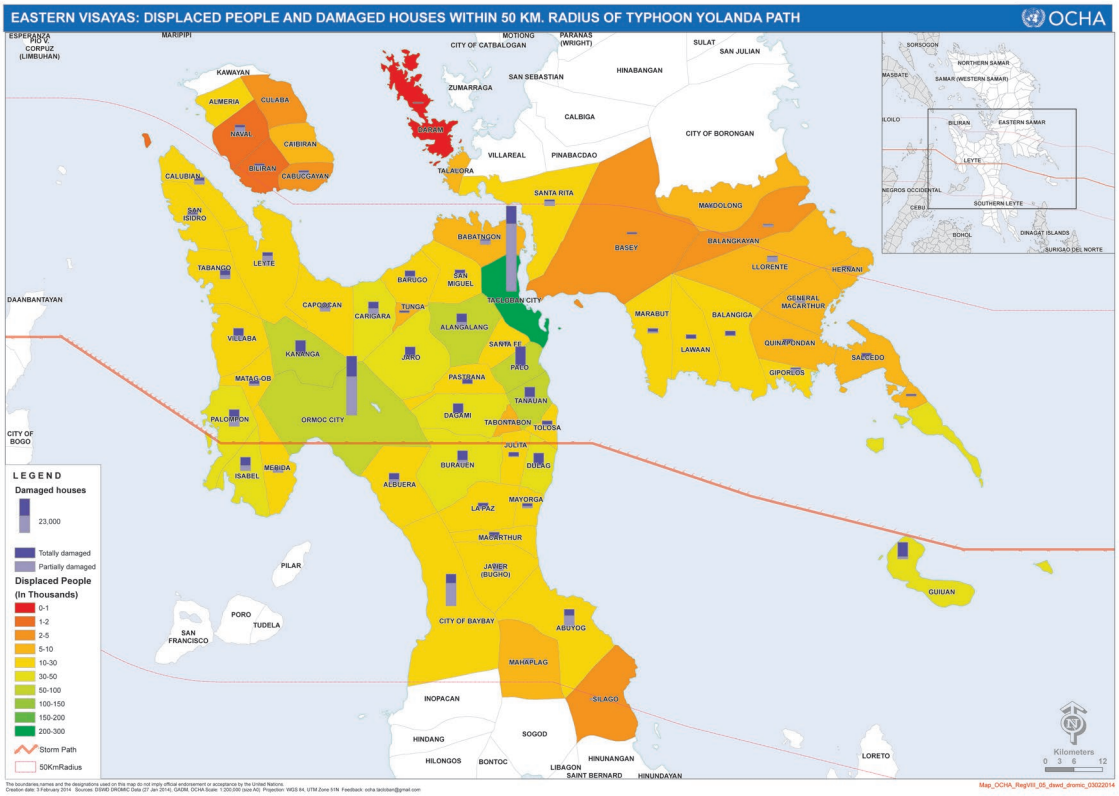

Figure 4. 2: Overall damage around Tacloban City [Source: OCHA]

4.2.3 Typhoon Damage in Tacloban

In Tacloban City, 46.28% of the total area was damaged, 35.33% of which was destroyed and 12.53% was half destroyed (Figure 4. 2). 78% of the houses within a radius of 100 km from the center of the typhoon were affected, and light-weight houses were the most damaged. Buildings made of 83% wooden construction and 94% nipa palm have been destroyed. Areas that suffered significant damage are concentrated in the coastal area of the southern part of the city. Inland areas and downtown areas are made of many sturdy building materials such as RC structures and block structures, so the damage is relatively small.

In the disaster area, all infrastructure such as airfields, roads, electricity, and communication networks were destroyed. Some local governments also suffered damages to the employees themselves, thus the administrative mechanism did not function sufficiently.

Therefore, compared to other disasters so far, rescue and recovery activities have become much more difficult.

In the Philippines, when a major disaster occurs, the NDRRMC, which is composed of representatives of the Department of Interior and Local Government, Department of Social Welfare and other government departments and agencies, and related organizations centering on the Department of Defense, organize disaster countermeasures. After coordinating with the respective disaster countermeasure councils established at the municipal level, rescue activities, installation of shelters, distribution of relief supplies, and restoration of infrastructure are carried out. At the local community level, the officers of the barangay (village), the smallest unit of government, play a central role in distributing relief supplies and in reconstruction activities.

This time, however, the disconnection of transportation and communication networks made it difficult to assess the damage situation, let alone the transportation of relief supplies. Also, in the rescue and reconstruction activities requiring heavy equipment and trucks owned by the local government in the disaster area, the materials and equipment to be used were severely damaged. Moreover, in some areas, all the houses were destroyed, and it is not possible for those affected to stay in the same area. There was only one truck in Tacloban that can be used to carry relief supplies, and only two out of 138 barangays in the city could receive relief supplies in a day.

4.3 Local Government Response to the Disaster

The typhoon-affected houses in Tacloban City account for 46.28 % of the total number of dwelling units. This does not include the illegal dwellers living in the coastal area. The plan, however, is to provide housing for everyone affected by the typhoon.

4.3.1 Stages of resettlement

The Government of Tacloban has decided to rebuild the housing in three stages: (1) Emergency Shelter, (2) Temporary Housing, and (3) Permanent Housing.

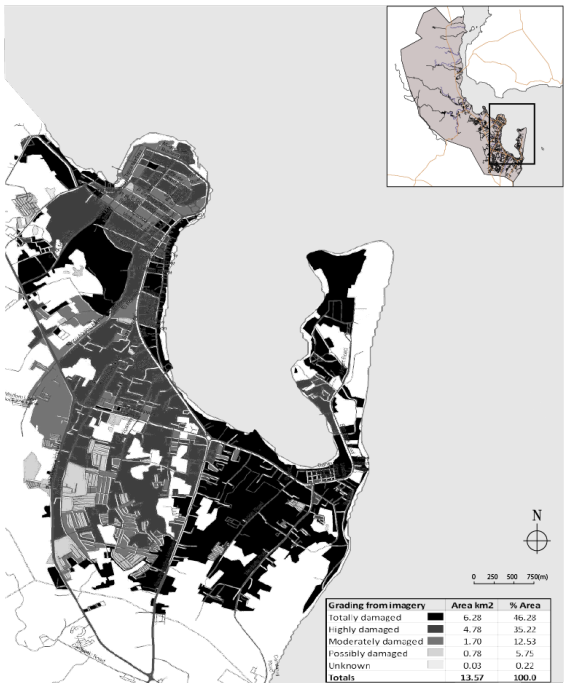

Figure 4. 3: Storm surge in southern Tacloban [Source: OCHA]

Emergency temporary tent (Emergency Shelter)

According to a report by JICA, after the disaster, the victims evacuated to public facilities, schools, relatives' homes, etc. Immediately after the disaster, emergency temporary tents were set up by government agencies, the Red Cross, and NGOs. These tents were constructed on any available land, even on the same areas affected by the typhoon.

Temporary Housing

The provision of temporary housing for reconstruction includes international cooperation groups such as the United Nations High Commissioner for Refugees (UNHCR) and the International Organization for Migration (IOM), Local Government Unit (LGU), and Operation Blessing (OB). It was carried out under the command of the Tacloban City Government with the participation of the NGO Operation Compassion (OC).

Temporary housing comes in different forms. This will be discussed in the subsequent section.

Permanent Housing

The production of permanent housing units was organized in collaboration with the City Planning Division of Tacloban City Government and the National Housing Authority (NHA). The housing program includes the relocation of the typhoon victims from the restricted area to the northern part of Tacloban.

4.3.2 Identification of Beneficiaries

To move from an emergency shelter to a temporary housing unit, the typhoon victims were asked to fill out an application form. This was required from all residents regardless of whether they wish to move to a temporary housing or not. The application form was submitted to the nearest Barangay Hall where it was checked by the Barangay Leader and evaluated by the Department of Social Welfare and Development (DSWD), and the Tacloban City Hall.

The criteria used to determine those who should qualify to move to the temporary housing were the following:

- with an income of PhP10,000/month or less.
- lives within the danger zone (a restricted zone within 40 meters from the coast)
- does not own any property (no assets such as land and savings)

Those who met the criteria were compelled to move to a temporary house. This process started in August of 2015. The typhoon victims stayed in the temporary house until the permanent housing units are finished. By then, the victims re-submit a copy of the family register called a Green Card (Figure 4. 4) to the National Housing Authority (NHA), which oversees planning the permanent housing. The residents cannot choose where to move in since the units will be raffled off at random to all the beneficiaries.

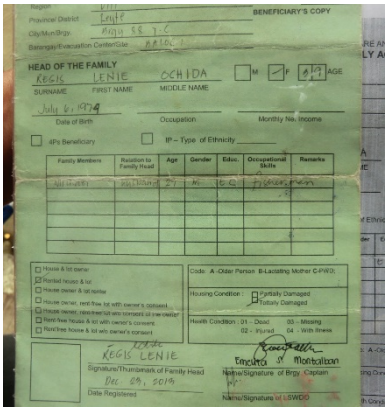

Figure 4. 4: Green card (Source: Ryosuke Inoue)

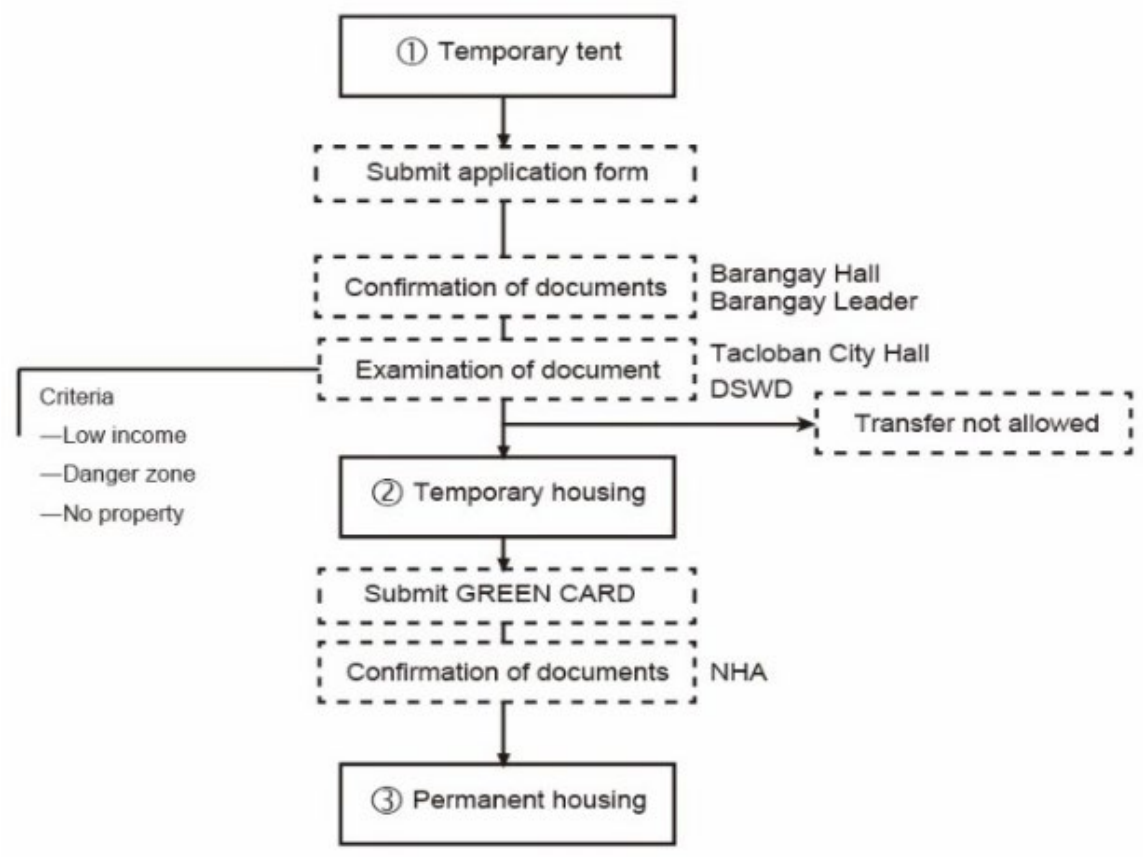

Figure 4. 5: Flow of migration

4.3.3 Temporary Housing: Site Characteristics and Shelter Design

Site Characteristic

There are 13 temporary housing areas designated as T1 to T13 (Figure 4. 18) and 12 permanent housing areas designated as P1 to P12 (Figure 4. 18) that the Tacloban government planned.

As mentioned earlier, many victims include those who lived in the coastal areas whose main livelihood was fishing. Their means of transportation were mainly by foot, bicycle, or public transportation such as jeepneys and multicabs, and their mobility was not high. Furthermore, there is only one national highway to the north of Tacloban, and transportation is generally poor. Based on the above, it is expected that moving to resettlement areas will have an impact on their living condition.

The features of the location are summarized below.

Location of temporary housing

Site 1: UPA (T1)

It is a temporary residential area planned in Barangay 88, San Jose, in the southern part of Tacloban city. The Tacloban Airport is in the same barangay, and it is located along the national highway. The area was heavily damaged by the typhoon, and many people wanted to move away from the place. On the other hand, some people who were engaged in fishing opposed the move to the north where the temporary houses are located.

Since there are frequent public transportation such as jeepneys, it is easy to access the city area, public facilities, and shopping malls. Moreover, it can be said that people living in UPA temporary housing have been living in Barangay 88, San Jose, before the disaster, and their lives can go back relatively easy because the burden of occupational changes due to the disaster is small.

Figure 4. 6: UPA Housing (Source: Ryosuke Inoue)

Sites 2 and 3: NHA Bunk House, IPI Bunk House (T 2 to T 3)

Each site is located inland, where damage by the storm surge was minimal. Large shopping malls and markets are open around each site, so it is easy to procure daily necessities, and public facilities such as schools and hospitals are also substantial. As a means of transportation, “pedicabs” (a bicycle equipped with a sidecar), which is used for short-distance transportation, also wait on the site of the temporary housing making it easier to go around.

Figure 4. 7: Bunk House (Source: Ryosuke Inoue)

Site 4: Abukay Bunk House (T 4)

It is in the mountains and is surrounded by residential areas. Like T2 and T3, this place is also a region where there is little damage from typhoons. A new bus terminal has been developed in the vicinity, which is very convenient for medium and long-distance travel to central city areas and out of the city.

Sites 5 to 12: Cali/ Yu/ Badato/ OB/ Duplex1/ Duplex2/ OC1/ OC2: Transitional Shelter (T 5 to T 12)

All T5-T12 settlements were built in the north of Tacloban. Since they were migrating from the southern part of Tacloban, households that earn a living from the fishing industry were forced to take on other occupations. Public facilities, shopping malls, etc. have not been built because the development is not progressing, and it is necessary to head to the urban area to buy daily necessities.

Since there is only one national road to the city, there are few public transportations such as the “multicabs” and jeepneys.

Figure 4. 8:Transitional Shelter (Source: Ryosuke Inoue)

Site 13: Tagpuro:Transitional Shelter (T13)

Among the temporary housing areas, Tagpuro is in the northernmost part of the city. Residents are made up of residents from Barangay 88, San Jose, the site of UPA, so it is the most distant place from the pre-disaster residence. Similar to other temporary housing in the north, it is difficult to obtain daily necessities. However, because there is good access to the nearby sea, people who were engaged in fishing have no need to change their occupations.

Of the thirteen temporary housing sites, eight were identified for this study. These eight are the following:

T1 – UPA, San Jose

With a land area of 7.900 m^2, 309 families inhabit this settlement distributed in 17 buildings. Before the typhoon, these people would live in the Barangays 37, 60, 62-A and 62-B, which were located near the seashore. Shared toilets and shower rooms account for 12 units, and shared kitchens for 5 units, distributed in the spaces between dwelling units.

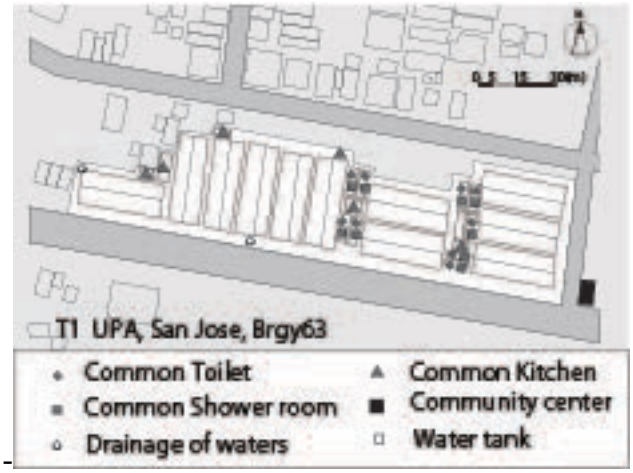

Figure 4. 9: Site Development Plan of T1, UPA, San Jose, Brgy 63

T3 – IPI Bunk House, Calibaan

The Calibaan project of temporary housing is placed in the areas designated as "No build zones" from the Barangays 31, 35-A, 88 and 897. Common kitchens, shower rooms, and unit baths account for 30 elements, 15 being common kitchens.

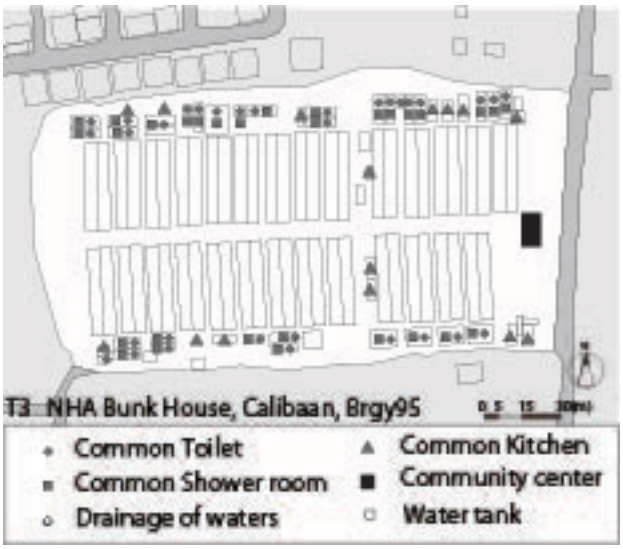

Figure 4. 10: Site Development Plan of T3 – IPI Bunk House, Calibaan

T4 – Abucay

This settlement was built in a mountainous area, so available land located in the outskirts is an issue. The available land for this project is rather small. It features seven bunk houses and has accommodated 121 families thus far.

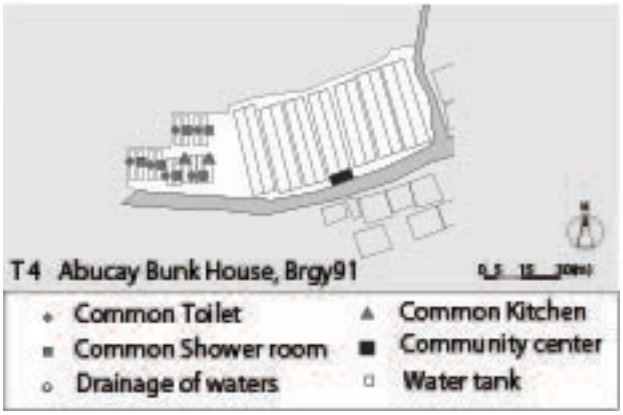

Figure 4. 11: Site Development Plan of T4 – Abucay

T5 – Cali

The completion date of Cali was scheduled for December 2014, and among the project for temporary houses, this one was completed last. Build coverage ratio is the second lowest, 16.3%, and, in the same way as in Tagpuro, residents have started making use of the exterior spaces attached to the kitchens of their dwellings for growing vegetables.

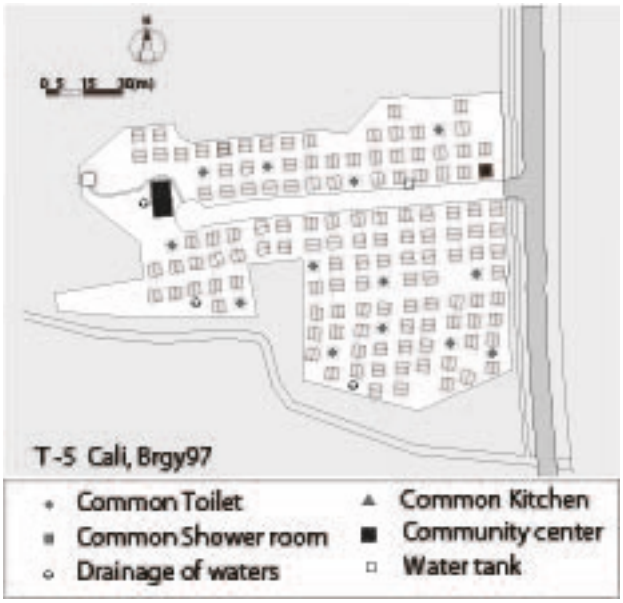

Figure 4. 12: Site Development Plan of T5 – Cali

T6 – Yu, San Isidro

This is the biggest project amongst those located in the North area. It is located along Babatngon road and has an orthogonal plan with detached houses. This project started relatively early, in February 2014, but the construction is still ongoing. 69 families from Barangay 37 have started to move in. The transfer of residents was slow because of the long distance between the city center and the site.

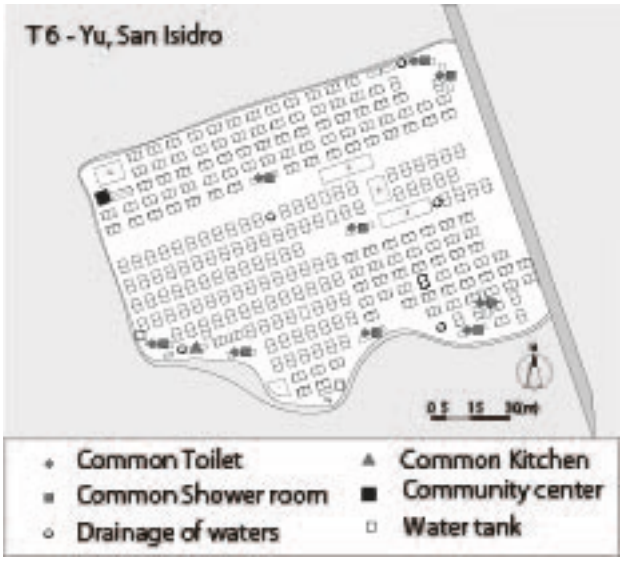

Figure 4. 13:Site Development Plan of T6 – Yu, San Isidro

T7 – Sto. Niño Badato

Completion date for Santo Niño was scheduled for October 2014.This settlement is located on the side of Babatngon road and has an orthogonal plan with detached houses. Common facilities include one community center, shared toilets, common showers, one water tank and water drainage. This settlement was made accessible as much as possible. Shorter paths for both disabled persons and pregnant women were provided by placing some dwellings near the shared premises. Solar panels also provide basic electric power to some dwellings.

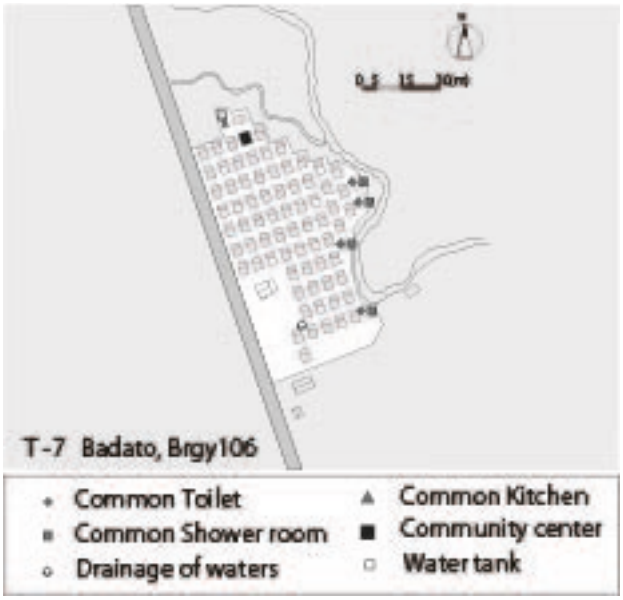

Figure 4. 14: Site Development Plan of T7 – Sto. Niño Badato

T9 – New Kawayan

This project was scheduled for 2014, but it was completed much earlier. In the same fashion as T1, is has access through a secondary road. The settlement has an open plan design and comprises two types of houses: single and detached. The project features common toilets and showers, as well as two community centers, but did not provide for common kitchens; for this reason, the residents have started to implement these kitchens into their own dwellings.

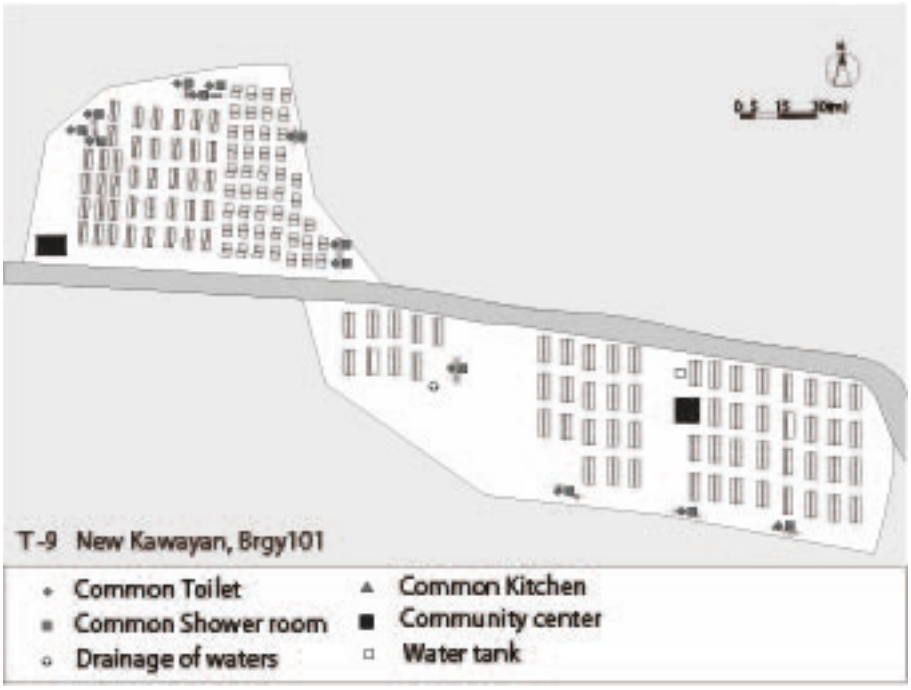

Figure 4. 15: Site Development Plan of T9 – New Kawayan

T13 – Tagpuro

The construction of this community was completed in October 2014 in a plot with 23,327 m^2 provided by the municipality of Tacloban. It is located near the seashore and connected with a secondary road that leads to Babatngon road. This community features detached houses, which are distributed on an irregular basis. Common facilities include a community center and shared toilets.

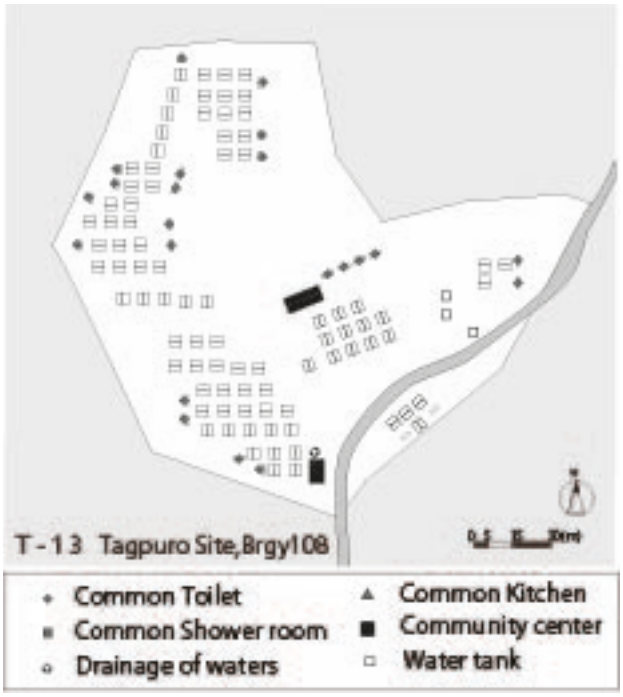

Figure 4. 16: Site Development Plan of T13 – Tagpuro

Shelter Design

Figure 4. 16 illustrates the different types of houses used in the temporary settlements. There are basically three types: Detached (D), semidetached (SD) and bunk houses (B). Three subtypes can be found for detached houses (1Ta, 1Tb and 1Tc), accounting for 23.04 m^2, 15.52 m^2 and 22.31 m^2, respectively. Sub-types 1Tb features internal divisions, whereas subtypes 1Ta and 1Tc do not. Semi-detached houses units accounts for 18.06 m^2 distributed in a single space. A single unit of bunk houses features only 9.10 m^2 and has no internal divisions.

