LAND TENURE SECURITY AND RESILIENCE TO MULTIPLE DISASTERS:

A Study of Camalig Municipality, Province of Albay, the Philippines

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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March 2013

DECLARATION

I declare that:

a. except where due acknowledgement has been made, the work is that of the author alone
b. the work has not been submitted previously, in whole or in part, to qualify for any other academic award
c. the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program
d. any editorial work, paid or unpaid, carried out by a third party is acknowledged
e. ethics procedures and guidelines have been followed.

_____

Muhibuddin Usamah
Date: 16 March 2013

from a son to a father,
for my late father: M. Usamah Boko

...

... and for my loving mother: Sitti Hafsah

ACKNOWLEDGEMENTS

Let me first acknowledge Australian Government for financially supporting my PhD under the 2009 Australian Leadership Award.

I had my first encounter with the issue of land and disasters during my deployment with ECHO in Ayeryawaddy Delta in Myanmar after Cyclone Nargis in May 2008. There, I had the chance of talking to many victims who lived without legal documents; some were fearful of going back, some quickly re-constructed their houses on the land they had previously occupied. I knew that it would be an interesting topic for a PhD and indeed, it has been an interesting PhD journey dealing with land and natural disasters. This thesis is for the people of Ayeryawaddy Delta in Myanmar who shared with me their incredible stories of Cyclone Nargis.

The PhD itself is a journey for me and there are many people who have supported me along the way. I first have to thank Dr. Dinand Alkema, Dr. Iftekhar Ahmed and NMSI Arambepola for providing me with recommendations and for supporting my application. Encouragement at the start line from Dr. Yurdi Yasmi is also appreciated.

I am indebted to my supervisors, Prof. John Handmer and Dr. David Mitchell for their invaluable comments, suggestions and superb guidance along the way. I could not ask for more from supervisors so am really grateful to have them as my mentors. Being based at the Centre for Risk and Community Safety of RMIT, I am thankful for many discussions with Dr. Josh Whittaker (especially during pre-fieldwork), Dr. Briony Towers (on the finish line) and Dr. Florence Crick (for the ways forward and the inspiring Oxford-Niger journey of her PhD). Discussions with Dr. Kat Haynes before, during fieldwork and until the Mayon Paper got published are much appreciated. Encouragement from Dr. Blythe McLennan, Dr. Karyn Bossomworth and Adriana Keating is also appreciated. Supports from the School of Mathematical and Geospatial Sciences (especially Eliza Cook) throughout the period is acknowledged and appreciated. Thanks to AusAid Liaison Officer (Emily Rose and Jamie Low) for all matters related to AusAid scholarship. I acknowledge Julie Banfield for her excellence in editing my thesis.

I thank colleagues from my former Bangkok-based employers. From the European Commissions Humanitarian Aid and Civil Protection (ECHO), I especially thank Maria Olsen, Vitor Serrano and David Verboom for their encouragement and for linking me with key disaster experts in the region. Encouragement and discussions with Anne-Francoise Moffroid are also appreciated. From the Asian Disaster Preparedness Centre (ADPC), I thank dr. Mel Capistrano, Kareff Rafisura and Philipp Danao for linking me with key stakeholders in Manila, Albay Province and Camalig Municipality (our ADPC time will always be remembered). *Muchas gracias* to Ms. Karen Castillejo who has been very helpful throughout this PhD process: from the translation of documents, finding accommodation in Manila to linking me to Bernie and her mom in Camalig. Your responses to my queries and our continued discussions on emails have always been very helpful. You *guys* have been very helpful on the Philippines-related matters. I acknowledge Ms. Estella Gumabon from NAMRIA for helping me with maps, linking me with key land agencies in the Philippines and for participating in data collecting processes. Big thanks for Mr. Cedric Daep from APSEMO, Mayor of Camalig and people at the municipal office who were very welcoming and helpful throughout the research processes. Special thanks to Jed Villanueva (for the interpretation and mediating in the

in-depth interviews and Focus Group Discussions), Matt Nebress, Josephine Abansie and Lourdes L. Llama for always asking me "*is everything okay?* and "*how else can I help?"* when I was in Camalig. Thanks to *Ate* Maribel Morco, Adelfa and Jenny for making sure that I was well-sheltered and well-fed during my fieldwork in Camalig; I always miss your (spicy) food! *Maraming maraming salamat* to all the people in the Philippines who have helped me, whose names cannot be mentioned individually.

Fellow PhD warriors have to be acknowledged here for motivating each other. A very special thanks is first conveyed to Romola Rassool for being such a lovely friend and sister. Our catch ups and discussions will always be missed (thank you Samoa's Faaolo Utumapu for this beautiful friendship). In Australia, I thank Chris Marmo (looking forward to the collaboration on Mac application in the future), Ralf Ottofuelling, Davide Ciceri, Chantinee Bonchai, Worawan Sukraroek, Adjie Pamungkas and Arie Rahadi. Faridah Ohan in Adelaide is thanked particularly for the discussion on qualitative research and the discussions on the 'anthropology of Indonesians'. *Merci beaucoup pour* Stephanie Jacquet in Switzerland for her continued support and for the Eyjafjallajökull experience in Iceland. *Hartelijk bedank* for the support of Rizki Pandu Permana in Utrecht and Nisa Fachry Snijders in Amsterdam who will soon finish their PhDs too.

Melbourne has been a home to me and I thank many people who have made me feel at home. They have 'walked' with me in balancing PhD and social life. *Kurre sumange'* to the *Anging Mammiri* group for bringing Buginese and Makassarese' life to Melbourne especially to (ladies first) Dr. Riana, Dr. Nana and Dr. Sudi, Lily and Farid, Mutia and Adnan, Misita and Petta Rukka, Rini and Zaki, Inga and Ali, Arma and Mimin, the Millanes (Habibie, you are the future!), the Paembonans, Wendy Miller (will always remember *pongoro'*), Lisa Giufre, Dian Fatwa, Masnijuri and Cipu Suaib. *Banyak terima kasih* to *Pak* Iham Arief Sirajuddin, *Ibu* Aliyah Mustika and my folks Iyul and Viqar with whom I shared the art and joy of parenthood (I wish you all the very best for your future).

I thank Dilan Weerasooriya for hosting me when I first arrived in Melbourne, Alex Chernyak (for sharing with me many proverbs and quotes on life, for exploring Australia's mountains, for heaps of one-day trips to the outback and for the Jewish odyssey in Israel), my cycling mates (especially Stefan Rummler), squash mates (especially Morgan and Daniel), and Janeven Runghen and Michelle Lugg who introduced me to many people in Melbourne. Thanks to fellow regular visitors at the detention centre and asylum seekers (at MITA and community detention centre) who gave me another perspective of life. Like you all, I support the *freedom of movement.*

I would like to thank my brothers and sisters for their love and support. This thesis is dedicated to my nephews and nieces (Uppi, Ika, Kiki, Riska, Saiful, Sabrina, Haekal, Haura and Atiah) who have already dreamed of flying high. I have "run" in Amsterdam, Apia, Bangkok, Belgrade, Brussels, Camalig, Copenhagen, Davos, Istanbul, Jerusalem, Malmo, Manila, Melbourne, Mostar, Nadi, Naga, Nuku Alofa, Paris, Port Vila, Reyjkavik, Rome, Sarajevo, Tel Aviv, Zagreb and Zurich for my late sister *Wastiah Usamah* who passed away while I was doing this PhD. May your soul rest in peace.

Finally, this thesis is especially dedicated to the people in *Barangays of Ilawod* and *Tagaytay* in Camalig Albay, the Philippines who have demonstrated their resilience to disasters.

ABSTRACT

This research examines the relationship between land tenure security and disaster resilience. The core concept of this research is the integration between the two major themes of *tenure security* and *disaster resilience.* Two case studies that fit the research context were selected, namely *Barangays* of Ilawod and Tagaytay in Camalig Municipality, Province of Albay, the Philippines. The two *barangays* are prone to multiple disasters, i.e. typhoon, flash floods, river flood, lahar/mudflow, lava/pyroclastic flow, ash flow, earthquake and landslide. At the same time, only 37 % of the total lots in the study area are titled or registered. This thesis presents the results of qualitative methods using in-depth interviews and focus group discussions with local communities and related stakeholders.

It was found that land titles are not the main instrument in securing land tenure in the study area. In the absence of title documents, the level of confidence gained through security of occupation is the main aspect that builds their perception of tenure security. There are two sources of tenure security that are respected by the local communities and the government: *de jure* and *de facto* tenure security. Communities with legal title documents and residents of government-assisted housing enjoy the benefit of *de jure* tenure security since their occupation can be proved by legal title documents or formal certificate housing award issued by the government. On the other hand, this research confirms that even among communities living as informal settlers and tenants, *de facto* tenure security through community and government recognition, is almost as important as *de jure* or legal recognition in determining tenure security in the study area.

Among the four dimensions of resilience (institutional, economic, social and physical) discussed in this research, social resilience is the strongest dimension in the study area that builds community's perceptions on disaster resilience. Social resilience is built by strong social cohesion and a sense of community, trust among the community, and community involvement and respect to existing cultures and values. In addition, the strong capacity of local government in disaster management and perception of local communities of 'natural disasters as part of life' are other key factors that constitute community resilience.

The research confirms that perceived tenure security can provide opportunities for Disaster Risk Reduction and promote disaster resilience. In a pre-disaster setting, it provides access to housing and livelihood, which are pre-conditions for economic growth. In a post-disaster setting, tenure security impacts early recovery and reconstruction process. Confidence to return to land and housing provides a shorter recovery time and rehabilitation process.

This research has demonstrated that social aspects of the society bring the bridge between tenure security and resilience. Aspects such as a strong sense of community and social trust play important roles in securing tenure and provide a platform for building resilience. In these situations where economic vulnerability persists, this research demonstrates the importance of having strong community cohesion and social bonds in securing tenure and building resilience.

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LIST OF ACRONYMS AND ABBREVIATIONS

A&D	Alienable and Disposable
ADPC	Asian Disaster Preparedness Centre
APSEMO	Albay Public Safety and Emergency Management Office
BLISS	*Bagong Lipunan* Improvement of Sites and Services
CAQDAS	Computer-assisted Qualitative Data Analysis
CDP	Centre for Disaster Preparedness
CENRO	Community Environment and Natural Resources Office
DAO	Department Administrative Order
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DMO	Disaster Management Office
DND	Department of National Defence
DPWH	Department of Public Work and Highway
DRLRL	Disaster Resilience of "Loss-Response" of Location
DRR	Disaster Risk Reduction
DRRMC	Disaster Risk Reduction and Management Committees
DROP	Disaster Resilience of Place Model
DSWD	Department of Social Welfare and Development
ECHO	European Commission Humanitarian Aid and Civil Protection
EM-DAT	Emergency Events Data Base
FAO	Food and Agricultural Organization of the United Nations
FGD	Focus Group Discussion
FIG	International Federation of Surveyors
FVR-FNM	The new relocation site named after President Fidel V. Ramos and Mayor Florencio N. Munoz
GTZ	German Technical Cooperation
HABs	Hazard-affected Bodies
HFA	Hyogo Framework for Action
HLURB	Housing and Land Use Regulatory Board
IASC	Inter Agency Standing Committee
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel of Climate Change
IOM	International Organization of Migration
IOTWS	Indian Ocean Tsunami Warning System
LGU	Local Government Unit
LECZ	Low Elevation Coastal Zones
LMB	Land Management Bureau
MDCC	Municipal Disaster Coordinating Council
MDMO	Municipal Disaster Management Office
MGB	Mines and Geosciences Bureau

MHO	Municipal Health Office
MSWD	Municipal Social and Welfare Development
Mt.	Mount
NAMRIA	National Mapping and Resources Information Authority
NASA	Neighbouring Association for Shelter Assistance
NDCC	National Disaster Coordinating Council
NEDA	National Economic and Development Authority
NHA	National Housing Authority
NSCB	National Statistical Coordination Board
OCD	Office of Civil Defence
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services
PDCC	Provincial Disaster Coordinating Council
PHIVOLCS	Philippine Institute of Vulcanology and Seismology
PLS	Plain Language Statement
RA	Republic Act
SES	Social-ecological System
SNAP	Strategic National Action Plan
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFPA	United Nations Population Fund
UNHABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
USAID	United States Agency for International Development

CHAPTER 1 - RATIONALE AND STUDY OBJECTIVES

1.1 Introduction

The 2012 report of the Intergovernmental Panel of Climate Change outlines the increasing climatic events that exacerbated the frequency, severity and unpredictability of natural disasters in the previous decade (IPCC 2012). EM-DAT, a major international disaster database, demonstrates the increase in reported occurrences of disasters through time. From 1980 to 2011, statistically, the Asian region has been the most affected region in terms of the total number of people killed and the number of disaster occurrences compared to any other regions (EM-DAT 2012). Hydro-meteorological disasters are considered one of the most prominent types of disasters that hit this region, which include tsunamis, floods, windstorms, cyclones and flood-triggered landslides (EM-DAT 2012; IFRC 2009; UN-ESCAP 2009). The recent report of IPCC also identifies the Asian region as the most exposed region to tropical cyclones and flooding (IPCC 2012). In addition to the great number of deaths, natural disasters impact various aspects of life such as economic, social, environment, health, and education (ADPC 2008; UN-ISDR 2009b; UN-OCHA 2005; UNICEF 2011; World Bank 2006).

Asia has also faced rapid urbanization. Statistics show that the urban population in Asia has been growing at 2.3 per cent per annum – faster than the global average of 2.0 per cent and has caused an increase in the number of informal settlements (UN-ESCAP 2009; UN-HABITAT 2006). The number of informal settlements is growing faster than formal settlements and about one billion people live in various forms of informal settlements (UN-HABITAT 2006, 2008c; UN-ISDR 2011; UNFPA 2011). In fact, Asia has the world's largest informal settlement population – in 2005, the region was home to more than half the world's total informal settlement population, or about 581 million people (UN-

HABITAT 2006). 40 percent in Asia live under informal tenure and therefore have highly insecure land rights (Deininger 2003).

In addition, about 238 million of Asia's population are located in Low Elevation Coastal Zones (LECZ) (McGranahan et al. 2007), areas which are most likely to encounter the immediate effects of climatic/hydro-meteorological disasters (Quan and Dyer 2008). Informal settlements occupied by low-income groups contain deficient housing conditions, and this is identified as a critical problem in the developing countries (Jiusto 2012; UN-HABITAT 2006, 2008b; Willis 2009). Housing, public services, and labour markets are placed under severe strain by people who are forced to settle in low-lying or hazard-prone areas, and who consequently become vulnerable to the impact of disasters (Quan and Dyer 2008). Therefore, settlement patterns, urbanization and changes in socioeconomic conditions have exposed more people to the risk of the effects of natural disasters. In other words, the people who occupy informal settlements are the most vulnerable populations to the impacts of natural disasters (IPCC 2012). The above-mentioned facts result in a lack of access to proper land tenure or a lack of secure land tenure (UN-HABITAT 2006b; World Bank 2006).

1.2 Overview of Land Tenure, Natural Disasters and Resilience

The direct impacts of disasters could potentially affect land access and tenure. Lessons from previous disasters show that the poor on informal tenures are vulnerable to losing access to land (Brown and Crawford 2006; Mitchell 2010; UN-HABITAT 2010). Floods and tsunami, for example, often leave large amounts of land uninhabitable through long-term inundation (UN-HABITAT 2010). In addition, they cause large numbers of people to be housed in temporary settlements (Mitchell 2010). Indirectly, the effects of natural disasters have negative repercussions on human livelihoods, welfare and prosperity (UN-HABITAT 2010; UN-ISDR 2011) since access to land is a fundamental basis for human shelter, food production and other economic activities (UN-HABITAT 2008b).

Natural disasters tend to expose pre-existing weaknesses in other areas such as land tenure security, thereby highlighting the need to address these problems at a more fundamental level (Barnes and Riverstone 2007). The issue of tenure security has also been recognised and drawn international attention since securing access to land is critical to millions of people who depend on land for their livelihood (IFAD 2008; UN-HABITAT 2006b). In the Philippines, tenure insecurity is a critical issue especially in rural areas, which are affected by natural disasters particularly those of a hydro-meteorological and volcanic type. About 60% of the property in the country is informal (or without legal title of documents) and about 46% of the Alienable and Disposable (A&D) lands are untitled (FAO 2009). The growth of informal settlers in the country contributes to this growing issue of tenure insecurity, where the influx of people in urban fringes has changed the people's living conditions (Antonio 2007). Drawing from the facts mentioned above, the vulnerability of people living in disaster-prone areas to the impacts of natural disasters may have been exacerbated by the existing condition of tenure insecurity.

Following natural disasters, land-related problems and particularly tenure security issues become worse (Barnes and Riverstone 2007; Brown and Crawford 2006; Fitzpatrick 2007; UN-OCHA 2005; UNDP 2007). A range of tenures and forms of access rights to land in urban and rural areas are affected by disasters and unfortunately people with insecure tenure (e.g. informal settlers and sharecroppers) are the most vulnerable to disasters. After disasters, their insecurity of tenure may not allow them to claim the land they previously occupied. Consequently, their livelihood sustainability, which is sometimes attached to their previous land, may take longer to resume (Mitchell 2010).

The urge to build resilience at the community level has been an international disaster agenda after the adoption of Hyogo Framework for Action in 2005 (UN-ISDR 2005). Addressing tenure security can also promote disaster resilience since it lays the foundation for effective land use and settlement planning,

particularly for rebuilding in better and safer ways after a natural disaster (UN-HABITAT 2010).

The identified problems that frame this research are shown in Figure 1-1:

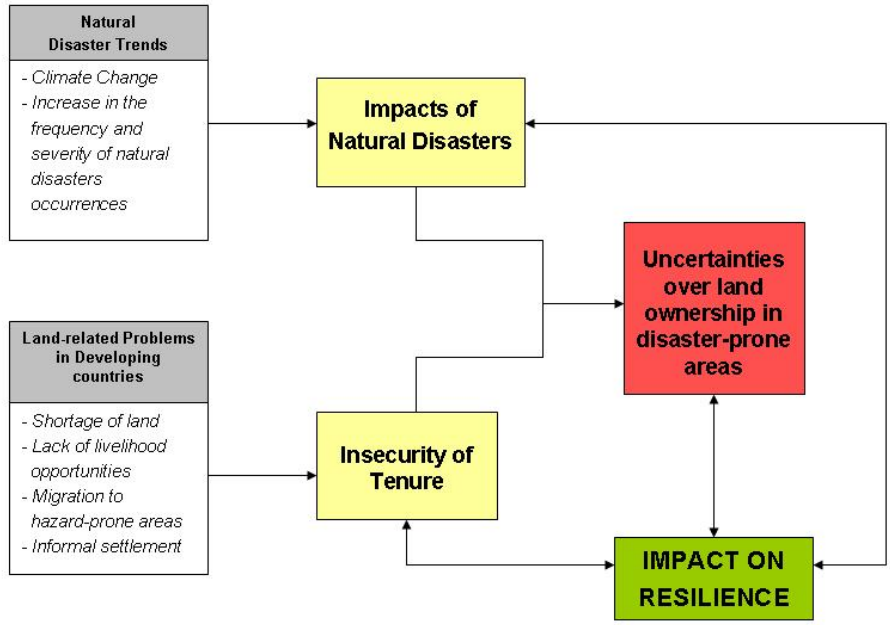

Figure 1-1 Identified key problems underpinning the research

1.3 Research Aim and Research Questions

This research study focuses on two major themes of *tenure security* and *disaster resilience.* The core concept of this research is the integration between the two concepts. This research aims to develop an understanding of the relationship between tenure security and disaster resilience. Thus, the main research question is:

"How does tenure security contribute to resilience to multiple disasters?"

Prior to answering the main research question, the two major themes will be explored separately in details. Therefore, two intermediate objectives and questions are going to be addressed in this research, presented in the table below.

Table 1-1 Intermediate objectives and their guiding questions

No	Intermediate Objectives	Guiding questions of analysis
1.	To examine the perception of land tenure security	How is tenure security perceived by different tenure groups?
2.	To understand the state of resilience to natural disasters and community's perception on resilience to natural disasters	How is resilience perceived? What constitutes resilience to natural disasters?

1.4 Research Design and Thesis Structure

This research was conducted in three phases. The first phase involved desktop research in defining the problem statements underpinning the research. It included literature reviews on the two core concepts of the research. During this phase, the research objective and question were defined, followed by reviews and selection of methodologies to be employed to address the research question. The result of this phase is contained in Chapters 1 to 4.

The second phase of the research involved fieldwork in the study area, during which mapping of different tenure types was undertaken. An exploration of perceptions of tenure security from various tenure groups was conducted employing various qualitative methods that are discussed in Chapter 2. Various stakeholders on land administration and disaster management were interviewed from the national level to the smallest level of administration in the Philippines. This phase also involved the conduct of in-depth interviews with local communities and focus group discussions with communities of various tenure groups. The outcome of this phase is contained in Chapter 5 and some parts of it are outlined in Chapter 2. This phase presents the data and information on the local situation pertaining to the two core concepts of the research. Findings from this phase were presented in the analysis phase.

The analysis was conducted in the third phase of the research. The main objective in analysing the relationship of *tenure security* and *resilience* is revealed in this phase. The results of this phase are contained in Chapters 6, 7 and 8. Chapter 6 presents the result of intermediate objective 1, which is the perception of tenure security by different tenure groups. In the same way,

intermediate objective 2 on resilience analysis is presented in Chapter 7. The main research question is addressed in Chapter 8. It discusses (1) the intercepting factors that mediate the two core subjects presented in Chapters 6 and 7, and (2) the implication of tenure security to disaster resilience. Chapter 9 concludes the discussion over the major themes presented in Chapter 6, 7 and 8 and provides research implications for future related studies and ways forward for policy-makers and related stakeholders. The research design in relation to the thesis structure is presented in Figure 1.2 below.

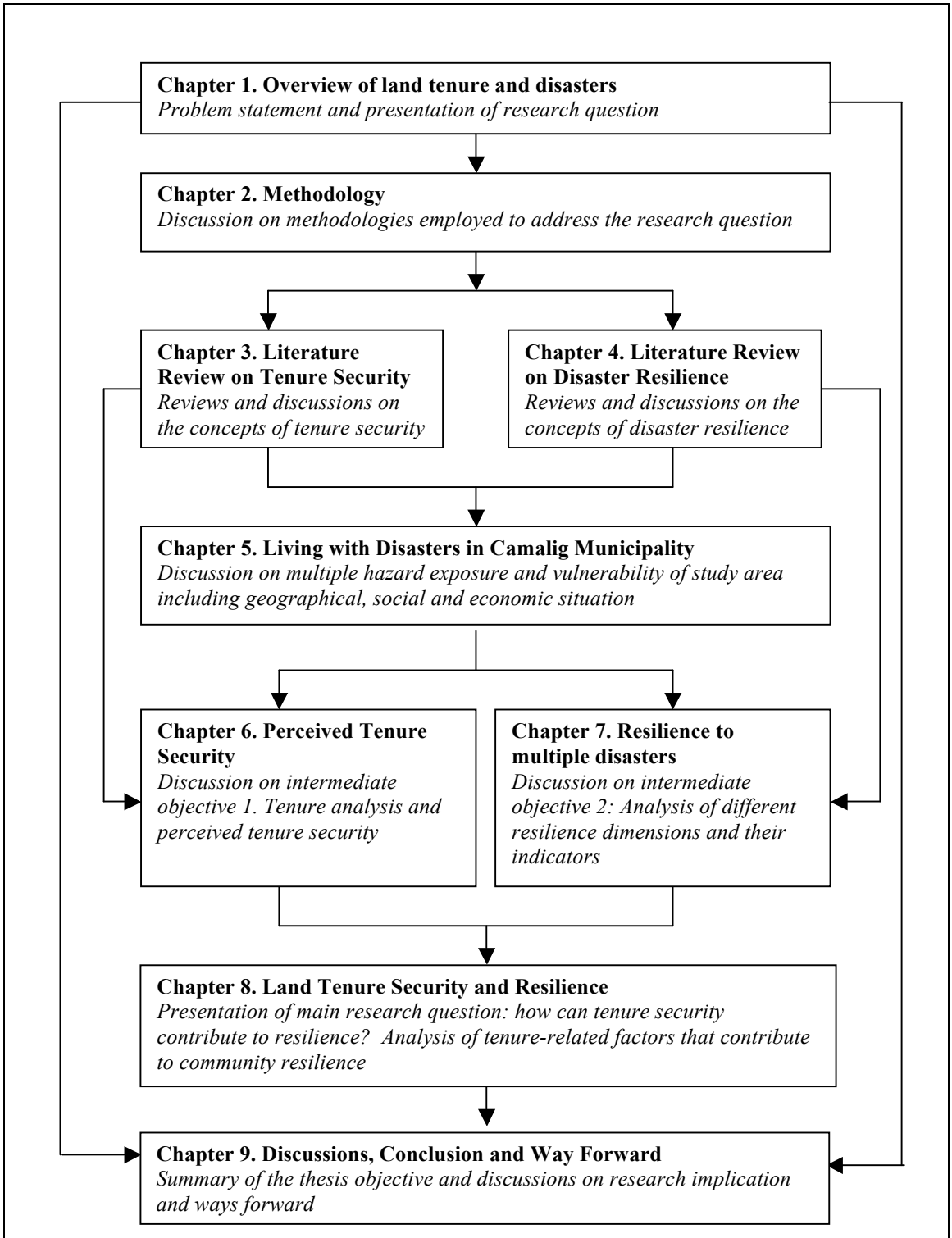

Figure 1-2 Research design in relation to research objective and thesis structure

CHAPTER 2 - METHODOLOGY

2.1 Introduction

This chapter discusses the approach, strategy and methods that were used to investigate the research aims and questions outlined in Chapter 1.

This chapter is organised into six sections beginning with an outline of qualitative research as the general research approach for this study. The next section discusses the multi-method setting and case study approach as the research strategy employed for this research. The third section discusses various qualitative methods that were used in the data collection process namely semi-structured interviews, focus group discussions and participant observations. It is followed by a description of the methods and procedures that were employed to analyse the data. The final section examines the ethical considerations and measures that were taken to ensure the dignity and privacy of the interviewed participants.

2.2 Qualitative Research Approach

This research was based on an analysis of community perceptions of tenure security and resilience, which was obtained through various qualitative methods that employed humans as participants and informants.

Qualitative research investigates people in particular situations in their natural environment using an interpretive research approach that relies on multiple types of subjective data (Denzin and Lincoln 2011). In other words, qualitative research discovers patterns which emerge after close observation, careful documentation, and thoughtful analysis of the research topic (Maykut and Morehouse 1994). Boeije (2010: p. 11) summarizes the definition and purpose of qualitative research as follows:

> The purpose of qualitative research is to describe and understand social phenomena in terms of the meaning people bring to them. The

> research questions are studied through flexible methods enabling contact with the people involved to an extent that is necessary to grasp what is going on in the field. The methods produce rich, descriptive data that need to be interpreted through identification and coding of themes and categories leading to findings that can contribute to theoretical knowledge and practical use.

The two fundamental issues tackled by qualitative research are concerned with either individual experiences or with social structure (Winchester and Rofe 2010). This becomes the basic foundation of this research study since it is about (i) understanding people's perceptions of land tenure security and resilience to natural disasters, which is interpreted as *individual experience* and (ii) social analysis of the two communities in the study area that define the shape of the societal structure, and by what processes they are constructed and maintained in terms of land tenure and disaster resilience that can support findings of individual experiences, interpreted as *social structure.*

Therefore, to answer the questions in qualitative research, types of data used usually consist of non-numerical data such as statements of a person during interview, written records, pictures, clothing or observed behaviour (Christensen et al. 2010). Christensen et al. (2010) argue that non-numerical data is the best-suited data for understanding behavioural patterns of people.

One of the advantages of qualitative research is that the research questions are allowed to evolve, or possibly change, during the study because qualitative research is focused on exploring phenomena. Similarly, the data collected is not only limited to predetermined questions and categories but can be extended to various observations methods and extended description of cultural behaviour and knowledge that can be gained (Boeije 2010). Consequently, this method provides rich and detailed data that can lead to a more focused description of the real situation and a more accurate interpretation of the real situation in the field. In the same way, the qualitative approach tends to be the most useful for understanding and describing local situations and for the generations of theories.

2.3 Research Strategy

To answer the research questions, this research study employed a multi-method setting using a case study strategy. The use of this strategy is supported by the fact that a major strength of case study data collection allows the use of many different sources of evidence (Yin 2009). Two case study area were selected in order to investigate the research questions in depth within its real-life context (see Section 2.3.3). The data gathering in this research was conducted in the natural setting of the respondents.

As this research employed humans as participants, their full participation was an important factor. However, it requires a good relationship between the participants and the researcher to build trust in order for the participants to feel free to express views, share experiences and describe events and situations that would ultimately become the data for the research study. The strategy employed provided opportunities for participants to describe the objectives of research in their own words and on their own conditions in their own familiar settings. It will be discussed further in this section.

2.3.1 Multi-method Setting

The main analysis of the research is based on participants' perceptions of land tenure security and resilience, which were gathered through a variety of qualitative methods i.e. interviews, focus group discussions and participants' observations involving stakeholders, communities and landholders at risk of natural disasters. These include such diverse data collection methods as an individual's account of a personal experience, an individual's life story, interviews with individuals, interviews with elite groups or decision-makers, observation of an individual or individuals, workshops / focus group discussions, written documents, photographs and historical information.

The use of several methods is believed to provide a better understanding of the phenomenon being investigated and is called triangulation (Christensen et al. 2010). Triangulation refers to examination of a social phenomenon from

different angles that can function as checking procedures in the research process or data comparison and validation from different sources (Boeije 2010; Bradshaw and Stratford 2010). There are four types of triangulation:

1. Data triangulation: the use of a variety of data sources in a study;
2. Investigator triangulation: the use of several different researchers;
3. Theory triangulation: the use of multiple perspectives to interpret single sets of data;
4. Methodological triangulation: the use of multiple methods to study a single phenomenon (Denzin and Lincoln 2011).