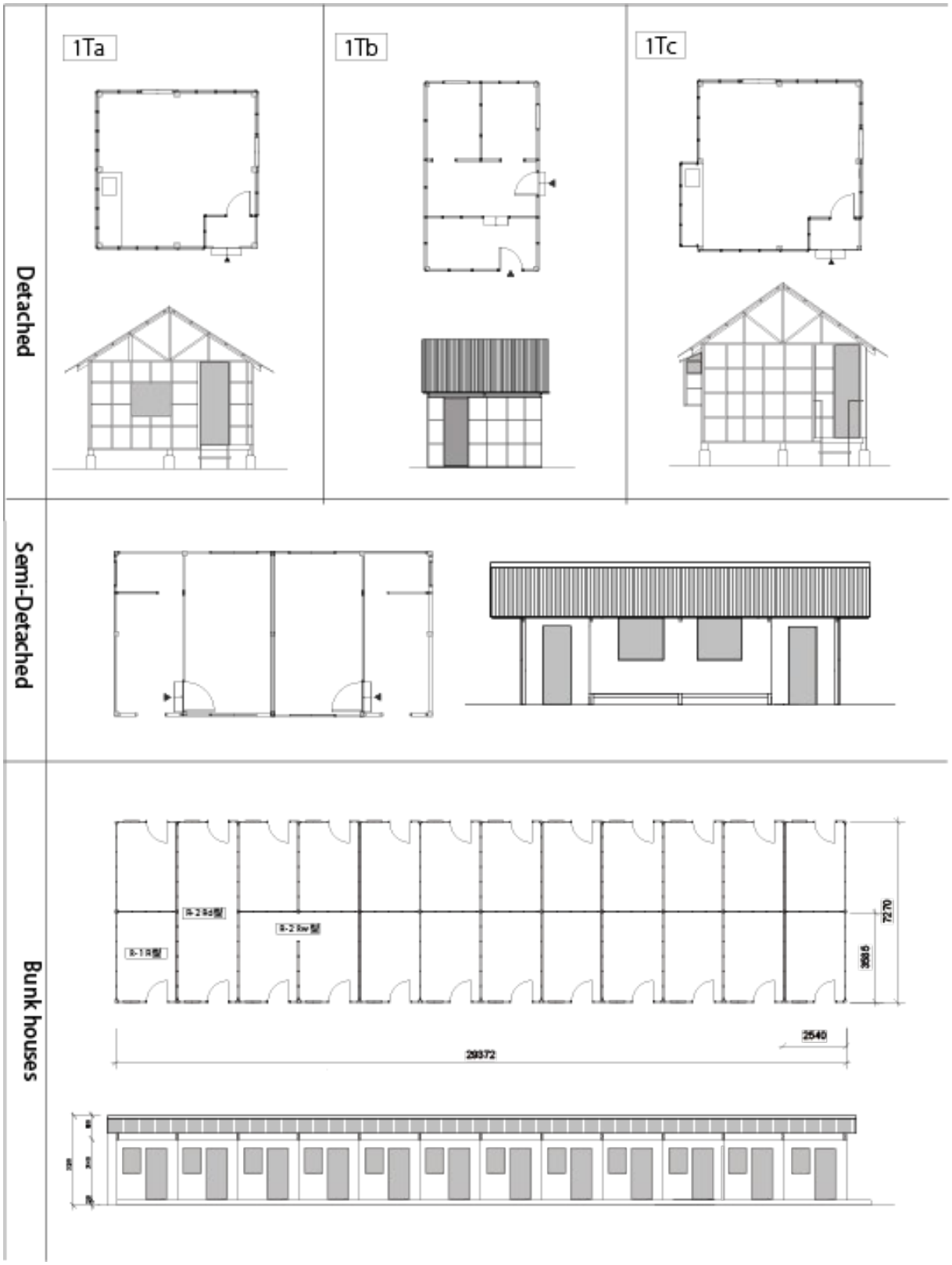

Figure 4. 17: Shelter Types (Temporary Housing)

The eight temporary settlements have been assessed against the UNHCR standards which are summed up in Table 4. 1 and Table 4. 2.

Table 4. 1: Result of Fieldwork

Settlement		TO1	TO2	TO3	TO4	TO5	TO6	TO7	TO8
Area	Settlement Area (m^2)	23,327	25,148	4,750	17,704	14,438	4,288	22,409	7,900
	Floor/area Ratio	6.38%	40.33%	54.55%	24.04%	16.32%	34.87%	25.74%	45.97%
	Available Camp Area (m^2)	21.839	15.006	2.159	13.448	12.120	2.793	16.641	4.269
Dwellings	Detached	86	76	130	246	117	0	0	0
	Semi-detached	0	249	0	0	0	0	0	0
	Bunk Houses	0	0	0	0	0	168	648	408
	Total	86	325	130	246	117	168	648	408
	Occupied	71	260	108	69	97	108	452	309
Residents	Permanent (P)	499	1726	753	1553	739	437	1685	1061
	Current (C)	416	1381	627	436	618	437	1176	804
Facilities	Shared Kitchen	0	1	5	0	0	0	15	5
	Community Center	2	5	0	3	2	1	1	0
	Share Toilet	24	29	12	11	24	26	30	12
	Water Tanks	2	4	4	0	3	2	0	0
	Common Showers	0	13	4	9	0	6	80	9
	Water Drainage	1	1	2	4	3	0	0	2

Table 4. 2: Compliance with Standards from UNHCR Emergency Handbook

	UN Standard unit	Modular planning unit	Average camp area per person (45 sqm)	Common toilet (1 per 20 persons)	Common kitchen (no guidance)	Common shower (1 per 50 persons)	Community center (as appropriate)	Drainage of water	Water tank (1 per 80 persons)
TO1	P	CO	46.7	21	(*2)	-	250	499	250
	C	CO	56.1	18	(*2)	-	208	416	208
TO2	P	BL	14.6	60(*)	0	133	863	1726	432
	C	BL	18.2	48(*)	0	107	691	1381	346
TO3	P	CO	6.3	63	0	189	753	377	189
	C	CO	7.6	53	0	157	627	314	157
TO4	P	BL	11.4	142	(*2)	173	1553	389	(*3)
	C	CO	40.6	40	(*2)	49	436	109	(*3)
TO5	P	CO	19.6	30	(*2)	-	370	247	247
	C	CO	23.4	26	(*2)	-	309	206	206
TO6	P	CO	9.81	17	437	73	437	-	219
	C	CO	9.8	17	437	73	437	-	219
TO7	P	BL	13.3	57	113	57	1685	-	(*3)
	C	BL	19.1	40	79	40	1176	-	(*3)
TO8	P	BL	7.4	89	177	118	1061	531	(*3)
	C	CO	9.82	67	134	90	804	402	(*3)

(*) Semi-detached houses feature private toilets.

(*2) Private kitchens are available inside the house.

(*3) There are no water tanks in TO4, TO7, and TO8.

P – Permanent

C – Current

BL – Block

CO – Sector

With regards to the assessment, the following considerations were made.

1. Minimum standards for planning camps: The number of dwellings (built and inhabited) in each settlement, as well as their typology, was surveyed; basic plans and elevations were also drawn (Figure 4. 17). It was extremely difficult to estimate the total number of residents in each settlement, so an estimation was made. Assuming that the minimum standards from UNHCR handbook was met, 3.5 m^2 of covered area per person was estimated. After that, an estimation of the current number of residents, that is, those ones who inhabit occupied dwellings, and potential number of residents, that is, the estimated number of people that would live in that settlement if all houses were inhabited, was done. This estimation is depicted in Table 4. 1 as potential residents (P) and current residents (C), giving in this way two possible scenarios: The first one showing the current situation of each settlement (scenario C) and the second one, showing and hypothetical situation where all available houses would be inhabited (scenario P).

2. Average camp area per person: Considering the unitary area of dwellings (Figure 4. 17) and the total number of dwelling for each typology (Table 4. 1) the area occupied by dwellings was calculated; after that, available camp area and floor coverage could be obtained. This area was divided into the number of current (C) and potential (P) residents to obtain a figure that could be used as an assessment parameter. Table 4. 2 shows the disparity of standards between settlements. Only T01 meets the minimum standard of UNHCR both in the current situation and in the event of a full occupation. The rest of settlements are below the recommended standard: T02, T03, T05, T06, T07 and T08 are within the critical range, always far below 29 m^2 per person. Only T04 is, at present, in an acceptable condition, but it could fall into a critical condition if all houses were inhabited.

3. Indicative modular planning units: According to the number of residents, all settlement range between community and block. Comparing their current state and the potential number of residents, only T04 and T08 could jump from community to block.

4. Site planning standards for services and infrastructures: The following facilities were not present in any of the settlements: rubbish container, refuse pits, health center, referral hospital school, distribution center, marketplace, feeding center, storage area, lighting, registration area, security post and security fencing. This can be explained by two reasons: The first one and most obvious, these facilities were not planned; the second one, some of them need a settlement with a larger scale (at least a sector with 5.000 people), since these settlements are smaller, it made no sense to plan them. For instance, 1 school is

recommended per 5,000 people or 1 sector, and neither of the surveyed settlements can house as many residents. Assessed services are depicted in Table 4. 2: Common toilets, common kitchens, common shower, community center, drainage of waters and water tanks (access to drinkable water). Only T01 and T06 settlements comply with the standards regarding common toilets. The number of common kitchens vary greatly between settlements; this can be explained by the fact that some typologies feature private kitchens, so common facilities are not necessary. Provision of shared showers vary greatly between settlements. Some of them (T01 and T05) have none; only T07 comply with UNHCR standard at present time but, if all dwelling were inhabited, it would not be possible to meet this standard. The rest of settlements do not meet the minimum standard by far. The UNHCR does not provide guidance for community centers, but it is remarkable that all settlements feature, at least, one of this facility. However, once more, there is disparity between settlements: T01 has 2 centers (one per 208 people) and T07 only one, serving 1,176 people. In the same fashion, there is no minimum standard regarding drainage of water, but some settlements do not have this facility (T06 and T07); amongst the ones that have this facility, there is disparity in data. The most evident shortcoming is related to water supply. Despite the minimum standard is 1 tank per 80 people, 3 settlements (T04, T07 and T08) do not have any of it. The ones that feature some sort of water supply are all far beyond the recommended standard.

4.3.4 Permanent Housing: Site Characteristics and Shelter Design

Site Characteristic

The northern part of Tacloban was chosen as a resettlement plan because of the large land owned by the city government. As a result, the relocation site of the permanent housing area was decided before the master plan for Tacloban City was revised to address post-disaster issues. In the north, however, which is originally a rural area, there are no public facilities such as schools, hospitals, and government offices, infrastructure, shopping malls, and other necessary facilities for living, and there is no urban infrastructure that can withstand a large amount of migration. To make the resettlement area a habitable area, it was necessary to integrate land development plans such as public facilities along with the construction of many housing groups.

Figure 4. 18 shows the location of the temporary housing resettlements as well as the permanent housing resettlements of which only twelve were identified as of 2015. The permanent houses P1 to P12 are all located in the north of Tacloban. Currently, construction of housing and public facilities has started as soon as possible based on the resettlement plan in the north. However, the business has not progressed much because of the need to build more than 10,000 homes.

Due to the delay in development, people living in permanent housing needed to go to Tacloban city center for a job. The same applies when purchasing everyday items and using public facilities. To get to the city center, they take a “multicab” which takes about 40 minutes and costs from 15 PHP to 20 PHP one way. The site is linked to the resettlement plan in the north, so it will be described in detail in the next section.

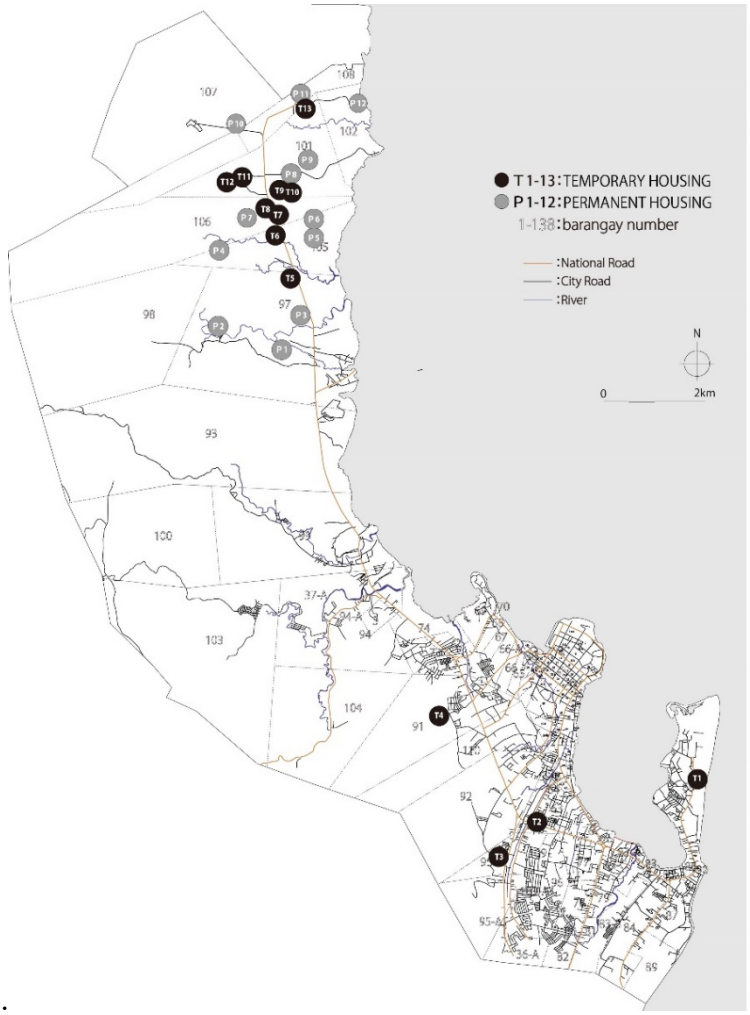

Figure 4. 18: Distribution of resettlement sites as of 2015

At present, NHA was able to accomplish 19 projects sites for permanent housing by the end of February 2017. The total number of houses would have been 14,433 units, however at this time, only 8,522 were completed and 2,833 were between 25% to 75% complete. The rest have not been started yet. Another government-initiated shelter project is the Post-Yolanda Core Shelter Project in Barangay 103. This is a housing project of the Local Government of Tacloban in collaboration with the GMA Kapuso Foundation, Inc. Its implementing arms were the City Social Welfare and Development Office (CSWDO) and the City Housing and Community Development Office (CHCDO). The beneficiaries include 66 families for house repair in Barangay Palanog and 72 families for new housing in the northern barangays. Listed below are the NHA projects and status of accomplishments for Tacloban City as of February 27, 2017.

It took four months for the Haiyan victims of Tacloban to be transferred to temporary shelter sites in lots owned by the National Housing Authority, IPI and the LGU in Barangay Abucay. It took two years after that for some of them to be transferred to permanent houses. In November of 2016, President Duterte gave a marching order to have all remaining beneficiaries of Tacloban City residing in temporary shelters immediately transferred to permanent homes. As a result, over 8,000 units out of the target of 14,433 units in Tacloban had been allocated for permanent housing at the end of December 2016. Moreover, the requirement for the victims to repay the government the amount of P95,000 in 30 years for the house and lot was waived, thereby giving away the houses for free (Karaos et al., 2017).

Table 4. 3: List of Permanent Housing Settlements as of 2017

No.	Project/Barangay	No. of Housing Units Bid out/ Awarded	% Land Devt	House Construction		Units Occupied / Awarded/ Turned over
				No. of Units 25% - 75% Complete	No. of Units Completed	
1	Kapuso Village, Brgy. Kawayan	403	99.34	-	403	403
2	Kawayan Village,	554	99.44	-	317	317

	Brgy. Kawayan					
3	Ridge View Park 1, Brgy. Cabalawan	1000	85.86	295	615	607-
4	Ridge View Park 2, Brgy. Cabalawan	1000	76.5	252	545	473
5	Greendale Residence Phase 1, Brgy. San Isidro (Suhi)	327	85.06	-	327	316
6	Greendale Residence Phase 2, Brgy. San Isidro (Suhi)	854	57.26	161	470	227
7	Greendale Residence Phase 3, Brgy. San Isidro (Suhi)	459	52.71	141	238	74
8	Villa Sofia, Brgy. Tagpuro	640	93.11	-	554	527
9	Knightsridge Residence, Brgy. Camansihay	1000	60.48	208	82	-
10	North Hill Arbours 1, Brgy. Sto. Niño (Suhi)	1000	93.33	-	1000	871
11	North Hill Arbours 2, Brgy. Sto. Niño (Suhi)	1000	85.79	130	870	767
12	Salvacion Heights, Brgy. Salvacion (Tigbao)	532	26.04	164	36	-

13	Villa Diana, Brgy. New Kawayan	409	94.03	-	409	362
14	Guadalupe Heights 1, Brgy. San Isidro (Suhi)	1000	87.04	587	413	290
15	Guadalupe Heights 2, Brgy. San Isidro (Suhi)	1000	82.41	338	662	484
16	Guadalupe Heights 3, Brgy. San Isidro (Suhi)	750	55.39	282	227	13
17	New Hope Village, Brgy. Kawayan and Brgy. Sta. Elena	1000	95.50	33	976	859
18	St. Francis Village, Brgy. Suhi	1000	42.48	232	368	-
19	St. Francis Village, Brgy. Suhi	505	-	-	-	-
TOTAL/AVERAGE %		14,433	76.20	2,833	8,522	6,590

Other than the government, different institutions also organized their own programs: (Karaos et al., 2017).

- Yolanda Response Project by the United Nations Development Program. They built a total of 232 permanent housing units distributed in four locations as follows: 55 units in Tacloban City; 55 units in Ormoc City, Leyte; 55 units in the municipality of Hernani in Eastern Samar and 67 units in the municipality of Basey, Western Samar.

- Post-Yolanda Support for Safer Homes and Settlements by UN-Habitat. The project built a total of 660 permanent housing units distributed in four locations: Roxas City (288 units), the municipalities of PanMay (110 units) and Pontevedra (235 units) in the province of Capiz, and the municipality of Estancia (27 units) in Iloilo.
- Resilient Recovery Program by CORDAID. Cordaid Philippines developed a recovery program focusing on housing, water, sanitation, hygiene, and livelihood in 2014.
- Eastwind Residences by ACTED. The project is in the same site as the NHA Eastwinds Residences in Barangay Cogon, Poblacion, Municipality of Guiuan, Eastern Samar. The beneficiaries of the ACTED Permanent Shelter project came from two barangays in the town proper or the Poblacion: Barangay 7 with a population of 990 in 2015; and Barangay Hollywood with a population of 2,006. In 2015, the Guiuan local government unit (LGU) estimated 1,200 families for relocation from no build zones.
- Basey Ecoville Housing Project by Julio and Florentina Ledesma Foundation. Basey is a first-class municipality with a total population of 55,480, according to the August 2015 census data of the Philippine Statistics Authority (PSA). There are almost 13,000 Yolanda affected families in the municipality of Basey. To address their housing need, 10 permanent resettlement projects were implemented in the municipality by various international and local non-government organizations, as well as government housing agencies. Among them is the Basey Ecoville Housing Project located in Barangay Bacubac. The two-hectare site was previously a farm land that was acquired by the local government of Basey.

At the time of the study, only two of these sites were started because they served as Phase 1 of the Tacloban Recovery and Rehabilitation Plan of March 2014. These are:

- Kawayan Village or UN-Habitat, Brgy 101 (Brgy. Kawayan)
- Kapuso Village or GMA[10], Brgy 101 (Brgy. Kawayan)

[10] GMA Network (Global Media Arts or simply GMA) is a Philippine free-to-air television and radio network. It is the flagship property of publicly traded GMA Network, Inc. It is commonly referred to as the "Kapuso Network" in reference to the outline of the company's

UN-Habitat and GMA were the organizations that started the reallocation of people into permanent residences in the North area, accommodating 1,116 families. The land was purchased to the Philippines Government to start the projects.

UN-HABITAT:

The project of permanent housing from UN-Habitat is still under construction at present time, featuring a total number of 716 dwellings; people will start to move in as soon as the project is completed. The houses feature two floors, being their structure is made of blocks; when compared with one-floor dwellings, these ones seem to have a better performance regarding their thermal environment; the second floor has also been self-built by the residents.

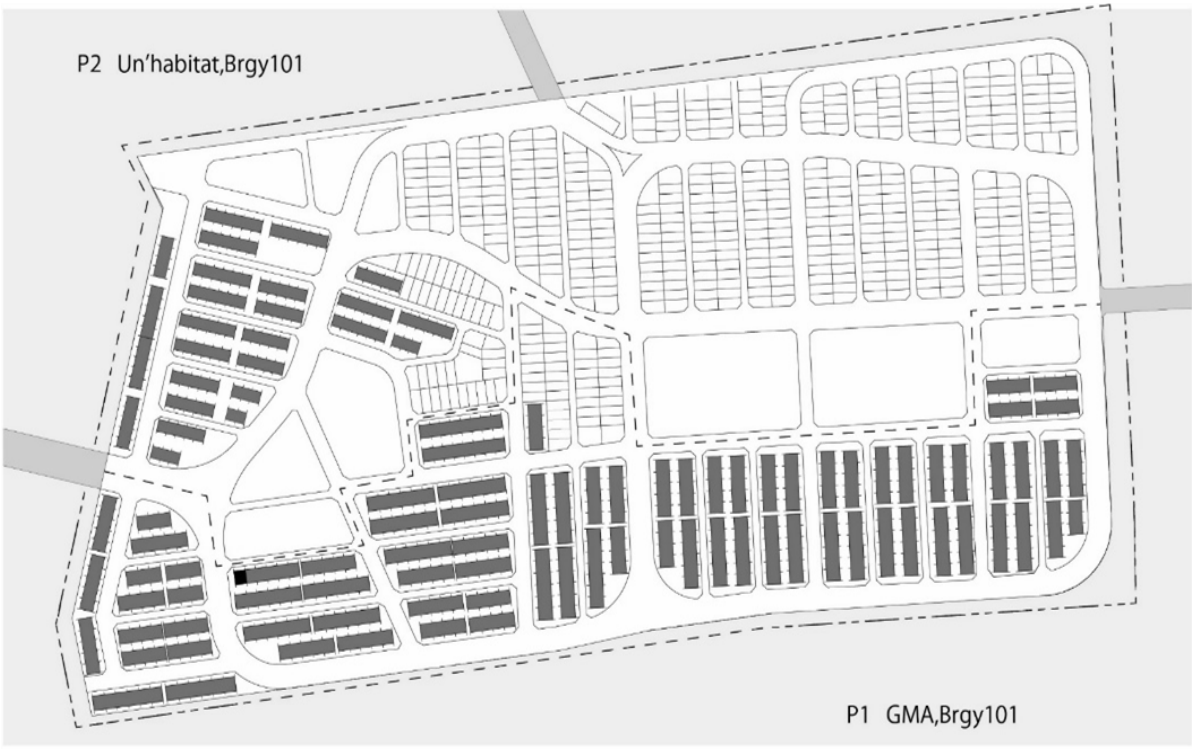

Figure 4. 19: Plan for a permanent housing community.

GMA:

Amongst the 400 dwellings from this project, 347 have been offered to residents. The rent is free, but families must pay for the water and electricity bill. Each family pays their bills individually to the water company (Mactan Rock) and the electric company (Leyco). The

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logo. The original meaning of the GMA acronym was "Greater Manila Area", referring to the initial coverage area of the station.

construction cost of one unit of these houses is estimated in 2.500 PHP; residents here come from Barangay 88.

The three main priorities of the GMA projects were listed as: (1) reallocate resident from Barangay 88, (2) accommodate families of at least seven members, and (3) reallocate anyone except government employees.

Table 4. 4: Area Requirements

Density = 85	BP220 Requirements	Actual
Parks and Playgrounds Requirements	3.5% of Gross Area or 0.034Ha (341 m^2)	Compliant
Area for Community Facilities	1.0% of Gross Area or 0.097Ha (97.5 m^2)	Compliant

Table 4. 5: Community Facility Allocation

No. of housing units = 872	BP220 Requirements	Actual
Neighborhood Multipurpose Center	Required	Compliant
Tricycle Terminal	Not Required	No facility. Tricycle simply waits along the road
Convenience Retail Center*	Not Required	Sari-sari stores serve the purpose
Elementary School*	Not Required	The churches are used as schools although there are formal schools near the community
High School*	Not Required	There are formal schools near the community

Table 4. 6: Minimum Lot Area and Frontage

	BP220 Requirements	Actual

	Minimum Lot Areas	Minimum Lot Frontage	Minimum Lot Areas	Minimum Lot Frontage
Single Detached (Corner and regular lots)	64 m^2	8 meters	unidentified	unidentified
Single Detached (Irregular lot)	64 m^2	4 meters	unidentified	unidentified
Single Detached (Interior lot)	64 m^2	3 meters	unidentified	unidentified
Duplex/Single Attached	48 m^2	6 meters	n/a	n/a
Rowhouse	28 m^2	3.5 meters	n/a	n/a

Table 4. 7: Road Right of Way

	BP220 Requirements		Actual	
Project Size Range = Below 2.5 hectares	ROW	Carriageway	ROW	Carriageway
Motor Court	6 meters	5 meters	n/a	n/a
Alley	2 meters	-	n/a	-
Path walk	3 meters	-	0.40 to 1.5 meters	-

Table 4. 8: Hierarchy of Roads

Project Size Range = Below 2.5 hectares	BP220 Requirements	Actual
Major	Required	None
Collector	-	-
Minor	Required	None
Motor Court	Required	None
Alley	-	-

Pathway	Required	Yes

Table 4. 9: Utilities

	BP220 Requirements	Actual
Water Supply	Mandatory connection to public water system	The community is connected to a public water system.
	At least an operational deep well and pump set	
	Minimum water supply requirement is 150 liters per capita per day for household	
Electric Power Supply	Mandatory household connection to primary and alternate source of power if available	The government provided the required streetlights, however each household had to apply for their own electrical connection.
	Mandatory provision of street lighting per 50m distance	
	Electric bill to be shouldered by users	
Drainage System	Made of concrete lined canal with load bearing cover	Each house has a septic tank that drains into a public sewer.
	Shall drain into appropriate water bodies, public drainage, or natural outfalls	
	If applicable, underground drainage system shall be provided with adequate reinforced concrete pipes	

	(RCP), catch basins, manholes/inlets, and cross drains for efficient maintenance	
Garbage Disposal System	Provided with sanitary and efficient refuse collection and disposal system whether independently or in conjunction with the local government garbage collection and disposal services	The government has a schedule for collecting garbage from a specific point source. Everyone is expected to bring their garbage to that area.

Shelter Design

Error! Reference source not found. illustrates the different types of houses used in the permanent housing communities: Type BP1 was constructed by GMA, while Type BP2 was constructed by UN HABITAT. Table 4. 10 shows additional characteristics of each type.

1. Type BP1: (GMA) Surface of 5m x 8.4m. One-story. Reinforce Concrete structure. With kitchen and toilet inside.

2. Type BP2: (UN HABITAT) Surface of 5.9m x 8.1m. Two-story, Reinforce Concrete structure. Wall of concrete blocks. With kitchen and toilet inside. Good thermal environment for air convection.

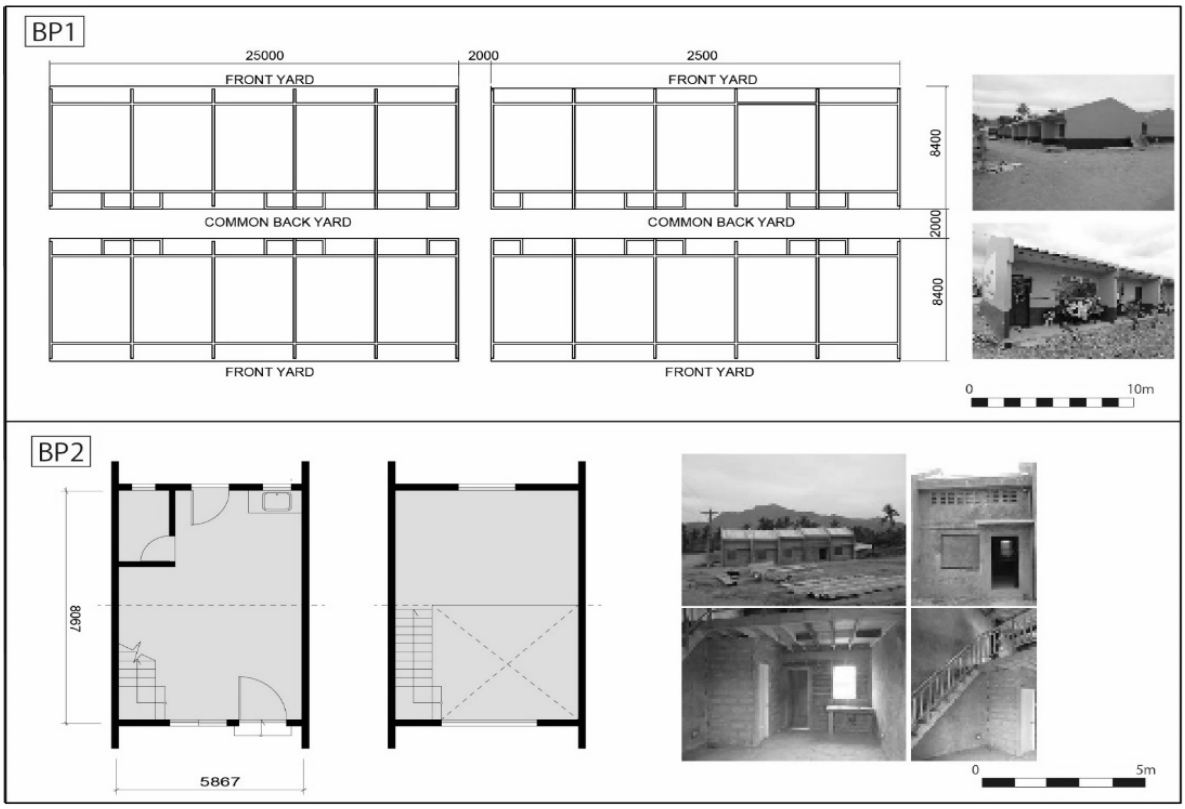

Figure 4. 20: Permanent Houses units (GMA and UN-HABITAT)

Table 4. 10: Shelter Components

	BP220 Requirements		Actual	
	Minimum Floor Areas	Minimum Level of Completion	Minimum Floor Areas	Minimum Level of Completion
Single Detached	18 m^2	Shell house (enclosed)	n/a	n/a
Duplex/Single Attached	18 m^2	Shell house (enclosed)	n/a	n/a
Rowhouse	18 m^2	Shell house (enclosed)	42 to 48 m^2	Shell house (enclosed)

Table 4. 11: Setbacks/Yard

	Required by BP 220	Actual
Front Setback	1.5 meters	60 cm
Side Yard	1.5 meters	n/a
Rear Yard	2.0 meters	60 cm

Abutments	May be allowed per requirement of the National Building Code of the Philippines	

4.4 Post Disaster Development

4.4.1 Revision of Tacloban Master Plan

Due to the typhoon damage, the land use in the coastal area and the northern part of Tacloban were reviewed and a large-scale relocation of the residential area from the coast to the north was carried out for the housing reconstruction project. The contents of the plan were drafted by the meeting held at the city hall every week from April 22 to August 12, 2015.