The use of triangulation methods can reveal varied dimensions of a phenomenon leading to a layered and thick description of a subject under study since it allows collection of a broader range of information (Boeije 2010). Similarly, Patton (2002) states that triangulation provides opportunities to gain insights into the relationship between the research methods and the phenomenon under study. In other words, though different methods are used to investigate different aspects of the same subject, the findings can be complementary.

This research employed both data and methodological triangulation to ensure validity and credibility of the research findings by checking: (a) sources of information against others (re-search); (b) processes and interpretations with local experts in the field and supervisors and (c) preliminary findings with the research participants to enhance credibility of the research. The use of triangulation in this research has enabled the gathering of different information through different methods that complement each other allowing for more detailed information about the subject being researched. In conclusion, the analysis of data in this study is supported by more than a single source of evidence, which is illustrated in Figure 2.1.

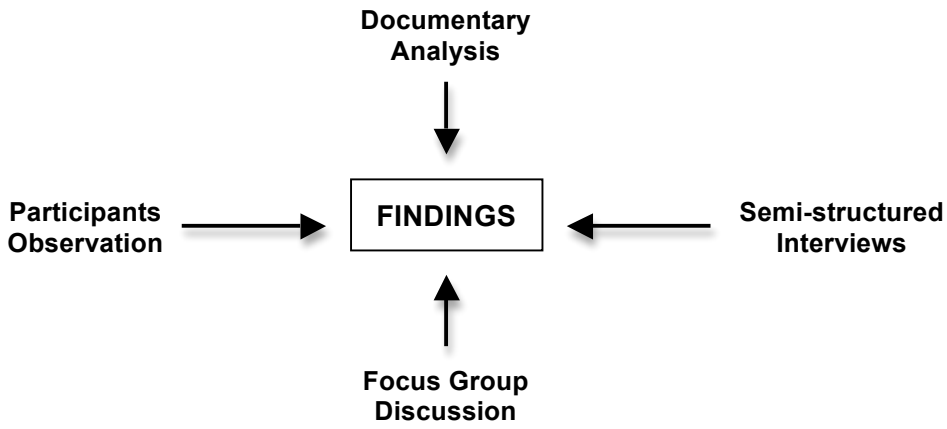

Figure 2-1 The multi-methods setting employed in this research (adapted from Yin (2009))

2.3.2 Case Study Strategy

A case study is defined as the intensive and detailed description and analysis of one or more cases. A case is a bonded system, such as a person, group, an organization, an activity, a process or an event that includes a set of interrelationships among the elements comprising the case (Christensen et al. 2010). Yin (2009) defines a case study as an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context. The case study copes with the technically distinctive situation that relies on multiple sources of evidence.

A case study strategy was employed in this research since the phenomenon being studied is best supported by an example that best describes the situation in an area. In other words, a case study strategy was used because the studied phenomenon could not be described through literature reviews alone. With the use of case studies, this research was able to explore the different types of land tenure and to gather local perceptions from communities at risk from natural disasters. In other words, experiences of the communities dealing with land issues and natural disasters were explored to represent a real-world situation in a particular area that could not be described by only theories. In the context of a real-world situation, the institutional framework, legal framework, cultural and

social settings about the study area were also explored to support evidence and analysis of data gathered from qualitative methods.

Therefore, this case study strategy allowed a comparison of theory and real situations in the field allowing the researcher to obtain a comprehensive understanding of the phenomenon being researched.

According to Stake (1995), there are three types of case studies: intrinsic, instrumental and collective. According to Stake (1995: p.3):

> *Intrinsic case study* is an in-depth description of a particular individual, organization or event conducted for the purpose of understanding that particular case. *Instrumental case study* is a case study conducted to provide insight into an issue or to develop, refine or alter some theoretical explanation; whereas *collective case study* involves the extensive study of two or more individual cases.

This research adopts the three types of case studies mentioned above. The investigation of community perceptions of land tenure security and resilience to natural disasters demonstrates intrinsic case study, in which whole aspects of community were explored to support the finding. Instrumental case study is demonstrated through the use of case study areas in this study. Furthermore, the analysis of two communities as case studies demonstrates the state of a collective case study.

2.3.3 Selection of Case Study Area

In order to answer the research question, two factors were mainly considered in selecting the case study area. The first one is that the study is conducted in an area frequently affected by more than one type of disaster (Chapter 5 provides more details). The second factor is the existence of different types of tenure groups and various land issues that are encountered due to the frequency of occurrence of such disasters.

The criteria for the selection of the case study area were established after consultation with several land experts and disaster management practitioners from the Asian region. The consultation was conducted by e-mail

communication before the first stage of the fieldwork. The criteria are as follows:

- The country had to have a national framework of disaster management, which included a national strategy on disaster response, relief and long term rehabilitation.
- The area had to be affected annually by one or more hydro/meteorological disasters, such as floods, cyclones, and also hit by different types of disasters becoming a multiple-disaster area. The area needed to have had significant disasters in the last decade.
- There is an on-going land titling process in the area, initiated by national/ local government and/or international organizations.
- The area had to comprise a dynamic community with different livelihood options, with significant dependence on land with high tenure insecurity.
- The residential areas had to have different tenure options, including informal settlements.
- Data accessibility was essential as this refers to the level of openness of the country's government to outside parties (including researchers) in allowing access to data. This leads to good governance, which is one of the key priorities for disaster risk management and land administration by the World Bank and UN agencies (UN-HABITAT 2012; World Bank 2011). In some countries, which are prone to natural disasters and where case studies could potentially be carried out, access to particular areas and data are a big issue.

The major criteria in selecting the study area were the multiplicity of the types of disasters, the frequent occurrences of disasters and the existing types of tenure groups.

During the first visit to the country, consultation meetings were conducted with various land stakeholders and disaster management practitioners at the national level from government officials to international organizations and private sectors. The national consultation resulted in the selection of Albay Province, which was then visited. A key disaster management official at the provincial level suggested Camalig Municipality and two rural[1] *barangays* of Ilawod and Tagaytay as the case study based on the multiple disasters that affect the area and the range of tenure systems at the two *barangays.* During the meeting with that disaster management official, facts about vulnerability and disaster statistics were shown to give evidence of the importance of conducting research in the area (presented in Chapter 5). The two *barangays* were visited to confirm the suitability of the study area. The range of different tenure systems was also confirmed at the consultation meetings with government offices dealing with land-related issues at the provincial, municipal and *barangay* level.

[1] According to National Statistical Coordination Board (NSCB), urban areas fall under the following categories Nscb, 'Urban / Rural Classification; Concepts and Definitions', accessed 1 June 2011 :

1. In their entirety all cities and municipalities having a population density of at least 1,000 persons per square kilometer;
2. *Poblaciones** or central districts of municipalities and cities which have a population density of at least 500 persons per square kilometer;
3. *Poblaciones* or central districts (not included in 1 and above), regardless of the population size which have the following:
   a. Street pattern, i.e., network of streets in either parallel or right angle orientation;
   b. At least six establishments (commercial, manufacturing, recreational and/or personal services);
   c. At least three of the following:
      1. a town hall, church or chapel with religious services at least once a month;
      2. a public plaza, park or cemetery;
      3. a market place or building where trading activities are carried on at least once a week;
      4. a public building like school, hospital, health centre and library.
4. Barangays having at least 1,000 inhabitants which meet the conditions set forth in 3 above, and where the occupation of the inhabitants is predominantly non-fishing.

All areas not falling under any of the above classifications are considered rural.

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* A ***poblacion*** is the term commonly used for the central barangay in municipalities in the Philippines

2.4 Fieldwork to Study Area

The first phase of fieldwork was a scoping visit to the study area, which took place from 15 November to 10 December 2009. Visits were also made to various institutions in Bangkok, Thailand, and in Metro Manila and Albay Province in the Philippines. During the visit, informal interviews were conducted with key identified stakeholders in order to get more ideas on the topic to be researched (Table 2.1).

Table 2-1 List of key stakeholders consulted during the first phase of the research

Location	Organization / Office
Bangkok, Thailand	Asian Disaster Preparedness Centre (ADPC)
	European Commission Humanitarian Aid and Civil Protection (ECHO)
Metro Manila	Food and Agricultural Organization of the United Nations (FAO)
	Department of Environment and Natural Resources (DENR)
	National Mapping and Resources Information Authority (NAMRIA)
	Food and Agricultural Organization of the United Nations
	International Organization of Migration (IOM)
Albay Province	Centre for Disaster Preparedness (CDP)
	Albay Public Safety and Emergency Management Office (APSEMO)
	Albay Provincial Planning, Legazpi City
	Office of Civil Defence (OCD) for Bicol Region
Camalig Municipality	Mines and Geosciences Bureau (MGB), DENR Region V
	Office of the Mayor
	Municipal Planning and Development
	Municipal Disaster Coordinating Council (MDCC)
	Key officials of Barangays Ilawod and Tagaytay

As expected from the scoping visit, contacts were expanded with the effects of snow-ball techniques, which involve identification of likely other sources of information from the contacted informants themselves (Bamberger et al. 2006). Interviews with key disaster-management stakeholders in the Philippines resulted in the selection of a municipality and its two *barangays* to be the case studies of the research. Therefore, at the end of the first phase of fieldwork, preliminary meetings were conducted with officials of the municipality and *barangay*, where the two case study area are located. During the period, the aims of the research and methodologies to be employed were explained to the *barangay* officials. Government officials at the provincial, municipal and *barangay* levels enthusiastically welcomed the idea that this research was to be

conducted in their areas. Considering the criteria, they showed confidence that the selected area was the most suitable for such research. Especially on resilience, Albay provincial government demonstrated the suitability of the area considering the pioneering efforts of the Disaster Management Office of Albay Province in building resilience, which was internationally recognised and nationally replicated (Chapter 7 provides more details). Enthusiasm and participation of government officials and community members were shown throughout the data gathering processes. Such acceptance and support smoothed the process.

The second phase of the research took place from May to July 2010. During this period, primary data collection was conducted, which was based on a qualitative approach in research using interviews, workshops, focus group discussions and participant observations (referred to in Section 2.5). During this period, documentary analysis was also employed to support findings from primary data collection. Details of each research methodology are presented in the next section.

2.4.1 Instrument Validation and Pre-testing

As part of fieldwork preparation, an interview guide was developed and then consultations conducted with supervisors and other experienced researchers at the university as part of the pre-testing of the interview guides. The purpose of the consultation was to validate the interview questions and to assess the logic of the questions in relation to the research questions and objectives. The validation confirmed the logic of the questions to the research objectives. However, the list of questions needed re-arranging based on priority. Complementary information such as demographic information and details of the houses were moved from the beginning to the end.

When arriving in the field, the translated interview questions were discussed with the interpreter from the disaster management office of Camalig Municipality and other officers (Table 2-2). This was aimed at assessing the

level of language in the questions to be asked and clarifying key words to be used in the interview guide.

After the consultation, the interview guide for stakeholders (Appendix 1) was distributed to them and a pilot interview was conducted. The list of questions was considered logical and gave stakeholders a greater understanding of what needed to be achieved during the fieldwork. The pilot interview was informally conducted and they shared stories related to the questions. They also offered some ideas and suggestions of other stakeholders to be interviewed.

An interview guide for use with community members was also distributed and reviewed, especially the terminologies to be used. Two pilot interviews were conducted in each *barangay*, one in English without the assistance of an interpreter and one in the local language with the assistance of an interpreter. Total of four pilot interviews were conducted in a very informal way and the respondents were enthusiastic in answering the questions. The questions stimulated them to share their experiences and views on disasters and land issues. The pilot interviews were also used to assess the amount of time needed to complete one interview, which was at least 45 minutes. It would take more time if there were specific stories to share. This later became the common situation since most participants were very enthusiastic about the topics; they had many stories and were keen to share their experiences.

Questions for the focus group discussion were discussed and tested with three officials of the Municipal Disaster Management Office to assess the level and flow of the questions. The list of questions was considered suitable in terms of the chosen terminologies and the level of questions to be delivered.

The pre-testing of instruments demonstrated that the questions were not ambiguous, offensive or difficult to understand.

2.5 Overview of Research Methodologies

2.5.1 Tenure Mapping

This was the first step towards addressing the intermediate research question presented in Chapter 1. To map different tenure / ownership arrangements in the study area and its distribution, a combined spatial mapping and participatory approach were employed. The tenure mapping employs a simplified version of participatory mapping; a tool that is increasingly used in tenure mapping (Cadag and Gaillard 2012).

The activity was aimed at identifying different types of ownership and observing the geographical distribution of different types of tenure. This activity is relevant to the next stage in recording and mapping tenure, which seeks agreement from the community members, often called adjudication. It is an important activity especially when there is land registration system exists in an area (Zevenbergen 2004).

This activity was not aimed at conducting detailed tenure mapping that involved detailed spatial analysis and processes. Rather, the mapping process utilised a freely available image from Google Earth to obtain building foot prints of the case study area. The building footprints were extracted from the image, which was used as a base map in the field. In addition to that, this activity also employed a participatory approach with the involvement of the local community to determine the geographical distribution of tenure types.

Combined with a series of interviews with land administration stakeholders in Albay Province and the Municipality of Camalig, the map was used in the discussion with the community leaders and members who assisted in identifying the spatial distribution of different tenure systems in the study area. The result is presented in Chapter 6.

2.5.2 Semi-structured interviews

Interviewing is one of the most commonly used qualitative methods in disaster research (Philipps 2002). Among the three major forms of interviewing, structured, unstructured and semi-structured (Dunn 2005), *semi-structured interviewing* was employed in this research for its flexibility in allowing an exploration of community perceptions of the two different topics to their furthest extent. This is demonstrated in the definition of a semi-structured interview as:

> … a flexible method of data collection based on a set of open-ended questions. The form of semi-structured interviews come with some degree of predetermined order but still ensures flexibility in the way issues are addressed by the informants. By using semi-structured interviews, the respondents are given the freedom to digress allowing a deeper understanding of the wider social situation along with other, previously unknown issues, brought up by the respondent (Dunn 2005: p. 88).

The flexible nature of the semi-structured interviewing process meant that the interview guide could be adapted depending on the person interviewed with more explanations given for questions and topics if necessary (Rubin & Rubin, 1995). Particularly with the community members in this study, the interviews encompassed ordinary conversation and listening as they naturally occurred during the course of social interaction (Lofland et al. 2006).

The list of open-ended questions employed in the semi-structured interviews gave the respondents freedom to share experiences to their fullest extent. New questions arose if further explanation was needed following their answers. This flexibility provided an avenue to further explore community perceptions, which is one of the important sources of data in this research.

Despite the advantages mentioned above, these semi-structured interviews were usually time-consuming or at least needed flexible lengths of time if more facts were needed after the questions in the interview guide. Similarly, transcribing the interview data, and subsequently analysing it, were also time-consuming, especially for the open-ended items (Christensen et al. 2010).

However, the process enabled the researcher to develop a thorough knowledge of the content of the interview data.

2.5.2.1 Selection of Interview Participants

The interviews targeted the following groups: (1) stakeholders involved in land administration and disaster management at the national and local level of administration; and (2) representatives of community groups of different tenure systems.

Selection of key stakeholders to be interviewed was based on consultation meetings conducted during the first phase of the fieldwork. In the informal meeting conducted during the first phase, the stakeholders were informed that the researcher would return for a more detailed interview. After identifying the stakeholders to be interviewed, contacts were made by email and telephone to set appointments with the relevant offices. Arrangements were made from Australia.

Table 2-2 List of interviewed key stakeholders

Government Offices	
Department of Environment and Natural Resources (DENR)	Metro Manila
Office of Civil Defence (OCD)	
Housing and Land Use Regulatory Board (HLURB)	
Land Management Bureau (LMB)	
Housing and Urban Development Coordinating Council (HUDCC)	
National Mapping and Resources Information Authority (NAMRIA)	
Department of Interior and Local Government (DILG)	
National Housing Authority (NHA)	
Albay Public Safety and Emergency Management Office (APSEMO)	Legazpi City, Albay
Albay Provincial Planning, Legazpi City	
Mines and Geosciences Bureau (MGB), DENR Region V	
HLURB Region V Regional Office	
Office of Civil Defence (OCD) for Bicol Region	
Albay Registry of Deeds Office	
Department of Agrarian Reform (DAR)	
Community Environment and Natural Resources Office (CENRO)	
Municipal Mayor of Camalig	Camalig Municipality
Municipal Planning and Development, Camalig Municipality	
Municipal Department of Social Welfare and Development (DSWD)	
Municipal Disaster Management Office	
Municipal Engineer Office	
Key officials of *Barangay* Tagaytay	
UN Agencies and NGOs	
Food and Agricultural Organization of the United Nations (FAO)	Metro Manila
International Organization of Migration (IOM)	
Centre for Disaster Preparedness (CDP)	
Save the Children	Naga City, Albay
Universities	
University of the Philippines	Metro Manila
Ateneo De Manila University	
Private Company	
Land Equity	Metro Manila

Table 2-3 Demographics of the interviewed participants

Characteristics	Number / Percentage [a]
Gender	
Male	26 (43%)
Female	34 (57%)
Age Group	
21-30	7 (4%)[a]
31-40	10 (19%)
41-50	11 (38%)
51-60	17 (27%)
>60	15 (11%)
Education	
None	-
Elementary School	30 (57%)
High School	9 (27%)
College	16
University	5
Occupation	
Government Employee	8 (15%)
Farming	17 (57%)
Small business	10 (27%)
Motorcycle taxi driver	6
Retired government employee	2
No Occupation [b]	9
Number of years living in the house	
< 1 year	- (47%)
1-2 years	6 (53%)
2-4 years	7 (53%)
4-6 years	3 (53%)
6-8 years	3 (53%)
8-10 years	- (53%)
>10 years	41 (53%)
Types of houses	
Nipa[c] and bamboo	4 (15%)
Nipa wood	4 (4%)
Bricks	37 (19%)
Duplex	2 (19%)
Bricks and bamboo	13 (11%)
Number of floors	
1	50 (15%)
2	10 (4%)
Status of land / houses	
Privately-owned (titled)	10 (15%)
Tenants	17 (4%)
Informal settlers	16 (15%)
Government-assisted housing [d]	17 (4%)

[a] Because of rounding, percentages may not add up exactly to 100%
[b] Including housewives
[c] *Nipa* is a local term for palm
[d] Including BLISS and relocation sites (see Chapter 6 for details)

Therefore, few appointments were arranged with key stakeholders from whom further contacts were obtained. This especially applied to government offices that have regional offices in the province where the case study area are located. In some cases, direct contacts and necessary recommendations were given by the headquarters to the regional office. Therefore, the already-existing platforms or networks in disaster management and land administration in the Philippines made it easier to identify related stakeholders to be further interviewed using the snowball effect.

Interviews were held with selected officials at the national, provincial and municipality level as well as a number of municipal government officers dealing with disaster management, land administration and housing programs (Table 2-2). Interviews included a mix of officials working at both policy and technical levels. Interviews with stakeholders involved many of the leaders or experts in a community, who are usually in powerful positions, which are called elite interviews (Kvale and Brinkmann 2009).

The community participants were selected with the assistance of *barangay* leaders and other officials at the sub-*barangay* level of administration (*purok*[2]). *Barangay* officials assisted in identifying the localities of most tenure groups. It is important to emphasise that participants were selected based on a random process rather than on human judgment. Henry (2009) points out that this allows researchers to use well-grounded theories and methods to estimate the characteristics of the study population from the sample data or to test hypotheses about the study population. Sixty community members ranging in age from 21 to 72 years old from two *barangays* that had different arrangements of land tenure were then interviewed (Tables 2-3 and 2-4).

[2] Purok (English: *Zone*) is a political subdivision of the barangay in the Philippines, especially in rural areas

Table 2-4 Break down of interviewed participants from different tenure groups from two *barangays*

Tenure System	Barangay		Total
	Ilawod	Tagaytay	
Titled	7	3	10
Tenant	10	7	17
Informal Settlers	10	6	16
Government-owned			
- BLISS	n/a	8	8
- Relocation site	n/a	9	9
Total	27	33	60

2.5.2.2 Interview Process

Interviews with stakeholders

All interviews with stakeholders took place in the offices of the participants and were tape-recorded with their permission. The interview was conducted using an interview guide (Appendix 1) that contains a list of questions on the subjects to be covered. There are two different themes to the questions in the interview guide: (i) disaster management and (ii) land administration. Not all questions in the interview guide were asked of all stakeholders. Questions were asked according to the subjects of interest of the stakeholders and were adapted and expanded to allow for more explanation, allowing for the discovery of potentially important meaning (Maykut and Morehouse 1994; Rubin and Rubin 1995).

Even though the interviews took place in the natural setting of the participants' offices, they were conducted in a very informal way. The nature of the Filipinos, which is warm and welcoming (Lapiz 2006), made the interviews even less formal. Since all identified stakeholders in the Philippines speak good English, interviews were conducted in English without the need of a translator.

The interviews began with a short introduction of the researcher and the aim of the study. Assurance was given that the interview was part of an independent research study to pursue a doctoral degree at RMIT University in Australia and the anonymity and confidentiality of each interviewee's organization would be protected to the fullest extent. The research aim was explained through provision of a Plain Language Statement (PLS) which is part of the ethics

procedure when conducting research involving human participation (see Appendix 2). Before the interviews began, the researcher also explained to the interviewee that the interview would take approximately 45-60 minutes, which was agreed. It was also emphasised that their participation was voluntary and they were free to withdraw at any time by simply informing the researcher. None of them asked to stop the interview. Sometimes the interviews took longer than planned and continued more informally over lunch or coffee outside the office. The format of the interviews was more like sharing experiences and information than simply answering a list of questions.

The issue of difficult access to top-level people known as 'elite interviews' (Maykut and Morehouse 1994), who are considered to have more power and knowledge in the society, was not a hindrance in the interview process. Good timing was also a factor since the fieldwork was not conducted in disaster seasons when most government officials are usually busy with monitoring, preparedness and response to disasters. Therefore, appointments were made easily and they were really enthusiastic and thankful that their area was chosen for the case study and thus full support was provided. The commonly-faced case in elite interviews whereby the interview can be cancelled out by the powerful position of the elite interviewee (Kvale and Brinkmann 2009), was not experienced by the researcher.

The government's awareness of the issues of disaster management and land administration that affects the daily life of local communities in both the short and long term, and the importance of having such research studies in the area, allowed for the smooth-running of the interviews and the researcher was made to feel welcome. At the end of the interviews, most participants requested a copy of the thesis once completed.

Interviews with local communities

Sixty interviews were conducted with community members from two *barangays* with different tenure arrangements (Table 2-4). Since most local communities

understand only Basic English, interviews were conducted in the local dialect of Bicolano with the assistance of an interpreter. The interpreter was a municipal disaster management officer who dedicated his time to this project with the approval of the Mayor. He was an invaluable resource as not only did he speak English, Tagalog (the national language) and Bicolano, but he had extensive local knowledge of the study area. Some people in the local communities, especially those working in government offices or as school teachers, understand English very well. Therefore eight interviews were able to be conducted without the assistance of the interpreter, including the pilot interview.

The interviews with local communities started with the introduction of the researcher to the interviewee in the local dialect. Most of the participants were aware of the presence of the researcher after the gathering of local people during the Focus Group Discussion that was conducted before the in-depth interviews. The local communities were very welcoming especially as they thought that the researcher was a Filipino as he has similar features. The researcher had a little understanding of the local language and this impacted on his acceptance by the local communities, which assisted in the smooth running of the interviews. Before the start, the aim of the research was explained again emphasizing that it was affiliated to neither a particular government nor a political party but was independent. The rights of the participants were explained, and these were provided in a Plain Language Statement (PLS) in English and Tagalog (see Appendices 2 and 4).

The interviews were conducted using an interview guide that included survey questions about the ownership status of the land and/or house, length of stay, type of house, and the number of floors. In addition, demographic information was gathered (see Appendices 5 and 6). After asking questions, the interpreter explained the answer to the researcher who wrote on the interview guide that had been coded. Notes were also taken during the interviews to record additional key information.

The flow of the interviews was very good because of several factors:

- They were conducted at a convenient time for the participants. The researcher spent some time observing the pattern of life in the study area, which provided a better understanding of the best time for the interviews. The identified local communities were informed of the intention of conducting the interviews. This was done during the tenure mapping process in the first stage of the fieldwork.
- They were conducted at a convenient place for the participants. Most of the interviews were conducted at workplaces and homes. It was also part of the participants' observation that takes place in everyday situations rather than in more formal conditions (Boeije 2010) (see participants' observation section for more details). All participants' activities were not disrupted by the interviews.
- The interviews were conducted in a very informal way. The interview questions were not asked continuously in sequence; the setting was like that of a normal conversation. The participants also asked questions of the researcher. Commonly asked questions were about the life in Australia and the four seasons. Some participants were even interested in seeing pictures from Australia; the researcher was sometimes able to accommodate such requests after the interviews. The result of establishing trust was that the interviewees expressed their answers very openly and some interesting experiences and practices were gathered.

The flexibility of the semi-structured interviews allowed more explanation on the questions and researched topics. In addition, the triangulation method was applied, where interviews were conducted at different points in time and from different sources to compare information and to check for consistency (Bamberger et al. 2006). This was the reason for selecting participants from different places with the same tenure groups.

2.5.3 Focus Group Discussion (FGD)

A focus group is defined as a situation where a moderator keeps a small and homogeneous group focused on the discussion of a topic or issue; such groups usually consist of between 6 and 12 people (Bamberger et al. 2006; Christensen et al. 2010). The emphasis of a focus group is on small-group interaction and in-depth discussion. It is especially useful for exploring ideas and obtaining in-depth information about how people think about an issue (Christensen et al. 2010).

Two focus group discussions were conducted in two *barangay* at two different times. The aim of the FGD was to explore two separate ideas and perceptions of tenure security and resilience. The community participants were selected with the assistance of *barangay* leaders who are responsible for the local administration of the two *barangay*. Consultation with *barangay* officials was conducted during the *barangay* monthly meeting when the full team of *barangay* officials was present (*Barangay* captain, secretary, treasurer and 7 *purok* leaders, Figure 2-2). In this meeting, the researcher was formally introduced to the forum by the *barangay* leaders, who briefly informed the other officials of the research. Participants were equally selected based on the tenure / ownership status. There were about 6-10 people from each tenure system who discussed the status of their ownership and how security is perceived according to their corresponding ownership status. The FGD in *Barangay* Ilawod took place in the *barangay* hall whereas the FGD in *Barangay* Tagaytay was conducted in a church due to the small size of the *barangay* hall. Though most participants understood basic English, for convenience, the discussion was held in the local dialect (Bicolano) with the assistance of an interpreter from the Municipal Disaster Management Office. A representative from the municipality also attended the FGD; she acknowledged the research study and encouraged the participants to fully cooperate.

Figure 2-2 Consultation with *barangay* officials before the FGD (A), briefing by the official of the municipality about the research (B) and the situation during FGD (C,D)

To stimulate the participants, the first few general questions were asked to the whole group before they were divided into small groups according to their tenure types. The general questions were mainly on their knowledge and understanding of the occurrence of disasters in their area: their perception of disasters, the impact, and the losses and measures taken to anticipate the losses caused by disasters. The discussion also explored the different community activities and support in the areas which were considered one of the factors in 'resilience' (Chapter 7 provides more detail on this).

Nineteen guiding questions were asked during the FGD on the subjects of disaster and land tenure security (Appendix 7). The questions and answers were explained in both English and Bicolano so that the researcher could understand the responses of the participants. After the series of general

questions, participants were grouped according to their tenure type and specific questions were asked accordingly. This activity explored their perception of 'tenure security' of land and housing and was intended to assess whether they are secured in terms of land tenure and housing. Further, their experiences on land and housing-related problems before and after disasters were explored. The responses of each tenure type were written on a discussion paper and presented to the whole group. At the end of the discussion, a community understanding on the relationship between the two topics was explored. When the FGD was finished, the researcher and the interpreter discussed the questions and answers in detail, including a full translation of the discussion sheets.

2.5.4 Participant Observation

Participant observation is a classic research strategy in both cultural anthropology and sociology. It is an approach to research which takes place in everyday situations rather than in laboratory conditions (Boeije 2010). It is defined as a process in which an investigator establishes and sustains a many-sided and relatively long-term relationship with a human association in its natural setting for the purpose of developing a scientific understanding of that association (Lofland et al. 2006). Saint-Germain (2001) explains this interaction as an attempt by the investigator to see the world from the participants' point of view. The researcher aims to fit within the world of the participants in order to develop a social scientific understanding of their world view and experiences (Lofland et al. 2006). Participant observation is an additional way to confirm or refute the data gathered in interviews and focus group discussions (Robbins 2010).

There are four different types of observations that were employed in the process of participant observation in this research (Christensen et al. 2010: p. 58):

Complete observer. Here the researcher observes from the "outside" and, if the setting is a public one, the researcher does not inform the participants that they are being studied.

Observer-as-participant. Here the researcher spends a limited amount of time "inside" the situation and obtains informed consent to observe the participants for a research study.

Participant-as-observer. Here the researcher spends extensive time "inside" the group or situation and always informs the participants that they are being studied and obtains informed consent.

Complete participant. Here the researcher becomes a full participating member of the group. In most cases, the group must be informed and permission granted.

In participant observations, it is important that the researcher be integrated into the local community as much as possible (Haynes 2005). In order to achieve this, the researcher of this study spent a number of days staying with different families in the study area. During this period, discussions were conducted with groups of males, housewives and teenagers. The researcher also spent time in the rice fields as this is one of the most dominant livelihood options in the area. In addition, several lunches were had at the canteen or in eateries owned and managed by the local residents, during which conversations was conducted. This process was considered effective in deepening the understanding of the participants' views and also for developing trust by the local community. While being involved in the participants' life, questions were asked in relation to their knowledge of disasters, land-related problems and their perceptions of the security of land tenure and housing and resilience. Observations were also made at the relocation site. In this case, a comparison between the life at the original settlement and at the relocation site was mainly explored.