Among the salient features of the revised master plan are the following:

1. Protection of Hazardous Areas by Infrastructure Development.
2. Land Use
3. Traffic and Transport Network

Protection of Hazardous Areas by Infrastructure Development

Northern Tacloban was chosen to develop as a new resettlement site for the city, including a new residential area built by the NHA to relocate people affected by typhoon Yolanda. However, according to the hazard map released by JICA, some of the land newly developed by NHA is in areas that are likely to be affected by storm surges in the future. In response to this, and to make the residential areas that correspond to the dangerous areas able to respond to emergencies in the event of a disaster (traffic network disruption, sharp increase in demand for daily necessities, etc.), the development of infrastructure was planned. The strategies called for include the following: elevated road,

Elevated road

The road along the eastern part of the new residential area from the Barangay San Isidro to the Barangay Tagpolo will be elevated and will be designed to withstand storm surges in the future. In addition, a part of the land between the Barangay/Old Kawayan and the Barangay/Tagpolo may be protected and used for daily transportation purposes. (2 in Figure 4. 21) This elevated road will be built more than 5m above the average sea level to

reduce the risk of disconnecting the transportation network with urban areas in the event of high tides due to typhoons. This enables continuous transportation even in the event of a disaster and is used as a barrier against high tides. (3 in Figure 4. 21)

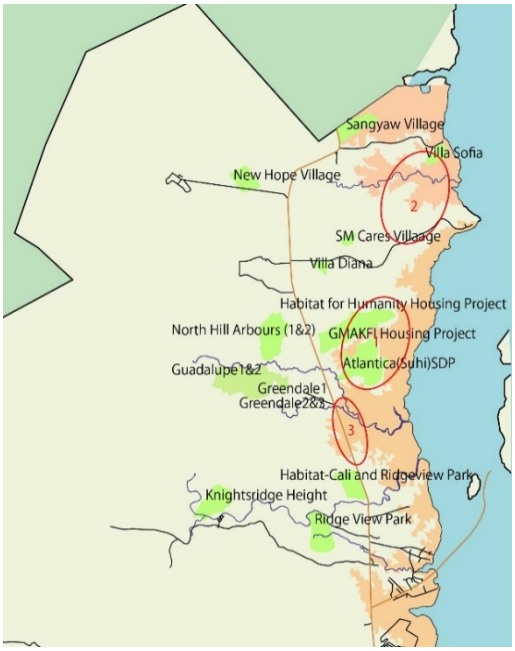

Figure 4. 21: Elevated Roads

Mangrove beach forest area

In addition to elevated roads, a plan for a beach forest area using mangroves was proposed to protect the most vulnerable areas in northern Tacloban. This is to mitigate inundation of seawater by planting mangroves within 40 m from the coast, which is a regulated building area. It is relatively susceptible to high tides. Barangay Tagpollo and Barangay Juanico Bridge Brgy. Juanico Bridge 2 areas are targeted.

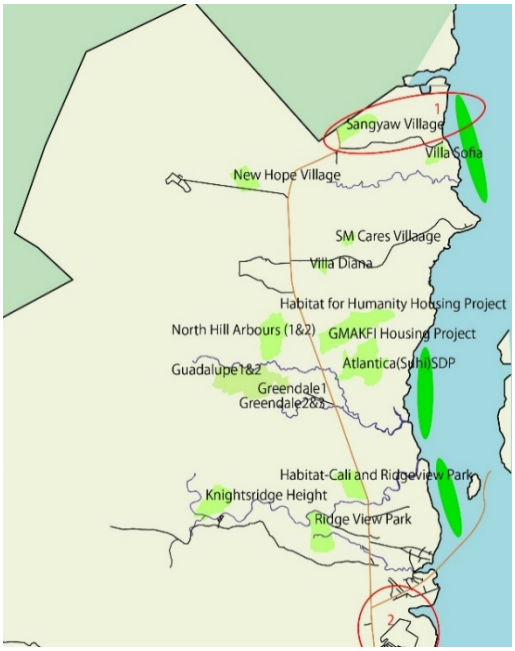

Figure 4. 22: Mangrove beach forest area

Land use

There was a need to revise the land use of the previous master plan. The coastal area of the residential area (R1 in Figure 4. 23) is in a dangerous area and is likely to be damaged by high tides. The coastal area of the large purple agricultural area is also located in the danger zone. There are several factories in this area, and if the factories are damaged by storm surge, it can cause pollution of the surrounding environment and human injury (3 in Figure 4. 23). There were also some features which are missing from the plan. Open spaces such as parks and plazas filled with nature, for example, are not planned. Major public facilities (universities, hospitals, shopping malls, etc.) are also missing from the plan.

Proposed agricultural land use.

The new plan changed the land use of the danger zones as an agricultural area to prevent the construction of industrial facilities and residential areas in this part. When severe storm surges occur, crops will be damaged, but the impact on residents will be mitigated.

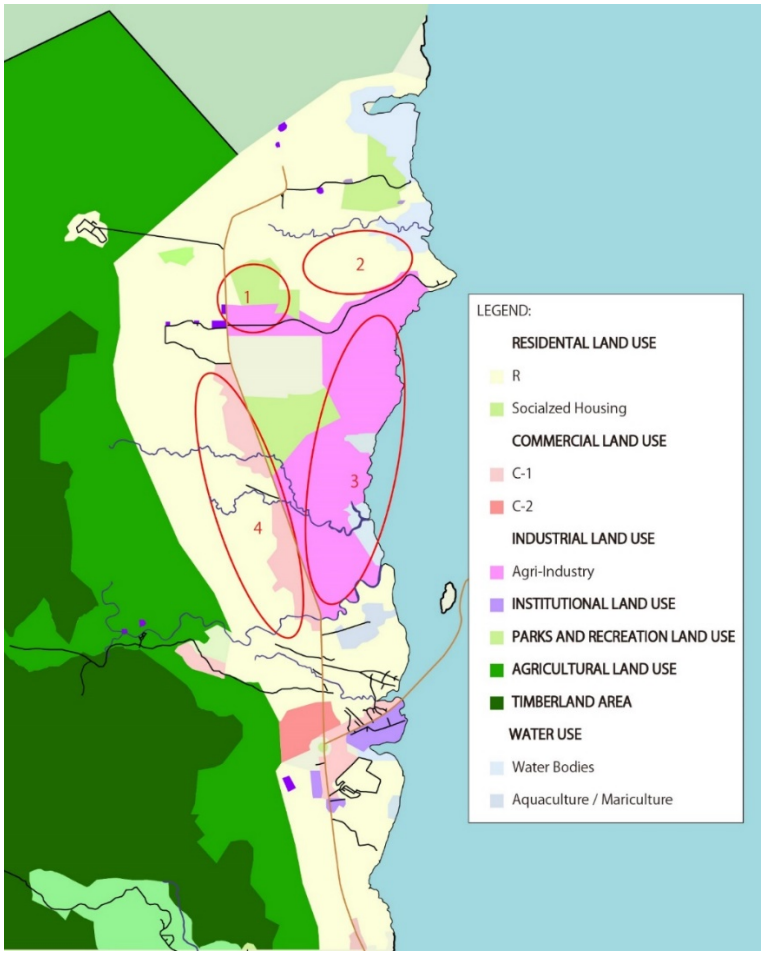

Figure 4. 23: Land Use

Proposed industrial land use.

Northern Tacloban is expected to experience significant growth in production activities as the resettlement plan is implemented. The proposed industrial land use is in the northernmost part away from the residential area to avoid risk of pollution. Due to the need for smooth distribution of goods produced in the area, the newly planned network of roads and ports was also considered. In Figure 4. 24, the area marked “1” was assigned as a mixed agricultural-industrial area. The area marked “2” was assigned as a light industry area, where only pollution-free facilities are permitted to operate.

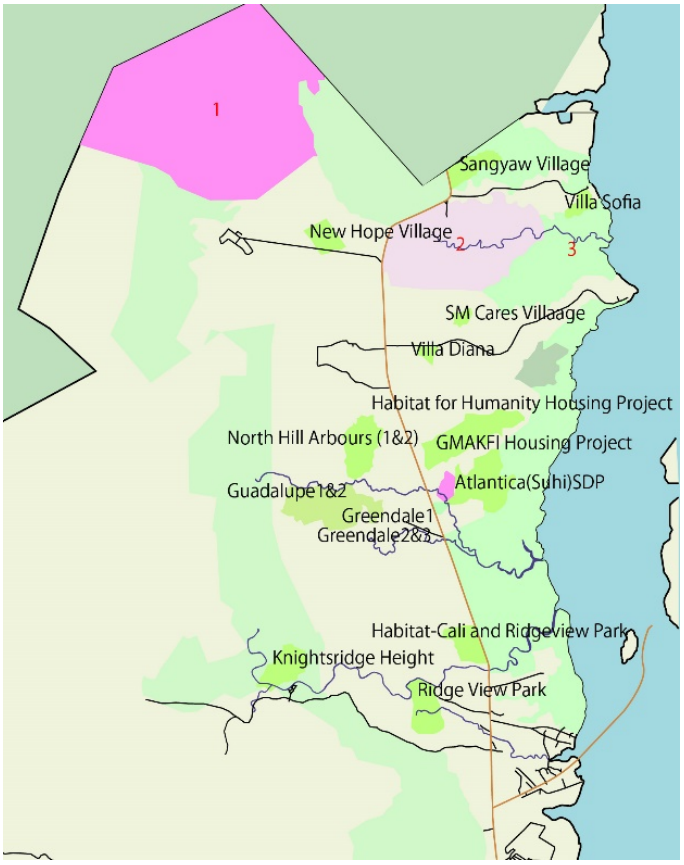

Figure 4. 24: Industrial Land Use

Proposed land use for public works.

Several public facilities were also relocated in the northern Tacloban. This includes: The University of the Philippines, Government Center, Maritime Science and Technology School, and the East Visayas Regional Medical Center.

Proposed commercial land use.

Many commercial facilities will be constructed to promote the economy and revitalize residents' activities. A big point in this plan is to relate different elements such as transportation network, surrounding facilities and central commercial area.

Proposed land use for parks and recreation areas.

In Figure 4. 25, shows the location of the buffer zone (location 1), eco-park (location 2), the lagoon space in the city center and the rivers (location 3).

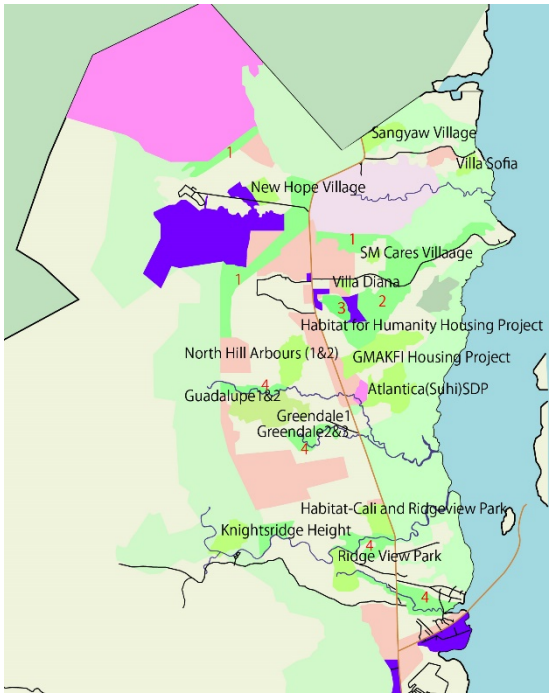

Figure 4. 25: Land use for parks and recreation areas

Proposed residential use.

In Figure 4. 26 the public housing areas are in the area labelled as “1”. The low density is or R1 are in the area labelled “2”. The medium density residential area or R2 are in “3” and the high-density residential area or R3 in “4”.

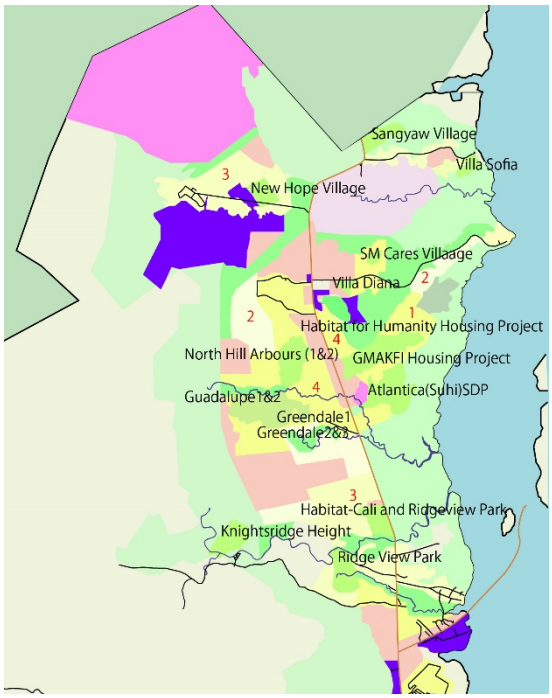

Figure 4. 26: Residential Land Use

Water use

Northern Tacloban is an area rich in water resources with numerous rivers and streams. It is a region where the fishing industry is thriving because the water that flows from the mountains forms a nutritious sea. The fishing industry, which is mainly used for aquaculture, is in two places, the Bargyai Cabalawan and the Barangay Tagpollo.

Traffic and Transport Network

Roads in Tacloban City consist of three national roads (width 20m), city roads (width 10m), and barangay roads (width 6m), and are classified according to the width of the roads. Only a narrow barangay road is connected to the new resettlement areas developed by NHA. Thus, there is a need to expand and improve the transportation network connecting the existing setup with the resettlement area. One of the proposed developments is the bypass road (Figure 4. 27 , 1) which extends from the Barangay Tagpolo to the national highway near the San Juanico Bridge and is designed with width of 50m. Another proposed project is the expansion of national roads (Figure 4. 27, 2) where the width of the road is expanded to 40m, and it is redesigned as an Avenida (avenue and tree-lined road) with bicycles and pedestrian paths are planned at the same time. There will also be an elevated road (Figure 4. 28, 1), mutual access road (Figure 4. 28, 2), industrial roads (Figure 4. 28, 3) and evacuation roads (Figure 4. 28, 4).

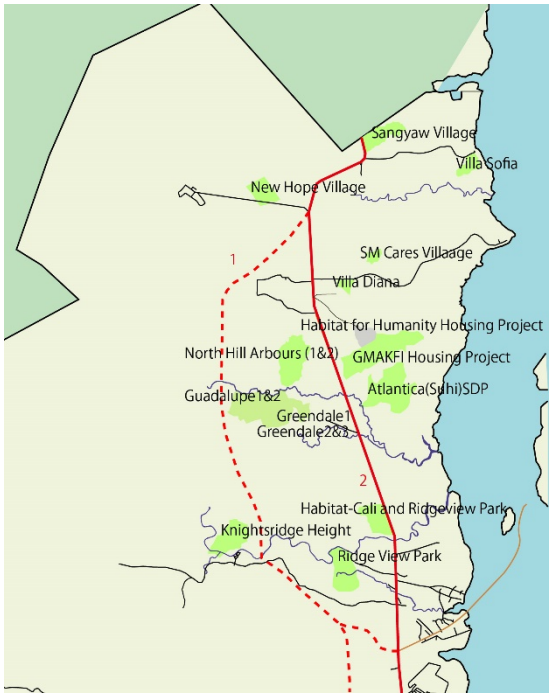

Figure 4. 27: Main Road Network (1)

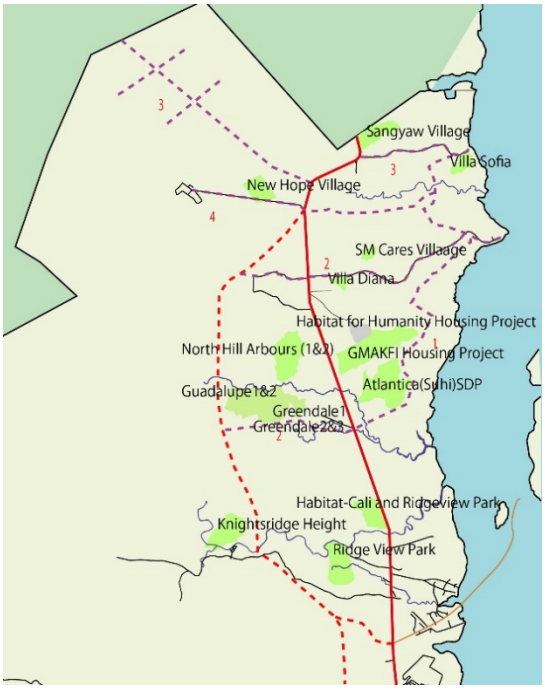

Figure 4. 28: Main Road Network (2)

Maritime network

A new port is proposed located 10 km by sea and 15 km by land from the current downtown area of Tacloban to the northern area Products produced and processed in industrial areas in the north can be transported by ferry while avoiding the traffic congestion.

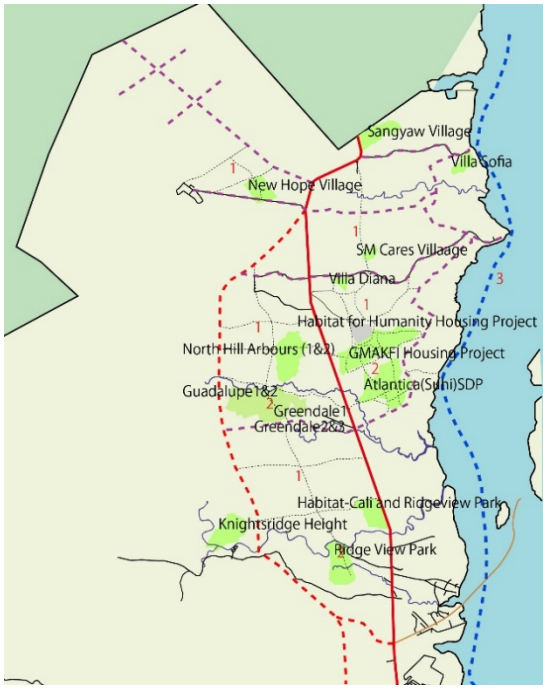

Figure 4. 29: Maritime network

4.4.2 Other Challenges

The Shelter Assistance Program (SAP) of the Department of Social Welfare and Development (DSWD) has helped 1.14 million families rebuild their houses destroyed by Typhoon Yolanda. As of September 2016, the Emergency Shelter Assistance program provided cash or material assistance to 105% of the target families with partially and totally damaged houses under the Comprehensive Recovery and Rehabilitation Program (CRRP). Under the Core Shelter Assistance Project (CSAP), 1,075 units have been completed and occupied by the family-beneficiaries, construction of 211 units is ongoing, and 1,709 have yet to be constructed. For permanent housing for Yolanda-affected areas, the NHA was tasked to assist 205,000 families/ households. The affected families/households are distributed in 6 regions, 14 provinces, and 115 cities and municipalities. As of September 2016, there are 29,661 units completed and construction of 102,240 units ongoing. Meanwhile, SHFC provided 4,000 ISFs with land security through 280 Community Mortgage Program (CMP) projects, amounting to PhP250.95 million, in the provinces of Leyte and Capiz. The delay in the implementation of the Yolanda Housing Projects, which started in December 2014, was mainly due to the following:

- Lack of suitable sites due to the classification of danger areas ("no-build zones") and protected areas (e.g., Bantayan Island is declared a wilderness area, Camotes Island is a Mangrove Swamp Forest Reserve)
- Slow conversion of safe sites from agricultural to residential use
- Titling problems as most lands in the Visayas Regions are untitled, with only tax declarations available.
- Difficulty in securing approvals of local Sanggunians
- Issues with BIR (e.g., contractors are required to pay taxes despite NHA's certification to fast track the issuance of titles for projects under Yolanda delay in the issuance of BIR ruling and electronic Certificate Authorizing Registration (eCAR) for lot titling)
- Non-implementation of Administrative Order No. 44 or "Streamlining the Process of Issuance of Permits, Certifications, Clearances, and Licenses for Housing and Resettlement Projects in Yolanda affected Areas, Directing all Government Agencies Concerned to Observe the Same and Imposing Sanctions for Non-Compliance"

CHAPTER 5

Case Study 2: San Roque, Cebu City

CHAPTER 5: CASE STUDY 2: SAN ROQUE, CEBU CITY

5.1 Overview of the Study Area: Sitio Panting, San Roque, Cebu City

At least around 800 AD, what is now called Cebu was an important port city for trade in China, Islamic countries, the Malay Islands, and so on. Therefore, it is known that the prehistoric Philippine had a population that could not be covered by the agricultural production capacity of Cebu Island at that time, considering its location as a residential type and a trade route for Southeast Asia. There is almost no academic material about the settlements and dwellings in Cebu before the Spanish colony, and it is only known that there were about 2000 inhabitants in Cebu. It is generally accepted, though, that the history of Cebu and its inhabitants generally begins after the arrival of the Spanish.

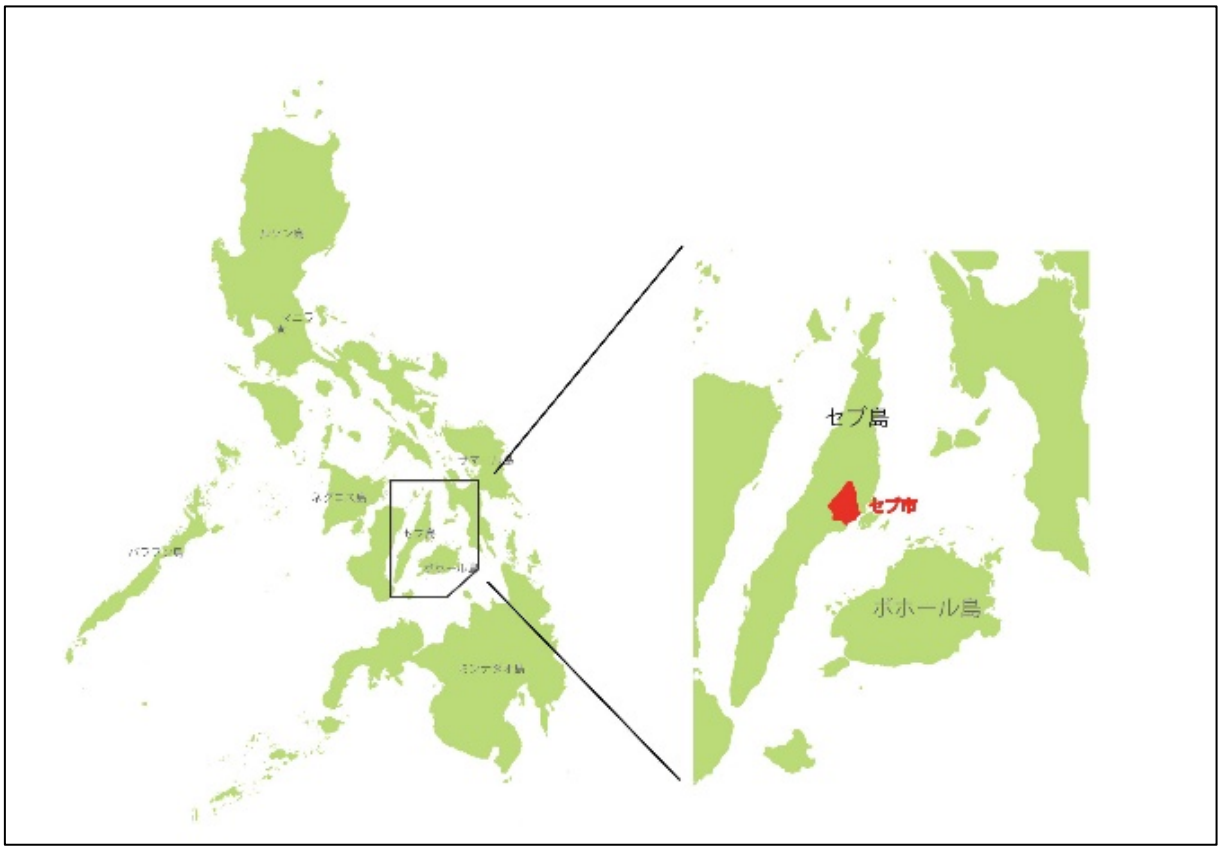

Figure 5. 1: Location of Cebu Island and Cebu City in the Philippines

When Miguel Lopez de Legaspi established “Villa San Miguel” in 1565 as the first Spanish settlement in the Far East, there were only a scattering of villages in Cebu. He would later establish the first town in the Philippines, the “Ciudad de Santissimo Nombre de Jesus” on January 3, 1569. Since then, Cebu has grown into the highly urbanized city that it is now. At present, Cebu City is confronted with problems associated with rapid urbanization. It has

breached its peri-urban limits and has lost its urban boundaries with its contiguous cities: Mandaue on the north, and Talisay at the south.

After the Second World War, Cebu has not been able to establish a city plan until 1980. By then Cebu must consider the urban development which grew organically. By 1990, Cebu experienced the start of its rapid development. Urban planners were not able to cope with this development, to the extent that, until now, the last comprehensive land use plan was not updated after it expired in the year 2000.

Cebu City is the capital of Cebu Province including 167 islands in the surrounding area and is the economic and political center of Cebu Island with a population of about 1 million. Cebu is the second largest city in the Philippines after Manila, and also the oldest city in the Philippines, where Spain was first based in colonizing the Philippines.

5.1.1 "Parian District"

During the Spanish colonial period, the Spanish government believed that there was a need to separate the Spanish citizens from the natives and other races for political, administrative, and religious reasons. This idea was passed on to Manila, and in 1581, a Chinese settlement called the Parian was created in Manila. However, in 1565, the Spanish Legazpi planned a city structure that separated the Gulf area of Cebu into a Spanish settlement and an indigenous settlement.

Meanwhile, a boundary was established to separate the Spanish settlement from the natives in Cebu. The Rio Fagina that used to connect to the present Guadalupe River created a natural boundary. The area beyond the river was designated as "Ciudad el Viejo", where the natives stayed. On May 16, 1584, the Augustinians established a parish in this area under the patronage of San Nicolas de Tolentino. The area was then referred to as San Nicolas and its boundary extended until Bantayan parish at the northern end of Cebu (Sy & Gerra, 2014). The same may be said for the south until the Augustinians established the parish in Sialo (present day Carcar) on 1599 (Redondo & Pace, 2014). One source, however, puts the date of separation from San Nicolas on April 29, 1617 (Sy & Gerra, 2014).

The arrival of the Jesuits and their missionary work with the Chinese led to the establishment of Parian as a parish 1614. During the 17th and 18th centuries, Cebu experienced a commercial decline and the Chinese population continued to decline. As a result, the Parian had turned into a community of Chinese Mestizo (a mixed race of

indigenous and Chinese descent), but in the latter half of the 1790s, Chinese became available again and a few returned. But Cebu was no longer an attractive land for Chinese traders. At that time, the Parian was used as a suburban residential area for the Chinese Mestizo, not for trade. For economic reasons, Parian has changed its character from a commercial district to a residential district.

In the mid-18th century, Chinese Catholics were able to travel and immigrate throughout the Philippines, spreading them throughout the Philippines and forming the Parian, a Chinese settlement in the major cities. Most of the inhabitants of the Parian in Cebu were Chinese Mestizo, with a few Chinese living there. In the second half of the 19th century, Parian came to be described as "the richest and most productive city of Cebu" in the latter half of the 19th century, as Chinese Mestizo rapidly increased its economic power.

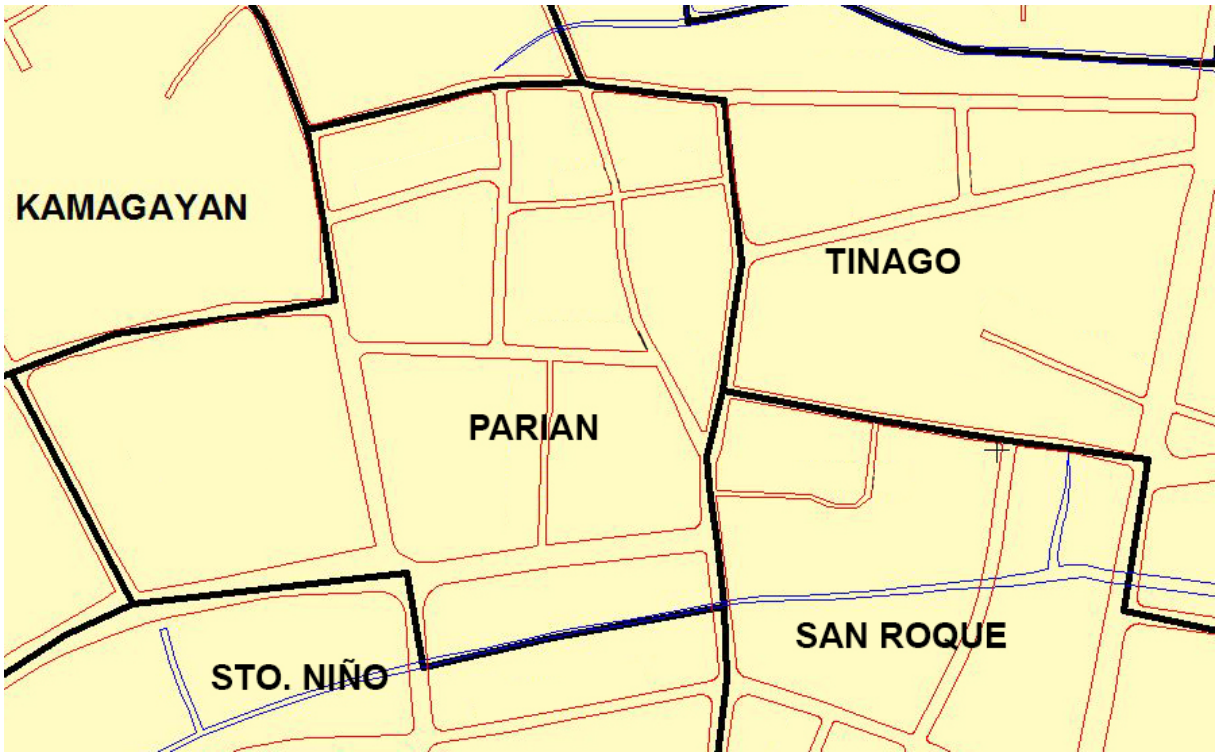

Figure 5. 2: Barangays that make up the "Parian District."

As a church organization, the Parian district existed as an independent parish from the Ciudad since the early 17th century. After that, as the Parian parish was repeatedly abolished and revived, its ability to maintain its function as a parish was diminished, and the Parian church was finally demolished in the mid-1870s, and the site of the church became a triangular Plaza Parian.

In 1900, Parian became a small and dense district with a population of 539. At present, almost no Chinese live in the city, which consists of commercial facilities and housing as an urban area. The boundary of the “Parian District” is now made up of different barangays of the city (Figure 5. 2).

As a result of the field survey of the buildings in the old Parian area where 363 buildings were measured, the old Parian area was divided into 16 blocks (Figure 5. 3).

Figure 5. 4 shows the spatial characteristics of Parian when each block was characterized according to the use, structure, and number of floors of the building.

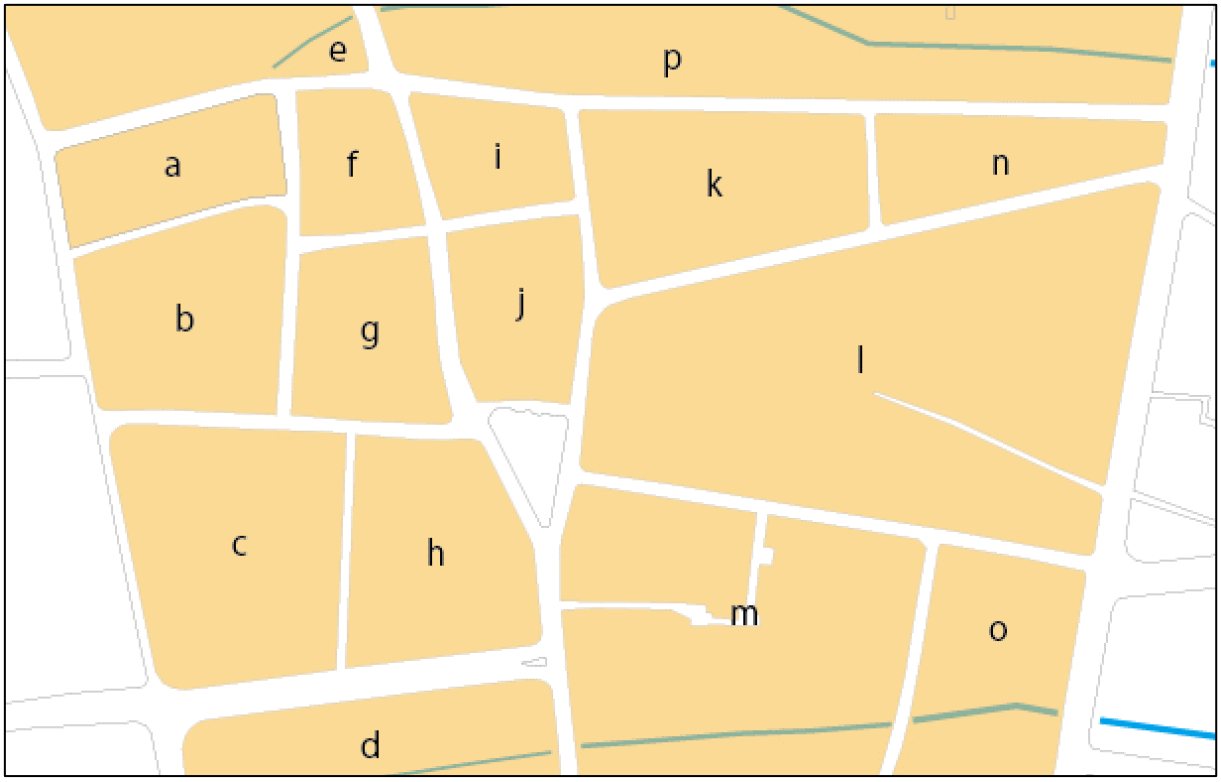

Figure 5. 3: Block diagram of the old Parian area

5.1.2 Overview of Sitio Panting

There are several slum areas in the “Parian District”. Sitio Panting is the name of one of the slums. This is in Barangay San Roque (Figure 5. 2). The place is surrounded by a street on the east side, a river on the south, and large warehouses in the north and west direction (see Figure 5. 5). The community in Sitio Panting started to develop about 60 years ago until the fire that broke out in October 2019. Before the fire, there were about 3,000 people living in an area of about 4,500 square meters, and there were about 90 homes. The property, however, is

privately owned. The owner has only agreed to allow the people to stay in the property temporarily.

Figure 5. 4: Spatial composition of the old Parian area

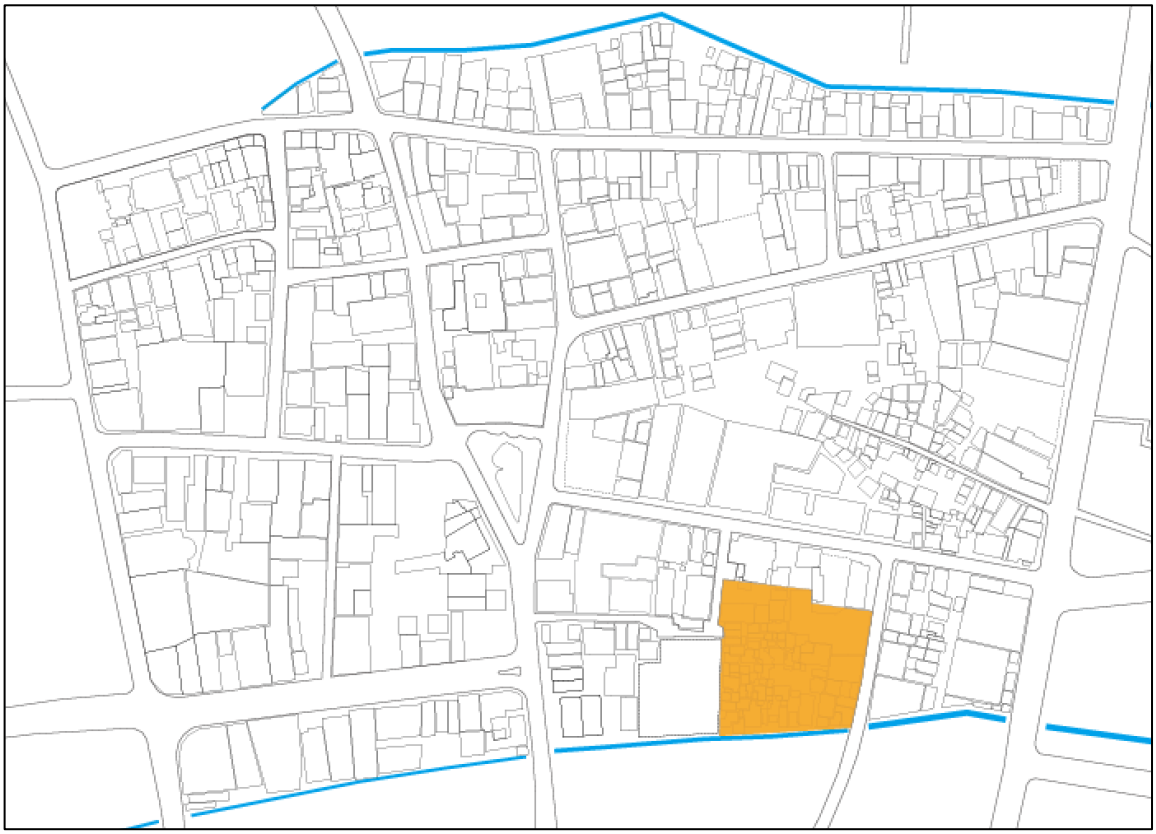

Figure 5. 5: Location of Sitio Panting in the old Parian area.

Within Sitio Panting, there is one well that is used as a common water area. Residents wash their clothes and even take a bath there. There are two main types of homes, and they take the form of a residence where only one family lives or a rental apartment where multiple families live.

There were many problems with Sitio Panting before the fire broke out. Figure 5. 6 is a layout of Sitio Panting before the fire. From this illustration, the houses are close to each other, and the passages are small and narrow. It is one of the reasons why the fire completely burned it down. There was also the problem of drug peddling and drug use which the local police were not able to monitor.

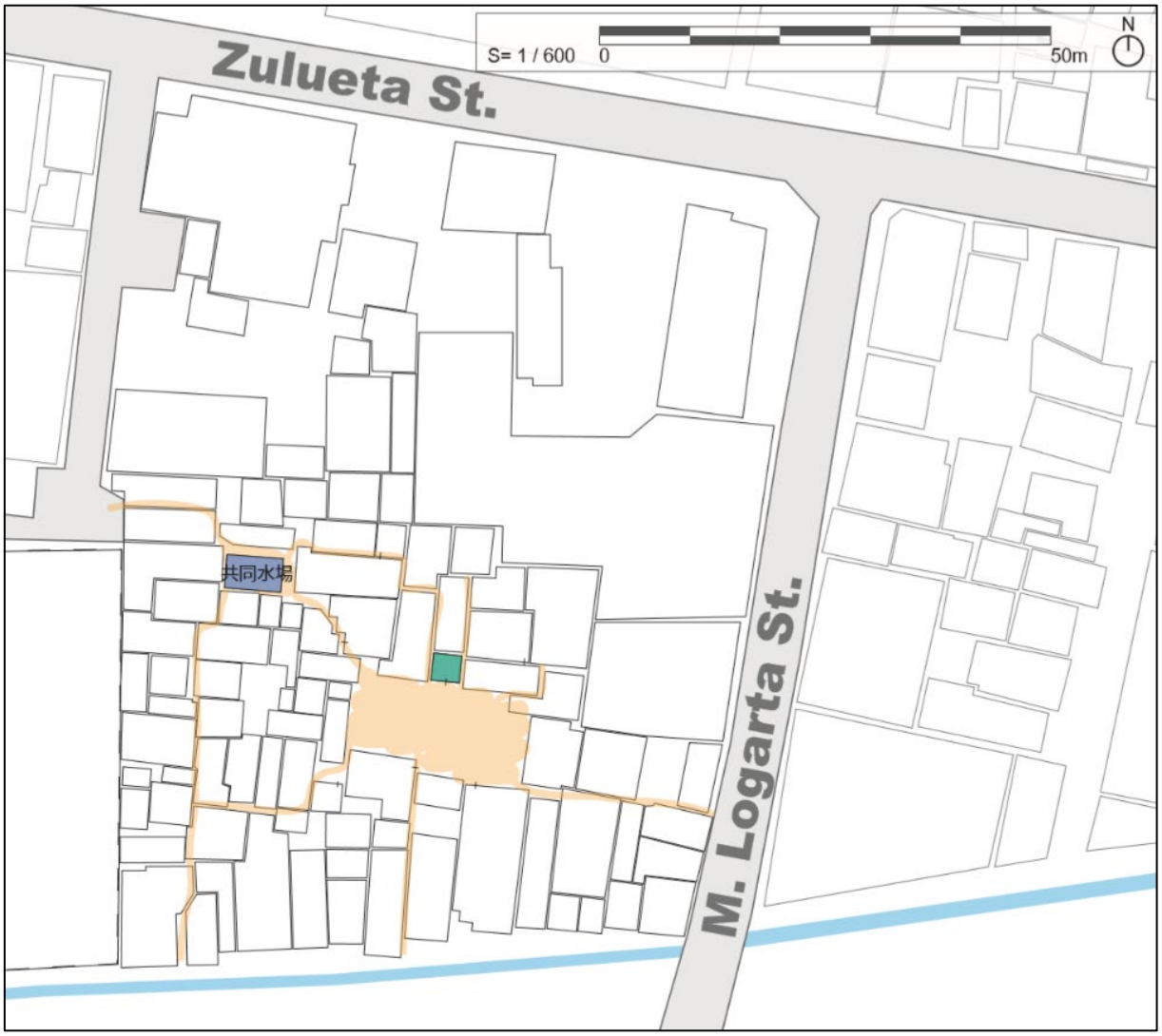

Figure 5. 6: Sitio Panting before the fire (2019)

Figure 5. 7: Inside Sitio Panting before the fire (September 2019)

Figure 5. 8 shows the result in terms of number of family members per household. The minimum number is 2 and the maximum number is 15. The number of family members with the largest number of families is 4 and 7 with six households representing each. Also, the average and median number of people per family is 6.

As mentioned above, there was a big difference between the maximum and minimum numbers of people per family. However, since the average and median are the same, it can be said that the maximum value of 15 (persons) and the minimum value of 2 (persons) have little effect on the overall result.

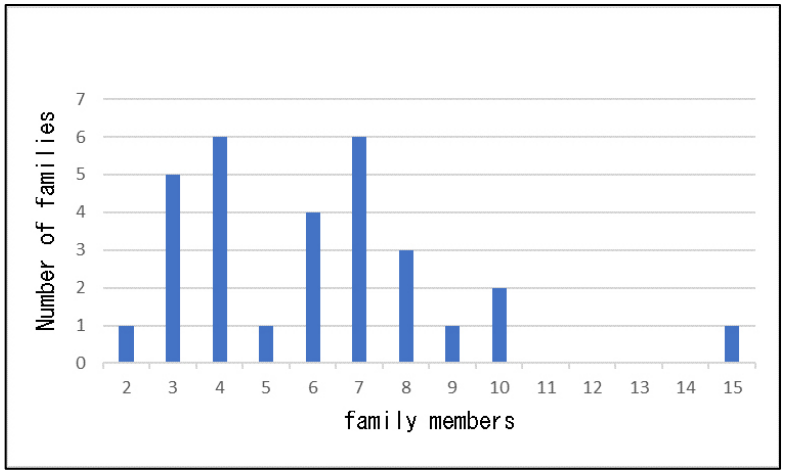

Figure 5. 8: Number of family members per household

Figure 5. 9 shows the number of generations in each household. Expressed in respective proportions. Households with two generations account for 83% of the total number of

households. Those with three generations account for 14%, and 3% for four generations. This is indicative of the extended family living in a household.

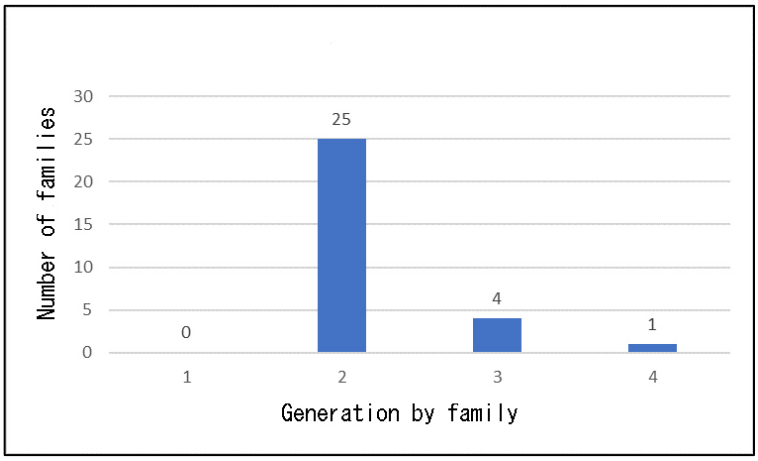

Figure 5. 9: Number of Generations per Household

90% of those interviewed claim that their hometown was Sitio Panting. The others come from either Samar or other parts of Cebu. The average age of those living in Sitio Panting is about 31 years, and it can be inferred that the sons and daughters of the family now live in Sitio Panting since their birth. The longest time a person stayed in Sitio Panting was 60 years and the shortest was one month. The latter moved in a month before the fire broke.

In terms of employment, residents of Sitio Panting were either self-employed (30%), working part-time jobs (15%), working as full-time employee (43%), or unemployed (10%)). Following are the details of the first three types:

Table 5. 1: Job categories for Sitio Panting residents

Self-employed	Retail store owner, Internet cafe owner
Part-time job	Restaurants, gas stations, supermarket cash registers, home center operations, printers
Regular employees	manicurists, security guards, school managers, call center operations, telephone lines, wholesalers, female salespersons, builders

5.2 The Disaster: Fire in Sitio Panting (October 2019)

On November 3, 2019, a fire broke out inside Sitio Panting, sparing only one house while burning everything else.

The Bureau of Fire Protection reported that the source of fire is a stove that leaked gas. Since the houses are made of combustible materials and are spaced close to each other, the fire quickly spread. The fire started around 3:00pm and was put in control around 6:20pm.

At the time of the fieldwork, there were two buildings used as temporary shelters within Sitio Panting. Based on the interviews with residents, the building material is made only of bamboo, and is rented from the city hall.

Figure 5. 10: Aerial view during the fire

Figure 5. 11: Aerial view after the fire

Figure 5. 12: Sitio Panting after clearing operations.

Figure 5. 13: The only house that remained after the fire.

5.3 Local Government's Response to Disaster

5.3.1 Stages of resettlement

Emergency Shelter

People who lived at Sitio Panting before the fire were temporarily sheltered in the gymnasium nearby. Inside the gymnasium, each family is given a space with a partition to

separate them from the rest (see Figure 5. 14). There were only 30 families staying in the gymnasium. The rest of the fire victims managed to find other places to stay temporarily such as houses of relatives. Some families, however, decided to return immediately to the site and make a temporary shelter for themselves made of debris materials (Figure 5. 15).

Figure 5. 14: Inside the gym

Figure 5. 15: House made of only debris

Temporary Housing

There was no temporary housing provided for the fire victims of Sitio Panting.

Permanent Housing

Since the site is privately owned, the government cannot provide permanent housing to those affected by the fire. They only facilitated the re-blocking (to ensure safety standards are followed) and the organization of the community (to ensure that only those affected will return to the site).

5.3.2 Identification of Beneficiaries

The process of identifying the beneficiaries for the resettlement program was given to the Department of Welfare for the Urban Poor (DWUP), a department under the Mayor's Office of the City of Cebu. DWUP identified those who were part of the affected community and organized them to form an association. The association had to apply for accreditation from the government so that they can avail of the assistance program of the government.

Once the association was formed, they were consulted on the plans to re-block the area, on the sizes of the lot, and how the lots will be distributed.

Figure 5. 16: Plan developed by City Hall

5.3.3 Characteristics of the Resettlement Site

The re-blocked plan made by the city hall was completely different from the layout of Sitio Panting before the fire. Figure 5. 16 shows the plan developed by DWUP for the re-blocking of Sitio Panting. With 90 households in a 4,500 m^2 property, the density of development is 200. This requires that the area for parks and playground should be at 6% of the gross land area or 270 m^2 and the area required for community facilities is 1.5% of the gross land area or 67.5 m^2 (See Table 5. 2). The final layout, however, allocated only 160 m^2 for parks and playground and around 20 m^2 for community facilities: a chapel and an artesian well which is their main source of water. BP220, however, does not require any community facility given the number of households (See Table 5. 3). The chapel in the new plan has been relocated such that it faces the open space. Also, since Sitio Panting has always had problems with drugs, the city hall's plan is to set up two police stations within Sitio Panting to improve public safety.

Compared to the previous site layout (see Figure 5. 6), the new layout is more orderly, with a 5-meter road connecting to Logarta Road, to ensure the access of fire trucks. The lots have been divided to have an equal size for everyone, which is 16m^2.

It is worth noting, however, that Sitio Panting is not managed by the city because it is privately owned, thus, the owner can make changes on the plan during implementation.

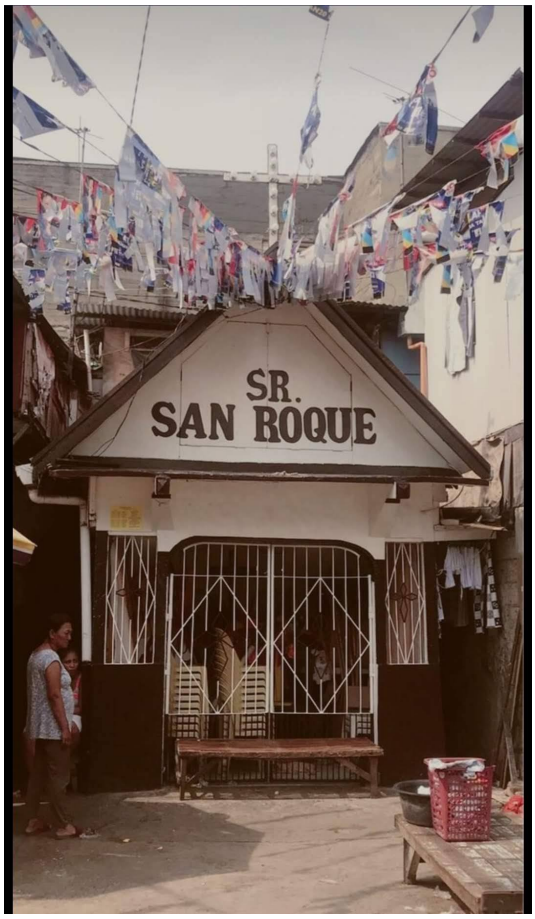

Figure 5. 17: The chapel before the fire

Figure 5. 18: The artesian well before the fire

Table 5. 2: Area Requirements

Density = 200	BP220 Requirements	Actual
Parks and Playgrounds Requirements	6.0% of Gross Area or 0.027Ha (270 m^2)	Only 160 m^2 provided
Area for Community Facilities	1.5% of Gross Area or 0.007Ha (67.5 m^2)	Only 20 m^2 provided

Table 5. 3: Community Facility Allocation

No. of housing units = 90	BP220 Requirements	Actual
Neighborhood Multipurpose Center*	Not Required	None. Although the main plaza serves the purpose
Tricycle Terminal*	Not Required	No facility. Tricycle simply waits along the road
Convenience Retail Center**	Not Required	Sari-sari stores serve the purpose
Elementary School**	Not Required	The churches are used as schools although there are formal schools near the community
High School**	Not Required	There are formal schools near the community

*Mandatory provision of area

**Optional saleable

With a parcel area of around 16 m^2, the frontage is limited to around three meters. Most of the lots are considered interior lots except for those along the main road. This is not relevant, however, since all the lots have been assigned the same size which are not compliant to BP220.

Table 5. 4: Minimum Lot Area and Lot Frontage

	BP220 Requirements		Actual	
	Minimum Lot Areas	Minimum Lot Frontage	Minimum Lot Areas	Minimum Lot Frontage
Single Detached (corner and regular lots)	64 m^2	8 meters	approx. 16 m^2	approx. 3m

Single Detached (irregular lot)	64 m^2	4 meters	n/a	n/a
Single Detached (interior lot)	64 m^2	3 meters	approx. 16 m^2	approx. 3m
Duplex/Single Attached	48 m^2	6 meters	n/a	n/a
Rowhouse	28 m^2	3.5 meters	n/a	n/a

Block lengths vary between 14 meters to 20 meters which are way below the maximum set by BP220[11]. There are basically three types of roads in the development: a 5-meter-wide major road, a 2.5-meter-wide minor road, and 1.5-meter-wide path walks. There is also a 3-meter-wide road along the "estero" which serves as the required buffer zone of a river in an urban area[12]. All the existing roads fall way below the minimum required by BP220.

Table 5. 5: Road Right of Way

Project Size Range = Below 2.5 hectares	BP220 Requirements		Actual	
Major	8 meters		5 meters	
Collector	-		-	
Minor	6.5 meters		2.5 meters	
	ROW	Carriageway	ROW	Carriageway
Motor Court	6 meters	5 meters	n/a	n/a
Alley	2 meters	-	n/a	-

[11] In BP220, maximum length of block is 400 meters. However, blocks exceeding 250 meters shall be provided with a 2-meter alley approximately at mid-length.

[12] This is a requirement of various laws such as the National Integrated Protection Areas System Act (NIPAS) which includes the protection of the river systems.

Path walk	3 meters	-	1.5 meters	-

Table 5. 6: Road Type

Project Size Range = Below 2.5 hectares	BP220 Requirements	Actual
Major	Required	Yes
Collector	-	-
Minor	Required	Yes
Motor Court	Required	None
Alley	-	-
Pathway	Required	Yes

Table 5. 7 shows the provision of utility systems in the development vis-a-vis the requirements of BP220.

Table 5. 7: Utilities

	BP220 Requirements	Actual
Water Supply	Mandatory connection to public water system	There is an artesian well on the site where the community draws out water for laundry, bathing and other washing needs. The local government also provides a water connection for common use. The sharing for the payment of the water bill is managed by the homeowners' association
	At least an operational deep well and pump set	
	Minimum water supply requirement is 150 liters per capita per day for household	

Electric Power Supply	Mandatory household connection to primary and alternate source of power if available	The government provided the required streetlights, however each household had to apply for their own electrical connection.
	Mandatory provision of street lighting per 50m distance	
	Electric bill to be shouldered by users	
Drainage System	Made of concrete lined canal with load bearing cover	No drainage system was established. Being near the river, all waste was diverted towards the river, although most houses made septic tanks.
	Shall drain into appropriate water bodies, public drainage, or natural outfalls	
	If applicable, underground drainage system shall be provided with adequate reinforced concrete pipes (RCP), catch basins, manholes/inlets, and cross drains for efficient maintenance	
Garbage Disposal System	provided with sanitary and efficient refuse collection and disposal system whether independently or in conjunction with the local government garbage collection and disposal services	The government has a schedule for collecting garbage from a specific point source. Everyone is expected to bring their garbage to that area.

5.3.4 Shelter Design

As mentioned earlier, the government cannot provide permanent shelter to the residents of Sitio Panting since the lot are privately owned. Aside from this, the government was constrained to allocate only 16 m^2 of land for each affected household, regardless of the number of members per household. It may be noted earlier that the number of members per household vary from two to fifteen (Figure 5. 8).

Figure 5. 19: Self-Build Reconstruction in Sitio Panting (Source: Liu Ly Chan)

Figure 5. 20: Self-Build Reconstruction in Sitio Panting (Source: Kentaro Nishiyama)

Table 5. 8: Shelter Components

	BP220 Requirements		Actual	
	Minimum Floor Areas	Minimum Level of Completion	Minimum Floor Areas	Minimum Level of Completion
Single Detached	18 m^2	Shell house (enclosed)	16 m^2	n/a
Duplex/Single Attached	18 m^2	Shell house (enclosed)	n/a	n/a

Rowhouse	18 m^2	Shell house (enclosed)	n/a	n/a

Table 5. 9:Setbacks/Yard

	Required by BP 220	Actual
Front Setback	1.5 meters	n/a
Side Yard	1.5 meters	n/a
Rear Yard	2.0 meters	n/a
Abutments	May be allowed per requirement of the National Building Code of the Philippines	n/a

5.4 Post Disaster Development

Since the property in Sitio Panting is privately owned, and that the owner allowed the previous settlers to go back temporarily, the government was constrained in many ways. They could not provide descent houses for permanent stay; they could not even plan the property so that each household gets the minimum area required by law for socialized housing. Whenever the size of the property is not capable to hold the household density that it is supposed to serve, the best solution would have been to build vertically, but the government cannot do this either.

Thus, the only assistance that the government can extend, aside from handing cash to buy construction materials, is to plan the layout of the community. Thus, the only disaster and risk prevention strategy that the government can implement to the built environment is to ensure the access of fire trucks by providing a 5-meter road along a strategic area of the community. The other roads were also laid out to be logical so that evacuation can be more efficient. These strategies were not meant to prevent another fire from happening, at best they can only prevent further damage caused by the disaster.

The community, however, also attempts to contribute to disaster prevention by rebuilding their houses using non-combustible materials as much as possible. Although the danger of fire is still there because of the lack of setback, the least that can happen is that the spread is slowed down.

Fire, however, is not the only problem of Sitio Panting in terms of disaster. The area, being close to the river and at a lower elevation than the new streets, is also prone to flooding. This type of disaster, however, is not considered hazardous even with the threat of typhoon.

CHAPTER 6

Case Study 3: Mambaling, Cebu City

CHAPTER 6: CASE STUDY 3: MAMBALING, CEBU CITY

6.1 Overview of the Study Area: Bajau Community, Mambaling, Cebu City

6.1.1 A Brief Description of the Bajaus13

From the 1870s onward, the introduction of seaweed aquaculture (Agar culture) enabled fishermen on houseboats to collect marine products as well as aquaculture. Since the waves near the coral reef are calm and the relatively shallow water is suitable for aquaculture, a house-on-stilts dwelling was built on the water near the aquaculture. Initially, however, the Bajau regularly left the stilt houses for several months to carry out fishing on ships and collect marine products during the fishing season. Eventually, however, the stilt houses on water would evolve into land-based stilt (Figure 6. 1).

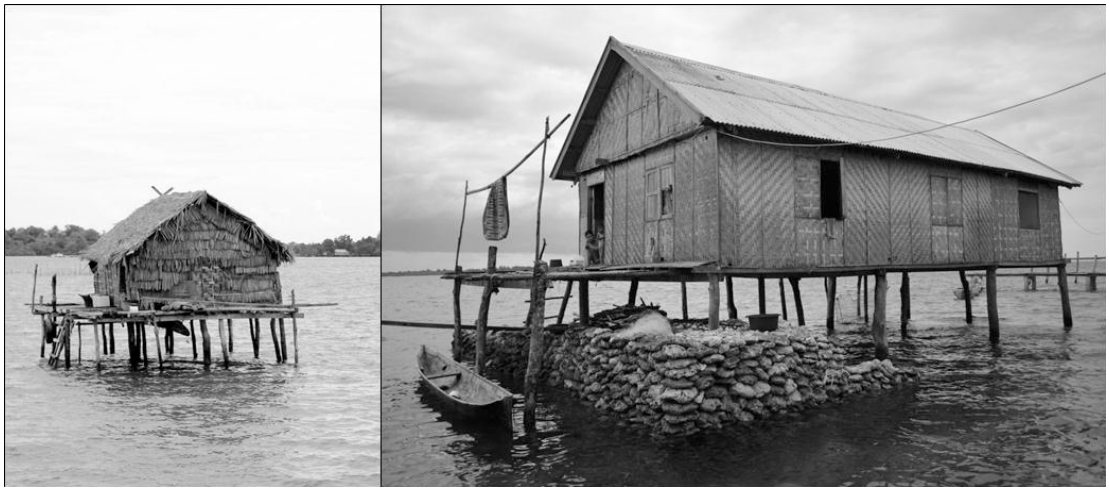

Figure 6. 1: Water stilt house (left: temporary house, right: permanent house)

The aquaculture industry strives off the coral reef since a stable number of fish that can be obtained there. Because of this, the Bajaus prefer to build their houses along the water to make it easier for them to gain access to their houses knowing that both their houses and their boats are crudely constructed and may not last long. As the construction system for the houses and boats improved, however, the Bajaus started to live nearer the ground because it helps them cope with typhoons and the ground floor can be used for storage.

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[13] The group of seafaring indigenous people are sometimes referred to as Badjao or Badjau, but in a group discussion with the residents of the village in Alaska, they prefer to drop the word “Bad” in Badjao or Badjau and suggested that they are referred to as Bajau.

As the population of Bajau who engage in the aquaculture industry increased, villages were formed. The previously used houseboats changed their uses as means of transportation within the village, means of collecting seafood, and means of transporting prey.

People who got off the boats have formed stilt water villages along the waterfront, or on man-made islands built by coral stones piled up on atolls. It is reported from the existing literature that many of them have settled on land as they move repeatedly in search of better fishing grounds. However, in the Philippines in recent years, due to intensifying conflicts and frequent attacks by pirates, people are moving to land as a means of escape instead. It is not due to traditional livelihoods, but due to external factors.

The house is a traditional wooden stilt house, but the material has changed, for example the walls have changed from Amakan to plywood, the roof from palm leaf to galvanized iron, and the underfloor pillar from bamboo to concrete.

In addition, in many countries the Bajau have started to adopt modernization policies, promoted resident registration, conducted social housing projects for the poor, and provided settlement sites to develop land-based land policies. The result is not necessarily a traditional wooden stilt house. In this case, a rowhouse made of concrete was constructed with a community facility.

Fishing as a livelihood, however, has suffered because of limited areas to fish and the pollution on the water due to urban development. There are those who decided to change to land-based livelihood although it was difficult for them to find a job because of low literacy rate and low skills other than fishing. Most of them are engaged in the sale of commercially available goods and retail business in the village.

6.1.2 Barangay Mambaling

The study areas are both Bajau Communities located in Mambaling, a barangay of Cebu City, Cebu Province, Central Philippines. Mambaling is located along the coast (see Figure 6. 2). Its population as determined by the 2015 Census was 32,564. This represented 3.53% of the total population of Cebu City.

The coast of Mambaling faces the development area in the south of Cebu City (commonly known as SRP or South Road Properties). SRP is building entertainment facilities such as large commercial facilities, hotels, and casinos, and is under development as a key

tourist and economic center. Furthermore, to alleviate the traffic congestion problem in Cebu City, a third bridge connecting Cebu Island and Mactan Island is scheduled for completion in 2030.