No specific formal interview questions were used in this participant observation period. However, some similar questions to those prepared for the formal interviews were asked and notes were taken accordingly. The information

gathered from this activity complements data that were gathered through the semi-structured interviews and focus group discussions.

2.5.5 Documentary Analysis

A broad range of documents and policies was used in the course of this research. They were mainly obtained from government offices, universities, international organizations and private sectors, and were collected during fieldwork. They included reports from governments and other agencies (international and private), policies, laws/ legislations and regulations that affect the daily life of the communities (Table 2-5).

Table 2-5 Examples of documents used in this research

Document type	Examples
Legislation and policies	Public Land Act Presidential Decree No. 705 (Forestry Reform Code) Manual of Land Surveying Regulations in the Philippines Disaster Risk Reduction and Management Bill (Congress of the Philippines)
Government and other reports	The State of mainstreaming disaster risk reduction in the Philippines (UNDP / Strategic National Action Plan (SNAP) 2009 Philippines Typhoons Final Report (International Federation of Red Cross and Red Crescent Society / IFRC) Natural Disaster Risk Management in the Philippines (World Bank and National Disaster Coordinating Council, Republic of the Philippines) Comprehensive Land Use Planning of Albay Province Land Use Planning of Camalig Municipality The Philippines country programme document on settlement (UN-HABITAT) Land Administration Reform: Policy Studies Integration Report (Land Equity and World Bank) Institutional Arrangements Policy Study (Philippines Australia Land Administration and Management Project)

2.6 Data Analysis

In qualitative research, data analysis incorporates the process of systematically searching for and arranging the interview transcripts, field notes and other material, all of which is intended to increase an understanding of the data. The discoveries that emanate from the analysis are then presented to others. The researcher must work with the data, organise it, break it into manageable units,

synthesize it, and search for patterns in order to discover what is important and should be shared (Bogdan and Biklen 2003).

In the same way, Boeije (2010: p. 93) explains that:

> Qualitative analysis is the segmentation of data into relevant categories and the naming of these categories with codes while simultaneously generating the categories from the data. In the reassembling phase, the categories are related to one another to generate theoretical understanding of the social phenomenon under study in terms of research questions.

Therefore, qualitative data analysis consists of a stream of activities from segmenting the data to reassembling them, and that each of these activities has components of both thinking and doing (Boeije 2010).

2.6.1 Computer-Assisted Qualitative Data Analysis

Computer-assisted qualitative data analysis (CAQDAS) is a generic methodology employed using a range of software that is specifically designed to handle unstructured qualitative data (Richards 2010). *NVivo version 9* was used to manage the data and to assist in the qualitative analysis. Basically, CAQDAS helps to manage and classify large amounts of data so it is more organised and is in digital form.

The process for this study involved transcription of all interviews and FGD and indexing all the transcripts, in order to group data that corresponded to a certain theme. A good example of this is the theme of *perception of tenure security*. Within the category of tenure security, a more detailed breakdown of the types of tenure security were categorized, i.e. tenure security of informal settlers, tenant group, BLISS, resettlement and titled property. This process of grouping qualitative data into categories is known as *coding* and in *NVivo* categories are referred to as *nodes* (Bryman 2008; Richards 2010). Both the processes of transcribing and indexing all transcripts are time-consuming yet it increased my familiarity with the data and encouraged me to think analytically when naming and grouping *codes.*

Despite the substantial amount of time spent during the transcription and coding process, it was indeed very effective and saved time overall. With the already-available grouped *nodes*, it was easy to analyse the outcomes of the different themes. For example, when discussing community perceptions of tenure security of informal settlements, all data and interview results were ready in that particular *node,* which demonstrated the perceptions of all interviewees. In addition, the data also linked to information and characteristics of informants. It made the analysis process easier as the data were only a click away and it did not involve going back over all the interview transcripts.

The already-classified nodes also led to a demonstration of patterns or key words that were mostly spoken by the interviewees. Hence, it justified the key patterns of the collected data. A good example of this is the key words that revealed perception of tenure security for informal settlements as the result of grouping *nodes.* This also applied to the different *nodes* that had already been grouped.

The results of the qualitative data analysis are presented in Chapters 5, 6 and 7 of this thesis. Direct quotes from participants are presented to demonstrate their experiences and perspectives that are relevant to the topic discussed. The exploration of interviewees' perspectives (either at the decision-maker or community level) contributes to the theory presented and at the same time builds on the theory that is discussed in that particular section. This type of analysis is the basis of building grounded theory that is discussed further in the following section.

2.7 Ethical Considerations

Since this research was conducted with human participants in countries other than Australia, it had to conform to the 2007 National Statement on Ethical Conduct in Human Research[3]. This section explains some issues related to

[3] National Statement on Ethical Conduct in Human Research is issued by National Health and Medical Research Centre, http://www.nhmrc.gov.au/publications/ethics/2007_humans/contents.htm, April 2010.

ethical conduct and the way the research conformed to the issues. This research project was approved by RMIT's Human Research Ethics Committee under the project number 16/10, dated 5 May 2010.

The research was conducted based on the understanding that it should not expose participants to harm. Though social research is highly unlikely to subject people to physical harm, it may bring them into contact with 'psycho-social' harm as issues raised in the research may be upsetting or potentially psychologically damaging (Dowling 2005). As the study was conducted in areas that had been subjected to various disasters, the researcher identified some potential risks that could be faced by the participants:

- The risk of discussing essential (but maybe sensitive) local cultural values and beliefs;
- Feelings of discomfort or inconvenience since the discussion may lead them back to the time when they experienced natural disasters;
- Psychological affect of remembering loved ones who died in natural disasters.

In order to address these potential risks, key aspects to addressing ethical considerations are discussed below. They cover informed consent, privacy, confidentiality and anonymity.

Informed Consent. Participants were obliged to consent to being part of the research or to give permission to be involved in the research. In all instances, informed consent should be voluntary, which means without threat or undue inducement (Sieber 2009). The informed consent is the basic document that certifies an agreement between the researcher and participants, in which their privacy, confidentiality and anonymity are protected. A Plain Language Statement (PLS) is also provided to explain the background of the research and its legal and ethical requirements.

Privacy, Confidentiality and Anonymity. The simplest way to distinguish between the three terms is that privacy is about people, confidentiality is about data and anonymity means no identifier (Sieber 2009).

Privacy refers to a persons' interest in controlling the access of others to themselves, which concerns certain needs to establish personal boundaries (Sieber 2009). In this context, a personal boundary is translated as the intrusion of participants' time to have the interview and/or that this research may touch sensitive issues through personal questions being asked. In addition, observing interactions in people's home is sometimes considered private (Dowling 2005).

Confidentiality refers to access to data, not access to people directly (Sieber 2009). The PLS and the consent form state that the anonymity and confidentiality of the participants will be protected to the fullest extent. Therefore, any resulting publication will not refer to the real name of the participants or provide any information that may lead to direct identification of the said person. To ensure anonymity, pseudonyms are used throughout this thesis.

This research recognises the importance of respecting participants' privacy; therefore the plain language statement that covers the issue of privacy was translated into the local language and explained again verbally by the researcher and the translator prior to conducting the interviews. The research would not commence without permission from the concerned person/s. Therefore, this research only involved participants who fully understood the purpose of the research and who had been assured that the research was not going to affect them emotionally. This research was also conducted at their available or convenient time so daily activities were not prevented (see Section 2.5.2.2).

2.8 Conclusion

This chapter has discussed the strategy and methods that were employed to answer the research question outlined in the previous chapter. It presented various qualitative methods in data gathering involving various stakeholders and community members in the study area. The various qualitative methods and flexibility of the qualitative instruments used in this research encouraged a high participation rate of community members during the data gathering process. The multi-method setting discussed in this chapter demonstrated how focus group discussions, in-depth interviews and participant observations have been instrumental in revealing the research objective. It thus demonstrated how qualitative approach helps understand:

- how different tenure groups perceive tenure security, and
- how resilience is perceived by community members.

While the results of this methodology chapter are presented in Chapters 5, 6 and 7, the following chapter provides a thorough understanding of tenure security and resilience as the two fundamental aspects of this research.

CHAPTER 3 - LITERATURE REVIEW ON TENURE SECURITY

3.1 Introduction

This chapter presents the theoretical basis of tenure security, which is one of the two core concepts of the research. This basis is a synthesis of a wide range of literature that is relevant to the exploration of the concept of tenure security. The aim of this chapter is to present the issues related to tenure security that provide the framework for answering one of the intermediate research questions outlined in Chapter 1: '*How is tenure security perceived by different tenure groups*?'

Concepts presented in this chapter are those of relevance to developing countries' context since, as outlined in Chapter 1, informal settlements (i.e. those without title documents) are growing faster than formal settlements and different forms of informal settlements exist.

This chapter commences with an overview of land tenure and the land tenure system. The concept of tenure security and why tenure security is important are further discussed. The last part of the chapter discusses the debate on 'title versus rights' in securing tenure and alternatives other than titles in the provision of tenure security.

The discussion in this chapter sets the foundation on how one of the major findings in this research study on the perceptions of tenure security is presented. This will be discussed in Chapter 6.

3.2 Overview of Land Tenure

The term 'tenure' is derived from the Latin word *'tenere'* meaning 'to hold' or 'to possess' (Bruce 1998) and is most commonly associated with the feudal social

system of medieval English. The concept of 'tenure'[4] itself is a social construct that defines the relationships between individuals and groups of individuals by which rights and obligations are defined with respect to control and use of land. The term is a derivative of the concept of natural resource tenure, which essentially refers to the terms and conditions under which natural resources are held and used (Economic Commission for Africa 2004).

Bruce (1998) explains land tenure more simply as the terms on which something is held: the rights and obligations of the holder. It is a legal term that means the right to hold land rather than the simple fact of holding land.

Dale and McLaughlin (1999) describe land tenure as the manner in which rights in land are held. This is defined by a broad set of rules, some of which are formally defined through laws concerning land and property, while others are determined by custom. Land tenure is also referred to as the ownership, whether formally or customarily defined, of people over land and its associated natural resources (water, trees, minerals, wildlife, etc) (FAO 2002). It is further stated that rules of tenure define how property rights to land are allocated in society. Therefore, land tenure defines the relationship between people, as individuals or groups, whether legally or customarily defined, with respect to land (FAO 2003). In other words, land tenure defines the way land is held or owned by individuals and groups and the set of relationships amongst people with respect to land (UN-HABITAT 2006b).

Tenure reflects the relationships between people and land directly, and between individuals and groups of people in their dealings in land. Hence, there is a clear understanding that land tenure depicts the relationship between land and humankind (Figure 3-1) (Dale and McLaughlin 1999; Zevenbergen 2004).

[4] For the remainder of this thesis, the term 'tenure' will be used to refer to 'tenure' of land, housing and associated natural resources.

Figure 3-1 Relationship between people and land (Dale and McLaughlin 1999; Zevenbergen 2004)

Dale and McLaughlin (1999) provide an analogy that 'tenure' itself is a 'bundle of sticks'. People hold sticks of different lengths and thicknesses illustrating the different strengths and weaknesses of people's rights over land (Dalrymple 2005). Land tenure thus constitutes a web of intersecting interests (FAO 2002: p. 13). These include:

> *Overriding interests:* when a sovereign power (e.g. a nation or community has the power to allocate or reallocate land through expropriation, etc.).
>
> *Overlapping interests:* when several parties are allocated different rights to the same parcel of land (e.g. one party may have lease rights, another may have a right of way, etc.).
>
> *Complementary interests:* when different parties share the same interest in the same parcel of land (e.g. when members of a community share common rights to grazing land, etc.).

Summarising the above definitions, the relationship between humankind and land in terms of access to, and control over, land and natural resources is regulated by a "tenure system" consisting of sets of formal or informal rules and institutions (UN-HABITAT 2006b).

3.3 Tenure Systems and Classification

A land tenure system can be described as an institution or set of rules to regulate behaviour between people, land and its associated natural resources (Brown and Crawford 2006; Dale and McLaughlin 1999; FAO 2002). This function of land tenure defines how property rights to land are allocated within society including, but not limited to, how access is granted to rights to use, control and transfer land as well as associated responsibilities and restraints (FAO 2002, 2005). Therefore, land tenure systems determine who can use what resources for how long, and under what conditions (Brown and Crawford

2006). Tenure systems often consist of many types of tenures, recognised by a national or local system of established rules and customary relationships in a social organisation (Asperen and Zevenbergen 2007). Each tenure system is a unique idiosyncratic system that is different from one country to another (Dekker 2003).

Land tenure systems are also often associated with property rights that refer to a bundle of rights on the use, control and transfer of assets including land (USAID 2007a). The basic rules of a tenure system define how property rights (of use, control and transfer) are to be allocated within societies. Property rights are social conventions that reflect agreement among people about how these assets are held, used and exchanged. This includes the rights to occupy, enjoy, and use; to restrict others from entry or use, to dispose, to inherit; to develop or improve, to cultivate, to sublet, to realise financial benefits, and to access services in association with land. Property rights can also include ideas and designs (copyrights, patents, and intellectual materials) as well as rights over moveable property such as cars, cows, and mobile homes (USAID 2007a).

There are many classifications of tenures. However, the four common typologies or idealistic systems of land tenure are private, communal, open access and state tenure (FAO 2002; GTZ 1998). These four systems outlined in Table 3-1 are based on Western concepts which originate with the type of stakeholder or owner, whether their interests are for an individual or private person, a designated group, or on behalf of the government (Dalrymple 2005; GTZ 1998).

Table 3-1 Common land tenure category (FAO 2002; GTZ 1998)

Private	The assignment of rights to a private party who may be an individual, a married couple, a group of people, or a corporate body such as a commercial entity or non-profit organization.
Communal	A right of commons may exist within a community where each member has a right to use independently the holdings of the community.
Open access	Specific rights are not assigned to anyone and no-one can be excluded. This typically includes marine tenure where access to the high seas is generally open to anyone; it may include rangelands, forests, etc, where there may be free access to the resources for all. (An important difference between open access and communal systems is that under a communal system, non-members of the community are excluded from using the common areas).
State	Property rights are assigned to some authority in the public sector.

However, some authors see the above classification as being very general (Dalrymple 2005; UN-HABITAT 2008b; Williamson et al. 2009). Dalrymple (2005) proposed tenure derivatives that extend from the general classification in Table 3-1, which are illustrated in Figure 3-2. It is not an exhaustive description of the full tenure spectrum; instead, it attempts to show derivatives of the main tenure typologies (Dalrymple 2005).

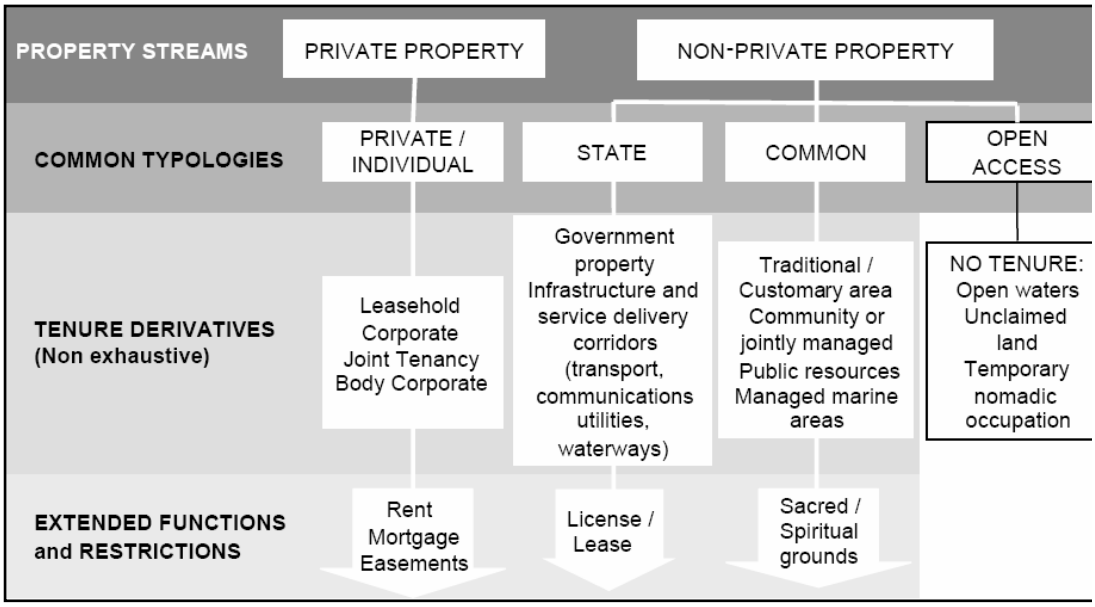


Figure 3-2 Extended forms of tenure systems (Dalrymple, 2005)

Payne (2001) further identified five major tenure types:

1. Customary tenure. In this type, land is regarded as sacred and its allocation, use, transfer, etc, are determined by the community leaders according to the needs. The payment system uses tokens instead (e.g. beer, cattle) in addition to money.
2. Private tenure. This system is based on individual title and permits the almost unrestricted use and exchange of land. Its primary limitation is the difficulty of access by lower income groups.
3. Public tenure. The concept of this system is a reaction to the limitation of private tenure in that it seeks to enable all classes of society to obtain

access to land. In socialist countries, all rights are vested in the State, while in capitalist countries, they may be restricted to a narrow range of public requirements, such as strategic or communal uses.

4. Religious tenure. This system is based on religious norms (e.g. Islamic religious land tenure, which is the traditional form of tenure in Islamic countries).
5. Non-formal tenure. This system includes a wide range of categories with varying degrees of legality or informality. They include regularised and un-regularised squatting, unauthorised subdivisions or legally owned land and various forms of unofficial rental arrangements.

A more simple classification of tenure is proposed by Payne (2004) outlined in Table 3-2.

Table 3-2 Different forms of land tenure (adapted from Payne (2004))

Formal rights	Unregistered but documented (e.g. rental, rent to buy, unregistered leases, etc.). Group/family/household rights (e.g. customary/tribal/clan family rights, Islamic tenure types, community land trusts, etc.). Unregistered and undocumented (e.g. adverse possession, use or occupancy rights without certificate, customary rights). Government-assisted housing (e.g. housing for the poor, resettlement site).
Irregular tenure	Documented (e.g. written agreements between irregular owners and tenants, *de facto* recognition, informal subdivisions, customary rights, tenancy at will, labour tenancy, share cropping, etc.). Undocumented (e.g. as above but without documents). Homeless.

Between the formal rights and irregular tenures, there is a range of possible forms of tenure that could be considered as a *continuum* (UN-HABITAT 2008b) (Figure 3-3). In other words, across a continuum, different tenure systems may operate, ranging from informal occupation to full property ownership. Each range of continuum provides different sets of rights and degrees of security of tenure (Sietchiping et al. 2012; UN-HABITAT 2008b).

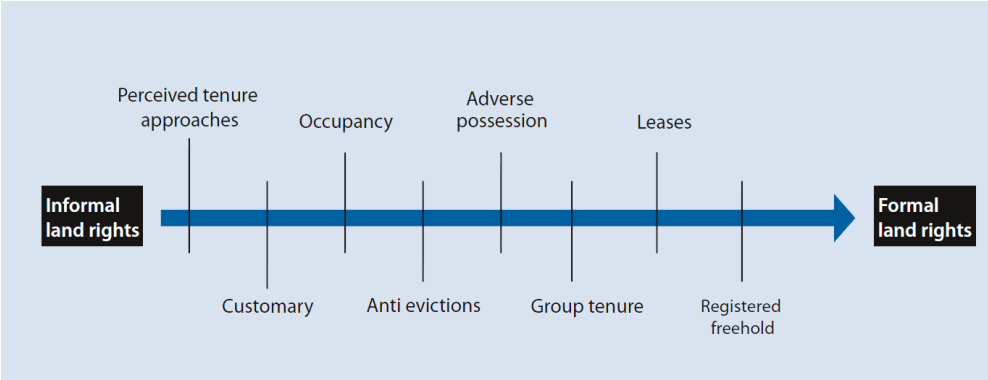


Figure 3-3 A range of tenure systems in a continuum tenure (UN-HABITAT 2008b)

The diagram above demonstrates a continuum's range of possibilities, from more informal situations on the left towards more formal ones on the right. In other words, included in this continuum are people with little or no security of tenure; they have no documents, no contracts and little protection under the law. They live constantly with the threat of eviction and infringement of rights and loss of tenure rights (Sietchiping et al. 2012). The relationship of each continuum range is explained below (Sietchiping et al. 2012; UN-HABITAT 2008b):

> As the status of various plots of dwellings change – for example if informal settlers are granted titles or leases, or if government regulations begin to formally recognise certain group rights – household statuses move to the right on the continuum, towards more formal rights for land occupancy or ownership.

Delville and Durand-Lasserve (2009) further classify the different forms of tenure that commonly exist in developing countries:

1. Squatters, including the homeless, and tenants in squatter neighbourhood.
2. Occupants of lands that have been subdivided and developed without authorisation.
3. Holders of temporary occupancy permits.
4. Holders of long-term or renewable occupancy permits.

5. Tenants with no lease or formal contract and/or with renewable short- and medium term leases.
6. Tenants with long-term leases or contracts.
7. Landowners (full-ownership).

Specific to squatters, tenure forms vary and there are many different terms associated with it (Table 3-3). In this research, the term *informal settlement* is used simply to represent an irregular type of tenure that is not part of the formal (legal) land tenure system.

Table 3-3 Different names for squatter settlements (adapted from Willis (2009))

Name	
Squatter settlement	Housing built on informally occupied land.
Shanty town / shanty	Area of poor-quality housing built from materials such as cardboard and corrugated iron. A shanty is an individual dwelling made of such materials.
Informal settlement	Area of housing which does not meet legal requirements of tenure, housing quality and land use.
Self-help housing	Housing which has been built by the residents themselves.
Spontaneous settlement	Settlement which has developed without formal planning. May be due to a land invasion, or gradual growth over time.

3.4 Land Tenure Security

Since 'tenure' is about the relationship of people and land, security of tenure is defined as the certainty that a person's rights to land will be recognised by others and protected in cases of specific challenges (FAO 2005). It refers to an assurance that an occupier of land will continue to occupy, control, and manage the land and benefit from the resources of the land without threat or risk of involuntary removal. They can only be evicted by means of a known and agreed legal procedure, which must be objective, equally applicable, contestable and independent (FAO 2005; IFAD 2008; UN-HABITAT 2008b).

Therefore, the concept of tenure security is based on recognition of land and the rights attached to it, by government and local communities. Much of the literature from international agencies dealing with land administration conclude that the aspect of 'protection against eviction' is an important component of tenure security.

The International Federation of Surveyors defines three components of tenure security: (1) Protection against eviction, (2) the possibility of selling, and transferring rights through inheritance and (3) the possibility of having a mortgage, and access to credit under certain conditions (FIG 1998). The Expert Group Meeting on Urban Indicators in October 2002 defined tenure security as the right of all individuals and groups to effective protection by the state against forced evictions (Augustinus and Benschop 2007). Similarly, UN-HABITAT (2008b: p. 7) outlines that

> … tenure security consists of effective legal protection against eviction or arbitrary curtailment of land rights, with enforceable guarantees and legal / social remedies against the loss of the rights. Tenure security also is about reasonable duration of rights appropriate to the use to which the land is put and the social needs of the land user.

A recent publication of UN-HABITAT also acknowledges Active and Passive Tenure Security (UN-HABITAT 2012: p. 24):

> *Active tenure security* means being able to perform transactions on a parcel of land – e.g., to buy, sell or lease it.
>
> *Passive tenure security* means being free of the risk of being evicted from the land.

To summarise, four general components or elements of tenure security are outlined below (Augustinus and Benschop 2007; FAO 2005; FIG 1998; IFAD 2008; UN-HABITAT 2008b):

1. Confidence that land users will not be arbitrarily evicted.
2. Certainty that land users' property rights will be recognised by others.
3. The right to have effective government protection against forced evictions.
4. The right to exercise property rights.

In addition, tenure security should also consider three important characteristics (IFAD 2008):

1. Protection – will land rights be protected if they are challenged or threatened?

2. Robustness – are the holders of land rights able to use and dispose of these rights, free from interference of others?

3. Temporal aspect – This includes seasonality and duration - how long will different land rights last?

In relation to duration, long and short-term tenure securities are also recognised. For example, a person may have the right to use a parcel of land for a six month growing season, and if that person is safe from eviction during the season, the tenure is secure. However, a person with usage rights for six months will not plant trees, invest in irrigation works or take measures to prevent soil erosion as the time is too short for that person to benefit from the investment. The tenure is insecure for long-term investments even if it is secure for short-term ones (FAO 2005).

Land tenure security can be defined as existing when an individual perceives that he or she has rights to a piece of land on a continuous basis (Place et al. 1994). In this regard, tenure security includes two important elements (Kanji et al. 2005):

- 'objective' elements (nature, content, duration and enforceability of the rights, state guarantee, quality of boundary descriptions, conflict handling).

- 'subjective' elements (landholders' perception of the security of their rights).

Objective security is often referred to as *de jure* security of tenure, while *de facto* security corresponds with the subjective elements. *De jure* security is normally easier to determine by assessing the laws and regulations related to land issues, although *de facto* security might be more important (Asperen and Zevenbergen 2007).

Tenure security can also be a combination of objective and subjective situations (FAO 2002). Objectively, tenure security can be exacerbated by the absence of a legal document defining a particular right or the existence of multiple documents describing the same rights for different people or entities over the same piece of land. Subjectively, security can occur in situations where there is an increasing probability of losing rights to land, which occur when society's rules of tenure change or when the power of one group to defend its rights wanes while that of a competing group increases (Dekker 2003).

The sources of security may also vary from context to context. A good example of sources of security is given below (FAO 2002, 2005):

- The local community and its groups such as local farmers' organisations and water users' associations. When neighbours recognise and enforce a person's rights, that person's security increases. In many customary tenure arrangements, people gain property rights through membership of social communities. Maintaining property rights validates membership in the group just as much as membership facilitates the acquisition and safeguarding of property rights.

- The government, in the form of political recognition of some rights, e.g. the acceptance of an informal encroachment or settlement of a community on state forest lands. However, in doing so, a government usually recognises the right of the community to occupy the land, but does not go as far as recognising the rights of individual people within the community.

- The state's administrative structures and formal legal system. The state may provide security in general by affirming the rights that people hold as well as through specific measures such as providing protection against trespass. Security is often seen as coming from protections provided through land registration and cadastral

systems, with adjudication of disputes taking place in the formal court system.

The three sources of tenure security outlined above (recognition of local community, government recognition and state administrative structures and formal legal systems) bring legal and social angles to tenure security, which will be used as a basis for discussion on tenure security presented in Chapter 6.

3.5 Why Tenure Security Matters

Tenure security provides access to land, which is fundamental and a pre-condition for economic development and other benefits, such as livelihood opportunities, public services and credit (UN-HABITAT 2008b). Security of tenure serves as a foundation on which any efforts to improve living conditions, especially for the poor, has to be built (Payne 2002). In other words, tenure security is 'a firm springboard for economy and productive activities' (UN-HABITAT 2008b).

From a more fundamental aspect, tenure security is a full realisation of human rights, since it provides access to the right to shelter (and access to other services) and the elimination of discrimination against minority and other vulnerable groups. This way, tenure security underpins social inclusion in the society (UN-HABITAT 2008b).

Since access to land is a strategic requirement for the provision of adequate shelter for all, and for the development of sustainable human settlements, the failure to address this issue remains the primary cause of inequity and poverty (UN-HABITAT 2003b)

Specific to natural disaster issues, the residents of disaster-prone areas may be unwilling to move or to be temporarily evacuated during disaster events, even for a short period of time, if they perceive that their rights to land are insecure. In this sense, tenure security protects the occupiers from land-grabbing when

they are temporarily displaced. At the early recovery stage, security of tenure provides confidence in coming back to their original settlement after disasters.

Furthermore, tenure security does not only provide confidence for the occupiers. In terms of shelter, housing providers need to be assured that they are building in the right place for the right people. Failure to identify land rights and claims, and obtain consent from all parties can lead to exacerbated disputes and conflicts in the area (UN-HABITAT 2010). It is further argued that tenure security overall influences the early recovery stage after disasters (UN-HABITAT 2010: p. 36):

> Eligibility for housing and livelihood assistance is often conditioned on the ability to provide clear evidence of land rights. Early recovery actors may avoid working in areas where such evidence is not available. It is further exacerbated by the fact that the most vulnerable to disaster impacts are people who are not landowners, or who lack clear documentary evidence of rights to land.

In the phases after early recovery, tenure security also provides platforms to occupiers to be able to invest time, labour and capital into productive uses of land such as planting crops, repairing buildings and establishing small businesses (UN-HABITAT 2010).

3.6 Measurement of Tenure Security: Titles or Rights?

The issue of secure tenure does not have a universal, operational definition (Laksa and El-Mikawy 2009). The notion of tenure security, however, has been an on-going debate, especially between the provision of titles for security of tenures and recognition of rights over land. In other words, the underlying debate on tenure security is between formal tenure regularisation through access to land ownership and measures aimed primarily at formalising security of tenure (Durand-Lasserve and Royston 2002).