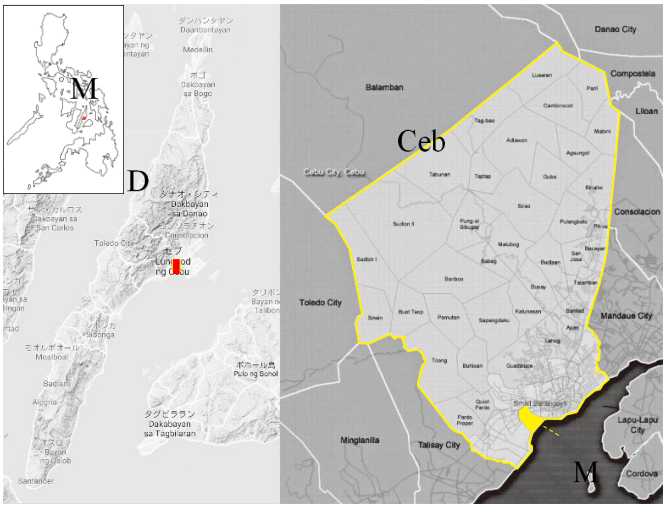

Figure 6. 2: Cebu City, Mambaling position

The study areas are two Bajau villages in Alaska, Mambaling, shown in Figure 6. 3 and Figure 6. 4. The administrative names of both communities are Bajau Community Site A and Bajau Community Site B (abbreviated as Site A and Site B below). The sites are only two kilometers from the city center and about 20 minutes by local bus (jeepney). It is in the center of the district where academic institutions, the barangay hall, hospitals, huge commercial facilities, and markets are located within a one kilometer radius. Adjacent to it is the urban development area, SRP.

Figure 6. 3: Survey area and its surroundings

Figure 6. 4: Fire area and 2 settlements

In 1972, the Bajau settled in Cebu (site A) to escape from the pirate attack in Zamboanga. In 2005, a large-scale fire broke out. All the houses were razed to the ground except for one house.

In the same year, a non-profit organization in the Visayas region, Ramon Aboitiz Foundation Inc. (RAFI), established a residential construction project as a Bajau Integrated Area Development Project (BIAD–P) with the aim of improving the living environment of the Bajau. This will later be the Site B.

They started a project to build a house on site B, funded by an Irish community service organization. In 2009, landfill for Site B was completed, and construction of the houses started. The evacuees from SRP and the barangay hall started to move into Site B. In 2011, the community service organization funded the construction of a permanent residence in consultation with RAFI, the University of San Carlos, and the community. In 2011, the first building was completed and was immediately occupied. All buildings were completed in 2015. The village was separated into two sites (Figure 6. 4). At present, the sites are occupied by a mixture of Bajau and Visayas.

6.1.3 Site A.

Site A is a 9,750 m^2 settlement settled on the waterfront with 126 homes and over 1500 people, and four public facilities.

Bajau communities are normally composed of relatives of a chieftain. However, as the community grows, there are other unrelated families who can establish themselves with the

permission of the village chief. In Site A, there are six families including that of the chief. In Figure 6. 5, the light blue relatives are the chief's relatives, who gather and live on land. The pink relatives were the Muslim area leader's relatives, the largest relatives in the village.

Figure 6. 5: Distribution of Relatives

The descendants of the Bajaus in Site A settled in from Zamboanga in 1972. At present, the community is mixed with people from Cebu and other parts of the Visayas, or the Visayans, which account for 23% of the population.

6.1.4 Site B

Site B, on the other hand, is a 5,600 m^2 settlement on the coast with 157 houses, about 1100 people, and 4 public facilities.

Site B came about when an Irish company had an agreement with the city of Cebu in 2007. Landfilling of the site area of 5,600 m^2 was started and completed in 2009. In the same year, with the cooperation of RAFI, Cebu City built a meeting place with a one-story wooden house and an educational facility on the site which was immediately occupied. The occupants were fire victims who evacuated to SRP. However, the wooden houses were constructed of light materials such as plywood and galvanized steel, so they were extremely fragile and were slowly damaged one after another by strong winds and heavy rain.

In 2009, the Irish community service organization collaborated with RAFI on a plan to build a stronger and more permanent home. The former oversaw finance, and the latter oversaw project management. At this time, in addition to the two groups, the University of San Carlos participated as a collaborator in design and construction technology, and the plan proceeded after discussions with the chief of the Bajau village and the section chief. The wooden house was converted to a concrete house. In addition to housing, this project included the construction of public facilities such as educational facilities, clinics, and shipyards. As for equipment, basic infrastructure facilities such as electricity supply to each dwelling unit and water supply and drainage lines such as shared toilets and shared faucets in the village were provided. This design plan was completed in 2011 and the first building was completed.

After the first building was completed in 2011, half of the village was constructed as the first stage. Villagers call the residential area built at this time as Zone 1. This was completed in 2013. Construction of the remaining half of the residential area (Zone 2) followed, and the entire building was completed in 2015.

There are 14 groups of relatives living in Site B. Each group has an average number of six relatives. Figure 6. 6 shows the distribution of these relatives. It is worth noting that the same group of relatives always occupy a house, they are never mixed with other group of relatives.

Figure 6. 6: Relative distribution map

The descendants of the Bajaus in Site B came from Site A, who settled in from Zamboanga in 1972. At present, the community is mixed with people from Cebu and other parts of the Visayas, or the Visayans, which account for 23% of the population.

6.2 The Disaster: Fire in Mambaling (2005)

There has been little documentation regarding the fire in Alaska, Mambaling that supposedly destroyed the Bajau communities in Site A. The fire occurred on April 21, 2005 and was believed to have been caused by faulty wiring. An estimated number of 200 houses were burned down.

The fire burned down socialized housing development area also, aside from the Bajau community. **Error! Reference source not found.** shows the boundaries of the two communities. The socialized housing project was re-developed separately. A part of its lot was used for the re-development of the Bajau community.

6.3 Local Government Response to the Disaster

6.3.1 Stages of resettlement

The rehabilitation and recovery efforts of the Bajau communities in Alaska, Mambaling, was made possible with the intervention of NGOs. While the government was more focused on rebuilding Sita A, the Ramon Aboitiz Foundation, Inc., together with some NGO's started developing Site B as an extension to the resettlement program of Site A.

Emergency Shelter

Immediately after the fire, residents evacuated to SRP, the barangay hall, the Mambaling Elementary School, the Nana Basketball Court, or their relatives. There were also those who returned immediately to site A and rebuilt new homes from debris left by the fire. There was little need to provide for any other form of emergency shelter.

Temporary Housing

There was no need to set up temporary housing as the resettlement project can be implemented sooner.

Permanent Housing

After the 2005 fire, a social housing project was carried out in the Visayas settlement, where the urban poor lived. The target area is the area surrounded by blue (see Figure 6. 7), and land reclamation was started in 2009. The housing provided was a two-story concrete block structure. Completed in 2011. Initially, only the Visayans lived, but the blue braided

area shown in the 2018 aerial photograph is now occupied by a mixture of Bajau and Visayans. Unlike Site A, the new site is a land-based residential development. This, however, is not part of the study.

The government did not have a pre-designed permanent housing for Site A. Although the land was owned by the province, the government was constrained by the fact that the Bajau's have their own cultural difference in community building, and by the fact that the community is on the water. Thus, the government was only able to give cash assistance while the houses were rebuilt using self-help system.

In Site B, Ramon Aboitiz Foundation Inc. (RAFI), started a social housing project as a Bajau Integrated Area Development Project (BIAD–P) for Bajau, an urban poor. At this time, an Irish community service organization that had an agreement with the city of Cebu took over the site B land from the then mayor of Cebu City, Tomas Osmeña, and became the mother body of the resident organization. The estimated planned fund was about 20 million pesos. The purpose was to improve the living environment of the Bajau by transitioning from the conventional simple living on a floating stilt house to the permanent living on land.

Site B is more like the Tacloban case since everything was planned according to Code. There is, however, criticism over the fact that the cultural traditions of the Bajaus were ignored in the planning (Achas, 2016).

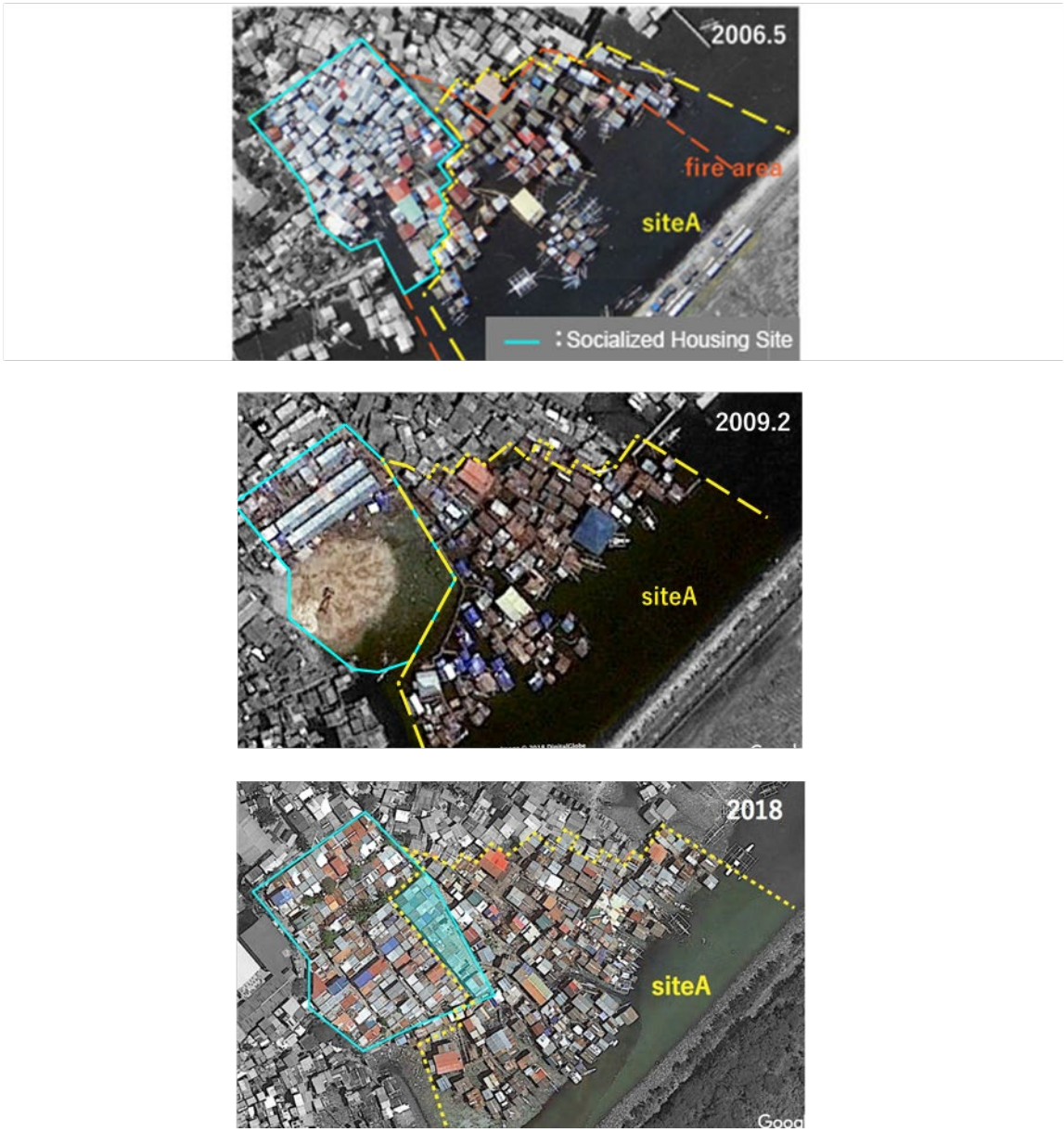

Figure 6. 7: Development of the Socialized Housing for Visayans

6.3.2 Site A: Relocation Process, Site Characteristic, and Shelter Design

Relocation Process

The patriarch and the leader of the Muslim area received an area management permit from the government and was given the authority to give residence permit when the villagers build a new building (Figure 6. 8). Villagers have four steps when constructing a new building.

I. The villagers obtain a residence permit from the area manager of one of the areas you want to live in.

II. The patriarch or area leader reports to the barangay hall.

III. The patriarch or area leader consult with neighbors of the settlement in the village. At this time, negotiate with the neighbors so that they will not build in a position where they cannot see the boat or the sea.

IV. The villagers are asked to abide by the housing rule set by the government, construction should not be done within 50m of the SRP. There is residential land that meets these conditions, and housing construction will begin after negotiations with neighbors are completed.

Republic of the Philippines
OFFICE OF THE PRESIDENT
OFFICE ON MUSLIM AFFAIRS
VISAYAS

CERTIFICATION

To Whom It May Concern:

THIS IS TO CERTIFY that [redacted] is the official Administrator of Alaska Mosque, located at Sitio Naba, Alaska, Barangay Mambaling, Cebu City. He is likewise, the President of the SAMA Muslim Community of the same Barangay.

This certification is issued to **Mr. Mokaddam** for whatever legal purpose/s that may serve him best.

Given this 26th day of June, 2009.

SAKIRAN A. HAJAN, MPA
Regional Director
OMA Visayas

FELIX C. GUANZON
Presidential Assistant for
Central Visayas

Figure 6. 8: Area Management Permit

Characteristics of the Resettlement Site

A settlement of 9,750 m^2 settled on the waterfront. It has 126 wooden stilt houses and 6 houses in reinforced concrete. There are 1500 or more inhabitants and 4 public facilities. The average water depth difference between low tide and high tide is about 1,500 mm.

Figure 6. 9: Village structure (as of October 11, 2018)

The following are the elements that make up the village.

Plaza

There are four plazas in the village. The features of each plaza are as follows.

Plaza 1: A floating stilt plaza.

It is 5m wide and 15m long and is the center of the village. It is in front of the patriarch's house. It is located on the land side of the village. It is connected to the land and five main roads extend from this square. In addition to daily use as a gathering place for villagers and a playground for children, it is also used as a wedding hall and funeral hall. It is

also used privately by the residents, such as the dining and washing areas facing the plaza, and the grocery store. (See Figure 6. 10)

Plaza 2: Land reclamation plaza.

It is the playground for children and a venue for the eve of weddings. It is also used privately by the residents for dining, washing, and sales counter facing the plaza. (See Figure 6. 11)

Plaza 3: A floating stilt plaza.

It is located on the seaside of the village. It used to have the same function as Plaza 1 but since the Plaza 2 was easily accessible from the land, it was no longer used as a festival place. Now it is mainly used privately by residents living in the surrounding area. (See Figure 6. 12)

Plaza 4: The sea.

The sea is the largest open space for the Bajau. It is used as a playground and a bathroom. (See Figure 6. 13)

Pier

The roads in the village are constructed by staking piles in the water, building a foundation on the water, and connecting wooden boards and bamboo to it. Houses are arranged along the main jetty, which serves as a guide for residents. Eight main jetties extend from land to the sea in the village. There are five main jetties extending from Plaza 1, and three main jetties extending from Plaza 2. These will be further dispersed and connected to each house. It can be classified into 3 types depending on the application. This will be explained in detail in the next section.

Religious facilities

Mosque: Located in the Islamic faith area in the village. It is a stilt type at the shop, the floor below is supported by concrete columns, and the floor above is wooden. It was constructed by the villagers in 2009 after the village fire. Worship is held on Friday. (See Figure 6. 14)

Church 1: A privately managed church. It is attached to the manager's residence (blue building in the photo to the right, see Figure 6. 15). The house is a two-story wooden stilt house, and the church is a one-story building. The floor is made of wood and is supported by concrete columns. it was funded by an American

religious group and constructed by a villager. It is a place of prayer for the residents around the area.

Church 2: The largest church in the village. It is a two-story, high-floor type, with a wooden floor below being supported by concrete columns. It was built in 2009 by the community and funded by a group led by a Korean missionary. It is managed by a local Visayas religious group. A mass is held on Sunday, and site B residents also participate. (See Figure 6. 16)

Figure 6. 10: Plaza 1 (Source: Wakana Katsura)

Figure 6. 11: Plaza 2 (Source: Wakana Katsura)

Figure 6. 12: Plaza 3 (Source: Wakana Katsura)

Figure 6. 13: Plaza 4 (Source: Wakana Katsura)

Figure 6. 14: Mosque (Source: Wakana Katsura)

Figure 6. 15: Church 1 (Source: Wakana Katsura)

Figure 6. 16: Church 2 (Photo: Wakana Katsura)

Public bathhouse

The public bathhouse is run by the Visayans. It is located at the entrance to the village. You can take a bath with 1 tank = about 20 L of water for 1PhP. Water is used by the Metro Cebu Water District (MCWD), which is relatively safe, so many of the Bajau also use it. (See Figure 6. 17)

Wharf

The dock is a large depression between the houses on the sea side. As of October 6, 2018, there are two docks in the village. A building regulation has since been issued where the landing area has been reduced to secure residential land, making it difficult to store ships. (See Figure 6. 18)

Figure 6. 17: Public bathhouse (Source: Wakana Katsura)

Figure 6. 18: Wharf (Source: Wakana Katsura)

Shipyard

As of October 6, 2018, there were two shipyards in the village.

It is a simple raised floor above the water. Most men over the age of 30 have been taught to make ships for generations and can work as carpenters. However, even if they were taught in their 20s or older, due to their dependence on life on land, there are now more people leaving the fishing industry. Therefore, boat building became the livelihood for most of the elderly, who are also highly skilled as fishermen. (See Figure 6. 19)

Sarisari store

A “sarisari” store is a personally owned daily necessities store in the village. There are nine stores in the village. Supplies are bought and resold at large commercial facilities. Sari-sari store is a unique selling method in the Philippines, which the Bajau followed. (See Figure 6. 20)

Figure 6. 19: Shipyard

Figure 6. 20: Sari-sari store

Table 6. 1:Area Requirements

Density = 135	BP220 Requirements	Actual
Parks and Playgrounds Requirements	3.5% of Gross Area or 0.034Ha (341 m^2)	Four plazas. The main plaza has a platform of 75m^2 but the whole sea becomes an extension of the plazas
Area for Community Facilities	1.0% of Gross Area or 0.097Ha (97.5 m^2)	There is more space for community facilities provided.

Table 6. 2: Community Facility Allocation

No. of housing units = 132	BP220 Requirements	Actual
Neighborhood Multipurpose Center	Required	None. Although the main plaza serves the purpose
Tricycle Terminal	Not Required	No facility. Tricycle simply waits along the road
Convenience Retail Center*	Not Required	Sari-sari stores serve the purpose
Elementary School*	Not Required	The churches are used as schools although there are formal schools near the community
High School*	Not Required	There are formal schools near the community

Although the property is publicly owned, the government could not impose the provisions of BP220 because the site is on the water, in principle, the site is part of the

easement and is not supposed to be buildable[14]. Even if an exemption was made to accommodate the Bajaus, it was not possible to divide the property into plots and introduce a road system unless parts of the area are reclaimed. With this dilemma, the government simply required the homeowners not to build within 50m from the SRP boundary.

Table 6. 3: Minimum Lot Areas and Lot Frontage

	BP220 Requirements		Actual	
	Minimum Lot Areas	Minimum Lot Frontage	Minimum Lot Areas	Minimum Lot Frontage
Single Detached (corner and regular lots)	64 m^2	8 meters	unidentified	unidentified
Single Detached (irregular lot)	64 m^2	4 meters	unidentified	unidentified
Single Detached (Interior lot)	64 m^2	3 meters	unidentified	unidentified
Duplex/Single Attached	48 m^2	6 meters	n/a	n/a
Rowhouse	28 m^2	3.5 meters	n/a	n/a

Street system

The road in the village is a pier that is constructed by staking piles in the water, forming a foundation on the water, and connecting wooden boards and bamboo to it.

[14] This provision is required by NIPAS or the National Integrated Protection Areas Systems Act, which requires specific easements where water bodies come in contact with the land. The easement requirement depends if the location is either a rural area or an urban area.

Figure 6. 21: Street system diagram

The street system can be classified into 3 types depending on the application. (See Figure 6. 21)

Main pier (red)

Eight main piers (red) extend from land to sea in the village. The width differs from 400mm to 1500mm. These piers divide the village into six areas. The southernmost main road is also a branch road between the area of belief in Islam and the Christian area. The pier and the residence are in contact with each other, and a porch and terrace serving as an entrance are provided facing the pier. The pier allows expansion of public and private spaces such as a playground for children, and a place for a vegetable garden.

Minor-pier (green)

A pier that derives horizontally from each main pier to the coastline. This pier enables to laterally spread the village structure to support SRP development. The width of the road varies from 300 mm to 800 mm, which is barely enough for people to pass each other, so it is mainly used as a passage.

Private pier (yellow)

A private road that connects either the main pier or the minor pier to a specific residence. The width varies between 150 mm to 300 mm.

Figure 6. 22: Pier: L-main pier, C-quasi pier, R-private pier (Source: Wakana Katsura)

Table 6. 4: Road Right of Way

	BP220 Requirements		Actual	
Project Size Range = Below 2.5 hectares	ROW	Carriageway	ROW	Carriageway
Motor Court	6 meters	5 meters	n/a	n/a
Alley	2 meters	-	n/a	-
Path walk	3 meters	-	varies from 300mm to 1500mm	-

Table 6. 5: Road Type

Project Size Range = Below 2.5 hectares	BP220 Requirements	Actual
Major	Required	None
Collector	-	-
Minor	Required	None
Motor Court	Required	None
Alley	-	-
Pathway	Required	Yes

Table 6. 6: Utilities shows the provision of utility systems in the development vis-a-vis the requirements of BP220.

Utilities

Table 6. 6: Utilities

	BP220 Requirements	Actual
Water Supply	Mandatory connection to public water system	The local government also provides a water connection for a fee. Only a few families are connected to this and they in turn sell the water to the community.
	At least an operational deep well and pump set	
	Minimum water supply requirement is 150 liters per capita per day for household	
Electric Power Supply	Mandatory household connection to primary and alternate source of power if	The government provided the required street lights, however each household had

	available	to apply for their own electrical connection.
	Mandatory provision of street lighting per 50m distance	
	Electric bill to be shouldered by users	
Drainage System	Made of concrete lined canal with load bearing cover	No drainage system was established. The waste goes directly to the sea below the houses.
	Shall drain into appropriate water bodies, public drainage or natural outfalls	
	If applicable, underground drainage system shall be provided with adequate reinforced concrete pipes (RCP), catch basins, manholes/inlets and cross drains for efficient maintenance	
Garbage Disposal System	provided with sanitary and efficient refuse collection and disposal system whether independently or in conjunction with the local government garbage collection and disposal services	The government has a schedule for collecting garbage from a specific point source. Everyone is expected to bring their garbage to that area.

Shelter Design

There are two types of houses: wooden stilt houses on water and reinforced concrete houses.

The main residence type of the village is a wooden stilt house on the water, and there are 126 of these houses. Of the 126 homes, only six have two stories. 95% of houses are one-story buildings. The wooden houses have bamboo pillar below the floor and a wooden structure above the floor.

The reinforced concrete house is a two-story house constructed on land in the northwestern part of the village. The building was provided by the government for the Visayans in 2011 through a social housing construction project. Bajau currently resides in six of these houses where they pay rent.

The house is a one-storied house with a roof shape with the gable side facing perpendicular to the coastline. For the floor of the house, bamboo piles were mainly driven into the water, and the floor was laid on top of it. For flooring material, wood is used for the living room and bedroom, and split bamboos are arranged in the shape of a cage around the water so that excrement can easily fall off. Each house has an open platform such as a terrace and porch overhanging the water, where various activities such as preparing food, fishing nets, and taking a nap can be performed. This is because the floor is made of split bamboo arranged like a cage, and it is designed so that the wind that crosses the surface of the water can pass through the gap, making it comfortable even on a hot day. The walls are made of plywood or woven bamboo (commonly known as Amakan), and the roof is made of palm leaves or tin.

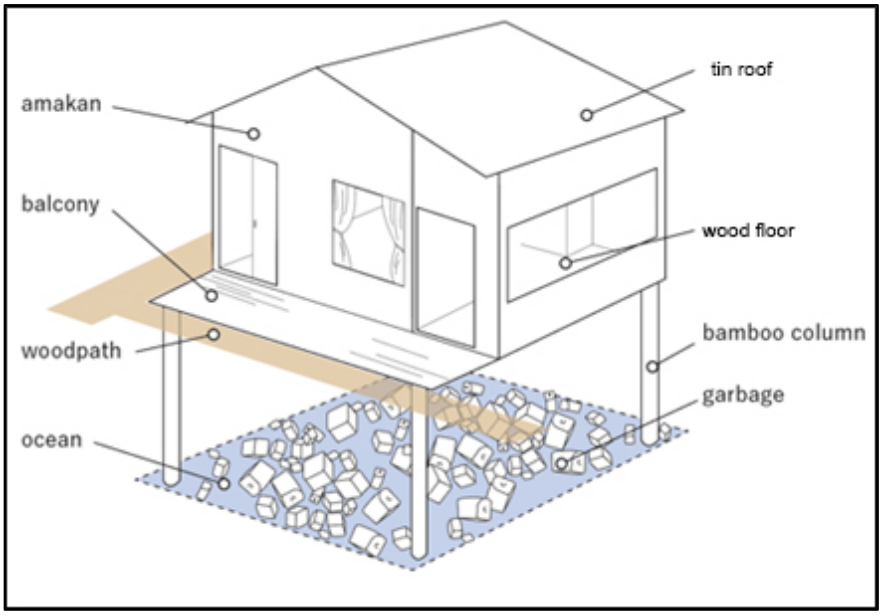

Figure 6. 23: Simplified housing plan

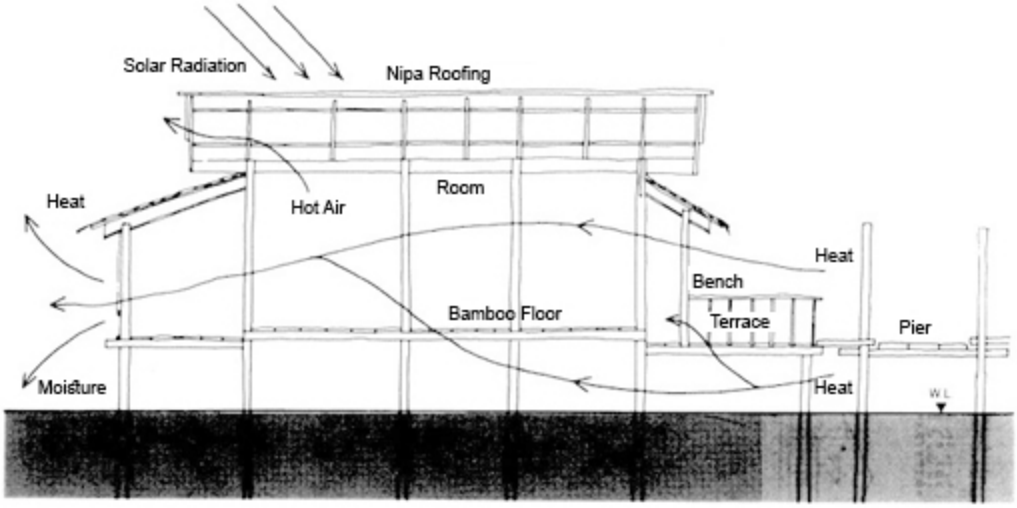

Figure 6. 24: Sectional view

Building Typology

126 wooden stilt houses were measured and classified in terms of plan configuration. The categories used for the classification were derived as follows:

The first set of categories were based on the frontage of the house, depending on the number of spans or room divisions. This is taken from the "front" of the house, which is the part of the house facing the coastline. After studying the plans of all the houses, three types were identified under this category. These are assigned the following labels: I, II, and III.

The next set of categories were based on the number of spans along the depth of the house. This refers to the side of the house, which is parallel to the front, as defined above. After studying all the plans of the houses, four types were identified under this category. These were assigned the following labels: A, B, C, and D.

The two sets of main categories are summarized in Table 6. 7: Main Categories for Classifying Houses.

Table 6. 7: Main Categories for Classifying Houses

According to Front Span		According to Depth Span	
I	Front span of 1.	A	Depth span of 1
II	Front span of 2.	B	Depth span of 2
III	Front span of 3.	C	Depth span of 3
		D	Depth span of 4

Combining these two categories resulted in 12 different types. However, when the plans of the houses were classified according to these 12 types, three of them are not represented by any existing house plans. This leaves the

According to these, 12 types can be classified, but 3 types do not exist, and they are classified into 9 types (Table 6. 8: Classification of the Houses According to Main Categories). Three categories, however, are most represented: Type II-B (two-front span and two-depth span), Type I-A (one front span and one depth span), and Type I-B (one front span and two depth span).

Table 6. 8: Classification of the Houses According to Main Categories

	I	II	III
A	25	9	1
B	18	34	0
C	8	7	1
D	0	0	1

The houses were further classified into two different sub-categories: one that classifies the separation of the living room, bedroom, and the kitchen, while the other category classified existence of a porch and a terrace.

The two sub-categories are summarized in Table 6. 9: Sub-Categories for Classifying House Types, showing the corresponding labels for each sub-category.

Table 6. 9: Sub-Categories for Classifying House Types

According to separation of living room, bedroom, and kitchen		According to existence of porch or terrace	
LBK	Living room, bedroom, kitchen exist in one room	X	No terrace or porch

LB-K	Separate kitchen only	T	Only terrace
LK-B	Separate bedroom only	P	Only porch
L-B-K	Separate living room, bedroom and kitchen	T+P	Both terrace and porch

Classifying the houses into both the main categories and its sub-categories result in the matrix found in Table 6. 10: Matrix of Classification. This matrix shows the number of houses that fall under each category.

Table 6. 10: Matrix of Classification

		I				II				III			
		X	T	P	TP	X	T	P	TP	X	T	P	TP
i	LBK	12	10						1			1	
	LB-K		2			3	1	2					
	LK-B	1				2							
	L-B-K												
ii	LBK			1	1			11					
	LB-K	8	5			7	3	5	1				
	LK-B		3				2	2	2				
	L-B-K					1							
iii	LBK							1					
	LB-K	2			2			1	1				
	LK-B	3					1						
	L-B-K	1				2		1					1
iv	LBK												
	LB-K											1	
	LK-B												
	L-B-K												

The houses in Site A, therefore, may be classified into the following types:

Type 1: Houses with one-front span and one-depth span. These are further classified into the following:

Type 1A: Combined living area, bedroom, and kitchen. No porch and terrace

Type 1B: Combined living area, bedroom, and kitchen. With terrace.