A renowned campaigner for land titling, Hernando De-Soto, argues in his book "*The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere,"* that the presence of a title document constitutes the main basis for

characterising tenure security (De Soto 2000). He sees the many positive effects of the formal property systems, particularly in the West, which allow citizens to generate capital. De Soto (2000) believes that some of the benefits of titling are as described below:

- The title document fixes the economic potential of assets. Capital is born by representing in writing- in a title, a security, a contract, and in other such records. It is about the concept, a representation of the most economically and socially useful guidelines about the asset as opposed to the visually more striking aspects of assets.
- Integrating dispersed information into one system. As an effect of integration, citizens in advanced nations can obtain descriptions of the economic and social qualities of any available asset without having to see the asset itself. The formal and integrated property systems let them know what assets are available and what opportunities exist to create surplus value.
- Making people accountable. The existence of one integrated formal property law shifted the legitimacy of the rights of the owners from the politicized context of local communities to the impersonal context of law thereby releasing owners from restrictive local arrangements and bringing them into a more integrated legal system facilitating their accountability.
- Making assets fungible. A formal property system transforms assets from less accessible condition to a more accessible condition, so that they can do additional work. By uncoupling the economic features of an asset from their rigid, physical state, a representation makes the asset "fungible" – able to fashion to suit practically any transaction, for example, representations also enable the division of assets without touching them.

- Networking people. By making assets fungible, by attaching owners to assets, assets to addresses, and ownership to enforcement, and by making information in the history of assets and owners easily accessible, formal property systems converted the citizens of the West into a network of individually identifiable and accountable business agents.

In other words, De Soto's "mystery of capital" provides that endorsement of formal property records and titles to represent what is economically meaningful about any asset where all the relevant and required information is captured and organised to conceptualise the potential value of an asset.

The importance of legal documents is also supported by the fact that the absence of formal property rights constitutes a severe limitation for the poor (Galiani and Schargrodsky 2006). The lack of formal titles impedes the use of land as collateral to access credit markets and affects the transferability of the parcels causing doubts in investments in untitled parcels (Feder and Nishio 1998; Galiani and Schargrodsky 2006). Galiani and Schargrodsky (2006: p. 1) argued that:

> … the absence of formal titles deprives poor families of the possibility of having a valuable insurance and savings tool that could provide protection during bad times and retirement, forcing them instead to rely on extended family members and offspring as insurance mechanisms.

Similarly, the advantage of titles is argued as an avenue for better access to formal credits, higher land values, higher investments in land and higher output / income (Feder and Nishio 1998).

In contrast to these views, a number of scholars question the title as the primary source of security and advocate the rights to land in the form of alternative instruments to secure tenure. This, which could be called the "rights group", demonstrates that the conventional approach of providing individual land titles is not necessarily the most appropriate or practical option and many others

exist which meet the needs of the poor and enjoy social legitimacy (Payne 2004).

Augustinus and Benschop (2007) outline that "security of tenure does not equal ownership". It is further supported by Deininger (2003), who further state that "security of tenure policies should not necessarily be systematically linked with conventional approaches to tenure based on access to property titles".

Dey, Sharma and Barman (2006) also question whether land titling is the sole parameter for securing tenure. In 1998 Lemel questioned "how accurate is the presence or the absence of title as an indicator of tenure security and tenure insecurity?"

Gilbert (2002) also argues that security of tenure does not require the issue of full legal title and therefore questions whether informality is the real problem. Taking a case study in various poor areas in Latin America countries, Gilbert (2002) found that security of tenure seems to be assumed from the start as settlers built homes after getting a receipt for payment for the plot of land without even asking about the formal documents. Therefore, the majority are prepared to build without holding title to their land. Thus, informality seems to have no or little effect on the willingness of people to invest in their dwellings.

3.6.1 Tenure Security: What are the alternatives to titles?

Indeed, initiatives in land titling have been and continue to be implemented in developing countries worldwide. A documented title would seem to have the following advantages (Lemel 1988):

- It publicly and officially associates specific persons with specific pieces of land.
- It may precisely define a property's physical boundaries, thereby reducing grounds for possible disputes with other claimants; and

- As a document issued by the state, it carries the implicit backing of the state for the proprietor against those who might seek to challenge the granted property right.

Over the last two decades, major international donors (i.e. World Bank, USAID, AusAid) and national governments have extensively promoted improving land administration programmes (in which land titling is included) as a means of increasing tenure security, improving access to formal credit and reducing poverty (Payne et al. 2007).

UN-HABITAT also identifies various benefits of having registered land (UN-HABITAT 2012: p. 23):

> Having your rights registered or recorded in such a system brings various benefits. In general, it gives you greater security of tenure, and reduces the chance of your losing your land or being evicted from it. You will be more willing to invest in or on the land and can sell the land more easily (often at a higher price). You can get credit by using the land as collateral. Local (and national) governments can more easily plan and manage land use, and collect revenue from it in the form of fees and taxes.

Hence, from an economic point of view, secure tenure is critical to providing incentives for households and entrepreneurs to undertake land-related investment (Deininger 2003).

Despite the benefits, however, there are also drawbacks of land titling programs. It is argued that the results of these projects are limited mostly to pilots or a few priority areas; allocating individual ownership titles to the huge numbers of people who do not have titles would take decades (or even centuries in some developing countries) (UN-HABITAT 2012).

This is further supported by Payne, Durand-Lasserve and Rakodi (2009: p. 36) that detail the limits of land titling and home ownership and challenged that

> There is no significant evidence that poverty levels are reduced. In many nations, land titles do not necessarily protect people from eviction and expropriation of their land. Titles also do not necessarily

> improve infrastructure and services provisions, while many settlements have obtained improved provision without titles.

In other words, approaches combining tenure legalisation and titling programmes with programmes to provide serviced land, upgrading and improvements at settlement level have had limited success (Dowall and Clarke 1991). Durand-Lasserve and Royston (2002: p. 10) give an example of the limited success of land titling programmes, in the context of a developing country as below.

> One of the cornerstones of regularization policy implemented in developing countries is that in Mexico during the 1990s. It was the massive provision of individual freehold titles or other forms or real rights (a right that can be transferred inherited and mortgaged). Such responses required a series of complex procedures to identify the holders of rights and their beneficiaries, to resolve disputes, to delineate plots by surveying, to pay out compensation if required and to provide land registration and titling. Although this provides beneficiaries with sound security of tenure, it is an expensive and time-consuming process, especially in the context where land-related information is out of date or insufficient, and where centralized land registration procedures are complicated. It is further aggravated by the frequent incidents of corruption in administration in charge of land management and the low level of literacy among the beneficiaries.

Augustinus and Benschop (2007) further strengthen the argument that individual titling is costly, time consuming and often not sustainable for low-income people, where full surveying and registration is involved. In addition, costs associated with formalisation, such as taxes and registration fees, for example, can lead to difficulties when poor residents are unable to keep up with their payments. Additionally, land titling has been said to potentially carry detrimental effects such as the disruption of community life and social networks (Reerink and van Gelder 2010)

Deininger (2003: p. 2), however, sees that the land governance factor contributes to the unsuccessful programme of land titling. He argues that:

> Inefficiencies in the land administration institutions responsible for demarcation of boundaries, registration and record keeping,

> adjudication of rights, and resolution of conflict can still preclude realisation of many of the benefits of secure tenure. If these institutions are not working well or are poorly coordinated, inefficient, or corrupt, transaction costs will be high, thereby reducing the level of transactions below what would be socially optimal, and in many cases excluding the poor completely.

Many of the international initiatives in improving the land administration system in developing countries, therefore, focus on institutional reform, including improved coordination within the government and with the private sector, which will be a precondition for the state's ability to deliver property rights effectively (Deininger 2003).

Therefore, responses regarding access to land and housing, which are mainly on the regularisation of irregular settlements, emphasising tenure legalisation and the provision of individual freehold, are considered conventional (Dowall and Clarke 1991).

Based on that, some of the recent shifts have skewed from that direction and are more focused on the following practices (Delville and Durand-Lasserve 2009; Durand-Lasserve and Royston 2002):

- Setting up a simplified registration system where tenure can be incrementally upgraded to real rights in accordance with the needs and resources of individual households and the capacity of the administrations in charge of the process.
- Devising and adopting innovative tenure formulae that emphasise collective trust and cooperative ownership.
- Emphasizing partnership between formal and informal actors.
- Emphasizing security of tenure (i.e. protection against evictions) whenever possible, through long-term lease and/or other measures that provide priority to the consolidation of occupancy rights rather than provision of property titles and priority of collective interests rather than individual ones.

- Provision of basic services as a form of settlement recognition and as a tool for alleviating poverty.

The discussion over tenure security versus land titling is concluded with a statement by Delville and Durand-Lasserve (2009: p. 47):

> Security of tenure takes various forms, depending on the legal and regulatory framework, social norms and value system of each culture and, to a certain extent, individual choices.

Van Gelder (2010) further argues that for informal tenure, tenure security does not depend on legal document but it is based on the actual control of property, regardless of the legal status in which it is held.

That statement is further strengthened by Augustinus and Benschop (2007) who argue that there is a wide range of options available to respond to the need for security of tenure; some of which are as follows:

- *De facto* recognition, but without legal status (this guarantees against displacement or ensures incorporation of the area into a special zone protected against evictions (further detailed in Section 3.6.2)
- Recognition of security of tenure, but without any form of tenure regularisation (the authorities certify that the settlement will not be removed)
- Provision of temporary (renewable) occupancy permits
- Temporary non-transferable leases
- Long-term leases (may or may not be transferable)
- Provision of legal tenure (leasehold or freehold).

3.6.2 Perceived Tenure Security

Since security of tenure is difficult to measure directly and, to a large extent, it is what people perceive it to be (FAO 2005), another aspect that is strongly considered as a measure of tenure security is the perceived tenure security

itself. This is in line with the concept proposed by UN-HABITAT that, especially in the context of developing countries, tenure security is also a matter of perception (UN-HABITAT 2006).

Van Gelder (2007) states that, 'perceived tenure security is derived from a probability estimate of the chance of eviction or other factors that threaten a tenure situation and may cause involuntary relocation'

It is further stated that perceived tenure security is *de facto* security of tenure itself, which can be based on a number of things (Payne 1996, 2004; UN-HABITAT 2006). Some of them are documented in Table 3-4.

Table 3-4 Documented sources of perceived tenure security (Payne 1996, 2004; UN-HABITAT 2006)

The informal occupation of a dwelling, since a court order is required before inhabited buildings can be demolished and the backlog of such cases provides effective security of tenure.
The provision of basic services to the area by a local authority, such as access roads, water and electricity. In some situations this later leads to some form of *de jure* tenure but in some cases residents have been forcibly relocated.
Support from a local politician. This can often give sufficient *de facto* tenure security for people to invest in housing. However, this generally only happens when a large proportion of any city are informal settlers.
The experience of the community concerned with both legal and informal instruments.
When land is under litigation, settlements are known to remain undisturbed as long as the court case is not settled, sometimes for decades.
When land is not required for any other purpose it is often perceived as secure. However, this land is often unsuitable for human habitation if it has steep slopes, railway margins, etc.
Where NGOs and grass roots movements have confronted the government repeatedly thereby limiting evictions.
When a religious structure is built in a prominent place in the hope that the authorities will be reluctant to demolish such a structure. In this way the surrounding areas hopefully acquire immunity.

Perceived *de facto* tenures are an important option for low-income households who cannot afford any other form of tenure (Payne 1996). People with perceived tenure security have no individualised legal rights. However, they might be protected under anti-eviction laws, which are a form of security of tenure at a general level; and this is based on circumstances and not on individually secured rights. In addition, these laws do not provide sufficient protection for the poor, unless legal aid is cheap and accessible and/or special zones for low-income families are declared. Therefore, they are often subject to evictions (UN-HABITAT 2003a).

3.6.3 Innovative Approaches towards Providing Tenure Security

As the "rights" group challenged the limits of titles in securing tenures and its applicability of implementation in poor / developing countries, they also propose and advocate other innovative approaches in providing tenure security. Those various alternative approaches and tenure instruments have been internationally advocated (UN-HABITAT 2003a, 2006) and good practices based on actual experiences in different countries have been inventoried. They cover aspects such as re-assessing conventional tenure types and land registration systems, recognising informal settlers, recording their existence and including them in planning for special zones for subsidised, social housing. Table 3-5 provides some of the good (and contrarily bad) practices that can be used as lessons to be learned in the provision of tenure security.

Table 3-5 Selected approaches towards achieving tenure security *vis-à-vis* worst practices initiatives (Augustinus and Benschop 2007; UN-HABITAT 2008b)

Best Practices Initiatives	Worst Practices Initiatives
Recognise and treat informal settlers as having a 'right to the city' and include them in planning and decision-making with emphasis on social and gender equity	Exclude informal settlers in regulatory frameworks and planning assuming that a *general* focus will also benefit the poor, especially women
Reassess conventional tenure types and land registration systems, and use them in more innovative ways. Create new, more appropriate instruments, e.g. basic lease for cooperative, community land trust, housing association + internal group tenure	Continue with conventional instruments, which are inaccessible and unaffordable to low-income groups
For people who cannot afford any form of *legal* tenure, a *s*tep by step, incremental, approach from perceived/temporary secure tenure to improvements/legalization could be the best option	Not recognise any informal tenure types and proceed with large scale and rapid tenure reform
Carry out public land inventory and land audit: clarify beforehand which level of government owns which land, clarify who owns/leases private land, clean up cloudy titles, sort out disputes and administrative 'limbo' situations	Find out during court procedures that there are no records that establish which level of government is responsible for which land and suffer long delays in sorting out private ownership
Record existence of informal settlements in city plans + record land use and *de facto* land rights in register	Poor records combined with corruption can lead to allocation of land that is already occupied, often by the poor
Create special zones for subsidized, social housing	Apply middle-class standards city-wide
City-wide, affordable planning that accommodates existing informal settlements rather than requiring that such settlements comply with the plans	Ad hoc planning; Require that informal settlements comply with plans, rather than accommodate existing reality
Prohibit forced evictions by law provide legal aid (incl. community based paralegals) and recourse in case of violation + simplify court procedures in case of violation. Recognise important role NGOs play in mobilization against forced	Forced evictions are not prohibited by law and court procedures too costly and lengthy. Legal aid is not available or too costly. If occupation of informal

evictions. If informal settlement is only protected by 'anti-eviction law', community and/or local authority should keep simple records of occupation	settlement is not recorded in any way, legal recourse after eviction is almost impossible
Simplify procedures and adopt special regulations for adverse possession that are affordable for low-income people. Allow group claims to adverse possession (while including a gender perspective) and provide legal aid	Use existing court procedures which are costly and lengthy and do not help informal settlers
Prohibit discrimination in rights and access to land. Formulate or amend laws to ensure that equal land, housing and property rights (including equal inheritance and marital property rights) are entrenched in the law and that these laws are implemented (e.g. through awareness raising, legal aid and paralegal networks)	Allow discrimination, thereby excluding women and vulnerable groups and violating international human rights law

The table above gives different perspectives of the provision tenure security in response to different cases of insecurity in different tenure systems, with respect to urban housing.

In addition, a number of measures to provide tenure security for informal landholders related to natural disasters are presented in Table 3-6.

Table 3-6 Innovative approach in providing access to land to informal landholders after a natural disaster (UN-HABITAT 2010)

Public statements by government officials affirming the principle of security of tenure for all.
Relaxing tenure restrictions on eligibility for housing assistance, subject to measures to avoid housing reconstruction in hazardous areas and providing for minimal planning and building guidance.
Relaxing planning standards and building codes that were inappropriate before the disaster in order to align them with practice. Careful consultation is required to strike an appropriate balance in light of the risks posed by hazards.
Incremental or intermediate steps towards legally recognised land rights can be a viable alternative in cases where authorities are reluctant to provide registered individual title to persons who occupied land in an informal or extralegal manner prior to a disaster. Intermediate tenure forms provide security without compromising the state's long term land rights, for example, through issuance of "certificates of occupation", which recognise that the claimant has the right to a space within a settlement even though the location of this right is not precisely fixed, and that these rights have the potential to be upgraded over time.
Land inventories or audits of state land, along with legal presumptions that government agencies must prove their ownership of alleged state land, can be effective measures to ensure transparency and consistency in the classification of extralegal occupiers in situations where landholders risk being classified as extralegal even though they are unaware that they live on state-claimed land due to poor quality land governance systems.

3.7 Conclusion

Tenure security is important as it provides confidence that land users will not be arbitrarily evicted and can continue to exercise property rights. Tenure security also provides confidence in accessing and maintaining livelihood as well as in investing and making improvement to land and housing.

This chapter has demonstrated that land title is not the sole instrument for securing tenure. Indeed, two sources of tenure security exist: *de jure* and *de facto*. *De jure* refers to the law, which in this case is land titling and leases. The bitter reality of this source of tenure security is, as outlined in Chapter 1, that the majority of people living in developing countries are without land titles. Although titling efforts have been initiated in developing countries by major international donors, it is still considered costly and time consuming thus often not sustainable for low-income people, where full surveying and registration is involved (Dowall and Clarke 1991; Durand-Lasserve and Royston 2002; Payne et al. 2007, 2009; Reerink and van Gelder 2010). The second source of tenure security outlined in this chapter is *de facto* tenure security. In this type of tenure security, recognition of rights to the land is emphasised, and can be obtained from either government or the society itself. This recognition is supported by a 'rights group' that sees other alternatives other than titles in securing tenure. As Delville and Durand-Lasserve (2009) state, this type of security can depend on social norms and the value system of each culture. As tenure security is also a matter of perception (UN-HABITAT 2006), tenure security also depends on what people perceive it to be (FAO 2005). In this regards, perceived tenure security becomes the source of tenure security itself. It is one important option for low-income households who cannot afford any other form of tenure (Payne 1996). Other alternatives in securing tenure, other than titles, have been presented in this chapter.

This chapter has introduced the concept of tenure security through a review of the relevant literature because it is a major objective in this research. Findings on this subject are presented in Chapter 6.

CHAPTER 4 - LITERATURE REVIEW ON DISASTER RESILIENCE

4.1 Introduction

Similar to Chapter 3, this chapter presents the theoretical basis of disaster resilience as another core concept of the research. This basis is a synthesis of a wide range of literature that is of relevance in exploring the concept of disaster resilience. The purpose of the chapter is to present a resilience-related issue that sets the conceptual framework for answering one of the intermediate research questions outlined in Chapter 1, which is *What constitutes resilience?*

The chapter firstly presents the general concepts of resilience and how the term is related to vulnerability. It justifies the inclusion of vulnerability in resilience analysis. The next section presents four important approaches in assessing disaster resilience based on a general understanding of various resilience concepts presented in the earlier section. The first approach is the scale of resilience, in which individual and system (society) resilience are illustrated. The second and third approaches in assessing disaster resilience are presented in the next section highlighting resilience as a multi-dimensional aspect with various indicators that constitute each dimension of resilience. The last section presents methodologies in measuring disaster resilience.

This chapter provides a conceptual framework of disaster resilience that sets the foundation for the way resilience is defined and assessed in this research study. This chapter will guide how Chapter 7 is presented.

4.2 General Concept of Resilience

The word 'resilience' is derived from the Latin word 'resilio', which means 'jump back' (Klein et al. 2003). The Oxford English Dictionary (2011) defines resilience as (i) the act of rebounding or springing back and (ii) elasticity. A number of resilience literature used in this research (Gunderson 2000;

Handmer and Dovers 1996; Holling 1973; Klein et al. 2003; Manyena 2006) reveal that there were two different fields where the term 'resilience' was originated. Some literatures state that the study of resilience was first evolved from the disciplines of psychology and psychiatry and only since the 1940s. In these fields, the term 'resilience' was used to analyse schizophrenic patients, parental mental illness, poverty or a combination of these (Masten 1999; Rolf 1999; Waller 2001). In that early concept, Waller (2001: p. 291) states that

> Resilience was initially conceptualized as the result of personality traits or coping style that seem to make people continue to progress along a positive developmental trajectory even when confronted with considerable adversity.

Based on that definition, a conclusion could be drawn that since the beginning of its use, the term 'resilience' has been used to describe individual strength in the presence of stress (Rolf 1999; Waller 2001). Moreover, studies done in the fields of psychology and psychiatry also used other related terms associated with resilience such as 'stress-resistance' and 'invulnerability'. However, among them, resilience has emerged as the most used or applied (Manyena 2006).

Another field that has applied resilience to its studies is that of ecology or socio-ecological systems. The term was first introduced to the literature on ecological theory by Holling in 1973 (Gunderson 2000). Holling (1973) defined resilience as "the amount of disturbance that the ecosystem could withstand without changing self-organised process and structures". In the ecological literature, resilience is defined in two ways, each of which reflects different aspects of stability. The first looks at stability as the persistence of a system near or close to an equilibrium state. This way resilience is viewed between *efficiency* and *persistence*, *constancy* and *change*, and between *predictability* and *unpredictability*. In contrast, the second one looks at indicative behaviour of dynamic systems far from equilibrium by defining resilience as the amount of disturbance that a system can absorb without changing state (Gunderson 2000; Holling 1973). Since the 1970s, the term 'resilience' has gained its currency. Is concept has also been used in metaphorical senses to describe systems that

undergo stress and have the ability to recover and return to their original state (Klein et al. 2003). This clearly relates to its original basic meaning of something springing or jumping back to its original shape.

In addition, the term resilience is also used in describing social systems (Adger 2000) and in interdisciplinary work concerning the interactions between people and nature or in the context of interaction between humans and the environment (Carpenter et al. 2001; Folke 2006; Klein et al. 2003). The term 'resilience' is not used to focus merely on ecosystems or societies *per se*, but on the integrated social–ecological system (SES) (Adger 2000; Berkes et al. 2003; Holling and Gunderson 2002). The term 'resilience' is also used in the field of economics (e.g. (Harwood et al. 2011)), medicine (Ward et al. 2011; White et al. 2008; White et al. 2010), psychology (Davydov et al. 2010; Friborg et al. 2006) and social science (Klein et al. 2003). The term is also used in studies on terrorism or terrorist attacks (Kendra and Wachtendorf 2003).

Regardless of the fact that resilience is used in many different fields, there is no one clearly defined and accepted single definition (Cutter et al. 2008; Gallopín 2006; Klein et al. 2003; Manyena 2006). However, among the many definitions of resilience, it is fundamentally argued that resilience is used to describe actions that focus on strengths rather than deficits (Johnson and Wiechelt 2004). Therefore, resilience cannot be discussed in the absence of stress (Rolf 1999).

Table 4-1 presents a selection of the various definitions of resilience based on the broad contexts of resilience discussed above. Those different definitions confirm that resilience is used in the context where 'strength' and 'stress' are present (Johnson and Wiechelt 2004; Rolf 1999). In addition, the term 'resilience' also demonstrates the flexibility of a system to change versus persistence in maintaining initial function in the presence of shock. Based on that concept of persistence and flexibility in relation to response to threats of disturbance, three typologies of resilience of a society or institution are then classified as follows (Dovers and Handmer 1992: p. 495-96):

> *Type 1.Resistance and maintenance* is characterised by resistance to change. The system of this type would avoid change and would typically deny that problems exist. Such a system seems to be very rigid as it is unable to change and lacks of flexibility and ability to adjust to new circumstances. However, this type of system shows apparent stability and certainty and will not make maladaptive change. Maintenance of status quo and of optimising capacity is considered positive.
>
> *Type 2. Change at the margin* is characterised by the acknowledgement of the problem, discussion of the implications and promulgation of reforms that do not challenge the basis of the society but may lead to changes in emphasis at the margins. This may include acknowledgement of the present system that is not sustainable and needs changing. Though the change is seen to be incremental rather than sudden, this type is unlikely to force sufficient change.
>
> *Type 3. Openness and adaptability* is considered the most flexible and it deals directly with the underlying causes of environmental problems by reducing vulnerability. The key characteristic is a preparedness to adopt new basic operating assumptions and institutional structures. The threat of this type of resilience lays in the fact that not all change is positive and flexibility may make change easier which can lead to both environment and human welfare.

In relation to the above, Dovers and Handmer (1992) further distinguished between the reactive and proactive resilience of society. A society with reactive resilience approaches the future by strengthening the status quo and making the present system resistant to change. On the other hand, a society that develops proactive resilience accepts the inevitability of change and tries to create a system that is capable of adapting to new conditions and imperatives.

The proactive resilience described above somewhat coincides with the concept of resilience given by Walker et al. (2004: p. 2) that defines resilience as

> the capacity of a system to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure and identity.

Pelling (2011) describes resilience as 'the degree of elasticity in a system and its ability to rebound or bounce back after experiencing some stress or shock". Therefore, while much work on resilience has focused on the capacity to absorb

shock and still maintain function (Folke 2006), the focus of resilience is more on the system of human communities to withstand external shocks and to recover from such perturbations (Timmerman 1981).

Table 4-1 Selected definitions of resilience

Author(s)	Resilience Definition
Holling (1973)	The persistence of relationships within a system, the amount of disturbance that can be sustained by a system before a change; a measure of the ability of systems to absorb changes of state variables, driving variables, and parametres, and still persist.
Timmerman (1981)	The ability of human communities to withstand external shocks or perturbations to their infrastructure, such as environmental variability or social, economic, or political upheaval, and to recover from such perturbations.
Pimm (1984)	The speed with which a system returns to its original state following a perturbation
Dovers & Handmer (1992)	Within the contexts of global environmental change and sustainable development, reactive and proactive resilience are distinguished. A society with reactive resilience approaches the future by strengthening the status quo and making the present system resistant to change. A society that develops proactive resilience accepts the inevitability of change and tries to create a system that is capable of adapting to new conditions and imperatives.
Adger (2000)	The ability of communities to withstand external shocks to their social infrastructure. (Social) resilience could be measured through proxies of institutional change and economic structure, property rights, access to resources, and demographic change.
Paton, Smith, & Violanti (2000)	The capability to bounce back and to use physical and economic resources effectively to aid recovery following exposure to hazards.
Waller (2001)	Positive adaptation in response to adversity.
Klein, et al. (2003)	The ability of a system that has undergone stress to recover and return to its original state; more precisely (i) the amount of disturbance a system can absorb and still remain within the same state or domain of attraction and (ii) the degree to which the system is capable of self-organization.
Pelling (2003)	The ability to cope with or adapt to hazard stress.
UN-ISDR (2005)	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure.
Norris, et al. (2008)	A process of linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance.
Zhou et al. (2010)	The capacity of hazard-affected bodies (HABs) to resist loss during disaster and to regenerate and reorganise after disaster in a specific area in a given period. It can be conceived as both the loss potential and the biophysical/social response.

4.2.1 Resilience and other related terms

A review of the relevant literature on the subject of resilience revealed that many terms are linked to resilience. Resilience is often used in conjunction with *adaptive capacity* (Carpenter et al. 2001) or *adaptive cycle* (Gallopín 2006; Gunderson 2000). Gunderson (2000) also mentions that adaptive capacity is a component of resilience that reflects the learning aspect of system behaviour in response to disturbance. Other sources view resilience as *the capacity of a*

system (Carpenter, et al., 2001; Handmer & Dovers, 1996; Klein, et al., 2003; UN-ISDR, 2005; Walker, et al., 2004). Walker, et al. (2004) also use the terms *adaptability* and *transformability* that link to or support resilience. Further, Adger (2000) uses the term resistance, recovery and creativity in determining disaster resilience whereas Paton, et al. (2000) and Mallak (1998) respectively use the term *resourcefulness* and *positive adaptive behaviour*. Other terms that are often associated with resilience are presented in Table 4-2.

Table 4-2 Selected terms associated with resilience (Carpenter et al. 2001; Folke 2006; Handmer and Dovers 1996; IOTWS 2007; Klein et al. 2003; Mallak 1998; Paton et al. 2000; Pelling 2011; Walker et al. 2004)

Adaptive capacity	Coping mechanism	Adaptive cycle	Capacity
Adaptability	Transformability	Resistance	Recovery
Resourcefulness	Adaptive behaviour	Stability	Creativity
Bounce back	Efficiency	Persistence	Self organization

4.2.2 Vulnerability[5]

Like 'resilience', the term 'vulnerability' is a contested area with a large literature. It is used in many scientific disciplines from economics and anthropology to psychology, engineering and social sciences (Adger 2006; Wisner 2004). In these disciplines, the term 'vulnerability' has been used to characterise buildings (and other structures), infrastructure (e.g. lifeline, communications), economies (macro, regional), businesses (or commercial activities) and society (Wisner 2004).

Unlike resilience, vulnerability, by contrast, is usually portrayed negatively as the susceptibility to be harmed (Adger 2006). What is common among many definitions of vulnerability is the core notion of 'potential for disruption or harm' (Hinkel 2011; Wisner 2004). Therefore, the concept of vulnerability is used to describe the state of susceptibility to harm, powerlessness, and marginality of both physical and social systems (Adger 2006). The term 'vulnerability' is used to determine the degree to which a system is susceptible

[5] This section does not intend to discuss the concept of vulnerability in great detail. Rather, the concept of vulnerability discussed here will be used to guide the presentation of disaster vulnerability of Camalig Municipality, which is presented in Chapter 5.

to adverse effects (McCarthy et al. 2001). It refers to the potential for a loss by factoring the likelihood of exposure and susceptibility to damage (Cutter 1996).

In the disaster field, the term 'harm' above is referred to as 'hazard', which is often associated with 'vulnerability' since they are mutually conditioning situations and neither can exist on its own; one cannot be vulnerable if one is not threatened, and one cannot be threatened if one is not exposed and vulnerable (Cardona 2004). Therefore, in hazard discourse, vulnerability is defined by the degree to which a system, sub system or system component is likely to experience harm due to exposure to a hazard (Turner et al. 2003). The United Nations International Strategy for Disaster Reduction defines 'vulnerability' as "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard (UNISDR 2009)".

This definition leads to geographical vulnerability of a particular location (Cardona 2004; Cutter 2003). In that regard, vulnerability is related to hazard exposure that is concerned with a location variable or an element's exposure to hazards (Gardner 2002; Turner 2010; UNISDR 2009). Adger (2006) states that exposure is the nature and degree to which a system experiences stresses, which include the frequency, duration and areal extent of the hazard. Therefore, in the hazard and disaster fields, 'vulnerability' refers to the likelihood of being affected and impacted by disasters (Pelling 1997). In this particular aspect, vulnerability is viewed as risk / hazard exposure (Cutter 1996; Weichselgartner 2001). It may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness and limited official recognition of risks and preparedness measures (UNISDR 2009). The concept described above is referred to as 'specific determinants of vulnerability' to a hazard context (Brooks et al. 2005).

In addition to the 'specific determinants', Brooks et al. (2005: p. 2) also state that there are 'generic determinants of vulnerability', which refers to:

> … certain factors that are likely to influence vulnerability to a wide variety of hazards in different geographical and socio-political contexts. These are development factors including poverty, health status, economic inequality and elements of governance.

Therefore, vulnerability is considered an inherent characteristic of a system and the concept of vulnerability often focuses on the situation of a system before a disaster (Cutter et al. 2008). In this regard, 'vulnerability' is viewed as a pre-existing state that includes the distribution of some conditions that stimulate potential loss due to disasters, from physical, social, economic, and environmental factors (UNISDR 2009; Weichselgartner 2001).

The environmental aspect in this regard refers to hazard exposure including frequency and duration (Adger 2006), whereas physical factor refer to general infrastructure and buildings (UNISDR 2009). On the other hand, social vulnerability is most often described using the individual characteristics of people such as age, race, health, income, type of dwelling unit and employment (Cutter 1996, 2003; Weichselgartner 2001). Economic vulnerability refers to lack of access to resources, which include income and poverty (Aysan 1993; Pelling 1997; Timmerman 1981; Wisner 2009). In addition to those factors, Aysan (1993) also identifies the following aspects as relevant:

> *Organisational vulnerability*, which refers to the lack of strong national and local institutional structures.
>
> *Attitudinal and motivational vulnerability*, which refers to the lack of public awareness.

Aysan (1993) outlines three factors that define vulnerability to disasters:

> *Proximity/exposure*: people who occupy or, for their livelihood, depend on areas of high-hazard risk.
>
> *Capacities and resources*: people who have means and capacity to mobilise them in order to increase their defences against hazards.
>
> *Disadvantage/marginalisation*: people who are peripheral or weak due to gender, age, ethnicity, class etc.

The important correlation between exposure and capacity in vulnerability is also argued by Wisner (2009: p. 179) who states:

> … while there is a strong correlation between income and access to resources with the ability of people to protect themselves and, especially, to recover after disasters, all persons at the same level of income do not suffer equally in disaster situations nor do they encounter the same limitation during the period of recovery.

This in turn suggests another extent of 'vulnerability' which emphasises 'coping capacity'; it is described by Wisner (2004: p. 11) as follows:

> By vulnerability we mean the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard.

As the term 'coping capacity' is also used in many resilience discourses (see Section 4.2.1), this demonstrates that resilience and vulnerability are two related concepts, which is discussed in the following section.

4.2.3 Resilience and Vulnerability

Resilience and vulnerability are two related concepts that have gained currency in various types of disaster work (Klein et al. 2003; Manyena 2006). This was particularly so after the publishing of Timmerman's monograph *Vulnerability, Resilience and the Collapse of Society* (1981: p. 8), in which he defined them as follows:

> *Vulnerability* as the degree to which a system, or part of a system, may react adversely to the occurrence of a hazardous event. The degree and quality of that adverse reaction are partly conditioned by the systems; whereas
>
> *Resilience* is the measure of a system's, or part of a system's, capacity to absorb and recover from the occurrence of a hazardous event.

Vulnerability further refers to the potential for a loss by factoring the likelihood of exposure and susceptibility to damage (Cutter 1996). It is also defined by the degree to which a system, sub system or system component is likely to experience harm due to exposure to a hazard (Turner et al. 2003). Vulnerability

is considered an inherent characteristic of a system so the concept of vulnerability only focuses on the situation of a system before a disaster (Cutter et al. 2008). Therefore, there is seemingly a general consensus that vulnerability to disaster is determined not simply by a lack of wealth, but rather by a complex range of physical, economic, political and social factors or the predisposition of a community to damage by destabilising phenomena involving an interdependent natural hazard and anthropogenic pressures (Manyena 2006).

A key question that emerges about vulnerability and resilience is about the relationship of the two concepts. Some sources state that resilience is the opposite side of vulnerability or, in other words, vulnerability is the flip side of resilience (Folke et al. 2002; Klein et al. 2003). Since resilience is clearly related to the capacity of a response component, Gallopín (2006) also sees it as the flip side of vulnerability. Klein, et al. (2003) states that the vulnerability of a system results from reduced resilience so something very vulnerable is therefore not very resilient. In addition, Cimellaro, Reinhorn and Bruneau (2010) state that a community needs to be "prepared" and less "vulnerable", in order to achieve a high "resilience." Manyena (2006: p. 440) further states that:

> The two concepts are opposites or two sides of the same equation on a continuum. Consequently their definitions are dependent on the reference framework or the distance from the definition from the furthest negative and positive pole points. If one situated more towards the positive pole of continuum, one becomes more resilient than vulnerable, and vice versa.

Other sources, however, see the relationship from different angles. Cutter, et al (2008) argue that resilience is a factor of vulnerability; a concept which is questioned with the opposite situation: is vulnerability a factor of resilience? (Manyena 2006). Folke et al. (2002) also list resilience as one of the three elements or determinants of vulnerability, along with exposure and sensitivity. Cutter, et al. (2008) further state that vulnerability and resilience are intersecting concepts.

Those different arguments presented above demonstrate that there seems to be no fixed consensus on the relationship between the two concepts. Manyena (2006: p. 443) concludes that:

> Two views have emerged: one sees disaster resilience and vulnerability as factors of each other, while the other sees them more as separate entities.

To provide further insights, some definitions of vulnerability that are more closely related to resilience are presented in Table 4-3.

Table 4-3 Definitions of vulnerability that are closely related to resilience (modified after (Manyena 2006; Weichselgartner 2001)

Author(s)	Resilience Definition
Timmerman (1981)	Vulnerability is the degree to which a system acts adversely to the occurrence of a hazardous event. The degree and quality of the adverse reaction are conditioned by a system's resilience (a measure of the system's capacity to absorb and recover from the event).
Dow (1992)	Vulnerability is the differential capacity of groups and individuals to deal with hazards, based on their positions within physical and social worlds.
Blaikie et al. (1994)	By vulnerability we mean the characteristics of a person or a group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone's life and livelihood are put at risk by a discrete and identifiable event in nature or in society.
Bohle, Downing, & Watts (1994)	Vulnerability is best defined as an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of potential harmful perturbations. Vulnerability is a multilayered and multidimensional social space defined by the determinate, political, economic and institutional capabilities of people in specific places at specific times
Hewitt (1997)	Vulnerability involves, perhaps above all, the general and active capacities of people – what enables them to avoid, resist or recover from harm. Whereas a hazards perspective tends to explain risk and disaster in terms of external agents and their impacts, vulnerability looks to the internal state of a society and what governs that.
Weichselgartner and Bertens (2000)	By vulnerability, we mean the condition of a given area with respect to hazard, exposure, preparedness, prevention, and response characteristics to cope with specific natural hazards. It is a measure of the capability of this set of elements to withstand events of a certain physical character.

4.3 Resilience to Natural Disasters

In the disaster management field, the term 'resilience' has been widely used especially after the adoption of the Hyogo Framework for Action 2005-2015, in which the United Nations International Strategy for Disaster Reduction put forward ''Building the Resilience of Nations and Communities to Disasters'' (Manyena 2006; UN-ISDR 2005). Since occurrences of natural disasters are sometimes connected to a more global field of climate change (IPCC 2012), the

term is also used in this field (Dovers and Handmer 1992; Pelling 2011; Shaw and Sharma 2011). A recent report of the IPCC also emphasises the importance of pro-active, long-term resilience to future climate events (IPCC 2012).

Specific to natural disasters, UN ISDR (2005: p. 4) defines resilience as

> The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the system is capable of organizing itself to increase this capacity for learning from past disasters for better future protection and to improve risk reduction measures.

Further, Pelling (2003: p. 48) defines resilience as

> The ability of an actor to cope with or adapt to hazard stress, which is a product of the degree of planned preparation undertaken in the light of potential hazard, including relief and rescue.

Based on the above definitions, it is clear that disaster resilience relates to the organisation of a disaster management body in organising and managing its capacity in a pre-disaster situation, hence the importance of disaster preparedness measures. In this case, the focus of the resilience is the preparedness of the stakeholders in responding to the potential natural hazards that may turn to disasters for the surrounding community (UN-ISDR 2005).

Mileti (1999: p. 18) strengthens those definitions by stating that:

> In the context of disaster management, resilience is used to describe the ability to resist or adapt to stress from hazards, and the ability to recover quickly.

The definition given by Wisner et al. (2003) illustrates that disaster resilience is also about the organisation of post-disaster capacity. Related to this, Zhou et al. (2010: p. 7) in their paper on 'geographic perspective of disaster resilience' define disaster resilience as:

> The capacity of hazard-affected bodies (HABs)[6] to resist loss during disaster and to regenerate and reorganise after a disaster in a specific

[6] Hazard-affected Bodies (HAB) is the term used to describe elements that are potentially affected by disasters. It includes community, system, institutions or combination of all (Zhou et al. 2010).

> area in a given period. It can be conceived as both the loss potential and the biophysical/social response.

Reorganisation of hazard-affected bodies requires a strong level of adaptability and flexibility in a system, which is a process of linking adaptive capacities to return to functioning after disasters (Norris et al. 2008). In relation to that Burton et al. (1993) outlines three generic strategies for hazard resilience (Table 4-4)

Table 4-4 Generic strategies of disaster resilience in relation to adaptability and flexibility (adapted from (Burton, et al. (1993) and Klein, et al. (2003)

Strategy	Option	Definition
Choose Change	Change location Change use	Accepting the hazard and changing land use, or even the location of exposed population.
Reduce losses	Prevent effects Modify events	Reducing the impacts of a hazardous event when it occurs
Accept losses	Share losses Bear losses	Bearing the loss, possibly by exploiting reserves, or sharing the loss through different adaptation mechanism.

In the same way, the United Nations International Strategy for Disaster Reduction (2004: p. 18) argues that:

> Resilience analysis includes all the strengths and resources available within a community, society, or organization that can reduce the level of risk or the effects of a disaster. This also includes analysis on how people or organizations use available resources and abilities to face adverse consequences in the face of a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions.

In further discussing the concept of disaster resilience, two existing models of disaster resilience will be presented in Section 4.3.1 and 4.3.2. These two models provide an introduction to the elements of disaster resilience and how they are analysed.

4.3.1 Time, Space and Attribute of Disaster Resilience

The Disaster Resilience of "Loss-Response" of Location (DRLRL) model proposed by Zhou et al. (2010) shows how hazard-affected bodies (HABs) resist loss during disasters and regenerate and reorganise after a disaster in a specific

area in a given period. It conceives disaster resilience as both the loss potential and the biophysical / social response. The model principally sees interaction of biophysical, social and other elements in a particular geographical setting and how they function in three different phases of a disasters: pre, during and after the disaster. In other words, the model recognises two factors that can affect loss potential: geographic setting and social fabric. Geographic setting determines biophysical resilience (includes capacity of HAB, socio-economic structure, local culture), whereas social fabric determine the overall social resilience of the locality (e.g. social structure, response capacity). This model introduces three important factors that define disaster resilience (Figure 4-1) (Zhou et al. 2010: p. 8):

- *Time*, which can be divided into three periods: before (pre-), during and after (post-) disaster. It also can be divided into several periods according to the number of disasters, and the post-disaster period in which one disaster is the pre-disaster in the next disaster.
- *Space*, which can be divided into several spatial scales according to the scope of the disaster-influenced area: community, town, county, province, and country. At each scale, resilience is different due to the various attributes of the HABs.
- *Attribute*, which indicates the content of the HABs, consisting of economic, institutional, social, and environmental characteristics in different localities.

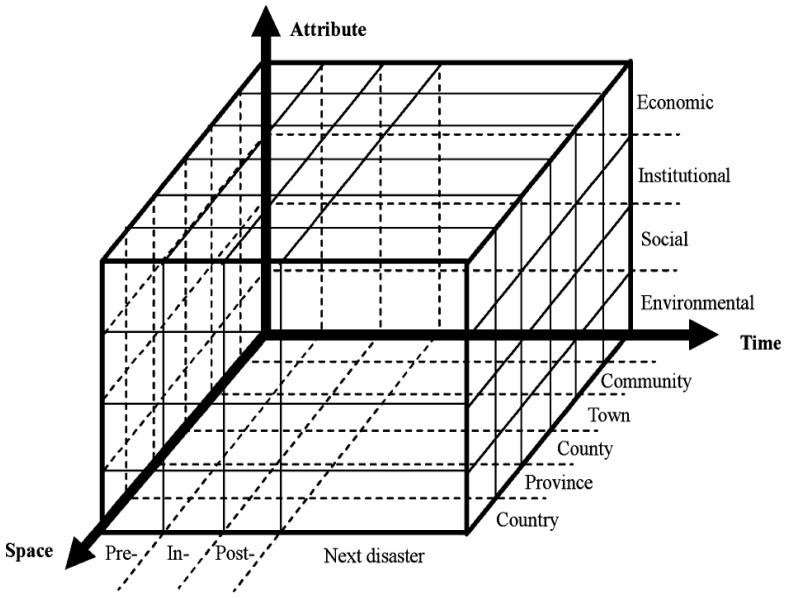


Figure 4-1 Three dimensions of disaster resilience (Zhou et al. 2010)

The theme of this Loss-Response of Location model focuses on the spatial pattern of disaster resilience that later defines which locality is more resilient to disasters. By incorporating the three important dimensions described above, the model can help understand what makes some localities more resilient and how resilience can be enhanced within these locations.

Case study strategy employed in this research (refer to Chapter 2 for more details) is in line with the principle adopted from this model in assessing disaster resilience in a specific geographic location. Meanwhile, the biophysical aspects defined in this model (including capacity of HABs, socio-economic structure, local culture) are presented in Chapter 5.

4.3.2 Inclusion of Vulnerability in Disaster Resilience

Cutter, et al. (2008) argue that analysis of resilience incorporates various aspects beyond resilience or capacity itself. It should be integrated with vulnerability analysis, (since the two concepts are both related, see Section 4.2.2), disaster risk mitigation, and coping responses of a community or a system. The concept of including various aspects in disaster resilience is

proposed in Disaster Resilience of Place Model (DROP) model proposed by Cutter, et al. (2008) (Figure 4-2).

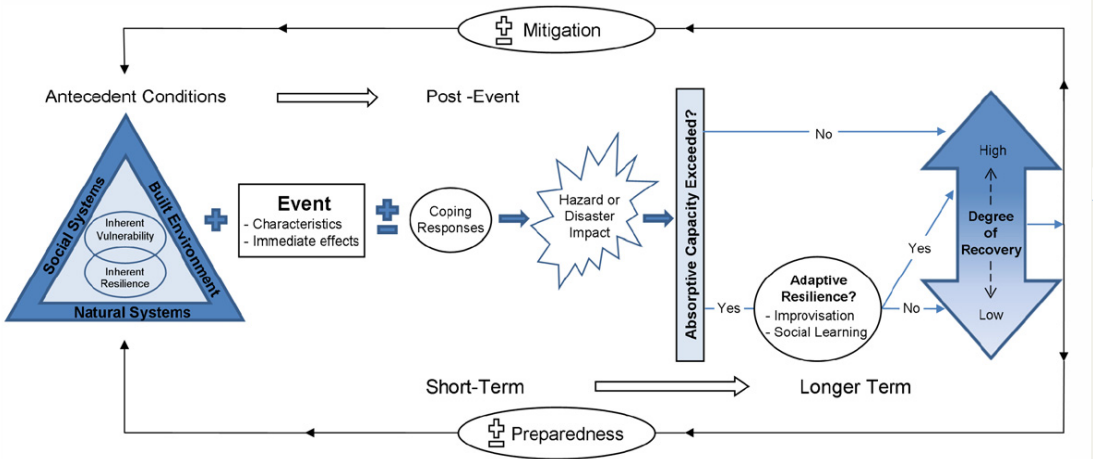


Figure 4-2 Graphical representation of the disaster resilience of place (DROP) model (Cutter, et al., 2008)

This DROP model overlooks all the situations and conditions in a system and how they are affected by incidences of natural disasters. It begins with an analysis of antecedent conditions (including both inherent vulnerability and inherent capacity) being a product of place-specific multi-scalar processes that occur within and between social, natural, and built environment systems (Cutter et al. 2008).

The analysis starts with analysing local or community-level endogenous factors or the existing local situation, which are argued as inherent vulnerability and resilience. The endogenous factors are embodied and influenced by exogenous factors, which are seen as broader systems affecting existing conditions of vulnerability and resilience. The exogenous systems in this model consist of social system, natural system and built environment.

The immediate effects of disasters result from the interaction of hazard events with antecedent conditions. They are attenuated or amplified by the presence or absence of mitigating actions and coping responses in the community. The model also includes an analysis of the coping responses factor, which indicates actions that allow a community to respond in a certain way to the immediate

event impacts. The action includes predetermined evacuation plans, creation of shelters, information dissemination, and emergency response plans (Cutter et al. 2008).

In this model, an effective coping response during the time of a disaster is considered as short term resilience. On the other hand, an effective coping response during a disaster and adaptive resilience that is improved through time and through social learning will determine long-term resilience.

4.4 Approaches in Assessing Disaster Resilience

Based on the discussions in Section 4.3, this thesis outlines four basic principles that are important to include in an assessment of disaster resilience. Each of the four principles below will be discussed further in this section:

- Different scales of resilience analysis
- Various dimensions of resilience
- Indicators of resilience dimensions
- Quantitative and qualitative approach.

These four indicators have set the context for how disaster resilience analysis is conducted. It is further presented in Chapter 7.

4.4.1 Setting the Scale: Individual Resilience and System Resilience

As discussed in Section 4.2, the two fields from which resilience originated reveal that it can be analysed from two different scales: individual and a system or a society perspective. From the disciplines of psychiatry and developmental psychology, resilience focuses on within-person factors. In this case, it is stated that 'resilience was initially conceptualized as the result of personality traits or coping styles when confronted with considerable trajectory' (Waller 2001). Pelling (2003) also views resilience from a human / individual perspective.

On the other hand, in the context of socio-ecology, resilience is viewed from a system perspective. Various definitions given in Table 4-1 reveal that resilience

is a system attribute and its analysis is based on the capacity of a system, interaction in the system when it is disturbed and the ability to bounce back to the same equilibrium state, when faced with stress or disturbances (Carpenter et al. 2001; Dovers and Handmer 1992; Handmer and Dovers 1996; Klein et al. 2003).

Based on those two concepts above and discussions on various definitions given in an earlier section, this research recognises individual resilience as well as society or resilience from a system perspective. This adoption of resilience scale sets the frame on the way the second intermediate objective of the research is answered in this research: 'How is resilience perceived?' The finding on the perception of resilience taking the different scale of resilience discussed above, is presented in Chapter 7.

4.4.2 The Multiple Dimensions of Disaster Resilience

Even after the adoption of the term 'resilience' by UNISDR, there is still uncertainty around the dimensions exactly resilience (Manyena 2006). This is based on the fact outlined in Section 4.2 that there is no defined and accepted single definition of resilience (Cutter et al. 2008; Gallopín 2006; Klein et al. 2003; Manyena 2006). However, there is growing recognition that resilience is multidimensional and multi-determined, and can be best understood as the product of transactions within and between multiple systemic levels over time (Waller 2001). It is important to emphasise again that the multidimensional and multi-determined aspects of resilience, however, still describe the system interaction that show the relationship between *stresses* versus *strength* that result in the ability to bounce back after disasters (Johnson and Wiechelt 2004; Klein et al. 2003; Rolf 1999).

Sivell et al. (2008) state that there are three broad dimensions of resilience, in addition to recognition of individual and collective resilience. They are social, economic and natural / environmental resilience. However, they further state

that those three dimensions can be expanded to transport, health, housing or infrastructure (Sivell et al. 2008).

A more complete list of resilience dimensions is proposed by Cutter et al. (2008). In their paper on understanding community resilience to natural disasters, six broad dimensions of resilience are proposed:

- Ecological
- Social
- Economic
- Institutional
- Infrastructure
- Community competence.

On the other hand Tierney and Bruneau (2007: p. 17), in their resilience analysis as a key to disaster loss reduction, propose four domains of resilience: technical, organizational, social and economic.

> *The technical domain* refers primarily to the physical properties of systems, including the ability to resist damage and loss of function and to fail. This domain also refers to physical resilience.
>
> *Organizational domain* relates to the organizations and institutions that manage the physical components of the systems. This domain encompasses measures of organizational capacity, planning, training, leadership, experience, and information management that improve disaster-related organizational performance and problem solving. The resilience of an emergency management system, therefore, is based on both the physical components of the system—such as emergency operations centres, communications technology, and emergency vehicles—and on the properties of the emergency management organization itself—such as the quality of the disaster plans, the ability to incorporate lessons learned from past disasters, and the training and experience of emergency management personnel.
>
> *Social dimension* encompasses population and community characteristics that render social groups either more vulnerable or more adaptable to hazards and disasters. Social vulnerability indicators include poverty, low levels of education, linguistic isolation, and a lack of access to resources for protective action, such as evacuation.
>
> *Economic domain* refers to inherent properties of economies—their adequacy to sustain life in pre-disaster time and stability or their capacity to be used in post-disaster situation.

Different dimensions proposed by different people as above demonstrate the importance of including various aspects in defining disaster resilience (Manyena 2006). The inclusion of various dimensions as described above supports the basic concepts and principles of disaster resilience analysis adopted in this thesis (see Sections 4.3.1 and 4.3.2) which is that it should include analysis of different attributes in a society and their interaction in a system (Cutter et al. 2008; Zhou et al. 2010).

Since, in addition to system analysis, disaster resilience can be analysed from individual perspective, the analysis incorporates different dimensions too, beyond the concept of psychology outlined in the first section of this chapter (see Section 4.2). Sivell et al. (2008), for example, argues that individual resilience is influenced by many factors, including

- Poverty
- Dependence
- Disposable income
- Location
- Adaptability
- State of housing (including tenure), and
- Awareness.

In relation to adaptation, Pelling (2011) argues that individual / household resilience also depends on economic / physical assets and social assets.

This section confirms the adoption of different dimensions of resilience in assessing the state of resilience in the study area. This is done so as to ensure that the analysis captures all dimensions in the society, their relationship and linkages between different systems in the society to achieve a broader standpoint of disaster resilience (Manyena 2006).

4.4.3 Resilience Indicators

As this research recognises various dimensions of resilience in assessing disaster resilience, it is important to discuss what constitutes each dimension of resilience. This section attempts to discuss that by presenting indicators that build those different dimensions of resilience. It is again based on the

fundamental concept of resilience, which is multidimensional and multifaceted (Cutter et al. 2010; IOTWS 2007; Klein et al. 2003).

The Oxford English Dictionary defines an indicator as "particular information that shows a state or level". A more rigorous definition is given by the International Institute for Sustainable Development (IISD 2009: p. 5):

> Indicators are specific, explicit measures of situation or change brought about by changes in the environment, social actions or activities. They enable measurement of variance over time, space or social category. Usually they measure one thing, which stands as a proxy for a more complex whole.

The importance of an indicator in defining the state or the level of a particular function is stated below (IISD 2009: p. 5):

> An indicator can be defined as that which helps us understand where we are, where we are going and how far we are from the goal. Therefore, it can be a sign, number, a graphic and so on. It must be a clue, a symptom, a pointer to something that is changing. Indicator is information that summarizes the characteristics of systems or highlight what is happening in a system.

Sivell et al. (2008) propose resilience indicators from the perspectives of individual and collective resilience. They consist of a range of disparate factors, often related to wealth and the extent of social support networks, covering all social, economic and natural aspects (Table 4-5). The classification also emphasises coordination between various actors as an important indicator in resilience (Sivell et al. 2008).

Table 4-5 Indicators of resilience according Sivell et al. (2008)

Individual resilience	Collective resilience
Poverty	Resources (GDP)
Dependence	Institutional networks and structures
Disposable income	Inequality
Location	Geography
Adaptability	Economic structure
State of housing	Environment
Awareness	Governance

In looking at resilience from a collective or broad system analysis, Buckle (2006) outlines five general indicators in defining disaster resilience:

1. Knowledge of hazards and community capacity to avoid or reduce the impacts of disasters
2. Shared community values, including positive sense of the future.
3. Established social infrastructure, which includes information channels, social networks and community organizations (e.g. religious clubs, sporting clubs)
4. Positive social and economic trends which include stable or growing population and a viable economy.
5. Partnership between agencies, community groups and private enterprise, or any combination that facilitates innovation, shared knowledge, experience and resources.

The indicators above do not particularly specify indicators of a particular dimension of resilience since the concept of community resilience is based on the social structure of the community (Buckle 2006).

A more comprehensive list of indicators is proposed by Twigg (2009). In his concept of characterising disaster resilient communities, five broad indicators of resilience are proposed (Table 4-6).

The concept proposed by Buckle (2006) and societal-related indicators dispersed in different thematic areas in the concept proposed by Twigg (2009) (e.g. community participation, social protection, see Table 4-6), are what is described as indicators of social resilience (Cutter et al. 2008).

Table 4-6 Components that characterise disaster resilient community and their indicators (Twigg 2009)

Thematic Areas	Indicators
Governance	Policy, planning, priorities and political commitment Legal and regulatory system Integration with development policies and planning Integration with emergency response and recovery Institutional mechanisms, capacities and structures; allocation of responsibilities Partnerships Accountability and community participation
Risk Assessment	Hazards / risk data and assessment Vulnerability / capacity and impact data and assessment Scientific and technical capacities and innovation
Knowledge and Education	Public awareness, knowledge and skills Information management and sharing Education and training Cultures, attitudes and motivation Learning and research
Risk Management and Vulnerability Reduction	Environmental management Health and well-being Sustainable livelihood Social protection Financial instruments Physical protection, structural and technical measures Planning regimes
Disaster Preparedness and Response	Organisational capacities and coordination Early warning systems Preparedness and contingency planning Emergency resources and infrastructure Emergency response and recovery Participation, voluntarism, accountability

Further, Cutter et al. (2008) expanded the indicators by stating the important inclusion of demographic information (e.g. age, race, class, gender, occupation) into that social context. It is based on the fact that social context (e.g. occupation) can lead to information on the level of employment as one indicator of economic resilience. Further, Cutter et al. (2008) mentioned the value of property, wealth generation and municipal finances / revenues as indicators of economic resilience (Cutter et al. 2008). Those two concepts of indicators above demonstrate the importance of defining resilience from individual as well as from system perspectives (see Section 4.4.1). This sets the frame in presenting the resilience status of the study area (see Chapter 7 for details). Further, disaster management-related themes shown in Table 4-6 (risk assessment, risk management and vulnerability reduction and disaster preparedness and response) are classified as indicators of institutional dimension since they are

related to the capacity of disaster management institutions (Cutter et al. 2010). Indicators of other resilience dimensions proposed by Cutter et al. (2008) are presented in Table 4-7.

Table 4-7 Indicators of various resilience dimensions (adopted from Cutter et al. (2008))

Dimension	Indicators
Social	Demographic (age, race, class, gender, occupation) Social networks and social embeddedness Community values-cohesion Faith-based organizations
Economic	Employment Value of property Wealth generation Municipal finance / revenue
Institutional	Participation in hazard reduction programmes Hazard mitigation plan Emergency services Zoning and building standards Emergency response plans Interoperable communications Continuity of operations plans
Infrastructure	Lifelines and critical infrastructure Transportation network Residential housing stock and age Commercial and manufacturing establishments

In the same way, different dimensions of resilience and their sets of indicators have been proposed by Joerin and Shaw (2011). In their classification (Table 4-8), natural dimension is added in addition to physical, social, economic and institutional resilience. Cutter et al. (2008) argue that natural dimension of resilience proposed by Joerin and Shaw (2011) is part of vulnerability analysis, which should also be incorporated in disaster resilience.

Another framework for evaluating disaster resilience was developed by Indian Ocean Tsunami Warning System Program (IOTWS). Their approach uses eight indicators which are: governance, society and economy, resource management, land use and structural design, risk knowledge, warning and evacuation, emergency response and disaster recovery (IOTWS 2007).

Table 4-8 Resilience dimensions and their indicators (adopted from (Joerin and Shaw 2011))

Resilience				
Physical	Social	Economic	Institutional	Natural
Electricity	Population	Income	Mainstreaming of DRR	Intensity / severity of natural hazards
Water	Health	Employment	Effectiveness of crisis management	Frequency of natural hazards
Sanitation and waste disposal	Education and awareness	Household assets	Knowledge dissemination and management	Ecosystem services
Accessibility of roads	Social capital	Finance and savings	Institutional collaboration with other organizations and stakeholders	Land use management
Housing and land use	Community disaster preparedness	Budget and subsidy	Good governance	Environmental policies

For the purpose of this research, four dimensions of resilience (institutional, economic, social and physical) are adapted to describe the resilience status of the study area. As discussed in this chapter, these four dimensions of resilience are the most commonly-used dimensions, parametres or indicators in resilience discourses to describe the state and indicators of resilience (Buckle et al. 2000, 2001; Cutter et al. 2008; Cutter et al. 2010; IOTWS 2007; Joerin and Shaw 2011; Pelling 2011; Shaw and Sharma 2011; Twigg 2009). The result of this analysis is presented in Chapter 7.

4.4.4 Measuring Resilience: Qualitative or Quantitative?

In order to properly assess the level of resilience, it is important to have a benchmark for each indicator. The benchmark represents a generic list of desired conditions against which to evaluate the resilience status. In other words, it is a comparison of the current status versus the ideal situation of each resilience indicator (IOTWS 2007). Examples of benchmarks are presented in Table 4-9.