Type 2: Houses with one-front span and two-depth span. These are further classified into the following:

Type 2A: Combined living area and bedroom, separate kitchen. No porch and terrace

Type 3: Houses with two-front span and two-depth span. These are further classified into the following:

Type 3A: Combined living area, bedroom, and kitchen. With porch

Type 3B: Combined living area and bedroom, separate kitchen. No porch and terrace.

Type 1A is the most common type of house (12%), followed by Type 3A (11%), Type 1B (10%) and Type 2A (8%).

Although the most common house types have all three spaces combined (LBK), the arrangement with a separate kitchen (LB-K) is the most common when all houses are considered. 42% of the houses have the LB-K arrangement compared to the LBK arrangement which only has 37%.

While most of the houses do not have a porch or a terrace (40%), there is an almost equal number of houses with either a porch or a terrace (26% and 25% respectively). There are very few houses that have both.

These house types, however, do not comply to BP220. All the houses are single detached. Although the required setbacks are not followed, there are no provisions for fire walls.

Table 6. 11: Shelter Components

	BP220 Requirements		Actual	
	Minimum Floor Areas	Minimum Level of Completion	Minimum Floor Areas	Minimum Level of Completion

Single Detached	18 m^2	Shell house (enclosed)	Approx. 12 m^2 (average)	n/a
Duplex/Single Attached	18 m^2	Shell house (enclosed)	n/a	n/a
Rowhouse	18 m^2	Shell house (enclosed)	n/a	n/a

Table 6. 12: Setbacks/Yard

	Required by BP 220	Actual
Front Setback	1.5 meters	n/a
Side Yard	1.5 meters	n/a
Rear Yard	2.0 meters	n/a
Abutments	May be allowed per requirement of the National Building Code of the Philippines	n/a

6.3.3 Site B: Relocation Process, Site Characteristic, and Shelter Design

Relocation Process

The patriarch and the Irish community service organization have received an area management permit from the government and were given the authorized to give a residence permit when a village wants to construct a new building. When moving in, villagers can go through four steps.

I. The villagers obtain a residence permit from both the patriarch and the head of the Irish Community Service Organization.

II. The chief or area leader reports to the barangay hall.

III. The chief or area leader consult with the neighbors of the planned residence.

IV. If there is a residential land available in the village, the villagers can start after negotiations with neighbors are completed.

Characteristic of the Site

The site B community structure created by the housing construction project is far from the conventional site A structure where stilt houses are installed along the waterway that runs perpendicular to the coastline.

Bajau and Visayans live adjacent to each other, but the boundary of the site was lined with concrete blocks and fences on all sides to emphasize the area. Previously, the sea was one of the plazas, but concrete blocks and fences were also stretched in the direction of the sea, so the plaza in the village is no longer the sea but the one in the center of the village. In addition, the road in the village is the ground of the reclaimed land as compared to the wooden road of Site A with a width of 150 mm to 1500 mm on the water. The layout of the houses is not spontaneous, and the housing complex is located on a rectangular landfill. The village structure is systematically organized.

A 5,600 m^2 settlement on the coast of the land. There are 140 houses made of compressed soil block and 26 wooden stilt houses. The village consists of about 1100 people and 4 public facilities.

The following are the elements that make up the village:

Village wall

A 2500mm-high wall that surrounds the four sides of the village along the boundary of the site. It consists of concrete blocks and fences. This emphasizes the area surrounding the Visayas village. It has been installed even on the coast, thereby restricting the access to the sea (See Figure 6. 26).

Village gate

There are village gates on all four sides of the village: three gates to the surrounding villages and one gate to the sea. All are fence doors have an opening width of 5000 mm and a height of 2500 mm.

Gate A: Main entrance/exit. Facing the main street leading to the surrounding villages (Figure 6. 27).

Gate B: The only gateway to the sea. You can get in and out of the boat from here (Figure 6. 28).

Gate C: Facing the water sales office outside the village. Village people Since it supplies water for domestic use, the water supply area in front of the gate is in the village (Figure 6. 29).

Gate D: Blocked and not used.

Figure 6. 25: Village structure (as of October 11, 2018)

Figure 6. 26: Village wall along the coastline (Source: Wakana Katsura)

Figure 6. 27: Gate A (Source: Wakana Katsura)

Figure 6. 28: Gate B (Source: Wakana Katsura)

Figure 6. 29: Gate C (Source: Wakana Katsura)

Plaza

The main plaza is the ground in the center of the village. There is a volleyball court where young people and children can play and fly kites. In addition, there are opened shops in the surrounding area which is a place for livelihood activities. In the evening, the place is packed with many villagers who come home from work, students who come from school and many other villagers. Previously, the sea was one of the open spaces, but concrete blocks and fences were also installed in the direction of the open sea, so the open space function shifted from the sea to the land. Since it is a landfill, drainage is poor and the entire site is flooded by about six cm in the rainy season, and it takes about a week to dry (Figure 6. 30 and Figure 6. 31).

Figure 6. 30: Plaza during the day (Source: Wakana Katsura)

Figure 6. 31: Plaza during late afternoon

Wharf

There are about 20 vessels of various sizes docked on the wharf. Garbage has accumulated and has formed a beach. Figure 6. 32 shows the wharf at high tide. At low tide, it becomes a beach of garbage up to the opposite bank, making it difficult for ships to get in and out of the sea.

Figure 6. 32: Wharf

Public Facility

School: The school is operated by an Irish community service organization. There are three classes, a toddler's class, a youth class, and an adult class. In addition to learning the language and land culture, vocational training such as making small items and sewing is carried out. The tuition fee is 1php=2.4 yen/day. The school is closed on Sundays and Mondays (Figure 6. 33).

Meeting place: There are indoor spaces and semi-outdoor spaces for meeting, but the indoor space cannot be used because it is filled with building

materials and rubble. The semi-outdoor space, on the other hand, is used as a place for ship making and as a food sales office (Figure 6. 34).

Clinic: Two German doctors visit the clinic twice a month (Figure 6. 35).

PC hut: Four PCs are installed, and children enjoy PC games every day (Figure 6. 36).

Figure 6. 33: School

Figure 6. 34: Meeting place

Figure 6. 35: Clinic

Figure 6. 36: PC

Sarisari store

A personally owned daily necessities store in the village. There are eight in the village, all on the first floor. The sari-sari store is a unique selling method in the Philippines. The store takes up half of the houses may even extend outside into the streets.

Figure 6. 37: Sari-Sari store in the house

Figure 6. 38: Extended Sari-Sari Store

Lantay

Since it is a narrow and hot house, the residents are expanding the wooden stilt type multipurpose space called “Lantay” into the street outside. The lantay is a platform used as a kitchen, or for laundry, for sleeping, or serves as a living area.

Figure 6. 39: Lantay (Source: Wakana Katsura)

Below are features of the site when evaluated against BP220

Table 6. 13:Area Requirements

Density = 250	BP220 Requirements	Actual
Parks and Playgrounds Requirements	9% of Gross Area or 0.05Ha (504 m^2)	A central plaza was provided with an area of approx. 1000 m^2 or 18% of the gross area.
Area for Community Facilities	2.0% of Gross Area or 0.011Ha (112 m^2)	Community facilities were provided on an area that totals 1000 m^2 or 18% of the

		gross area

Table 6. 14: Community Facility Allocation

No. of housing units = 140	BP220 Requirements	Actual
Neighborhood Multipurpose Center	Required	A meeting area or livelihood center was provided
Tricycle Terminal	Not Required	No facility provided inside the lot, however a makeshift terminal exists outside the gate.
Convenience Retail Center*	Not Required	Sari-sari stores serve the purpose
Elementary School*	Not Required	A school building was provided but for informal education. A formal school is located near the community.
High School*	Not Required	The space was shared with the school building. A formal school is located near the community

The main type of house is called a Quad House which is a two-story structure with two units below and two units above. The house is not divided vertically into two by a firewall, thus it is considered as a single detached house rather than a duplex house. The site is not divided into plots which are sold or assigned to individual families. Instead, the site was planned as one community with many dwelling units. Only the buildings were assigned to families, the site was held in common following the traditions of the Bajaus.

Table 6. 15: Minimum Lot Areas and Lot Frontage

	BP220 Requirements		Actual	
	Minimum Lot Areas	Minimum Lot Frontage	Minimum Lot Areas	Minimum Lot Frontage
Single Detached (corner and regular lots)	64 m^2	8 meters	approx. 93 m^2 for two units on the ground.	None
Single Detached (irregular lot)	64 m^2	4 meters	n/a	n/a
Single Detached (Interior lot)	64 m^2	3 meters	n/a	n/a
Duplex/Single Attached	48 m^2	6 meters	n/a	n/a
Rowhouse	28 m^2	3.5 meters	n/a	n/a

Street system

The street system for Site B is unconventional. The main "street" where the houses face are technically "alleys" while the "path walks" are placed at the back of the houses (**Error! Reference source not found.**).

Alleys

The front street where the entrances of the houses face each other has a passage width of 1000 to 1500 mm. Here, you can lean out from your home to hold a well-end conference or leave your chair or desk to sell food or prepare for sales. The alley, however, is not compliant to the provisions of BP220.

Path walks

The street at the back of the house has a width of 3000 to 4000 mm. Since it is wide and has little shade, it is used as a washing place and a laundry place. It is also used as a shipyard and furniture factory.

Motor Court

The road from Gate A leads directly to the open space which also functions as a parking space for visitor's cars. This road serves only as a driveway and may be considered as a motor court. The development does not consider any vehicle entering the facility and staying for an extended period.

Figure 6. 40: Street System Diagram - Site B

Figure 6. 41: Alley (left: front street, center: back street, right: passage bet. residences)

Below are the street features of Site B as they are compared with the requirements of BP220:

Table 6. 16: Road Right of Way

	BP220 Requirements		Actual	
Project Size Range = Below 2.5 hectares	ROW	Carriageway	ROW	Carriageway
Motor Court	6 meters	5 meters	6 meters	5 meters
Alley	2 meters	-	1m to 1.5 m	-
Path walk	3 meters	-	3m to 4m	-

Table 6. 17: Road Type

Project Size Range = Below 2.5 hectares	BP220 Requirements	Actual
Major	Required	Not required. Served by a motorcourt
Collector	-	-
Minor	Required	None
Motor Court	Required	Used as main road.

Alley	-	Yes
Pathway	Required	Yes

Utilities

Water supply and drainage facility

Water supply and drainage facilities were installed to improve the standard of living, but many of them suffered from a lack of maintenance.

Water tank: No water, no function.

Common washing room: It is used as a washing place for laundry and dishes, and a bathhouse. Although the drainage pipe was installed, it was not functioning because it was blocked due to the lack of construction period at the construction stage.

Common Faucet: There are 7 faucets in the village but only 3 are functioning.
Shared toilet: Two toilets are installed in each building. However, to prevent water from flowing and Bajau, use a toilet bowl.

There are 21 toilets, but these are seldom used. It is customary for the Bajaus to excrete their waste into buckets and throw them into the sea.

Figure 6. 42: Water tank

Figure 6. 43: Shared washroom

Figure 6. 44: Shared faucet

Figure 6. 45: Public toilet

Table 6. 18: Utilities

	BP220 Requirements	Actual
Water Supply	Mandatory connection to public water system	Water supply is provided in common. The water bill is paid for by the association which, in turn, are distributed among its members.
	At least an operational deep well and pump set	
	Minimum water supply requirement is 150 liters per capita per day for household	
Electric Power Supply	Mandatory household connection to primary and alternate source of power if available	Electric power is available to those who apply for it. The power for the common facilities is paid for by the association which, in turn, are distributed among its members.
	Mandatory provision of street lighting per 50m distance	
	Electric bill to be shouldered by users	
Drainage System	Made of concrete lined canal with load bearing cover	The common toilet facilities are provided with the appropriate septic tank and drainage to public sewer system; however, the Bajaus have the habit of not using the toilet facilities. Instead, they use buckets for their waste and throw the waste directly to the sea.
	Shall drain into appropriate water bodies, public drainage, or natural outfalls	
	If applicable, underground drainage system shall be provided with adequate reinforced concrete pipes (RCP), catch basins, manholes/inlets and cross	

	drains for efficient maintenance	
Garbage Disposal System	provided with sanitary and efficient refuse collection and disposal system whether independently or in conjunction with the local government garbage collection and disposal services	The government has a schedule for collecting garbage from a specific point source. Everyone is expected to bring their garbage to that area.

Shelter Design

Housing format

There are two types of houses, compressed soil block houses and wooden raised floor houses.

Compressed soil block, or KU housing, is a two-storied house, with four living units (two on the ground floor and two on the second floor). Each unit has a dimension of 4800mm x 2700mm. 140 housing units have been constructed. Each living unit only has a bare room without toilet and kitchen. Cooking is done outside the entrance on the first floor. The water connection is supplied outside the house. Each housing unit is equipped with two common toilets to be shared by the four living units. The Bajaus, however, prefers to use a chamber pot thus the toilets were hardly used and ended up as a storage room.

The one-story wooden houses were added to the development when some people did not like to live in the concrete houses. Around 26 wooden houses were all around the site. Since these wooden houses were not planned, and are ad hoc, they will not be considered in this study.

Figure 6. 46: Compressed soil block house

Figure 6. 47: Wooden stilt house

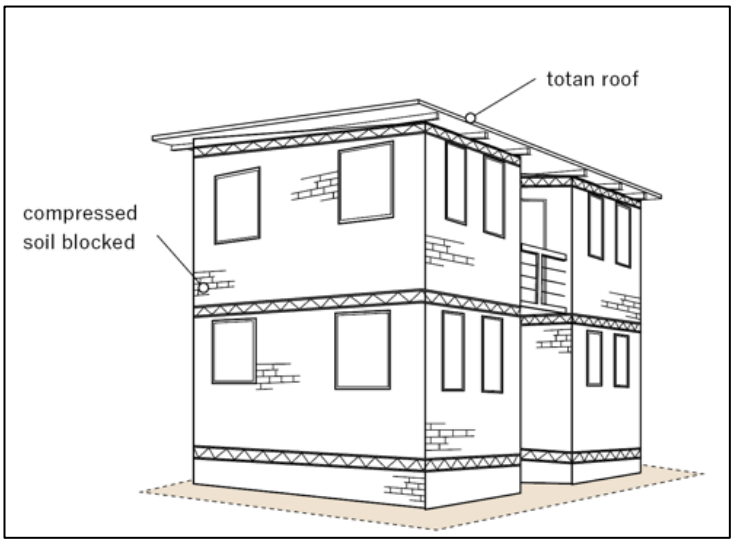

Figure 6. 48: Simplified housing diagram

Figure 6. 49: Compressed soil block

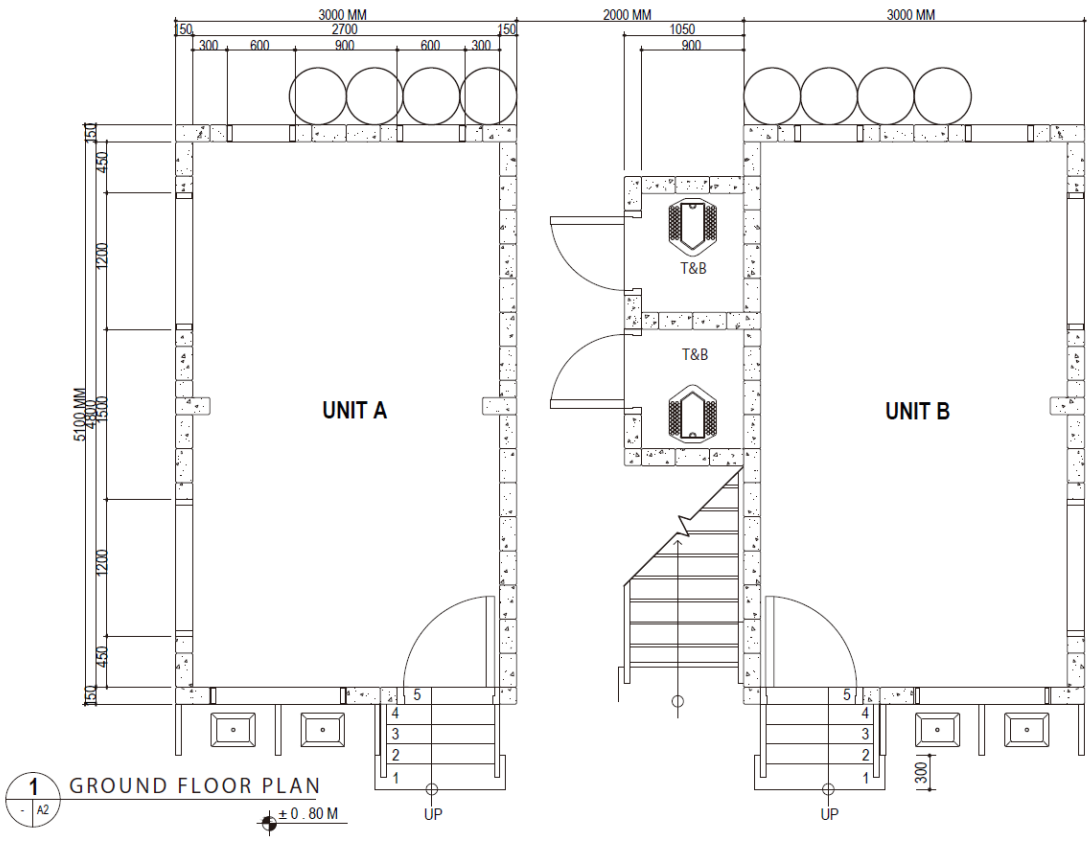

Figure 6. 50: Ground floor plan of house (Source: University of San Carlos)

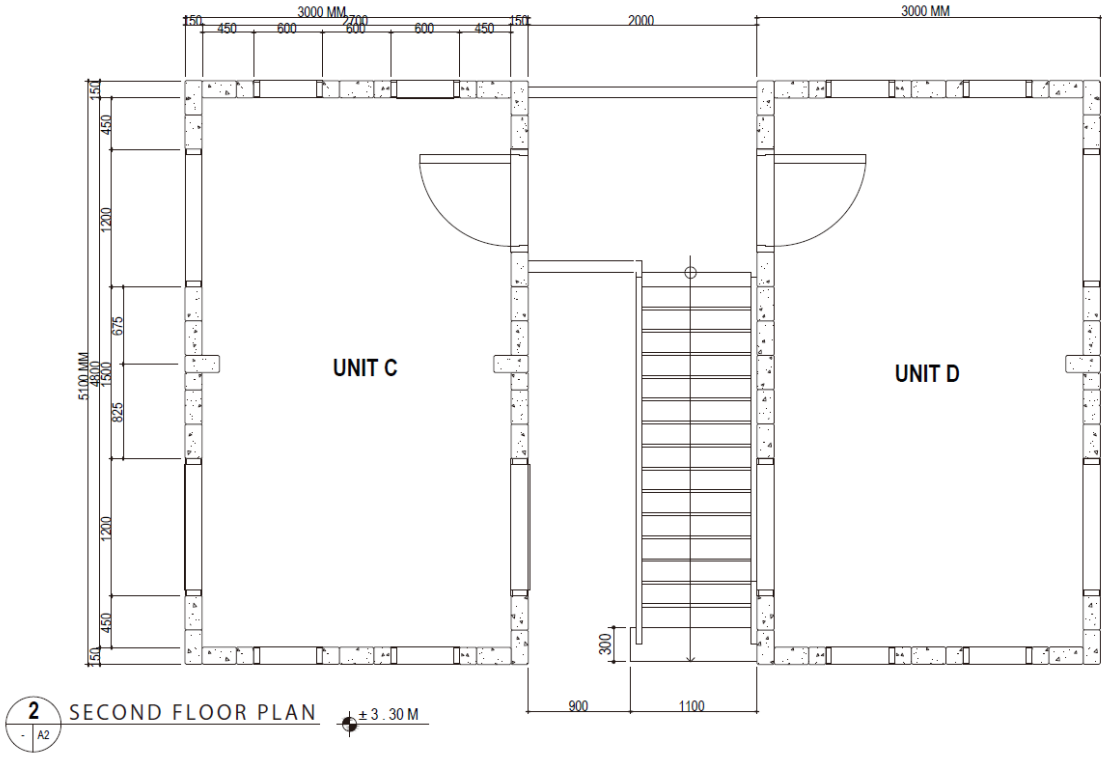

Figure 6. 51: Second floor plan of the house

Figure 6. 52: Elevation of house (Source: University of San Carlos)

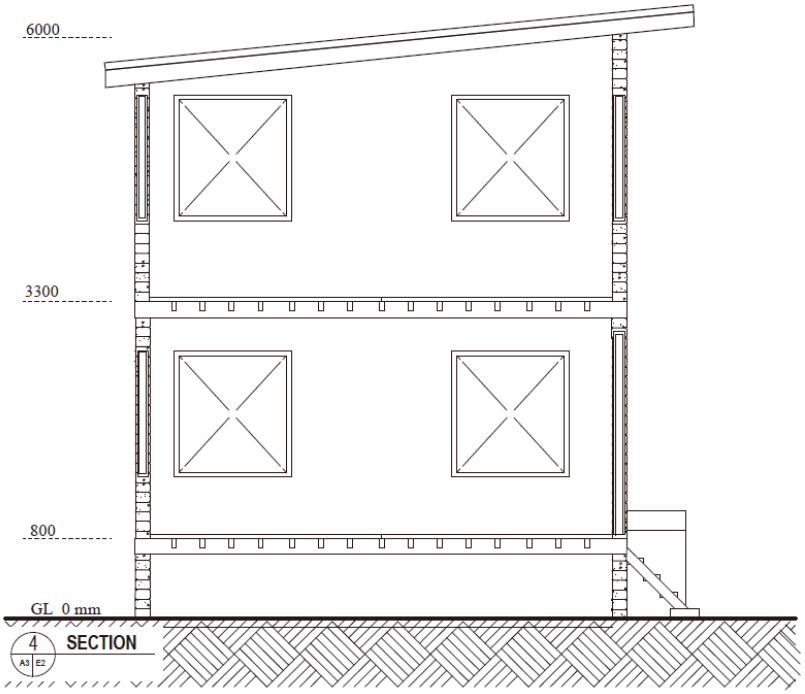

Figure 6. 53: Sectional view of house (Source: University of San Carlos)

Table 6. 19: Shelter Components

	BP220 Requirements		Actual	
	Minimum Floor Areas	Minimum Level of Completion	Minimum Floor Areas	Minimum Level of Completion
Single Detached	18 m^2	Shell house (enclosed)	n/a	n/a
Duplex/Single Attached	18 m^2	Shell house (enclosed)	12.96 m^2	Shell house (enclosed)
Rowhouse	18 m^2	Shell house (enclosed)	n/a	n/a

Table 6. 20: Setbacks/Yard

	Required by BP 220	Actual
Front Setback	1.5 meters	n/a
Side Yard	1.5 meters	1.5m distance between houses, although the space is considered public
Rear Yard	2.0 meters	n/a
Abutments	May be allowed per requirement of the National Building Code of the Philippines	n/a

6.4 Post Disaster Development

After the villagers have settled down in Site A, after the recovery period, life was described to have gone back to normal. This meant that people went back to their previous livelihood. The same cannot be said of the villagers of Site B. Since they were relocated, they

must deal with the new environment. They also must deal with the fact that they are now land-based instead of the old water-based lifestyle they were used to. Thus, the livelihood of the villagers in Site B was very much affected.

Prior to their relocation, All the villagers live by fishing. After relocation, only 13% continued fishing while the rest are engaged in other forms of livelihood (**Error! Reference source not found.**). Selling comes in many forms, including selling on the streets (Figure 6. 54 and Figure 6. 55). These products could be pearls, food in the market, or wares (Figure 6. 56 and Figure 6. 57).

Table 6. 21: Livelihood before and after relocation

	Fishery	Fishery+Vendor	Vendor	Sari-Sari	Construction
Before immigration	100% (14 cases)	0 % (o cases)	0 % (o cases)	0 % (o cases)	0 % (o cases)
After migration	13.0% (3 cases)	27.1% (5 cases)	39.1% (9 cases)	13.0% (3 cases)	13.0% (3 cases)

Figure 6. 54: Retail business on the street

Figure 6. 55: Retail business in urban areas

Figure 6. 56: Pearl sales at Site A (Source: Wakana Katsura)

Figure 6. 57: Sewing folk costumes at Site B (Source: Wakana Katsura)

Inside the village, people still engage in selling through the sari-sari stores. Part of their fishing livelihood, however, is the building of boats (Figure 6. 58 and Figure 6. 59)

Figure 6. 58: Site A Ship making work (Source: Wakana Katsura)

Figure 6. 59: Site B Shipbuilding work (Source: Wakana Katsura)

Aside from their livelihood, the lifestyle of the Bajaus living in Site B were also greatly affected. A study analyzed the residential areas of Site A and discovered that the terrace or the porch play an important part of the Bajau's daily lives. Those who do not have this feature in their house would make use of the plaza to carry out the activities normally associated with the porch or terrace. In Site B, however, there are no porches or terraces. The plaza is also centralized instead of the dispersed small plazas in Site A. This led to the "reshaping" of the built environment where "lantays" were made and smaller wooden houses were also constructed. Toilet facilities were also not used because they do not respond to the cultural tradition of the Bajaus.

As designed Site B respond more to disaster prevention, however, because of the "reshaping" done by the villagers, the site is now riskier especially in terms of fire.

CHAPTER 7

Conclusion

CHAPTER 7: CONCLUSION

7.1 Overview

The case studies presented are varied. This, however, is advantageous in evaluating the housing resettlement efforts in different aspects.

The case study for Tacloban City features different sites because of the need to relocate away from the original site which had been considered as a hazard zone. The case study in Sitio Panting differs in the sense that the land is privately owned. In Mambaling, two cases emerge: an in-situ resettlement in Site A, and a relocation site in Site B. Site A offers a unique feature because it is not land based. Both Site A and Site B also have a unique feature, being mainly a community for Bajaus.

Table 7. 1: Characteristics of the Site

	Land Ownership	Scope of Disaster	Type of Disaster	Type of Resettlement
Tacloban	Public	National	Typhoon	Relocation (temporary and permanent)
Cebu – San Roque	Private	Local	Fire	In-situ (permanent)
Cebu – Mambaling Site 1	Public	Local	Fire	In-site (permanent)
Cebu – Mambaling Site 2	Public	Local	Fire	Relocation (permanent)

7.1.1. Tacloban

Because of the extent of the damage caused by the super typhoon Haiyan, several sites for temporary housing were established. Prior to this, however, the affected community had to struggle in availing of emergency shelters. While support from international organizations had not been lacking, the local government took some time to recover from the shock caused by the disaster causing disorganization in the implementation of programs.

There were many lapses in the provision of temporary shelters in terms of completion and quality. The affected community ended up staying in the temporary housing for four years before the permanent housing was finally provided to them. As mentioned earlier, this lapse caused the national government to give away the permanent housing for free to make up for the delay.

Although only two sites were considered in this study among the permanent housing sites, the development of the sites follow the provisions of BP220.

7.1.2. Cebu – San Roque

In Sitio Panting, the affected community were sheltered in a public covered court or gym. There was no temporary housing arranged, instead the DWUP tried to speed up the process of returning to the sites.

Since the land is privately owned, the government can only facilitate the clearing of the site, the making of a re-blocking plan, and the handing out of cash assistance to the affected communities. The community takes care of rebuilding their houses. It should be noted, however, that most provisions of BP220 were not met.

7.1.3. Mambaling, Site A

Immediately after the fire, the affected community was sheltered in different public facilities including the Barangay Hall. Building back was faster because the community is not based on the land. Recovery, therefore, was more of a self-help system with minimal interventions from the government. In this site, the applicability of BP220 can be contested simply because there were no provisions for the physical planning of a non-land-based community.

7.1.4. Mambaling, Site B

in contrast to Site A, everything in Site B was controlled. In fact, the design of the living units was almost dictated by the Irish organization. The facilities, however, were complete and compliant with BP220.

7.2 Evaluation of Temporary Resettlement Sites

1. Eight temporary settlements have been surveyed, which are distributed around the city center and the reallocation are in the north fringe of the islands. Their location, extension and planning are diverse, and no common pattern can be devised for any of them.

2. According to the UNHCR standards, all settlements range between block and sector, placing them in the middle range of the classification. There are two of them that are placed between the two categories, depending on the percentage of occupied dwelling and the number of residents. Smaller or bigger settlements are not present, so reallocation projects can be classified as mid-sized according to international standards.

3. None of the assessed settlements comply with all the minimum standards, so that they cannot be categorized as providers for a decent living. The most evident shortcoming is the one related to the camp area per person, which prevents overcrowding that, at last, can lead to other conflicts, such as insecurity and rapid spread of diseases. Sanitary facilities are present in all settlements, but do not reach minimum standards per UNHCR.

4. All settlements have facilities that are not regulated by the UNHCR, such as the community centers. This suggests a real concern for building a strong community and provide social interaction between residents. In turn, recovery and resilience of communities reach beyond the provision of basic facilities and has much more to do with protecting and fostering the bond between families and neighbors. At last, despite that, in theory, all reallocation projects would be coordinated by a master plan, this research has found that such coordination was inefficient; particularly, the allocated lots of the master plan did not bear relation with the size of the actual resettlements.

7.3 Evaluation of Permanent Resettlement Sites

7.3.1 Location and settlement planning

Distance of shelters and/or resettlement sites from areas with known natural or man-made threats, risks, and hazards.

The National Mapping and Resource Information Authority (NAMRIA) of the Philippine provided the following hazard maps to all the local government units to serve as basis for policy making:

01 - Earthquake-induced Landslide

02 - Ground Rupture

03 - Ground Shaking

04 - Liquefaction

05 - Storm Surge

06 - Tsunami

07 - Rain-induced Landslide

08 – Volcanic

Appendix E shows the hazard maps of Tacloban City indicating the location of the temporary and permanent resettlement sites. Excluded are the ground rupture hazard map and the volcanic hazard map. This is because Tacloban City is not affected by these hazards.

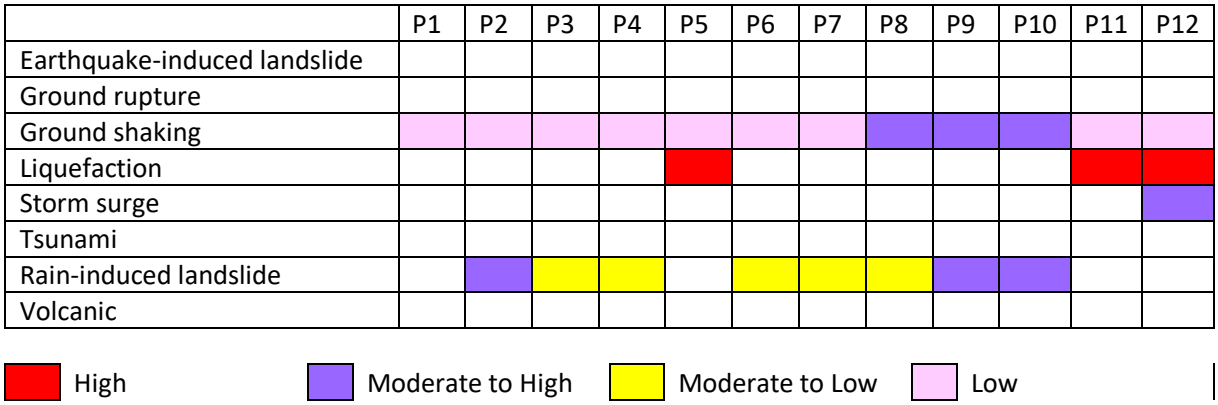

Figure 7. 1: Evaluation on Hazard of Permanent Housing Sites in Tacloban

This study only considers the sites in P1 and P2, however, a broader look at majority of the sites (see Table 7. 1), shows that not all the sites are selected properly.