Table 4-9 Example of benchmark of an indicator (source: research data)

Institutional Resilience	
Indicator	Benchmark
Disaster management policy and political commitment	Established legal framework and institutions provide enabling conditions for resilience through community involvement with government.
Institutional mechanisms, capacities and structures	Clear and established institutional mechanism in different phases of disasters. This includes clear allocation of responsibilities and collaboration / involvement of different agencies in different phases of disasters.
Funding support for disaster management	Established legal framework pertaining to disaster funding and availability of financial support from government to support disaster-related activities, from disaster risk reduction to disaster response.
Hazard mitigation and emergency response plan	Mechanism and networks are established and maintained to respond quickly to disasters and address emergency needs at the community level. This includes establishment of emergency response plan.
Public awareness and community participation	Established strategies on public awareness and existence of disaster drills. High community involvement / participation in different public awareness efforts.

In order to compare each benchmark and current condition as described by a resilience assessment, a rating system can be used. It can be determined either in qualitative or quantitative ways. Quantitatively, scoring (numerical rating) can be a useful approach to evaluate progress toward or achievement of each benchmark. Scores of 0 to 5, for example, can be assigned to each benchmark based on an analysis of the assessment results, as follows (IOTWS 2007):

5: Excellent (81-100 percent fulfilled, sustainable)
4: Very good (61 to 80 percent fulfilled)
3 Good (41 to 60 percent fulfilled)
2: Fair (21 to 40 percent fulfilled)
1: Poor (1 to 20 percent fulfilled)
0: Condition absent

The scores for each reliance element are averaged to give an overall indication of resilience (Table 4-10).

Table 4-10 Example of numerical rating system for each benchmark (source: data)

Institutional Resilience Benchmark	Score*
Disaster management policy and political commitment	4
Institutional mechanisms, capacities and structures	2
Funding support for disaster management	3
Hazard mitigation and emergency response plan	2
Public awareness and community participation	1
Average	2.4

* Score given in this table is for example purpose only. It does not reflect the real assessment

Sivell, et al (2008) also mention the possible use of *weighting and scaling* as other quantitative methods in rating the current situation of each indicator versus the set benchmarks. The problem with *weighting* is that it tends to show that a particular indicator contributes more significantly to resilience than other indicators (Sivell et al. 2008). For example, referring to an indicator presented in Table 4-10, it is not possible to decide that funding support for disaster management is contributing more to disaster resilience than public awareness and community participation.

Indeed, the use of scoring, which is knowledge-based, demonstrates the inclusion of each indicator in defining the level of resilience of each dimension. In other words, this demonstrates the integration of various indicators as a manifestation of the multidimensional concept of resilience discussed in Section 4.4.2. Some of the quantitative-based resilience assessments in relation to natural disasters have been demonstrated in the work of Sivell, et al (2008), Cutter, et al (2010), Shaw and Sharma (2011) and Joerin, et al (2012).

On the other hand, assessing resilience can be done on a qualitative based level. It is conducted by assigning each indicator into qualitative parametres. In this case, instead of quantifying the indicator by assigning value, the status of each indicator is set as, for example, good, fair and poor; or high, medium or low. Symbols can also be used to show the progression of each indicator (IOTWS 2007) (Table 4-10).

Table 4-11 Example of qualitative assessment for each benchmark (adapted from (IOTWS 2007))

Institutional Resilience Benchmark	Status*	
Disaster management policy and political commitment	■	High
Institutional mechanisms, capacities and structures	▲	High
Funding support for disaster management	▲	Low
Hazard mitigation and emergency response plan	▲	Medium
Public awareness and community participation	■	High
Legend	* There is no correspondence between statuses in the form of symbol and on the right column. Status given in this table is for example purpose only and it does not reflect the real assessment ■ / ▲ / ▼ = Good / Good and improving / Good but declining ■ / ▲ / ▼ = Fair / Fair and improving / Fair but declining ■ / ▲ / ▼ = Poor / Poor and improving / Poor but declining	

Since there is no agreed way of measuring resilience, there is no clear criteria on when to use quantitative or qualitative analysis (Sivell et al. 2008). However, the challenge lies in describing its multi-sectoral nature as the conditions defining resilience are dynamic and ultimately change with differences in spatial, social and temporal scales (Cutter et al. 2008).

4.5 Conclusion

The basic definition of resilience presented earlier in this section, which is about *strength* in the presence of *stress* (Johnson and Wiechelt 2004; Rolf 1999) is used as two basic key terms are used in defining disaster resilience in this thesis. *Strength,* in this resilience discourse, reflects what capacity an entity entails in maintaining and building the level of *self organization, preparedness, adaptability, transformability* and *coping capacity* (Handmer and Dovers 1996; Klein et al. 2003; Mallak 1998; Pelling 2011) in the presence of *stress.* In various resilience discourses, the term *stress* is also referred to terms such as *perturbation, shock* and *disturbance* (Holling and Gunderson 2002; Pelling 2003; Timmerman 1981), all of which are referred to as natural disasters in this thesis (this will be discussed in Chapter 5).

In order to have a comprehensive resilience assessment, conceptualising resilience requires analysis on the interaction within and between levels (e.g. individual, community, institutional, environmental) (Buckle 2006). Four different approaches discussed in Section 4.3 will be used in assessing disaster resilience. The foremost concept of resilience in this thesis argues that resilience cannot be seen from one angle. Resilience in this thesis is argued as multidimensional; each of which consisting of a various set of indicators. The important analysis of interaction within and between different levels in that particular dimension was further highlighted as another approach. Therefore, setting up the scale of resilience, either from an individual or society perspective is also discussed in this chapter. Specific to system analysis, quantitative and qualitative methods of resilience analysis have been outlined.

Analysis of disaster resilience should include situations in pre, during and after disasters. A pre-disaster situation in resilience analysis is demonstrated by the pre-condition situation of an entity before the occurrence of disasters. This approach sees the important inclusion of vulnerability analysis in assessing the level of resilience. It is part of the inherent analysis that is argued as a basic endogenous factor of an attribute of resilience analysis (Cutter et al. 2008). This concept then highlights the importance of the information provided in the next chapter, to describe the vulnerability aspect of the community. In the during- and post-disaster phases, resilience analysis must include analyses of strength and available resources and ability to minimise the impacts of disasters. This should include, but should not limited to, analysis on (UN-ISDR 2004):

- Degree of flexibility and persistence of particular functions
- Capacity to absorb shock or disturbance
- Ability to bounce back after the shock and return to normal life.

Since there is no agreed way of measuring resilience (Sivell et al. 2008), discussions presented in this chapter have set the context in which ways resilience analysis can be conducted. The result of resilience analysis is presented in Chapter 7.

CHAPTER 5 - LIVING WITH DISASTERS IN CAMALIG MUNICIPALITY: THE BASIS FOR VULNERABILITY AND RESILIENCE ANALYSIS

5.1 Introduction

The purpose of this chapter is to examine the multiple hazards exposure and vulnerability of the case study area. The presentation of vulnerability of the study area is guided by the discussion in Section 4.2.2. In that section, vulnerability is defined by the hazard exposure and the pre-existing state stimulating potential loss due to disasters including physical, social and economic aspects (Adger 2006; UNISDR 2009; Weichselgartner 2001; Wisner 2004, 2009).

The chapter is organised in three sections, preceded with general information of the study area. The second part of the chapter outlines the community's exposure to natural disasters arising from their geographical vulnerability. It presents natural disaster risks that define the multiplicity of disasters in the study area and hazard profile of the two *barangays*. The last part of the chapter presents vulnerability determinants of the communities at the two *barangays.* It provides base-line information on economic and social vulnerability status including age, income, employment, health status as well as settlements and housing characteristics.

Though the main aim of the chapter is to present data on the two *barangays,* data on the provincial and municipal level is also presented to provide wider situational assessment. What is presented in this chapter will be used as the basis for discussion on resilience from a system analysis and household level perspective in Chapter 7. It is also used as basic information that determines the level of vulnerability, which will be included in the discussion on the relationship between tenure security and resilience, presented in Chapter 8.

5.2 Location

The Province of Albay lies at the southern tip of the island of Luzon and is geographically located at 13° to 13° 32' latitude and 123°15' to 124°15' longitude. On the north-northwest, it is bonded by Camarines Sur, Lagonoy Gulf on the north-northeast, the Pacific Ocean on the east, Sorsogon on the south and Burias on the west. Administratively, it belongs to Region V (Bicol Region) with a total land area of 2,566.77 square kilometres or 256,677 hectares, including three islands.

Camalig Municipality is bounded on the northern side by Mayon Volcano; in the south by the Municipality of Jovellar; in the East by the Municipality of Daraga; and in the west by the Municipality of Guinobatan (Figure 5-1).

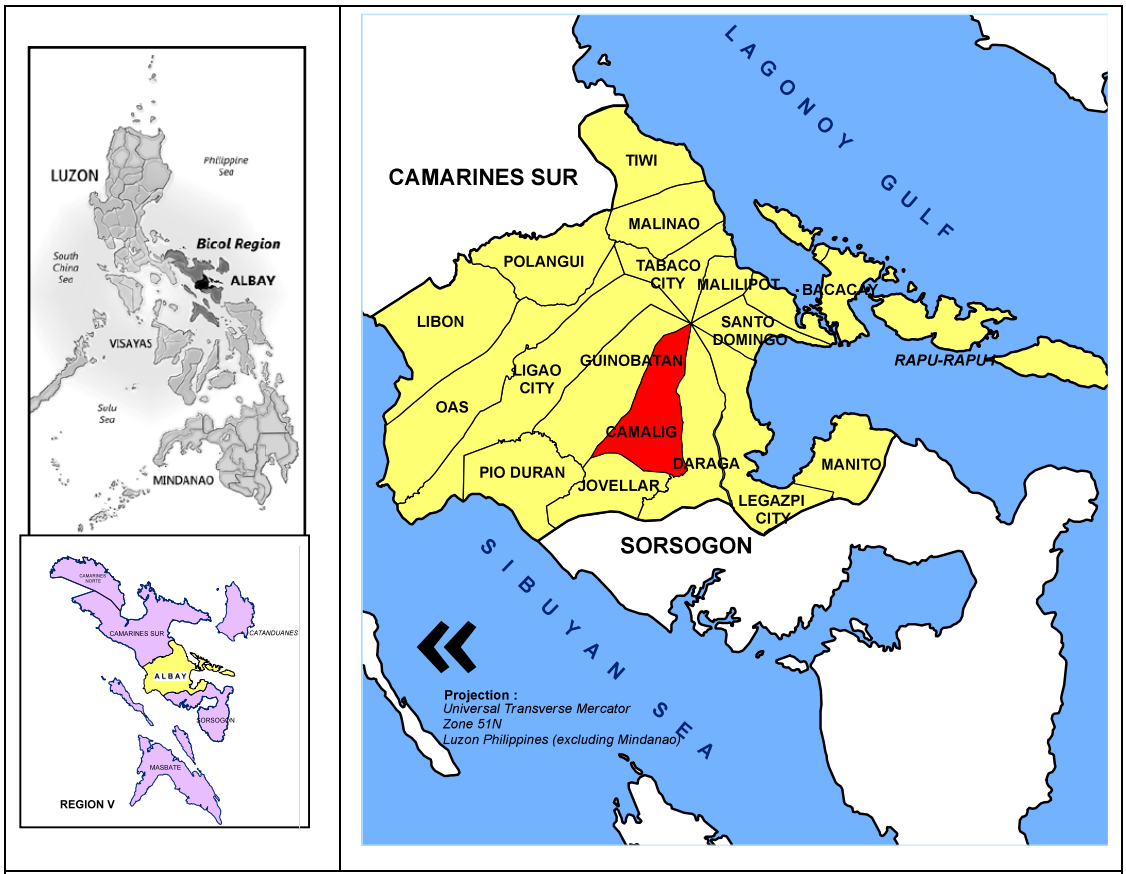


Figure 5-1 Location of Albay Province in Bicol region in the Philippines (left) and position of Camalig Municipality in the province (right) (source: NAMRIA, LGU Camalig)

Camalig is 15 km from Legazpi City, the nearest growth centre, and 516 km south east of Metro Manila. The Municipality has a total land area of 13,088

hectares or about 5.12 percent of the total provincial land area and 0.7 percent of the whole Bicol Region (NEDA 2001).

The topography of Camalig Municipality ranges from 0 to 2460 m with a slope class dominated by level to nearly level (0–3%) and with a total area of 8,405 hectares (Appendices 8 and 9). Gently sloping to undulating (3–8%) land occupies an area of 2,281 hectares, which is mostly in the eastern portion of the municipality (Appendices 5-1 and 5-2). Steep slopes dominate the northern portion with the Mayon Volcano slopes consisting of undulating to rolling elevation (8–18%) with an area of 840 hectares; rolling to moderately steep (18–30%) with an area of 845 hectares; and steep (30–50%) with an area of 357 hectares (MDCC Camalig 2009). Total land area in the municipality is 13,088 Ha comprising 95.5% alienable and disposable lands and 4.5% of forest land which is on the southern flanks of Mayon Volcano.

The Municipality is composed of 50 *barangays*. Seven of these *barangays* are classified as urban and 43 are rural. The two case study areas belong to rural *barangays,* which are adjacent to each other (Figure 5-2).

Barangay Ilawod is located in the northern part of Camalig, bordering with *Barangays* Quirangay and Sua in the north, Tinago and Poblacion in the east, Tagaytay and Tinago in the south and *Barangay* Libod in the west. It is approximately 8 km-10 km from the top of Mayon Volcano. The total land area of Ilawod is 191.3 ha or equivalent to 1.45 % of the total land area of the municipality. *Barangay* Ilawod is relatively flat, falling within 0–30 metres elevation with a slope class of 0–3 percent (level to nearly level). The northern part of the *barangay* is dominated by gently sloping to undulating land which is the lower part of Mayon Volcano.

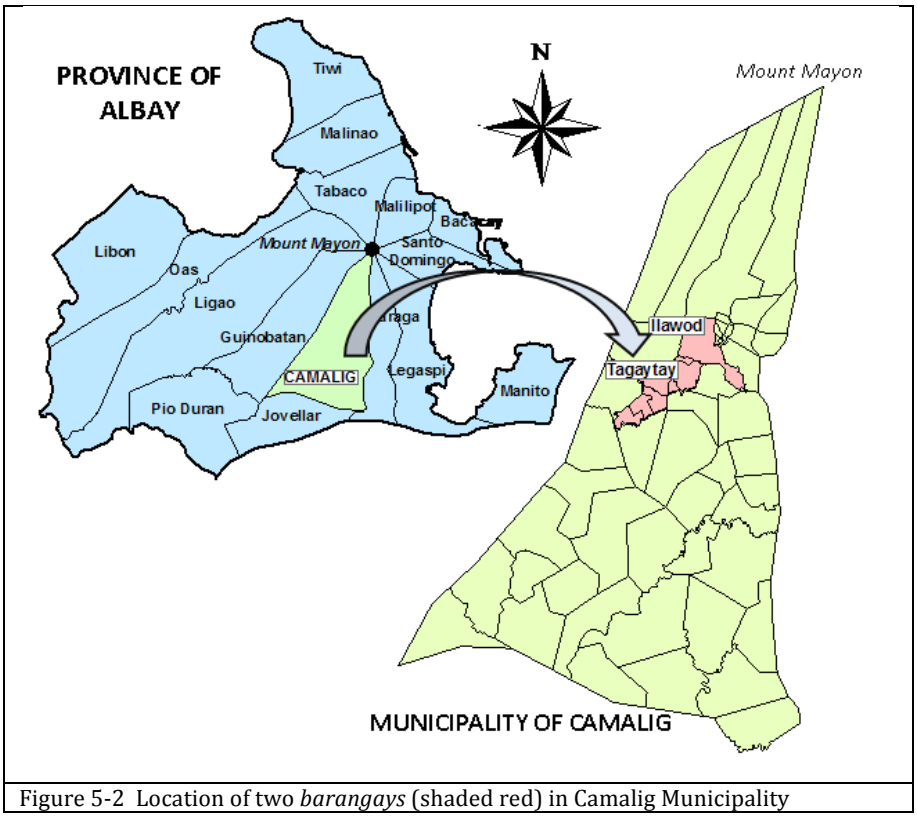


Figure 5-2 Location of two *barangays* (shaded red) in Camalig Municipality

Barangay Tagaytay is located in the central part of Camalig bordering with *Barangay* Sua and Ilawod in the north, *Barangay* Ligban, Gotob and Baligang in the east, *Barangay* Bantonan and Palanog in the south and *Barangay* Bariw and Libod in the west. This *barangay* is located approximately 10–14 km from the top of Mayon Volcano. The total land area of Tagaytay is 280.2 ha or equivalent to 2.14 % of the total land area of the municipality. *Barangay* Tagaytay lies at an elevation of 0–200 metres and consists of slope classes that range from flat to undulating. Administratively, *Barangay* Ilawod is divided into five *purok* whereas *Barangay* Tagaytay is divided into seven *purok* (Figure 5-3). Two of the *purok* in *Barangay* Tagaytay contain new settlements, which include both government assisted housing (BLISS) and new relocation sites (Section 6.2 has more details).

Figure 5-3 Division of *purok* in two *barangays*, map not to scale

5.3 Multiplicity of Natural Disasters

The geographical vulnerability of Albay Province combined with its rapid population growth and slow economic development are identified as the causes of the severe impacts of natural disasters in the province (Government of Albay 2010). The location of Albay along the pathway of three to five typhoons that wreak havoc upon Bicol Region each year, and the presence of the Mayon Volcano, the most active volcano in the Philippines, make Albay Province a recipient of significant suffering from the consequences of natural disasters (Oxfam GB 2008). Out of 19–21 occurrences of typhoons per year in the Philippines, three to five hit the province of Albay. About 198,000 houses are threatened by wind destruction and at least 350,000 people are evacuated because of typhoons (Government of Albay 2010).

The Albay Provincial Development Physical Framework Plan of 2009–2013, identifies threats of natural disasters which are listed below (Government of Albay 2009).

- Threats of Mayon Volcano eruption which affects three cities and five municipalities;
- About 127 *barangays* or about 11,000 to 12,000 families are threatened by landslides;
- Eight municipalities and two cities are threatened by floods;
- About 222,000 people can potentially be affected by earthquakes due to the presence of fault lines in the province; and
- The province has 354 km of coastline and about 300,000 people can potentially be affected by storm surges and tsunamis.

Being one of the most perfectly symmetrical composite volcanoes with smooth and regular concave slopes (Moore and Melson 1969; Wolf et al. 2007), all radial sectors of the Mayon Volcano can equally be affected by its volcanic activities: both aggradational and degradational processes over the long term. Nevertheless, in the short term, activity is not even as pyroclastic flows do not evenly radiate along all its flanks (Paguican et al. 2009). During many of Mayon's eruptions and even during quiescent periods, heavy rain from monsoons and typhoons that are of sufficient intensity and duration can generate debris into lahars on its flanks (Paguican et al. 2009; Rodolfo 1989).

5.3.1 Exposure of Camalig Municipality to Natural Disasters

The exposure of Camalig Municipality to natural disasters is rooted in its geographical location which explains why the municipality is geographically vulnerable to three major natural hazards:

- The municipality is situated along the typhoon belt thus is strongly affected by monsoon (rain-bearing) winds from the southwest from

approximately May to October and from the northeast from November to February. In addition, from June to December, typhoons often strike the archipelago and the island where Camalig is situated (Luzon, in the north) is significantly more at risk than the southern islands (World Bank 2005). The municipality also sits squarely along the pathway of three to five typhoons that affect the region every year (Oxfam GB 2008).

- The municipality is located near Mayon Volcano, one of the 22 very active volcanoes out of 220 volcanoes in the archipelago (World Bank 2005). There have been 53 major eruptions of the Mayon Volcano since records began in 1616 (PHIVOLCS 2010; Ramos-Villarta et al. 1985). In relation to volcanic disasters, six *barangays* in the Municipality of Camalig are situated within the six kilometer permanent danger zone declared by the PHIVOLCS. In addition, 22 out of 50 *barangays* in the Municipality of Camalig were considered as high risk due to the threats of a variety of hazards: typhoons, flashfloods, mudflows, landslides, earthquakes and volcanic eruptions. These 22 *barangays* have a total population of 33,343. The *barangays* of Ilawod and Tagaytay belong to the top three most populated *barangays* in Camalig, which are located in high risk areas.
- The municipality is located within the catchment of the Bicol River Basin, resulting in threats of flooding incidents. The Bicol River is a medium-size river in southern Luzon draining an area of 3,771 sq km. The runoff which is estimated annually at 5,100 million cubic metres, starts from the Mayon Volcano with an elevation of 4,421m, and meanders in a generally northwesterly direction (PAGASA 2009). The municipality is located in the northern part of the basin system.

5.3.2 Natural Disaster Risks in Camalig Municipality

In the Municipal Disaster Management and Contingency Plan of the Municipality of Camalig, eight different types of natural hazards are identified as threats to the municipality based on historical disasters and projection of occurrence. They are volcanic eruption (Pyroclastic flow, lava flow and ash-fall), typhoon, lahar[7] flows, flash floods, mudflows, landslides and earthquakes. These hazards are categorized according to their probability and consequence as well as elements at risk. The consequence is classified based on the following definitions (MDCC Camalig 2009):

- Minor: No deaths or injuries; negligible damage to houses made of light materials
- Moderate: Few injuries; some damage to any part of houses and community buildings or facilities, and people's livelihoods
- Major: Some injuries; few fatalities; significant damage to houses, community buildings, facilities and people's livelihoods
- Disastrous: Many injuries; some fatalities; serious and significant damage to houses, community buildings, facilities and people's livelihoods
- Catastrophic: Overwhelming numbers of injured; many fatalities; almost all community houses, buildings, facilities and people's livelihoods destroyed

Probability of disaster is classified based on its occurrence in the municipality (MDCC Camalig 2009), where:

- Certain is defined as 'known to occur often; at least two times in a year,'
- Likely is defined as 'may occur every one, or at least two years,'
- Possible means 'could possibly occur once every three to ten years,'
- Unlikely means 'expected to occur perhaps once every 11 – 100 years.'

[7] Lahar is "an Indonesian term describing a hot or cold mixture of water and rock fragments flowing down the slopes of a volcano and (or) river valleys" Usgs, 'Lahars and Their Effects', <http://volcanoes.usgs.gov/hazards/lahar/index.php>, accessed 07 June 2011

Risk Summary

The fact that the municipality suffers from different consequences of natural disasters as outlined above, the risk of these disasters is also perceived differently. The Disaster Management Office of Camalig Municipality thus justifies three rankings of risk based on analysis of relationships between vulnerability of communities, hazards' probability of occurrence, consequence of disasters and capacity. The matrix in Table 5-1 demonstrates the hazards, their probability of occurrence, consequences to the community and general interpretation of risks.

Table 5-1 Municipal Risk Register of Camalig (MDCC Camalig 2009)

HAZARD	PROBABILITY	CONSEQUENCE	RISK INTERPRETATION
Typhoon Signal No. 3[8]	Certain	Moderate	Medium Risk
Typhoon Signal No. 4	Likely	Disastrous	High Risk
Ash fall	Likely	Minor	Medium Risk
Lahar flow	Possible	Moderate	Medium Risk
Flash flood	Possible	Disastrous	High Risk
High intensity earthquake	Unlikely	Disastrous	High Risk
Landslide	Likely	Major	Low Risk
Lava and pyroclastic flow	Possible	Minor	Low Risk

5.3.3 Hazard Profile at the two *barangays*

Four major hazards have been identified in the two *barangays* as having a potentially high level impact on the communities; they are listed in Table 5-2. They have been identified as major hazards as they have affected the communities in the last 30-40 years. It is recognised that a major hazard may comprise different levels of other hazards, for example, the wind intensity of a typhoon. The major characteristic of a typhoon is wind and its intensity in each

[8] Philippines Atmospheric, Geophysical and Astronomical Services (PAGASA) classifies 4 cyclone warning signals in the Philippines:
1. Signal # 1 = winds of 30-60 kph in at least 36 hours or intermittent rains expected within 36 hours
2. Signal #2 = winds >60 kph and up to 100 kph expected in at least 24 hours
3. Signal #3 = winds of greater than 100 kph up to 185 kph expected within at least 18 hours
4. Signal #4 = winds of greater than 185 kph expected in at least 12 hours Pagasa, 'The Philippines Public Storm Warning Signals', <http://kidlat.pagasa.dost.gov.ph/genmet/psws.html>, accessed 20 June 2011

typhoon event may differ. For the purposes of identifying major hazards, it is listed as just typhoon. The same can be applied to volcanic eruptions.

Table 5-2 Municipal Hazard and Risk Level Identification in two *barangays* (MDCC Camalig 2009)

Barangay	Hazard and Risk Identification Level Identification			
	Flash floods/ mudflows	Volcanic eruptions	Landslides/ earthquakes	Typhoons
Ilawod	High	High	High	High
Tagaytay	High	High	High	High

The Focus Group Discussions conducted in two *barangays* also revealed the types of hazard that affect the areas. They are listed in Table 5-3 in order of frequency of occurrences based on FGD with community members in *Barangays* Ilawod and Tagaytay.

Table 5-3 Identified hazards in *Barangays* Ilawod and Tagaytay based on Focus Group Discussions with *barangay* communities

Barangay Ilawod	*Barangay* Tagaytay
Typhoon (signal 3 and 4) Mayon Eruption (lava flow, ash fall, lahar flow) Floods (flash floods / river floods) Landslide Earthquake Fire	Mayon Eruption (ash fall, lahar flow) Floods (impact of typhoon in other areas) Landslide / land subsidence Earthquake Fire

5.4 General Vulnerability Profile

In the Philippines, the Bicol Region has the second largest number of poor families and individuals (Oxfam GB 2008). Based on the 2007 census, the total population of Albay Province is 1,190,823 with a density of 464 persons per sq km which, compared to the 2000 census, is a 9.6% increase. Between the two census periods, the population grew at the rate of 1.22 percent annually. This is the second fastest growth area after Camarines Norte which had a growth rate of 1.57 percent. The province has the second largest population in the Bicol Region with a population percentage share of 23.30% to the total regional population (Government of Albay 2009). Among the total population in Albay, 42% live below the poverty line.[9] This group consists primarily of the

[9] According to the National Statistical Coordination Board, the poverty threshold in the Philippines varies by province and region. For Albay Province in Bicol Region, the 2007 threshold was PhP 15,407/year in all areas. In urban areas, it was PhP

disadvantaged sectors of small farm operators, fishers, landless labourers and upland farmers, half of whom live below the subsistence level. The main livelihood in Albay is agriculture that mainly produces coconut, rice, sugar and abaca. Abaca products, such as hats, bags, mats and slippers are also a major source of income in the rural areas, in addition to fishing (Oxfam GB 2008).

The population in Camalig Municipality has continued to grow since 1970 at an average of 0.91% annually. In 2007, the total population in the municipality was estimated at 60,963 and is projected to be 63,350 by 2013 (Table 5-4). The average household size is six which matches the national standard of six persons per household (MDCC Camalig 2009).

Table 5-4 Demography of Camalig Municipality based on 2007 Census (Government of Albay 2010; MoC 2010)

Population (2000)	58,141
Population (2007)	60,319
Projected Population (2013)	63,350
Number of Households	12,766
Growth Rate (1970 – 2007)	0.51%
Population Density	461 per square kilometre
Projected Population Density (2013)	484 per square kilometre

As for key economic activities, 40% of the population depends on farming for their livelihood, 35% are employed in the formal sector, 13% in trade and manufacturing and 12% are engaged in handicraft making. The primary agricultural products within the municipality include rice, corn and coconut. Other products are banana, *pili*[10], papaya, mango, root crops, cocoa, vegetables and fishery (tilapia) products. The potential products for export include abaca handicrafts, *pinangat*[11], cement and coco woven fibre. Limestone, guano, aggregates and clay are the mineral resources available in the municipality (MDCC Camalig 2009).

The vulnerability of the municipality is even increased by the human settlements within the lower part of the river basin thus exposing the

18,343/year and PhP 14,259/year in rural areas. Complete figures are available on http://www.nscb.gov.ph/poverty/2006-2007/pov_th_07.asp

[10] *Pili* is a native Filipino nut, which is a drupe, 4 to 7 cm long, 2.3 to 3.8 cm in diameter, and weighs 15.7 to 45.7 gr. Pili kernel is also used in chocolate, ice cream, and baked goods. Albay Province is one of the main producers of *pili* that is exported largely to Hong Kong and Taiwan

[11] *Pinangat* is a typical dish from Camalig Municipality. This dish is a blend of taro leaves, chili, meat and coconut milk wrapped and tied securely with coconut leaf.

community to the threat of flooding. This is also exacerbated by the increasing incidence of flooding and landslides due to denuded highlands. Interviews conducted with various government officials and focus group discussions with communities resulted in a list of vulnerability factors that match those identified by the municipality. The list below also uses information available from the Disaster Management and Contingency Plan of the Municipality of Camalig (MDCC Camalig 2009).

- Flood control dikes are either destroyed or are non-functional or are non existent in some areas (especially in Mayon Area and the *Barangays* of Ilawod, and Tagaytay).
- Parts of the municipality suffer from urban flooding due to clogged drains and rivers, which are unable to accommodate the volume of flood water. This especially occurs around Mayon Volcano, *poblacion* and *Barangays* Ilawod and Tagaytay.
- Some roads used for evacuation are not properly built or are frequently destroyed by flooding or sedimentation from Mayon Volcano. This is particularly in areas around Mayon and *Barangay* Tagaytay.

5.5 Vulnerability Profiles of Communities at *Barangay* Ilawod and Tagaytay

5.5.1 Population Profile

The majority of the native population in Camalig Municipality are of Bicolano ethnicity and Christian religiosity is deeply rooted in the society. This is one factor that builds strong social connection at the study area (this will explained further in Sections 7.2.2 and 8.3.2.3).

The municipal records for 2008 show that *Barangay* Ilawod had a total population of 2,819, an increase from 2,071 in 2005; the population was comprised of 51% males and 49% females. On the other hand, *Barangay*

Tagaytay had a total population of 2621, increased from 2,530 in 2005. The population in Tagaytay consisted of 48% males and 52% females. With an average of 4-6 persons per household, *Barangay* Ilawod had 615 households whereas *Barangay* Tagaytay had 672 households. The population in Ilawod is projected to increase by 16% by 2013 and almost similarly, by 17% in Tagaytay (MDCC Camalig 2009; MoC 2010). These population statistics (Table 5-5), especially for *Barangay* Tagaytay, do not include the population of the two resettlement sites being administered in Tagaytay (see Section 6.2.4 for more details).

Table 5-5 Demographic profile of the two case study area (MDCC Camalig 2009)

	Ilawod	Tagaytay
Total population (2008)	2819	2621
- Male	1425	1263
- Female	1394	1358
Number of households (2008)	615	672
Projected population (2013)	3009	2969
Projected population density (2013)	11.71	6.52
Average annual population growth rate (2000-2008)	0.3%	0.3%
Average annual household income (2005)	PhP 80,000 – 90,000	PhP 70,000 – 80,000

In terms of disaster risk, the Municipal Disaster Management Office declares that the whole population of *Barangays* Ilawod and Tagaytay are at risk of typhoon and lava / pyroclastic flow and ash fall, but more people in Ilawod are at risk of flash flood, lahar/mud flow and river flooding (Figures 5-4 and 5-5).

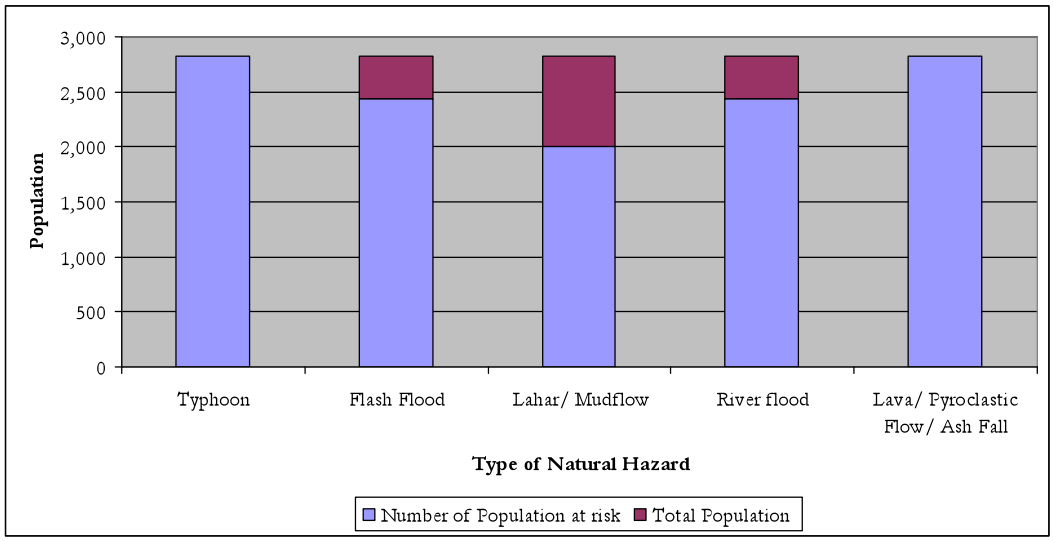


Figure 5-4 Total population *versus* population at risk to different hazards in Ilawod (MDCC Camalig 2009)

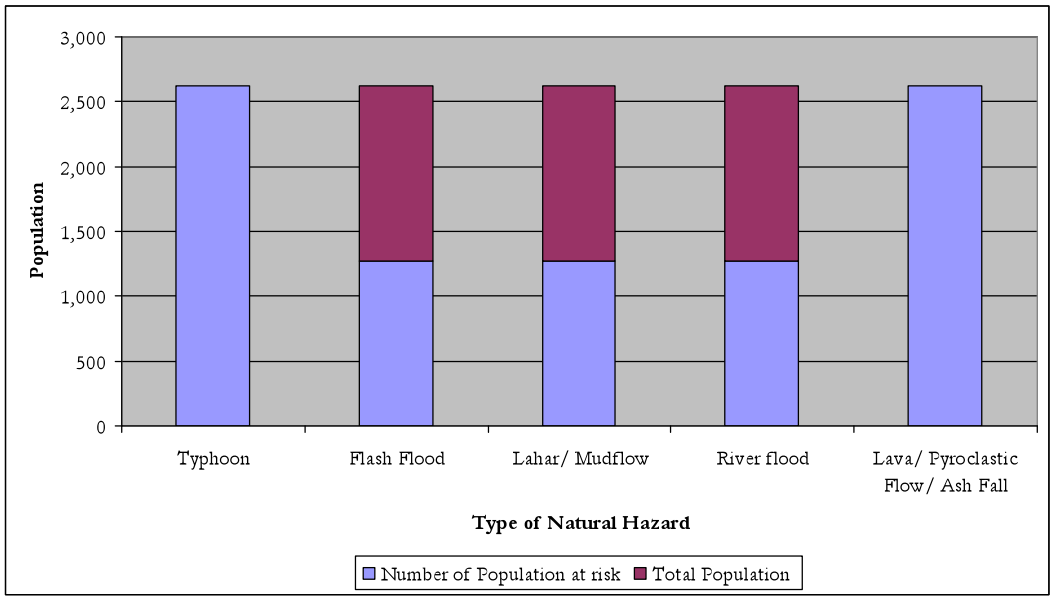


Figure 5-5 Total population *versus* population at risk to different hazards in *Barangay* Tagaytay (MDCC Camalig 2009)

5.5.2 Economic Profile

The economy of the population in the two *barangays* in the study area largely depends on agriculture. Sixty percent of Ilawod's total population depends on farming, 20% are engaged in handicraft-making and 20% are unemployed. The farming households cultivate *palay*[12] as a main crop, in addition to vegetables and coconut. While coconut is grown all year, *palay* is grown from May to November and vegetables from December to March.

In *Barangay* Tagaytay, about 40% of total households are engaged in farming, 30% are unemployed and the remaining 30% are handicraft-makers. Like in *Barangay* Ilawod, the farming households cultivate *palay,* coconut and vegetables, but also *camote*[13], cassava and corn.

Sixty to ninety percent of these crops are marketed in the local public market in Camalig central. The market is open every day including a fresh food market for vegetables, fish and meat. However, the fresh food market where all farmers

[12] *Palay* is a Filipino term for an erect grass, *Oryza sativa*, that grows mostly in Asia on wet ground and has drooping flower spikes and yellow oblong edible grains that become white when polished
[13] *Camote* is a Tagalog word, derived from Spanish, for sweet potato.

from different *barangays* in the municipality sell their products only opens on Saturdays. This is where the local farmers not only sell their products to individual buyers, but they also look for potential regular customers who are willing to buy their products in bulk. In addition, local villagers also market their products to their neighbours in front of their houses for local and daily consumption. In both *barangays*, many households also establish a small grocery shop (locally known as a *sari-sari* shop, Figure 5-6) to help sustain their daily needs and support the local economy. Both small and large *sari-sari* shops are becoming so popular that it is not surprising to see them every 100–200 metres in the settlements. The establishment of a *sari-sari* shop may bring more income to a family but as it has to compete with others there is the risk of closure (this will be explained further in Chapter 7).

The increasing role of women in the livelihood of a family is demonstrated by the fact that they grow most of the vegetables. Those not engaged in farming may venture into production of handicrafts, namely *abaca*[14] slippers, bags and other handicraft items (Figure 5-6). These handicraft products are marketed at the Camalig public market and locally exported to Legazpi City, the capital of Albay Province.

Figure 5-6 Typical *sari-sari* shop and slippers produced by the communities at the two *barangays* (photos by author)

[14] *Abaca* is a species of banana native to the Philippines and also grown as a commercial crop in Ecuador, and Costa Rica. The dried fibre of abaca is used to make slippers and bags.

5.5.3 Settlement and Housing Characteristics

The three major characteristics of housing construction in the two *barangays* are:

- Full reinforced concrete house, generally owned by the richest group in the *barangays*. The ages of these houses are generally less than 10 years old. The owners generally understand the risk of hazards thus their houses were built on elevated ground, approximately 30–70 cm above the ground level to avoid the impact of flooding.
- Semi-concrete buildings with corrugated iron sheets and *nipa*[15] for roofing. Mostly, the houses of this type have been upgraded from the original settlement houses. The structure has been strengthened to avoid destruction by strong winds from typhoons.
- Houses made of light materials. The materials such as bamboo and *nipa* used to build this type of house can be obtained locally at very low cost. The owners usually belong to the lowest socio-economic group, most of whom do not have permanent income.

There is a general pattern of settlement *vis-à-vis* the different type of houses. The full reinforced and semi concrete houses are mostly built along the main provincial road or along the main road in the *barangay* centre. Houses made of light materials are built in the forest, inside the boundaries of land managed by the occupants or in rural settlement blocks away from the main road. Most informal settlements along the river bank also have houses constructed of light materials whereas informal settlements along the railway usually have semi-concrete houses (Figure 5-7). However, many of the informal settlers also have permanent-type of houses built fully of concrete (this will be explained further in Section 6.2.1).

[15] *Nipa* is a local term for palm trees. In rural parts of the Philippines, *nipa* is used for roofing as it is easily available i.e. a no or low cost housing material. Most informal settlers start their houses with *nipa* roofing.

Figure 5-7 General characteristics of settlements in study area: house built with light materials (A), full reinforced concrete house (B), semi concrete houses with *nipa* for roofing (C) and corrugated iron sheet (D)

Since there are no building codes applied in the two *barangays*, a mixture of house types is common. The exception is in *Barangay* Tagaytay where two government-assisted housing schemes (resettlement sites and BLISS, housing for the poor) were built under the *barangay*'s administrative areas. Since the two government housing schemes were funded by the government, the houses are constructed similarly with reinforced concrete materials (Figure 5-8). Details of these two housing schemes are presented in Chapter 6 (see Sections 6.2.3 and 6.2.4).

Figure 5-8 Uniformity of housing in resettlement site. Background is the flank of Mayon Volcano (photo by author)

The multiplicity of natural hazards in the study area has exposed a large number of houses in the two *barangays* to risk from different natural disasters. 95% of houses in Ilawod are at risk of lava / pyroclastic flow and flash floods, about 80–83% are at risk of typhoons and flash floods and 18% from lahar / mud flow. In Tagaytay, 94% of houses are exposed to typhoons whereas about 60% are exposed to different volcanic disasters (MoC 2010). This is due to the fact that Tagaytay is located 2-4 kilometres further from the top of Mayon Volcano, thus is considered safer from the impact of volcanic hazards.

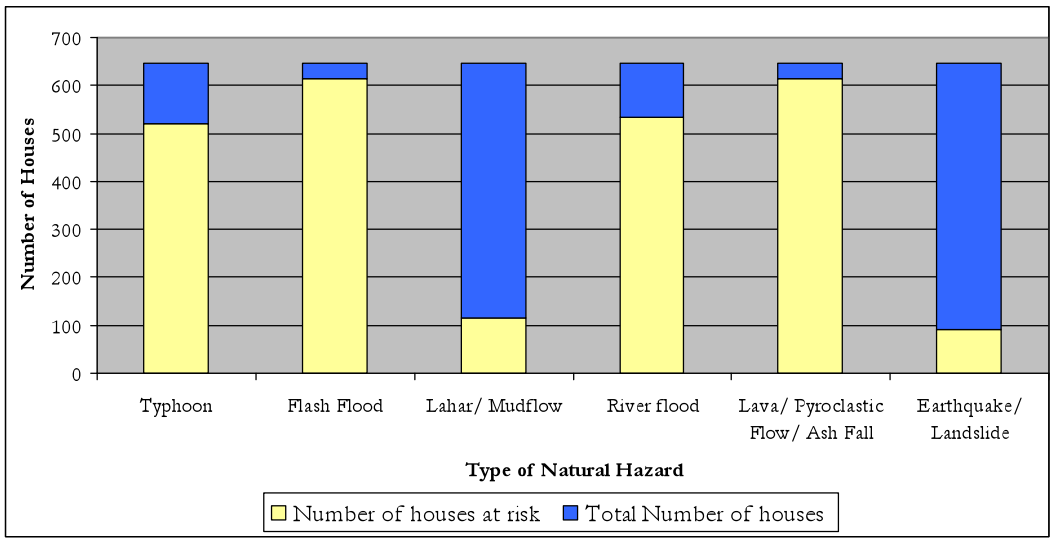


Figure 5-9 Total number of houses and percentage of houses at risk of different natural hazards in *Barangay* Ilawod (MDCC Camalig 2009).

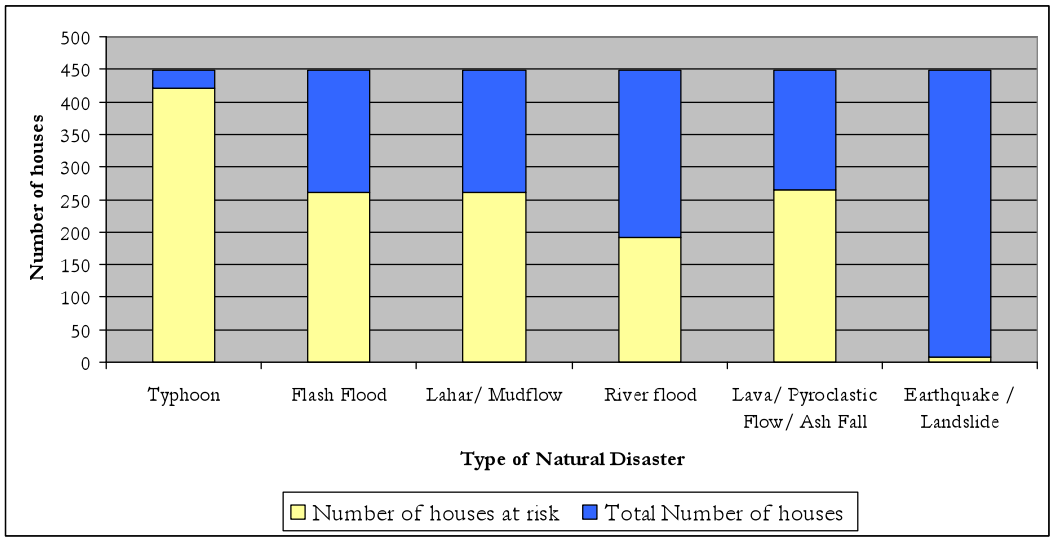


Figure 5-10 Total number of houses and percentage of houses at risk of different natural hazards in *Barangay* Tagaytay (MDCC Camalig 2009).

5.6 Conclusion

The life of communities in the study area and the geographical vulnerability of the study area have been demonstrated in this chapter, from the provincial scale, down to municipal and *barangay* levels. The geography is clearly the key

element in how the study areas are exposed, thus prone to different types of natural hazards. Socio-economic, population and settlement characteristics have been presented to outline the vulnerability profiles of the communities in the study area. This chapter has demonstrated how communities, with economic constraint, face various types of disasters. These exposure and vulnerability have made the communities used to dealing with disasters and their negative impacts.

This chapter lays the basic information to justify the vulnerability level and is used as a basis to analyse the level of community resilience which is further discussed in Chapter 7. Discussion in Chapter 8 also refers the information presented in this chapter.

CHAPTER 6 - PERCEIVED TENURE SECURITY

6.1 Introduction

This chapter is a major element of the analysis in the research. It presents one major finding of the research as it discusses the first intermediate objective outlined in Chapter 1, which is the perception of tenure security held by communities with different tenure groups. The findings described in this chapter are the views of the local communities in terms of their understanding of their level of tenure security. This chapter is organised around the results of the interviews, focus group discussions and participant observations as discussed in Chapter 2.

This chapter commences with a discussion of tenure systems in the study area. In comparison to the broader concepts of tenure systems outlined in Chapter 3, this chapter presents the existing tenure systems and groups and describes each tenure type. The next section discusses the degree of formality of various tenure groups based on different rights attached to them *vis-à-vis* perceived tenure security and factors that improve their perception of tenure security. Quotes from interviewees of different tenure groups are presented to provide facts that strengthen the discussion. The last part of the chapter presents the degree of security of different tenure groups and how tenure groups with greater insecurity move along a continuum of tenure security. This chapter concludes with discussions on sources of tenure security and factors that constitute tenure security by different tenure groups.

6.2 Tenure Systems in the Study Area

The land tenure systems in the study area are comprised of different types of tenures namely land titles, informal settlements, tenancy and government-assisted housing (Figures 6-2 and 6-3). Two schemes of government-assisted

housing exist in the study area, namely BLISS[16] and resettlement sites. BLISS is an initiative in providing housing to low-income families whereas resettlement is aimed at providing safer housing to families living in hazard-prone areas (see Sections 6.2.3 and 6.2.4).

The analysis of the tenure systems is based on the land tenure type for individual housing plots in the two study areas. For most of the tenures considered in this research, the tenure refers to a parcel of land on which there may or may not be a house. In the case of informal settlements, the tenure is related to the house and the amount of land used by an individual family varies considerably.

Data and figures described in this section are result of tenure mapping that was discussed in Chapter 2.5.1. Based on the records of the Land Registration Authority on the cadastral survey conducted in the 1920s, only 37% of the total 574 land lots in the two *barangays* in the study area are titled or are registered as land titles (Figures 6-1a and 6-1b). There are 646 buildings in *Barangay* Ilawod whereas in *Barangay* Tagaytay, there are 2,278 buildings including two relocation sites that consist of 1677 buildings occupying one *purok*[17] each (Table 6-1 and Table 6-2).

Table 6-1 Number of buildings in *Barangay* Ilawod

BARANGAY ILAWOD					
Purok	**Tenant**	**Titled**	**Informal Settlers**	**Public**	**Total**
Purok 1	8	36	90	2	136
Purok 2	4	43	119		166
Purok 3		32	12	1	45
Purok 4		38	69	12	119
Purok 5	76	21	81	2	180
	88	170	371	17	
		T O T A L			**646**

[16] BLISS stands for *BangongLipunan* (Tagalog terms that mean 'new society') Improvement of Sites and Services.
[17] *Purok* is the smallest political subdivision of the barangay in the Philippines, especially in rural areas.

Table 6-2 Number of buildings in *Barangay* Tagaytay

BARANGAY TAGAYTAY							
Purok	**Tenant**	**Titled**	**Informal Settlers**	**Public**	**BLISS**	**Resettlement**	**Total**
Purok 1					59		59
Purok 2		18	61	1			80
Purok 3	7	21	80	2			110
Purok 4	15	56	73	1			145
Purok 5	82	6				520 (old)	608
Purok 6	5	58		1		1157 (new)	1221
Purok 7	3	57					60
	112	216	214	5	59	1677	
T O T A L							**2278**

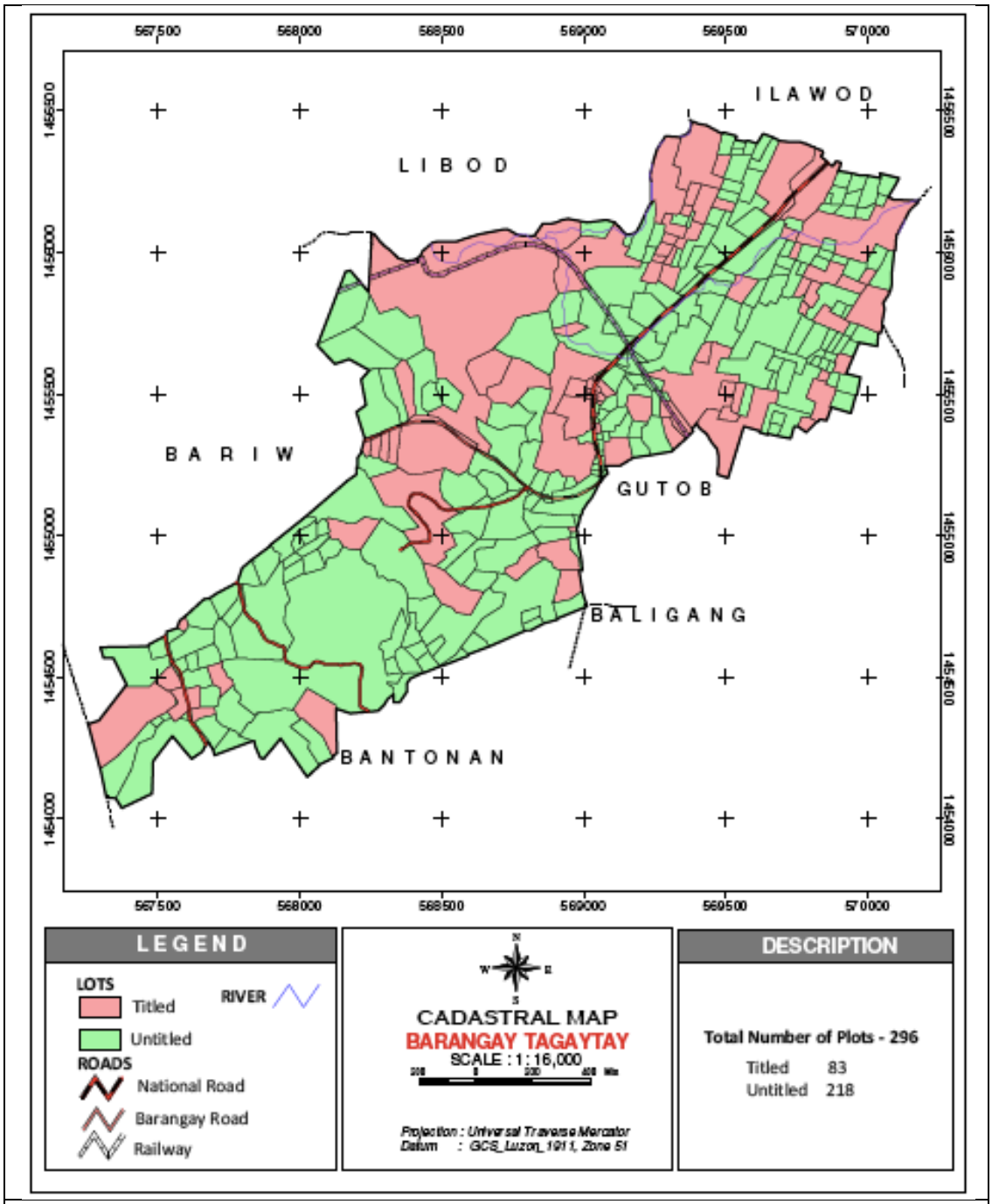


Figure 6-1. a. Comparison of titled (red) and untitled plots of land (green) in *Barangay* Ilawod (left). Data on cadastral lot numbers were obtained from Municipal Assessors Office in Camalig and status of cadastral lots was obtained from Office of Registry of Deeds, Albay Province. Projection Map is from NAMRIA and Land Management Sector, DENR Region V

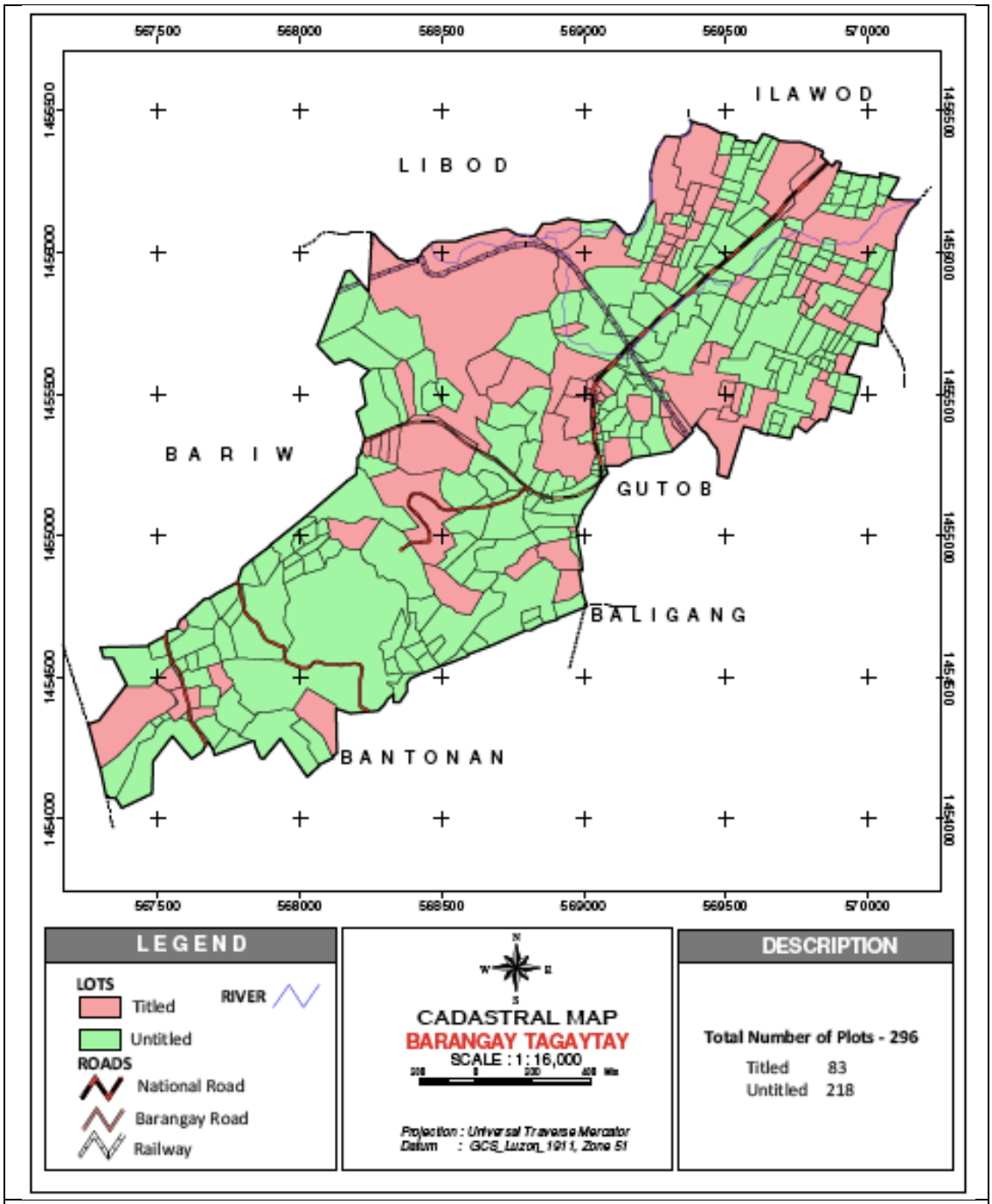


Figure 6-1. b. Comparison of titled (red) and untitled plots of land (green) in *Barangay* Tagaytay. Data on cadastral lot numbers are obtained from Municipal Assessors Office in Camalig and status of cadastral lots is obtained from Office of Registry of Deeds, Albay Province. Projection Map is from Land Management Sector, DENR Region V. Base map is from NAMRIA

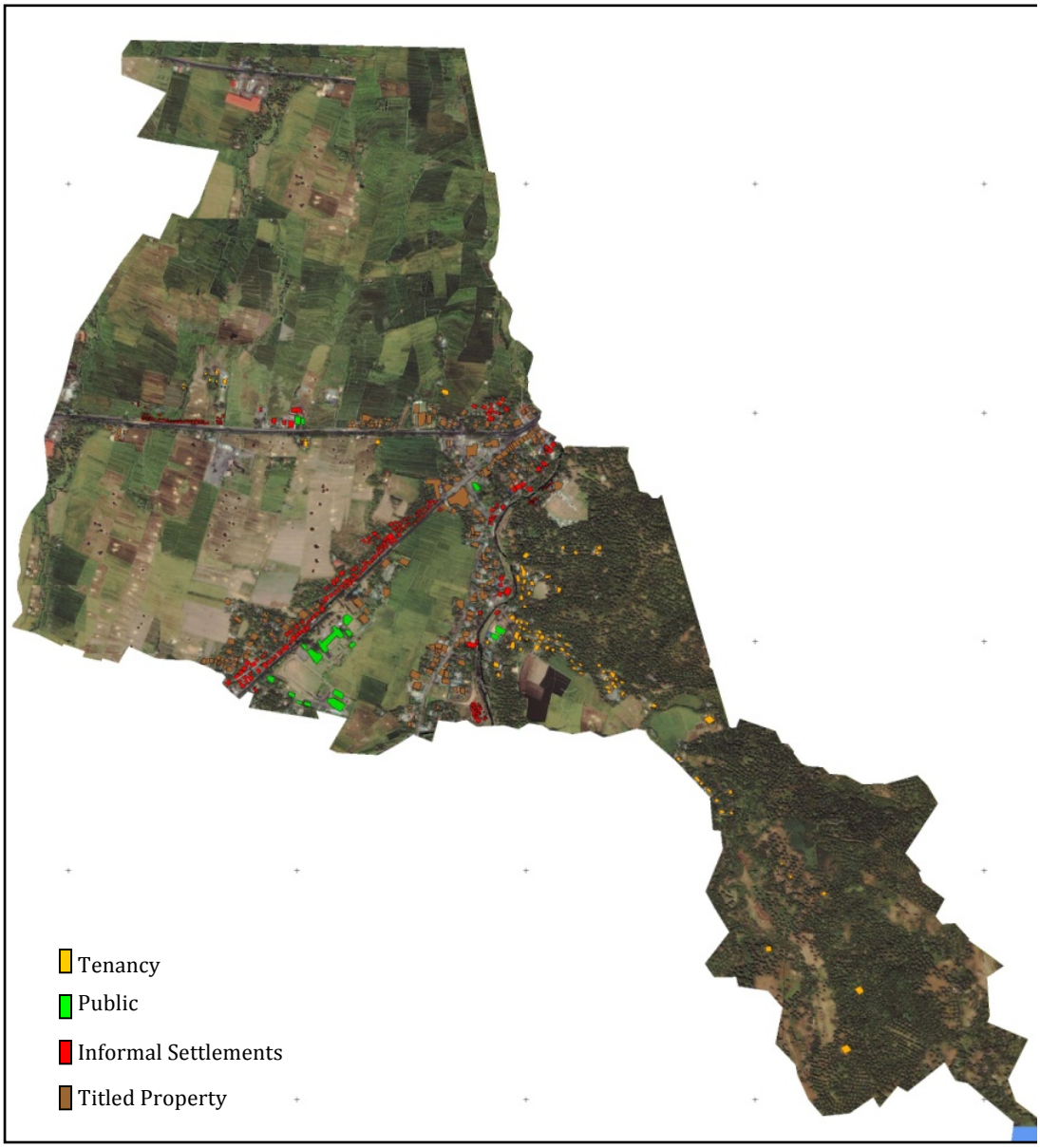


Figure 6-2 Distribution of tenure systems in *Barangay* Ilawod. Image Source: GeoEye-1 (60 cm resolution) from Google Earth. Map Not to Scale