For Cebu, it is unfortunate that NAMRIA does not have a hazard map. Cebu City Hall can only provide the geo-hazard map shown in Appendix F. This shows that the Mambaling sites belong to an area with low susceptibility to natural floods. The San Roque site, although further inland, belongs to and area with moderate susceptibility to natural. Historically, the San Roque area used to be a marsh land, therefore it is expected that the volume of storm water will be greater in this area. The Cebu sites were resettlement projects in situ, thus there was no choice but to deal with the existing hazards brought about by the location. Those affected, however, are willing to face the difficulties arising from these hazards for as long as the site can provide them with opportunities to survive on a day-to-day basis.

Travel distance of shelters and/or settlement sites to essential services

The sites for Tacloban were located outside the city center, thus the essential services became less accessible in terms of distance and transportation. This caused some difficulty in convincing people to either transfer to the new sites, or to remain there. The government, however, revised their master plan for the city to accommodate this problem. The Cebu sites do not have this problem since the sites are in the city center.

Area of space for private and public outdoor activities appropriate to the context.

Sites A and D were provided with sufficient space for parks and playgrounds, as well as for community facilities. In Site B, the area is smaller, but the residents have the tendency to convert the main road into a semi-plaza by holding activities there. In Site C, the area

allocated is smaller because the community is on stilts, and yet one may argue that their area for recreation is bigger since it includes the sea.

Table 7. 2: Parks and Playgrounds Requirements

	Density	BP220 Requirements	Actual
Tacloban	85	3.5% of Gross Area or 0.034Ha (341 m^2)	Compliant
Cebu – San Roque	200	6.0% of Gross Area or 0.027Ha (270 m^2)	Only 160m^2 provided but the road becomes an extension
Cebu – Mambaling Site 1	135	3.5% of Gross Area or 0.034Ha (341 m^2)	Four plazas. The main plaza has a platform of 75m^2 but the whole sea becomes an extension of the plazas
Cebu – Mambaling Site 2	250	9% of Gross Area or 0.05Ha (504 m^2)	A central plaza was provided with an area of approx. 1000 m^2 or 18% of the gross area.

Area for Community Facilities

In Appendix A, the only community facility required for a community with a density less than 500 is a neighborhood multipurpose center, yet all the sites have at least one more facility like a school or a retail center. The San Roque site and Mambaling Site A do not have the required multipurpose center, but their plaza served the purpose, and they also have the option of using a facility nearby. While a retail center is not required given the density of the sites, a sari-sari store normally takes its place.

Table 7. 3: Area Requirements

	Density	BP220 Requirements	Actual
Tacloban	85	1.0% of Gross Area or	Compliant

		0.097Ha (97.5 m^2)	
Cebu – San Roque	200	1.5% of Gross Area or 0.007Ha (67.5 m^2)	Only 20 m^2 provided
Cebu – Mambaling Site 1	135	1.0% of Gross Area or 0.097Ha (97.5 m^2)	There is more space for community facilities provided.
Cebu – Mambaling Site 2	250	2.0% of Gross Area or 0.011Ha (112 m^2)	Community facilities were provided on an area that totals 1000 m^2 or 18% of the gross area

7.3.2 Living spaces.

The single detached houses were only applicable in Cebu's, Mambaling – Site A because of the unique cultural characteristics. In the other sites, a rowhouse was the popular choice because it maximizes the use of the land for resettlement. In Sitio Panting, however, the building type is peculiar since the houses are adjacent to each other but are not necessarily designed as a rowhouse.

Area of living space in carrying out daily activities.

The permanent shelter in Tacloban provided a generous space compared to the standards for socialized housing. The unit is already equipped with a kitchen and toilet inside.

Mambaling Site B, although a new development, falls short in terms of size. A common toilet is shared by four units in each shelter. There is no kitchen inside the living unit but a faucet for each unit is provided outdoors.

The shelters in San Roque were built by the homeowners according to their own design. In most cases, they manage to provide a toilet and kitchen in a 16 m^2 of space. The shelters in Mambaling Site B were also built by the homeowners according to their own design but their toilet and kitchen set up follows their cultural practice.

Number of shelters that complied with culturally acceptable practices.

There are basically two distinct cultural sets making up the four case studies: the Bajaus and the informal settlers. The cultural traits of the Bajaus had been discussed in Chapter 5. The researcher. however, acknowledges the distinction of the cultural traits of informal settlers compared to those who live in gated or secured communities and condominium units.

The Bajaus make up the residents for the two Mambaling Sites. While the shelters in Site A, adhere to culturally acceptable practices, the same cannot be said for Site B (Achas, 2016).

The informal settlers who transferred to the resettlement sites in Tacloban, however, were able to easily adapt to their new surroundings. The residents formed a homeowner's association which took care of the improvement of the whole site. Each resident, in turn, works on the improvement of their own shelter, renovating or expanding as needed by each one.

The informal settlers in San Roque built their own houses according to their needs, given the constraint of space, thus there are no problems in terms of adherence to culturally acceptable practice.

Number of people receiving shelter assistance who feel safe in their shelter.

Surveys indicate that nearly all the residents feel safe about their shelter except for the residents of San Roque, who express apprehension about the possibility of another fire destroying the community despite the access provided by the government for fire trucks.

7.3.3 Household items

Type and cost of energy supply that people have to maintain thermal comfort, prepare food and provide lighting.

All the sites are provided with electrical connection. In the case of San Roque, the electrical connection had not yet been installed although this is already in process. For cooking, however, majority of the residents of the Mambaling Sites use firewood or charcoal while the rest make use of gas stoves with gas tanks.

7.3.4 Technical assistance

Involvement of local authorities in programs defining construction standards and in monitoring of construction activities:

In Tacloban, the local government units work with various NGOs in monitoring of construction activities, however, defining construction standards was not done. The assumption was to simply comply with the provisions of the National Building Code, even if the standards of other NGOs or institutions are adapted. For the other case studies, which are all based in Cebu City, the Department for the Welfare of Urban Poor (DWUP) is the local government agency handling all matters relating to the informal sector and indigenous tribes. The DWUP has its engineering division which takes care of surveying properties, dividing plots, and other technical work involved in resettlement projects.

Shelter units constructed, repaired, retrofitted, upgraded or maintained according to the agreed safe building practices for the specific context and hazards

The two new developments, the Tacloban Sites and Mambaling Site B, were designed and constructed following provisions of the National Building Code and BP220. The self-build dwelling units of San Roque, Cebu, were also up to Code except for the setbacks. Both Mambaling Site B and San Roque, do not comply with the setback requirements. It is not clear how the Code requirements can be applied to Mambaling Site A since the community is located on the water.

Households having received appropriate technical assistance and guidance

As regards the process for determining the beneficiaries, the following difference arise between each case study:

Tacloban:

Tacloban follows the protocols set by the national government on determining the beneficiaries. The problem, however, is not in the identification of beneficiaries but on the delivery of the housing units. The delay was extended so much that it prompted President Duterte to decide to give away the housing units for free instead of applying a payment scheme.

Sitio Panting

In Sitio Panting, the resettlement is handled by the Department for the Welfare of the Urban Poor (DWUP) of the local government. The community affected by the fire was occupying a private property. Fortunately for them, the owner consented to their going back. DWUP's role was to guide the community to form an association from among those who were original occupants of the site. The association then represents the interest of the community in the re-blocking effort.

Mambaling

Both Sites A and B have the unique process of assigning the beneficiary to the village chief. Although the resettlement is also under the DWUP, the cultural tradition among the Bajaus was upheld.

7.4 Conclusion:

While the evaluation section presented how each type of resettlement project perform in comparison with the respective standards assigned to them, this section discusses the common traits for both types.

7.4.1 Planning and Design

1. For special cases, BP220 has a provision for variances in the implementation of the law. In principle, the peculiarity of the housing sites considered in this study should fall into this provision; however, variances should only be applied to cases which are not prevalent. The cases presented here, however, are common in the Philippines. It is common to have informal settlements and blighted communities around the country. It is also common to have Bajau communities, living along the seashore, throughout the country.
2. The control of standards should still be the same for post-disaster resettlement projects and socialized housing projects. There should be an inspector to approve the final design of the site and the buildings before these are occupied.
3. The same standards should be applied regardless of the ownership of the property.

4. It may be necessary to establish a minimum density requirement where not even a multipurpose facility will be required, for as long as there is a facility nearby that can serve the purpose.

7.4.2 Cultural Considerations

1. A separate set of standards should be drawn up for the Bajau communities. The Bajaus are not technically considered as indigenous people because they do not own land, but they are allowed by the government to occupy properties in alienable land, therefore the built environment that they create should also be assured of safety and sustainability.

2. Even a "normal" situation, where the property is owned by the government and the beneficiaries do not form a particular cultural tribe, the peculiarity of the lifestyle of the informal settlers should be studied and considered in the planning standards. From the examples given, it is clear that the planners on the field recognize this fact and apply this in their planning, however, they end up violating the laws and standards simply because these laws were not compatible with this sub-culture.

7.4.3 Project Implementation

1. There should be no distinction between a post-disaster permanent housing resettlement project and a typical socialized housing project in terms of site planning and building design standards. The only difference may be in the delivery approach, where community participation may be allowed in a post-disaster housing project to augment development cost and provide temporary income to those affected by the disaster.

2. Ideally, the community should be empowered to participate, however, this will all depend on their actual capabilities. In any case, they should participate no matter how little.

7.5 Future research

7.5.1 Limitations of this study.

The selection of case studies is limited to the resources at hand, particularly in terms of time and budget. Thus, the selection was dependent on a possible collaboration with

another researcher so as to pool the resources together. This added to the constraints of coordinating schedules of trips as well as in processing data. The fact that the research collaborators are Japanese also add to the constraints of translating the data in both Japanese and English. There is also the difficulty encountered in field work when there are not so many local students who can assist in gathering data.

The topic itself has to be limited to housing settlements only otherwise the scope would be too much to handle for the time allotted for it. Yet, even with a delimited scope, there is still difficulty in gathering data because the sources are not systematic.

7.5.2 Recommendations for future research

These findings will help researchers and planners in the future in devising more effective planning tools when devising the allocation process after a disaster.

Moreover, future research is needed for clarifying the main characteristics of the different typologies of dwellings, assessing in such way the convenience of the private space for displaced residents.

The research could be more comprehensive if a categorization of all types of disasters, whether man-made or natural, is made and then have a case study to represent each category. This research was meant to show the need for more of this similar study. The condition of any community in the Philippines is so varied because of its geographical and cultural make up so it would certainly be useful for the governing units to follow the guidelines that are almost tailor made for their conditions.

Sustainability is basically the main aspect that is being explored. At present, the strategy is to give a “universal” environment where the community has to adapt. This is basically a product of the international style movement. As related studies show, communities show their rejection of the build environment offered to them by making changes not only on the shelter design, but even to the site development plan, to the point of vandalizing them. Adapting takes time and may result to an adverse environment. It would be a more efficient way of allocating resources if the housing resettlements are already built according to the existing culture.

Herschberger maintains that any issues in a design problem would fit in any of these categories: temporal, environmental, safety, technological, economic, aesthetic, cultural, and

human issues. This study was only able to deal partly on environmental, cultural, and human issues (Hershberger, 1999). Therefore, there is a wide range of topics that can be tackled for further research in human resettlement.

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APPENDICES

Appendix A: Salient Provisions of BP 220

An act authorizing the ministry of human settlements to establish and promulgate different levels of standards and technical requirements for economic and socialized housing projects in urban and rural areas from those provided under presidential decrees numbered nine hundred fiftyseven (957), twelve hundred sixteen (1216), ten hundred ninety-six (1096), and eleven hundred eighty-five (1185).

Project Location

Within suitable sites for housing and outside potential hazard prone and protection areas Land Allocation for Projects One Hectare and Above

- Saleable Area – Variable
- Non-saleable Area – Mandatory allocation for parks and playgrounds and area for community facilities

Parks & Playgrounds Requirement

Density (lots/dwelling units per hectare)	% of Gross Area for Parks & Playgrounds
150 & below	3.5%
151 - 160	4.0%
161 - 175	5.0%
176 - 200	6.0%
201 - 225	7.0%
Above 225	9.0%

- An addition of 1% increment for every 10 or fraction thereof above 225.
- In no case shall an area allocated be less than 100 square meters. The same shall be strategically located within the subdivision project.

Area for Community Facilities Requirement

Density (lots/dwelling units per hectare)	% of Gross Area for Community Facilities
150 & below	1.0%
151 - 225	1.5%
Above 225	2.0%

Mandatory provision of area for neighborhood multipurpose center both for economic and socialized housing projects with an area of one hectare and above. These areas are non-saleable. However, the developer may provide areas for community facilities such as schools

and convenience/retail centers in excess of the mandatory requirement set in the rules which shall be deemed saleable. The use of the said area shall b indicated in the plan and annotated in the title thereto.

Community Facilities Allocation

Number Of Saleable Lots And/Or Dwelling Units	Neighborhood Multipurpose Center *	Convenience Retail Center **	Elementary School **	High School **	Tricycle Terminal *
10 & BELOW	–	–	–	–	–
11–99	–	–	–	–	–
100–499	X	–	–	–	–
500–999	X	–	–	–	–
1000–1499	X	–	–	–	–
1500–1999	X	X	X	–	X
2000–2499	X	X	X	X	X
2500–3000	X	X	X	X	X
* Mandatory provision of area			** Optional	Saleable	

Minimum Lot Areas

	ECONOMIC HOUSING	SOCIALIZED HOUSING
Single Detached	72 square meters	64 square meters
Duplex/Single Attached	54 square meters	48 square meters
Rowhouse	36 square meters	28 square meters

Minimum Lot Frontage

	ECONOMIC HOUSING	SOCIALIZED HOUSING
Single Detached		
– Corner lot	8 meters	8 meters
– Regular lot	8 meters	8 meters
– Irregular lot	4 meters	4 meters
– Interior lot	3 meters	3 meters
Single Attached/Duplex	6 meters	6 meters
Rowhouse	4 meters	3.5 meters

Length Of Block

Maximum length of block is 400 meters. However, blocks exceeding 250 meters shall be provided with a 2-meter alley approximately at mid-length.

Project Size Range	Economic			Socialized		
	Major (in meters)	Collector (in meters)	Minor (in meters)	Major (in meters)	Collector (in meters)	Minor (in meters)
2.5 hectares & below	8	–	6.5	8	–	6.5
Above 2.5–5 hectares	10	–	6.5	10	–	6.5
Above 5–10 has	10	8	6.5	10	–	6.5
Above 10–15 hectares	10	8	6.5	10	8	6.5
Above 15–30 hectares	12	8	6.5	10	8	6.5
Above 30 hectares	15	10	6.5	12	10	6.5
	ROW	Carriageway		ROW	Carriageway	
Motor Court	6	5		6	5	
Alley	2	–		2	–	
Pathwalk	–	–		3	–	

Road Right of Way

- The minimum right-of-way of major roads shall be in accordance with the preceding table. However, in cases where the major road will serve as interconnecting road, it shall have a minimum right of ay of 10 meters. It shall have a 15-centimeter mix gravel (pit run) base course on well compacted subgrade.
- Major roads shall maintain a uniform width of road right-of-way. Tapering of road width shall not be allowed.
- Minor road shall have a minimum right of way of 6.5 meters.
- Interior subdivision project must secure right of way to the nearest public road and the right of way shall be designated as Interconnecting Road with a minimum right of way of 10 meters. This fact shall be annotated on the title of the said road lot and must be donated and deemed turned over to the LGU upon completion of the said interconnecting road.

Setback Requirement Along Main Public Road

Road Right of Way

- Contiguous projects or projects to be developed by phases shall be provided by interconnecting road with a minimum right of way of 10 meters.
- Alley shall have a width of 2 meters intended to break a block and to serve both pedestrians and for emergency purposes, both ends connecting to streets. It shall not be used as access to property.
- Pathwalk shall have a width of 3 meters intended only to provide pedestrian access to property for socialized housing projects. It shall have a maximum length of 60 meters.

Hierarchy of Roads Per Project Size Range

2.5 hectares & below	Major, minor, motor court, alley	Major, minor, motor court, pathway
Above 2.5 – 5 hectares	Major, minor, motor court, alley	Major, minor, motor court, pathway
Above 5 – 10 hectares	Major, collector, minor, motor court, alley	Major, minor, motor court, pathway
Above 10 – 15 hectares	Major, collector, minor, motor court, alley	Major, collector, minor, motor court, alley
Above 15 – 30 hectares	Major, collector, minor, motor court, alley	Major, collector, minor, motor court, alley
Above 30 hectares	Major, collector, minor, motor court, alley	Major, collector, minor, motor court, alley

Road Specifications

ROW	PS	SW	CW
15.0 meters eters	1.30 meters	1.20 meters	10
12.0 meters eters	0.80 meters	1.20 meters	8
10.0 meters eters	0.80 meters	1.20 meters	6
8.0 meters eters	0.40 meters	0.60 meters	6
6.5 meters eters	optional	0.50 meters	–

Road Pavement

Major	Concrete/Asphalt
Minor	Concrete/Asphalt
Motor Court	Macadam
Sidewalk	Macadam
Pathwalk/Alley	Macadam

Concrete road pavement shall have a minimum thickness of 150 millimeters and a minimum compressive strength of 20.7 MPa at 28 days. Asphalt pavement shall have a minimum thickness of 50 millimeters.

Water Supply

- Mandatory connection to appropriate public water system. Each subdivision shall have at least an operational deepwell and pump sets with sufficient capacity to provide ADD to all homeowners provided further that a spare pump and motor set is reserved. Water supply shall be potable and adequate.
- Minimum water supply requirement is 150 liters per capita per day for household connection
- Provision for fire protectionfacilities shall comply with the requirements of the Fire Code of the Philippines

Electrical Power Supply

- Mandatory individual household connection to primary and alternate sources of power if service is available in the locality.

- Mandatory provision of street lighting per pole if 50-meter distance; and at every other pole, if distance is less than 50 meters.
- Electric bills shall be proportionately shouldered by the users prior to issuance of COC and turn over of open space to LGU
- Installation practices, materials and fixtures shall be in accordance with the provisions of the Philippine Electrical Code and local utility company.

Drainage System

- The drainage system for economic and socialized housing projects shall be made of concrete lined canal with adequate capacity and load bearing cover.
- The drainage system must conform with the natural drainage pattern of the subdivision, and shall drain into appropriate water bodies, public drainage system or natural outfalls
- If applicable, underground drainage system shall be provided with adequate reinforced concrete pipes (RCP), catch basins, manholes/inlets and cross drains for efficient maintenance. Minimum drainage pipe diameter shall be 300 millimeters.

Sewage Disposal System

- Individual septic tank conforming to the standards of the Sanitation Code of the Philippines must be provided.
- Construction of individual septic tanks shall conform to the standards & design of said Code.
- Whenever applicable, connection shall be made to an approved public or community sewer system subject to the requirements and provisions of the Sanitation Code and other applicable rules and regulations.

Garbage Disposal System

- Project should be provided with sanitary and efficient refuse collection and disposal system whether independently or in conjunction with the local government garbage collection and disposal services

Shelter Component

Minimum Floor Area		
	Economic	**Socialized**
Single Detached	22 square meters	18 square meters
Duplex/Single Attached	22 square meters	18 square meters
Rowhouse	22 square meters	18 square meters

Mandatory provision of firewall for duplexes/single attached units and at every unit for rowhouses. The number of rowhouses shall not exceed 20 units per block/cluster but in no case shall this be more than 100 meters in length

Minimum Level of Completion

	Economic	**Socialized**
Single Detached	Complete house (based on submitted specifications)	Shell House (with doors & windows to enclose the unit)
Duplex/Single Attached	-same-	-same-
Rowhouse	-same-	-same-

Setback/Yard

Front Setback	1.5 meters
Side Yard	1.5 meters
Rear Yard	2.0 meters
Abutments	May be allowed per requirement of the National Building Code of the Philippines

Appendix B: Inclusion/Exclusion of SPHERE standards

Area	Standard	Key Indicators	Inclusion/Exclusion
Planning	Shelter and settlement interventions are well planned and coordinated to contribute to the safety and well-being of affected people and promote recovery.	• The shelter and settlement plan provides for the essential needs of the target population and is agreed with the population and relevant authorities	• Excluded because there were no pre-agreed essential needs to provide.
		• Affected people indicate that shelter and settlement assistance reflect their needs and priorities and contributes to a more durable solution	• Excluded because there were no pre-agreed essential needs to provide.
Location and settlement planning	Shelters and settlements are located in safe and secure areas, offering adequate space and access to essential services and livelihoods.	• Shelters and/or settlement sites are located in areas with no or minimal known natural or man-made threats, risks and hazards	• Included
		• Shelters and/or settlement sites have safe access to essential services within an acceptable	• Included

		amount of time or distance	
		• Those receiving settlement assistance feel safe about the location of their shelter or settlement	• Excluded because data could not be obtained
		• Settlement site offers sufficient usable surface area to carry out private and public outdoor activities appropriate to the context	• Included
Living space	People have access to living spaces that are safe and adequate, enabling essential household and livelihoods activities to be undertaken with dignity.	• Affected population have adequate living space in and immediately around their shelters to carry out daily activities	• Included
		• Shelters meet agreed technical and performance standards	• Excluded because there were no pre-agreed technical and performance standards.
		• Shelters are culturally acceptable	• Included
		• People receiving	• Excluded

		shelter assistance feel safe in their shelter	because data could not be obtained.
Household items	Household item assistance supports restoring and maintaining health, dignity and safety and the undertaking of daily domestic activities in and around the home.	• People have sufficient and appropriate quality clothing	• Excluded because of privacy issues
		• People have sufficient and appropriate quality items for safe, healthy and private sleeping	• Excluded because of privacy issues
		• People have sufficient and appropriate items to prepare, eat and store food	• Excluded because of privacy issues
		• Affected population have access to a sufficient, safe and affordable energy supply to maintain thermal comfort, prepare food and provide lighting	• Included
		• No incidents of harm to people using stoves or storing or sourcing fuel	• Excluded because data could not be obtained
Technical assistance	People have access to appropriate technical assistance in a timely	• Local authorities are involved in programs defining construction	• ?

	manner.	standards and in the monitoring of construction activities	
		• Construction activities demonstrate active involvement of the affected population	• Excluded because data could not be obtained.
		• Shelter units are constructed, repaired, retrofitted, upgraded or maintained according to the agreed safe building practices for the specific context and hazards	• Included. Note: the pre-agreement is assumed to be the compliance of the law.
		• Households report having received appropriate technical assistance and guidance	• Excluded because date could not be obtained
Security of tenure	The affected population has security of tenure in its shelter and settlement options.	• Shelter recipients have security of tenure for their shelter and settlement option at least for the duration of a particular assistance program	• Excluded because date could not be obtained
		• Shelter recipients have an appropriate	• Excluded because date

		agreement for security of tenure for their shelter option	could not be obtained
		• Shelter recipients with tenure challenges have accessed, independently or through referral, legal services and/or dispute resolution mechanisms	• Excluded because date could not be obtained

Appendix C: Material requirement and unit of analysis for SPHERE standards

Location and settlement planning		
Standard	Materials for analysis	Unit of analysis
Shelters and/or settlement sites are located in areas with no or minimal known natural or man-made threats, risks and hazards	**Hazard maps** showing shelters and/or settlement sites are located in areas with no or minimal known ***natural or man-made threats, risks and hazards***	Distance of shelters and/or resettlement sites from areas with known natural or man-made threats, risks and hazards
Shelters and/or settlement sites have safe access to essential services within an acceptable amount of time or distance	**Vicinity map** showing shelters and/or settlement sites have safe access to ***essential services*** within an acceptable amount of time or distance.	Travel distance of shelters and/or settlement sites to essential services
Settlement site offers sufficient usable surface area to carry out private and public outdoor activities appropriate to the context	**Development plan** of the settlement site showing sufficient usable surface ***area to carry out private and public outdoor activities appropriate to the context***	Area of space for private and public outdoor activities appropriate to the context.
Living space		
Standard	Materials for analysis	Unit of analysis
Affected population have adequate living space in and immediately around their shelters to carry out daily	**Floor plans** and plot plans of shelters showing adequacy of ***living space in carrying out daily activities***.	Area of living space in carrying out daily activities.

activities		
Shelters meet agreed technical and performance standards and are culturally acceptable	**Survey** showing shelters are ***culturally acceptable***.	Number of shelters that complied with culturally acceptable practices.
Household items		
Standard	Materials for analysis	Unit of analysis
Affected population have access to a sufficient, safe and affordable energy supply to maintain thermal comfort, prepare food and provide lighting	**Survey** of affected population having access to available sufficient, safe and affordable ***energy supply to maintain thermal comfort, prepare food and provide lighting***.	Number of affected populations having access to available sufficient, safe and affordable energy supply to maintain thermal comfort, prepare food and provide lighting.
Technical assistance		
Standard	Materials for analysis	Unit of analysis
Local authorities are involved in programs defining construction standards and in the monitoring of construction activities	**Interviews** confirming ***involvement of local authorities*** in programs defining construction standards and in the monitoring of construction activities	Degree of involvement of local authorities in programs defining construction standards and in the monitoring of construction activities.
Shelter units are constructed, repaired, retrofitted, upgraded or maintained according to the agreed safe building practices for the specific context and hazards	**Checklist** indicating that shelter units are constructed, repaired, retrofitted, upgraded or maintained according to ***the agreed safe building practices for the***	Number of shelter units constructed, repaired, retrofitted, upgraded or maintained according to the agreed safe building practices for the specific

	specific context and hazards	context and hazards
Households report having received appropriate technical assistance and guidance	**Survey** of households having received ***appropriate technical assistance and guidance***	Number of households having received appropriate technical assistance and guidance

Appendix D: Hazard Maps and Location of Resettlement Sites (Tacloban City)

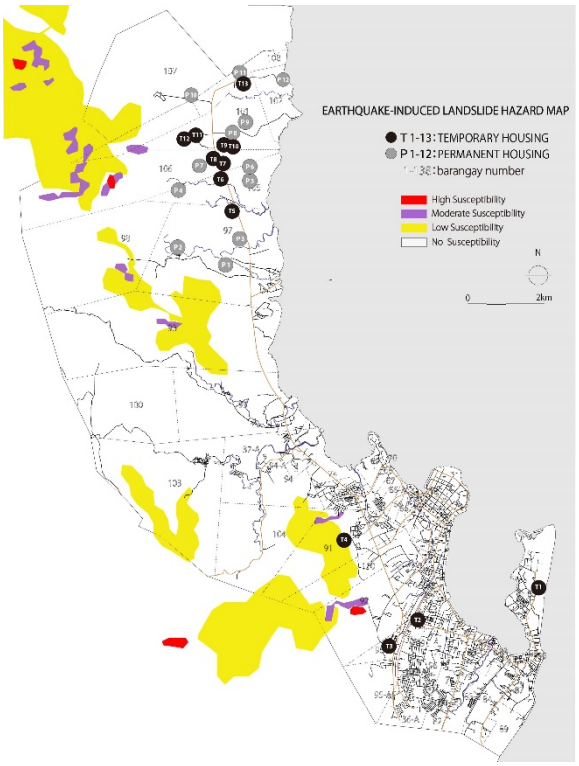


Figure 6. 60: Earthquake-Induced Landslide Hazard Map

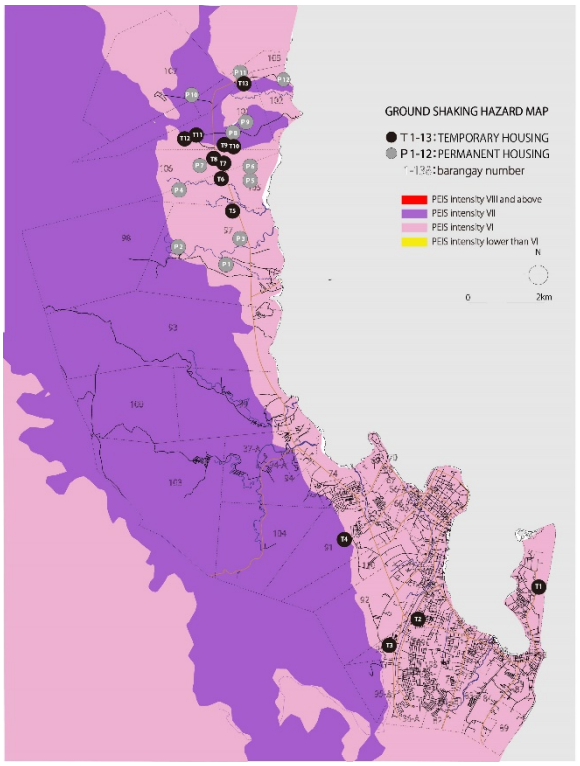


Figure 6. 61: Ground Shaking Hazard Map

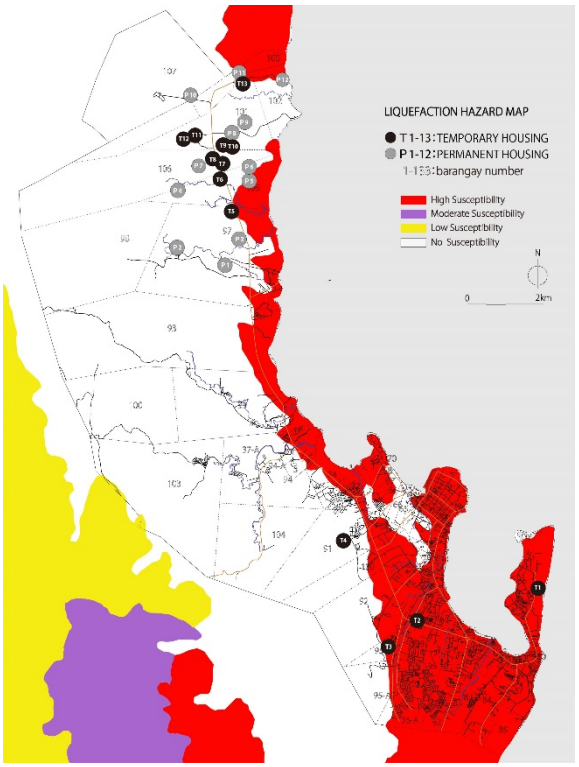


Figure 6. 62L Liquefaction Hazard Map

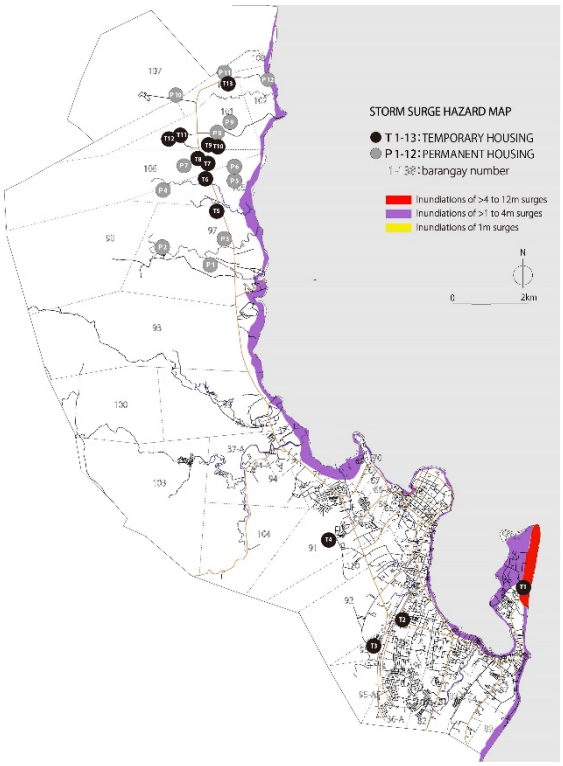


Figure 6. 63: Storm Surge Hazard Map

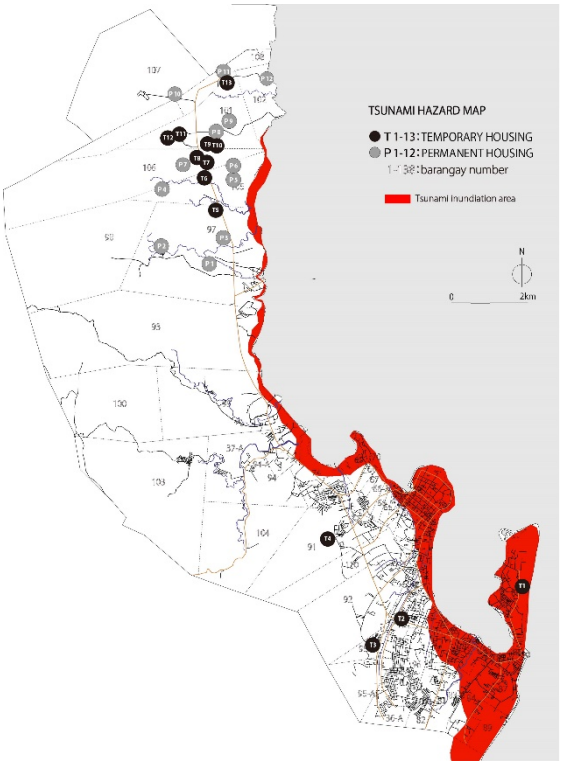


Figure 6. 64: Tsunami Hazard Map

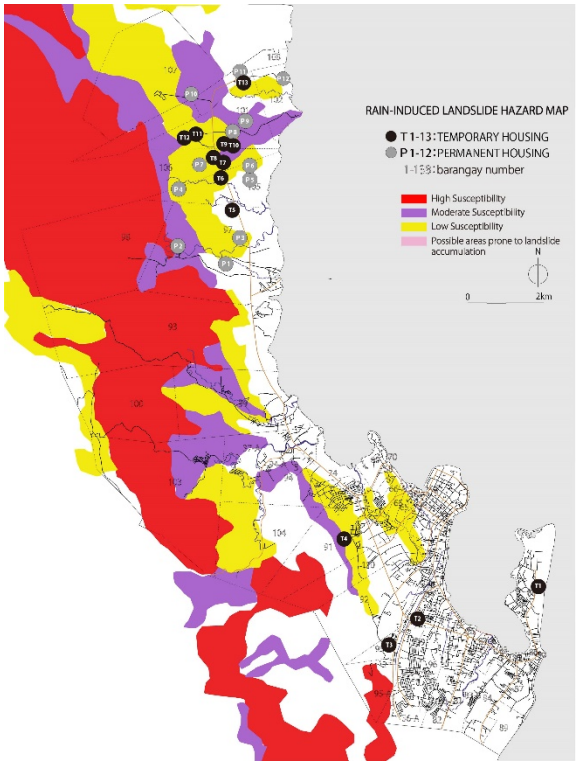
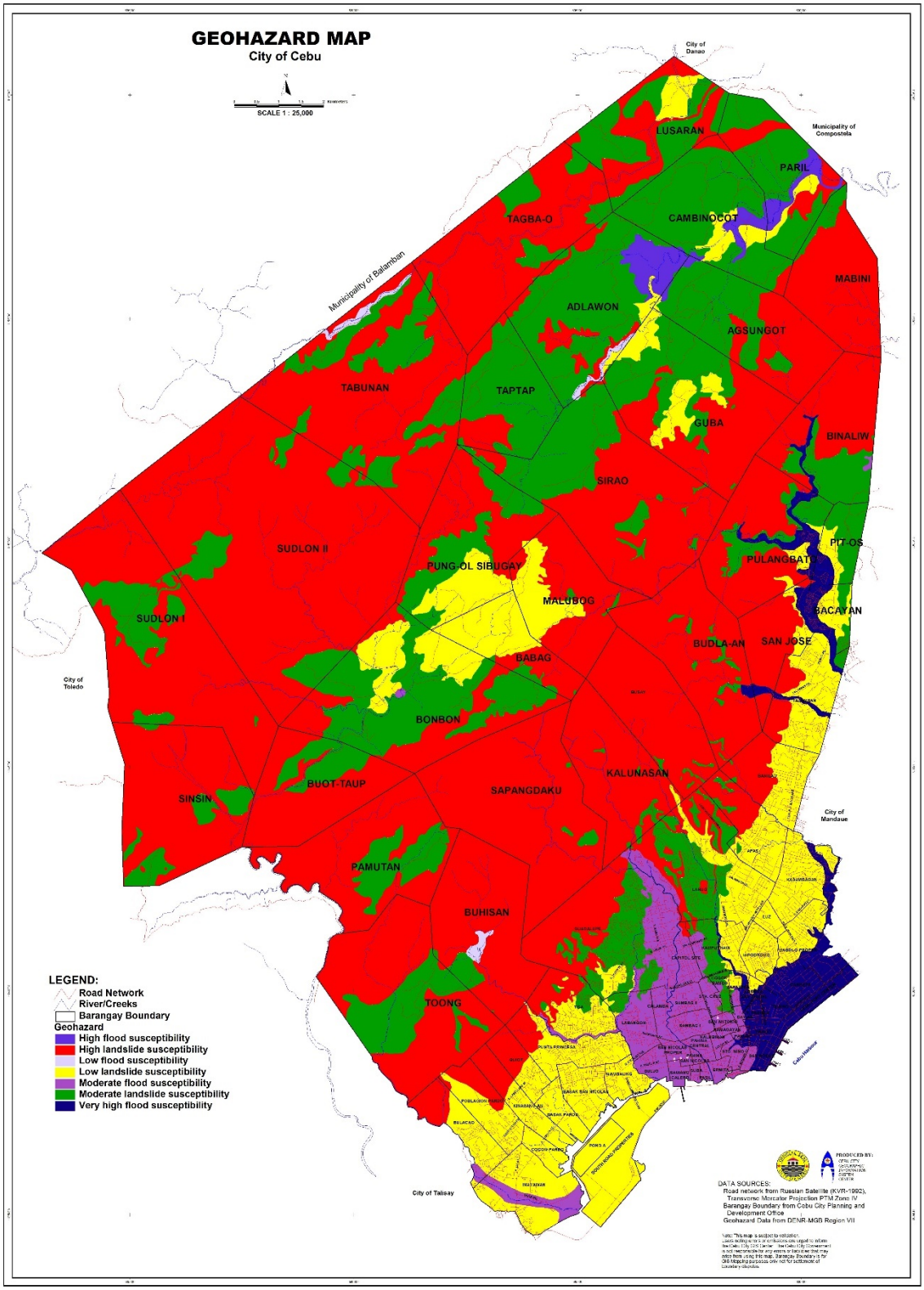
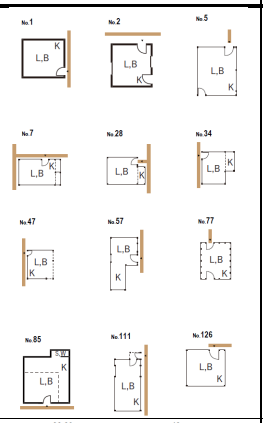
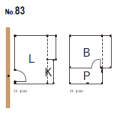
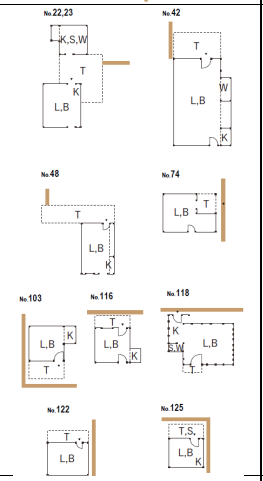
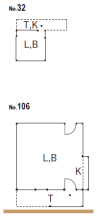


Figure 6. 65: Rain-Induced Hazard Map

Appendix E: Hazard Map for Cebu City



Appendix F: Typology Study for Site A, Mambaling Shelter

land 間口数 / 奥行き sea		i			
		LBK	LB,K	LK,B	L,K,B
I	X				
	T				
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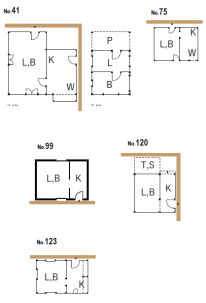
II	X				
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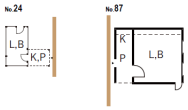
	P				
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III	X				
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land 間口数 / sea 奥行き		ii			
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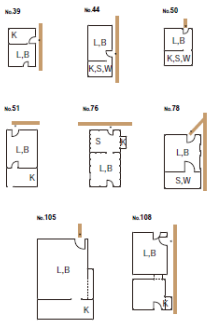
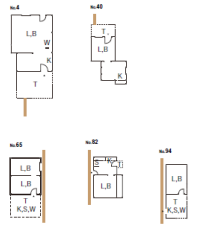
I	X				
	T				
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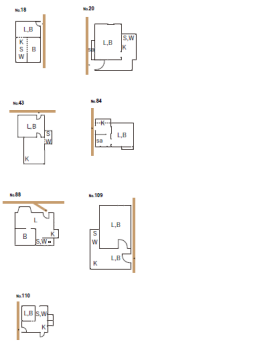
II	X				
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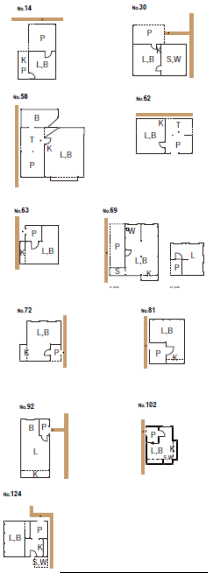
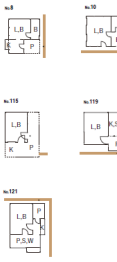
	P				

land 間口数 / sea 奥行き		iv			
		LBK	LB,K	LK,B	L,K,B
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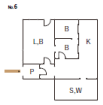
	P				
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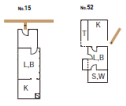
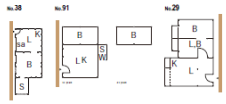
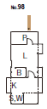
I	X				
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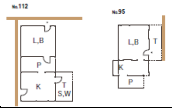
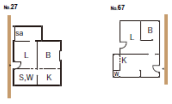
	T+P				
II	X				
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	T+P				

Appendix G: Typology Study for Site B, Mambaling Shelters

Table G. 1: First Floor Plan

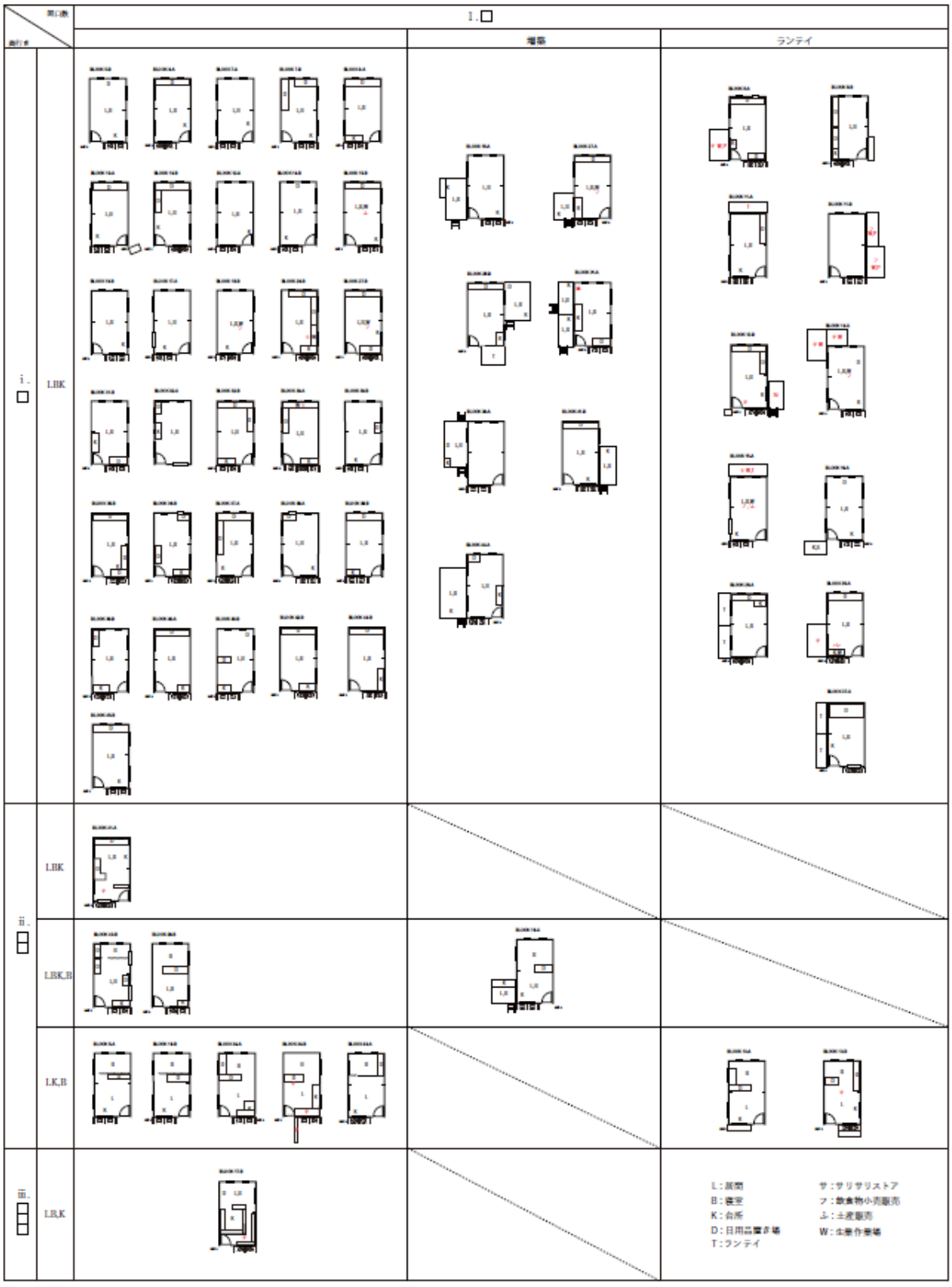
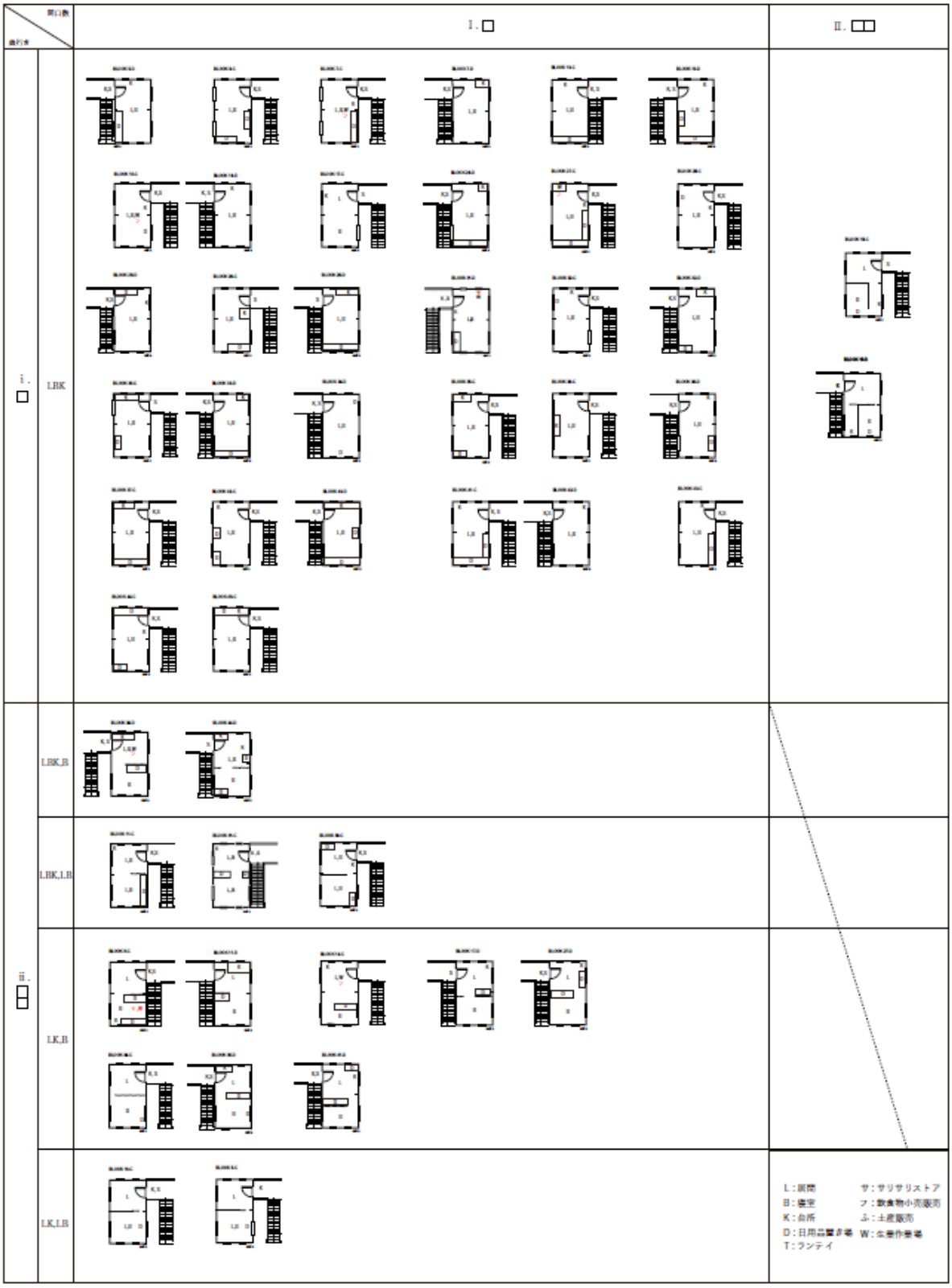


Table G. 2: Second Floor Plan



Appendix H: Typology Study For Site B, Mambaling Shelters (Porch and Terrace)

Table H. 1 Number of Terraces and Porches, Location, Connection Locations

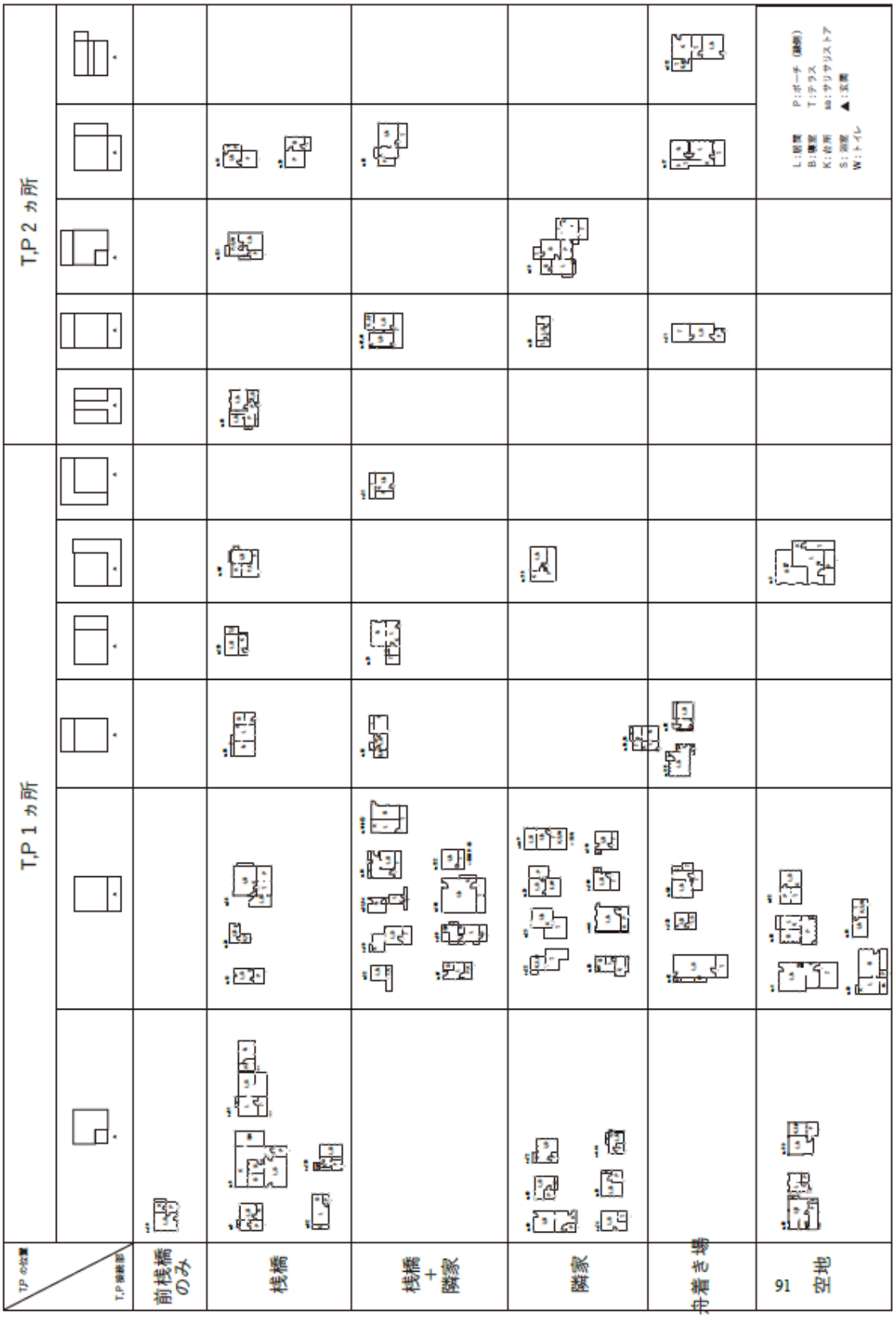
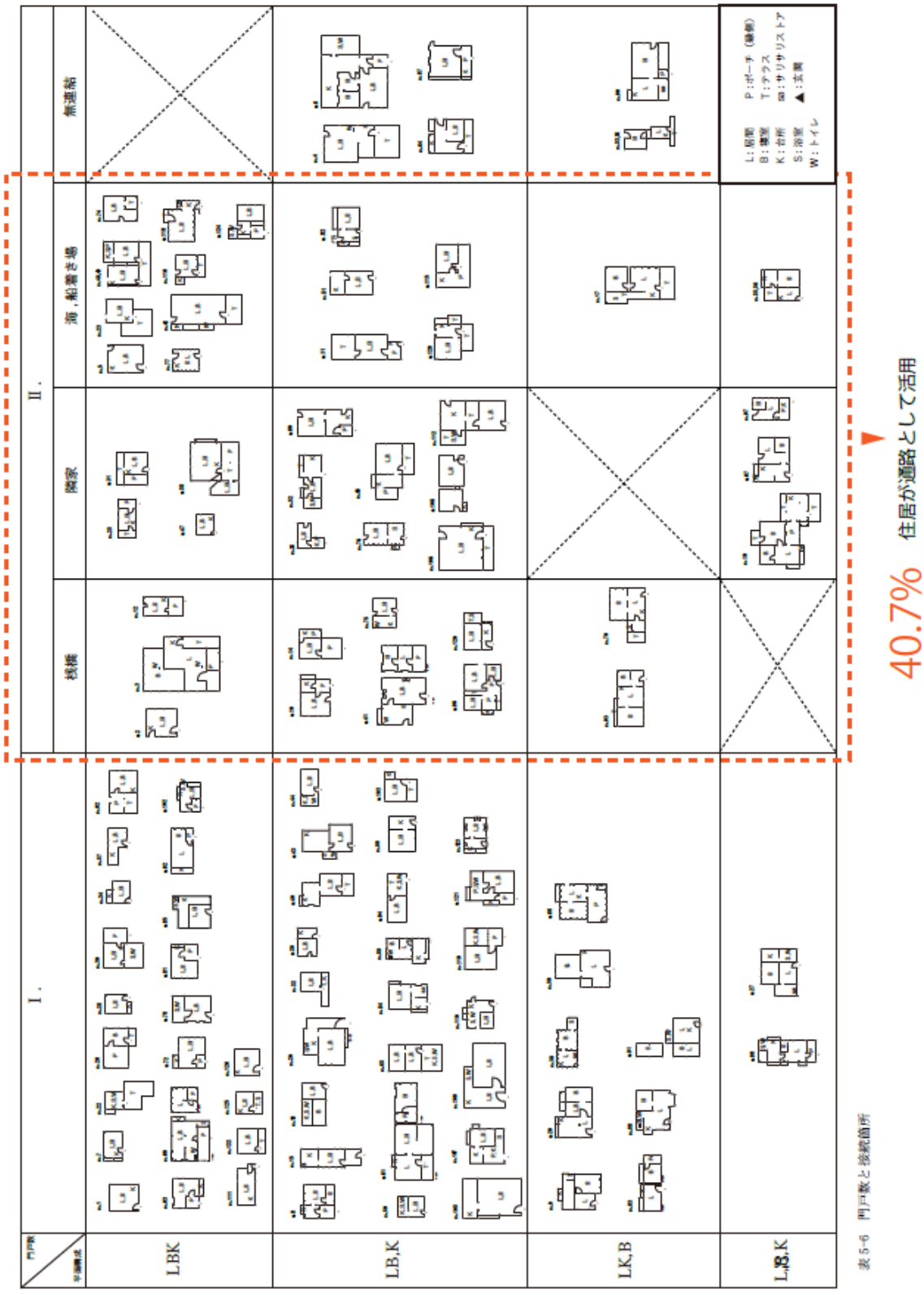


Table H. 2: Number of doors and connection points



Appendix I: UNHCR indicators used in the study

Table I. 1: Water

N. REF. SIR	INDICATOR DESCRIPTION	STANDARD	METHODS OF MEASUREMENT
41	Average quantity of water available per person per day (liters)	≥ 20 liters	**Numerator**: Total volume of water distributed during 1 month minus water used in communal infrastructure minus 10% for spillage and waste (# of liters of water available per day) at the end of reporting period **Denominator**: Number of days in the month x number of beneficiaries in camp at the end of reporting period
42	Number of persons per usable water tap	< 80	**Numerator**: Total population using water taps at the end of reporting period **Denominator**: Total number of functional taps available to refugees excluding water points in communal infrastructure such as schools and hospitals at the end of reporting period
43	Number of persons per usable well/hand pump	< 200	**Numerator**: Total population using wells/hand pumps at the end of reporting period **Denominator**: Total number of functional wells and hand pumps available to refugees excluding those used only for communal infrastructure such as schools and hospitals at the end of reporting period
44	Percentage of population living within 200 m from water point	100%	**Numerator**: Total number of households within 200 meters of water points x average number of people per household **Denominator**: Total population
45	Percentage of positive faucal coliform detected at distribution points per 100 ml sample during the year	0%	**Numerator**: Total number of fecal coliform results that were in excess of 0 colony forming units/100 ml per year **Denominator**: Total number of fecal coliform tests undertaken per year
46	Percentage of households with sufficient daily water storage capacity	100%	**Numerator**: Number of families/households with 10L per person per day storage capacity **Denominator**: Total number of families/ households

Table I. 2: Sanitation

N. REF. SIR	INDICATOR DESCRIPTION	STANDARD	METHODS OF MEASUREMENT
47	Percentage of families	100%	**Numerator**: Total number of households with family

	with latrines		latrines at the end of reporting period **Denominator**: Total number of households at the end of reporting period
48	Number of persons per drop-hole in communal latrine	≤ 20	**Numerator**: Total population using communal latrines drop holes at the end of reporting period **Denominator**: Number of communal latrines drop-holes at the end of reporting period
49	Number of persons per communal shower head	≤ 50	**Numerator**: Total population using communal showers at the end of reporting period **Denominator**: Total number of functioning shower heads at the end of reporting period
50	Number of persons per communal refuse pit	≤ 500	Count the number of refuse pits in use, even if they are partially filled. Do not count full pits or pits being dug (that are therefore no more or not yet in use). **Numerator**: Total population using communal refuse pits at the end of reporting period **Denominator**: Total number of communal refuse pits at the end of reporting period
51	Percentage of communal buildings with adequate water/ sanitation	100%	**Numerator**: Total number of communal buildings with adequate water and sanitation at the end of reporting period **Denominator**: Total number of communal (school and health) buildings at the end of reporting period

Table I. 3: Shelter and physical planning

N. REF. SIR	INDICATOR DESCRIPTION	STANDARD	METHODS OF MEASUREMENT
52	Average camp area per person (m2)	≥ 45 m2	**Numerator**: Total camp area (m2) **Denominator**: Total number of populations
53	Percentage of households with adequate dwellings	100%	**Numerator**: Number of adequate dwellings at the end of reporting period **Denominator**: Total number of dwellings at the end of reporting period
54	Average dwelling floor size per person (m2)	≥ 3.5	**Numerator**: Total number of houses based on a standard design x average area of each house at the end of reporting period **Denominator**: Total number of persons at the end of reporting period