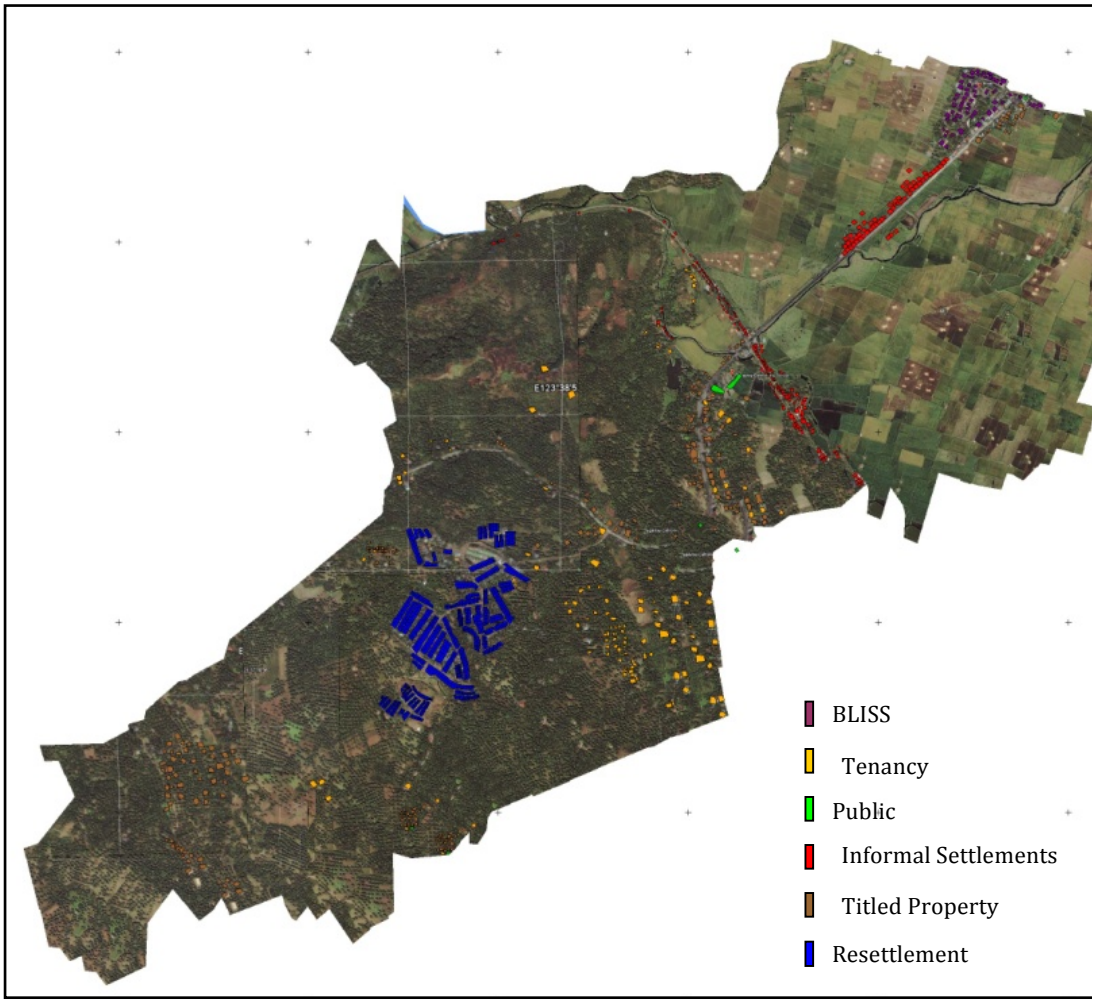


Figure 6-3 Distribution of tenure systems in *Barangay* Tagaytay. Image Source: GeoEye-1 (60 cm resolution) from Google Earth. Map Not to Scale

The tenure group with the highest number is the resettled communities. These are communities living in disaster-prone areas that were relocated to new safer sites selected by the local government (see discussion on resettlement groups in Section 6.2.4). The number of resettled communities demonstrates the physical vulnerability of people living around the study area. Prior to this resettlement, informal settlers accounted for most of the housing. Figure 6-4 emphasizes the dominance of informal settlement in tenure system.

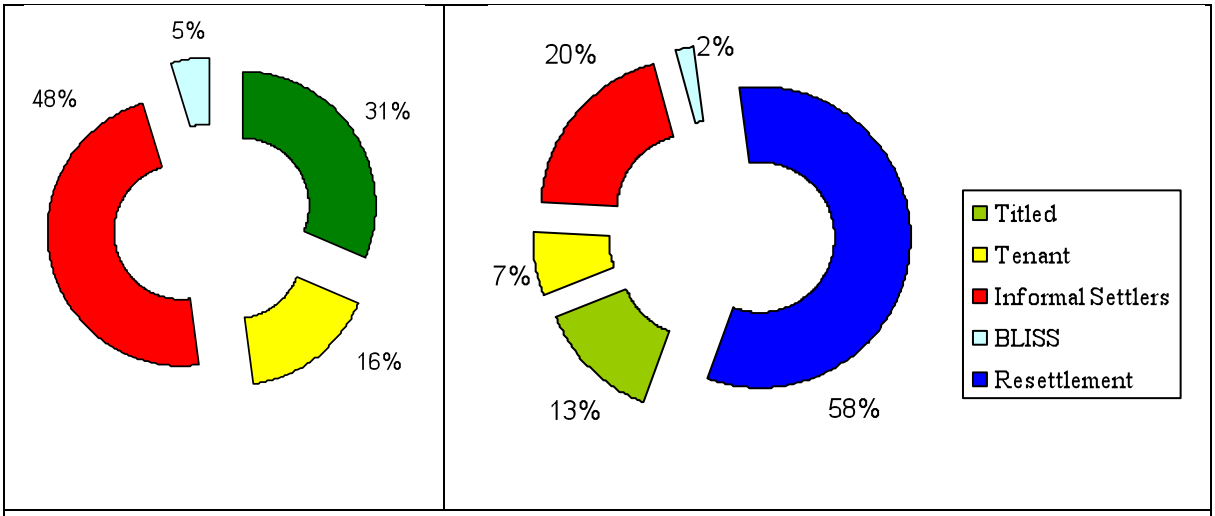


Figure 6-4 Percentage number of tenure systems in the study area. In normal situations, without including newly-established resettlement sites, the study area is dominated by informal settlers (left) that account for almost 50 percent of the total settlement

Details of each land tenure system in the study area are presented in Section 6.2.1 – 6.2.5. Data and analysis presented in these sections were acquired from tenure mapping; in-depth interviews and focus group discussions conducted with each tenure group.

6.2.1 Informal Settlements

Surveys conducted in the two *barangays* have shown that there are about 371 informal settlers out of 646 households in *Barangay* Ilawod itself or about 57% of the total number of households in the whole *barangay*. In the original setting of *Barangay* Tagaytay, i.e. excluding the additional houses at the old and new resettlement sites, 371 out of 606 houses or about 61% in the *barangay* are occupied by informal settlers.

The informal settlers are mostly squatting in four primary locations: (1) within a 15 meter strip of the railway, (2) within a 15 meter strip of the river or on the river bank itself and (3) within 25 metres from the centre of the main road. Some families also squat inside (4) forested areas (Figure 6-5).

There are many reasons why people squat and become part of informal or resettled groups. Interviews with informal settlers living in each of those four

primary locations revealed different motivations to move into the informal places they occupy now:

- Seeking space to live: most households identify this as the main reason to squat and move from one place to another. Some moved from a squatting life in big cities, especially Metro Manila, to squatting in this area because of the difficulties they had faced in more compacted settlements and the stricter rules for informal settlers in big cities. The threat of eviction and the 'hide and seek' practices for living frequently becomes the motivation to move to more rural areas. The length of time in an area varies from recent squatters (less than one year) to families living in an area for 40-70 years. Interestingly, the length of a period of occupation has also resulted in the inheritance of land and houses. In this case it has increased the communities' sense of belonging to the land and houses that they occupy. A number of people also moved to follow their spouses who had been squatting there, especially after getting married. This happens to females who followed their husbands who had been working around the area. A few cases were also found where the men moved to live with their wives and their wives' families. Despite the strong family bond in the Philippines society, the issue of privacy and the urge to have their own spaces encouraged more new informal settlements thus expanding the size of informal settlements. This expansion caused by marriage usually takes place by constructing small houses at the rear of the main family houses. As the practice continues, more public lands are occupied, which explains the occupation of river banks as a new pattern of settlement.

- Seeking jobs and livelihood opportunities: this encourages more new informal settlements in the study area. Some squatters see the opportunity of getting a better life by moving from a city squatting

life to a rural area, believing there are more opportunities in farming. The complexity of life through squatting in the city made some people want to establish a new life on a more permanent basis. In this case, this group of people sees the promise of permanent land even without formal titles or registration prior to occupation.

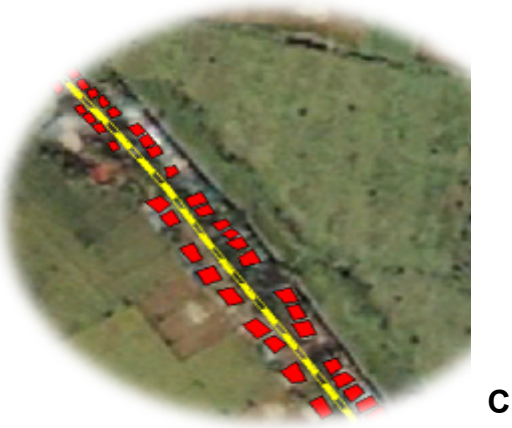


Figure 6-5 General patterns of informal settlers (red buildings) in *Barangay* Ilawod (A). Informal settlement within the 15 meter strip of the main road (B) and along the railway (C). Map not to scale

The sizes and the structures of houses of the informal settlers vary, depending on the length of occupation and the capital they have available to invest in the

construction. Some of the houses are made of *nipa*[18] trees and bamboo, duplex and bricks (Figure 6-6). The majority of the houses are a combination of bricks and bamboo.

They are not concerned about investing capital in building homes on state land (government land as they call it). Some of the houses look stylish and strong. Businesses can be established inside houses such as art studios, internet cafés, beauty salons, grocery shops, bakeries, and small restaurants or eateries.

Figure 6-6 Closer look at settlements near the railway (A) and on the river bank (B and C). The two-storey house built along the main road showing investment by the informal settlers (D). The ground floor of the house is used as an internet café as one of the income sources

On the other hand, the construction of many of the houses are very basic, utilising local resources, particularly bamboo and nipa trees. However, the

[18] *Nipa* is a local term for palm trees. In rural parts of the Philippines, nipa is used for roofing for being easily available i.e. a no or low cost housing material. Most informal settlers start their houses with nipa roofing.

settlers all believe that their houses will be improved as they gain more capital. They have no fear of investing in their dwellings despite their informal status of settlement. During focus group discussions and interviews, informal settlers also expressed their full sense of belonging to their house and the land they occupy. Most of them realise that there is always the threat of eviction to their occupancy since the land does not officially belong to them or they occupy parts of roads and railways. However, they also know their rights to being provided with housing if the government evicts them.

An Administrative Order issued by the Department of Environment and Natural Resources (DAO) No. 98-12, issued in March 1998, indicates that no houses are to be built within 15 metres of a railway or road or within 50 metres of a body of water (Figure 6-7).

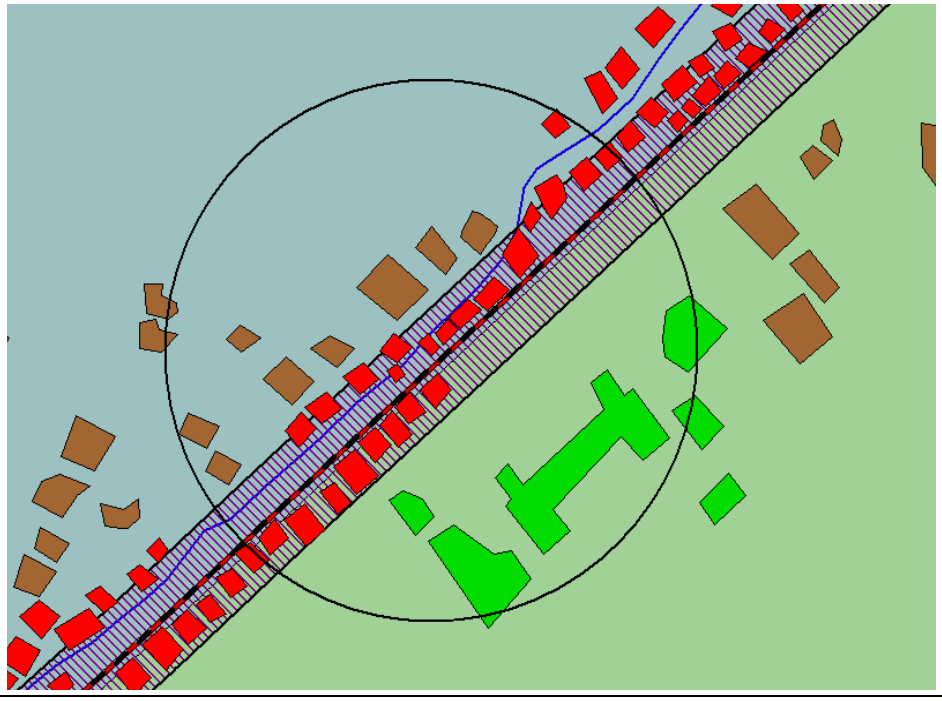


Figure 6-7 Illustrated pattern of squatter houses (red dots) in *Barangay* Ilawod that lie within the 15m of road reserve

DAO 98-12 on Revised Manual of Land Surveying Regulation in the Philippines explains the regulation:

- Section 310 (d) – A strip of fifteen (15) metres in width on each side of the centrelines of trails and roads which are reserved for right-of-way and timber outlet should be set on the ground, and indicated in the field notes and on the plan.
- Section 668 (b) – Strips of land at least fifty (50) metres in width fronting the sea, ocean or other bodies of water and 20 metres on both sides of river channels/banks maintained and developed to enhance the protective capability of mangroves against strong currents, winds and high waves (DENR 1998).

6.2.2 Tenancy

A tenancy arrangement in rural areas in the Philippines has become one of the ways for people to have access to housing. The system was widely established based on the fact that many people do not have capital to purchase land for farming. The arrangement is also a demonstration of the strong community ties in the Philippines society where trust among family or community members is the basic foundation, especially in rural life.

The Food and Agricultural Organization of the United Nations outlines the four most significant tenancy arrangements (FAO 2001):

- Contractual license arrangements, in which the landowner determines and largely undertakes all farming decision-making and operations, but licences others to perform certain functions, often involving crop planting and harvesting.
- Labour tenancies, in which labourers receive a token wage or share of output, together with usufruct rights to a small parcel of land for their own purposes.
- Sharecropping and other similar arrangements, in which the expectation is that both landowner and tenant share the cost of inputs and receive a share of outputs. This may vary from

arrangements which look very similar to contractual labour relationships, to those where the scale of the venture more closely resembles a full tenancy.

- Tenancies, in which there is a fundamental separation between the interests of the landowner (leasing out land) and the tenant (leasing land). This tenancy arrangement is significantly different from the other forms, principally in that the tenancy involves the transfer of certain property rights.

In the study area, there are 200 families whose lives depend on tenancy practices that use the different types of tenancy arrangements as described above. The word 'tenant' is locally recognised as *katiwala,* a Tagalog word that, in relation to this thesis, literally means agent, steward, delegate, representative or trustee. The term is used to describe people whose livelihood is farming the land of other people as a caretaker of the land. There are three different practices of the *katiwala*:

- A *katiwala* who lives on the land they take care of.
- A *katiwala* who lives outside the managed land and visits the land on a regular basis. Depending on the season and the type of crops planted, the visits to the land can be daily or on alternate days.
- A *katiwala* who moves from one tenancy to another. In this case, the tenant does not have a house and mainly moves to have access to housing. This practice is solely to gain access to housing on a temporary basis.

The tenant living on the land has full occupancy rights in addition to the obligation to manage the land. In addition, they also have the right to build a house inside the bondaries of the land and live there during the period of tenancy. In that sense, they are usually responsible for building their houses and for bearing any costs related to developing their homes. No restrictions are applied in regard to expanding their houses. One of other privileges is that the

tenants also have rights to bring family members to live on the land. In some cases, the family continues to expand when children marry and the new family continues to live on the same land.

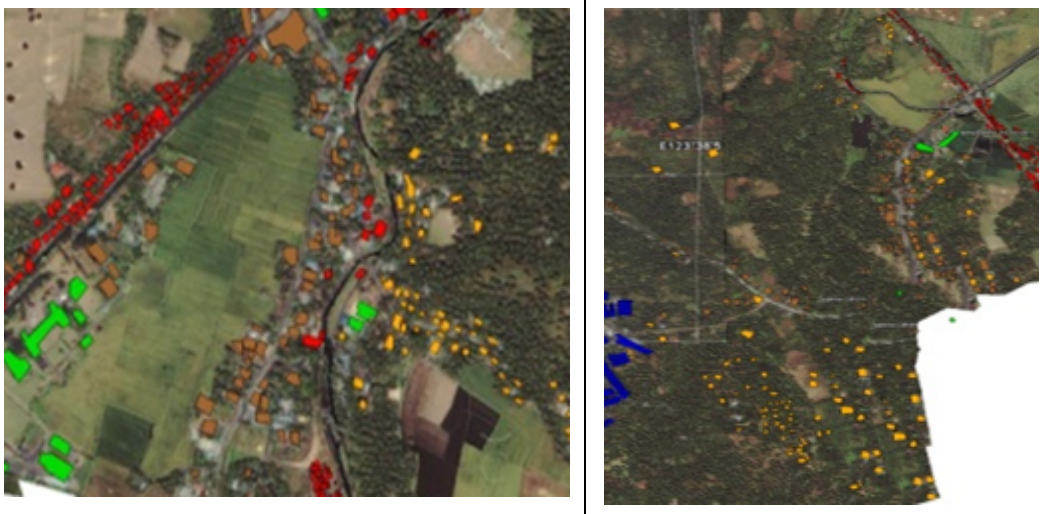


Figure 6-8 General pattern of tenancy (yellow) in *Barangay* Ilawod (left) and Tagaytay (right) showing their location dependencies to the farmland they manage. Map not to scale

In most cases, the relationship of owner and tenants are the result of:

1. Family relationship. Mostly the owner and tenant are bound by family connections, either through close or extended families. This also includes inheritance of tenancy from parents. Examples are:

   Mr. Rudi Nocete, 67 yo, has managed the 6 Ha of land in Purok 5 in Barangay Ilawod since 2007. The owner of the land is his uncle who lives in Manila. He worked as a labourer in different places in Camalig. When his uncle and families moved to Manila, he was asked to live in the house and manage the rice field.

   Mrs. Pilar Narito, 73 yo, has managed 4 Ha of land since 1961. After their marriage, she followed her husband, who had lived and farmed there since 1951. The land is owned by a distant relative of her father-in-law. The owner might not be directly related but in the Philippines, if people live close to each other for a long time, then they become like family and sometimes even introduce each other as family.

2. Extended labour connection from a different place.

   Mrs. Mary Lou Villa, 38 yo knew the owner of her land from her cousin living in Legazpi City. Her cousin worked with the brother of the owner who was

then looking for someone to take care of their rice fields in Camalig. Mary Lou was introduced to the owner and they came to a mutual agreement on managing the land. She and her family have been living there for almost 10 years.

3. Trust in neighbours.

Mrs. Helen Dalagit, 45 yo, has been managing land for almost 20 years. She inherited the tenancy from her mother. The land is owned by their neighbour who does not have a family connection to her family. It was all based on trust and she always remembers her mother saying that the land must be kept as if it were their own in order to sustain life.

4. Informal occupation of land that was later recognised by the owner and has changed to strong trust from the owner.

Mr. Fransisco Mortega, 52 yo, inherited the tenancy from his father. Their family has been living in their house for almost 40 years. At first, his father just squatted on this land and started planting rice without knowing the owner of the land. The owner was surprised to see that the land was occupied and planted by a stranger. After explaining to his father that they were the owner, they let his father stay there and manage the land, until now.

This tenancy system provides space to live and land to manage providing another livelihood opportunity in the form of farming.

Arrangements for most tenant systems in the study area are usually based on an undefined time depending on the land owner and there is no renewable system established in this relationship. In fact, the sustainability of this pattern of life depends so much on:

- The availability of land and the wealth of the owner. When there is a need to sell the land for whatever purpose, then the tenancy arrangement is at risk.
- A good relationship between the owner and the tenant. The good relationship may be built based on the way the tenant manages the land. It is often defined by the success of the farming and how well the land is taken care by the tenant, including clearing the land of wild plants, etc.

- Trust. The level of relationship mentioned above can increase the level of trust from the owner, which in this case is the most prominent factor that determines the sustainability of the tenancy. Because of strong cultural and social connections, in some practices, the owner sells the land to other parties not because of needing money but because of the hassle and complication in dealing with irresponsible tenants.

Two main practices of tenancy arrangements exist in the study area:

- Labour tenancy. In this case, tenants receive wages as agreed with the owner. Some tenancy practices are based on a fixed wage, while some are based on the amount of harvest. The more harvest, the more wages the tenant receives. The wage-based tenant lives outside the managed land and therefore has more freedom in doing other things for their livelihood as this sort of tenancy is like a short-term practice. In the labour tenancy system, all capital is provided by the owner including provision of seeds, fertilisers and required machinery to plough the land, if it is not done manually.

- Share-cropping. A pre-defined share between the owner and the tenant is usually agreed to in this sort of arrangement, most of which are not on an equal-share basis. The arrangement is that the owner provides the land and all other matters are arranged by the tenants who have full responsibility for the management of all work. This includes provision of machines or equipment needed to cultivate the land, seeds, fertilisers and any other related needs. This practice of share-cropping is mostly encountered in the study area where tenants live inside the boundaries of the land that they manage and become fully responsible for all land and crop management.

6.2.3 Government-assisted Housing (BLISS)

BLISS is a national development strategy launched through the issuance of Executive Order 517 under the President Imelda Marcos Regime. BLISS was conceived during a corporate planning workshop of the Ministry of Human Settlements in December 1978 and the original idea of BLISS was to provide housing to the rural poor.[19] The main objective of the program was to provide shelter to low-income families and to make available long-term housing loans at low rates of interest. It was also intended to provide livelihood and employment opportunities for the non-working (unemployed) members of the BLISS community, so that "self-managing" and "self-reliant" community was achieved (Abueg 1986). Despite the original idea of assisting the rural poor, the first BLISS was actually set up in an urban centre in Metro Manila in February 1979.

As the program continued, it was planned that each town in the Philippines had to have one BLISS complex (Domingo 2001).[20] Many of the established BLISS complexes in Metro Manila are also complemented by livelihood components to ensure sustainability of urban life in the long term. These programs are expected to generate new sources of income for low-income families within the BLISS community as well as the surrounding areas (Abueg 1986).

In the study area, there are 59 BLISS houses which were constructed and finished in 1980 through the National Housing Authority and the Local Government Unit of Camalig, Albay. The BLISS complex is administratively located in *Barangay* Tagaytay and has become a *purok* (sub-*barangay*) by itself. Approximately 200 local residents applied for a house in the complex after a series of seminars about the housing schemes were conducted for the rural

[19] In the book 'Banker to the poor' by Muhammad Yunus (Winner of the 2006 Nobel Peace Prize), it is stated that the Consultative Group to Assist the Poorest and Micro-credit Summit Campaign Committee have adopted the definition of 'the poor' as anyone who is below the poverty-line, and the poorest as anyone among the bottom half of those below the poverty line.

In the Philippines, poverty incidence among households increased from 24.4% in 2003 to 26.9% in 2006 and the number of poor families increased from 4.0 million in 2003 to 4.7 million in 2006 Adb, *Poverty in the Philippines: Causes, Constraints and Opportunities* (Mandaluyong City, the Philippines: Asian Development Bank 2009)..

[20] Also based on an interview with MSWD Officer of Camalig Municipality (Municipal Social and Welfare Development) in July 2010.

poor. Applications were addressed to the provincial office of the Ministry of Human Settlement in Cabangan Albay who then selected the beneficiaries.

The requirement of BLISS beneficiaries in the study area follows the general requirement set out for urban BLISS, in addition to an assessment of the applicants' level of poverty conducted by the provincial office of the Ministry of Human Settlement and Camalig Municipal Social Welfare and Development (MSWD).[21] In urban settings, the requirements were established as follows: (1) Filipino citizenship and resident of Camalig for at least 3 years prior to application, (2) Family size of 3 or more but not exceeding 8 per household, (3) Gross family income of not less than P500 (~AU$10.80) but not exceeding P5,000 (~AU$100.80) per month; and (4) Employment within a 3-kilometre radius from the BLISS site (Abueg 1986).

The size, design and length of occupation of BLISS houses are different in urban and rural contexts. In the study area, all BLISS houses were built on 240 m^2 of land using the same house design (Figure 6-9). A BLISS house in Camalig consists of a living room, bedroom, kitchen and yard. Awardees are given full rights of occupation through a certificate that legitimates their ownership.

In urban settings, different houses are given to applicants based on their income status. There are four types of members ranging from Member Type I who is in the low income bracket to Member Type IV whose income source is commercial. Once the income bracket and member type is determined, the type of house to be awarded is decided as well as the period of occupancy and required monthly payment. Details are in Table 6-3 below.

Table 6-3 Membership dues and occupancy periods in a BLISS in Metro Manila (Abueg 1986)

Member type	Income bracket	Unit type	Monthly dues (PhP)	Occupancy
I	Low	A	150	25 years
II	Middle	A	275	50 years
III	High	B	500	50 years
IV	Commercial	C	1,200	50 years

[21] Interview with MSWD Officer of Camalig Municipality (Municipal Social and Welfare Development) in July 2010.

Complications can arise in urban settings for housing awardees as the monthly payment becomes an additional burden on the residents who often find it difficult to pay (Abueg 1986). This does not happen in the rural context, e.g. Camalig Municipality, where communities move in as soon as the houses are ready and awarded. At present, most of the BLISS houses have been expanded (Figure 6-9) and in fact, have been transformed into a urban housing complex in a rural setting.

Figure 6-9 Original setting of a house in BLISS (left) and expanded BLISS houses (right)

In an urban setting in Metro Manila for example, BLISS sites are easily recognisable. The buildings are alike and look like condominiums (Abueg 1986). In the rural study area, the BLISS site is located one block behind the main road connecting *Barangay* Ilawod and Tagaytay (Figure 6-10).

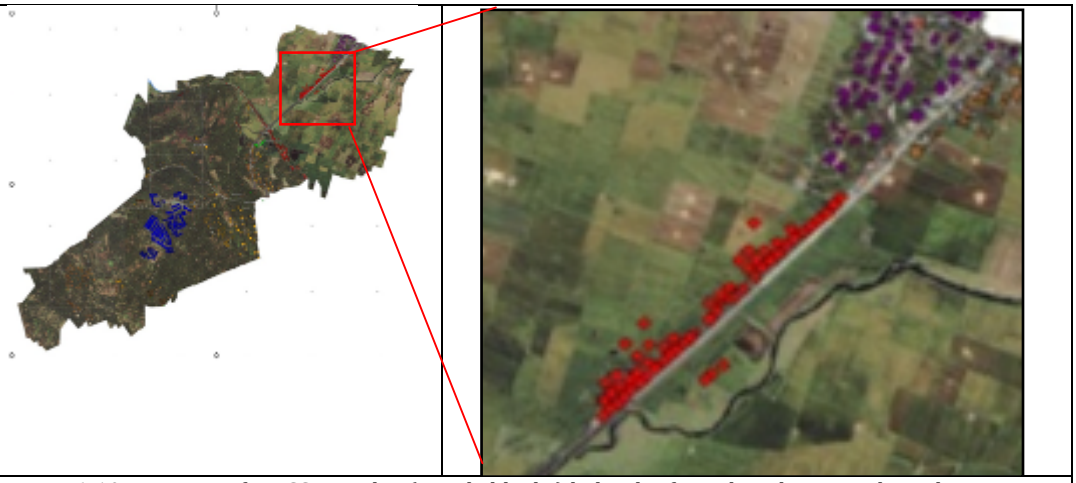


Figure 6-10 Location of BLISS complex (purple blocks) behind informal settlements along the main road connecting Ilawod to Tagaytay. Maps not to scale

The fast development of houses, most of which have been re-built into 3 or 4 storeys, provide a prominent view of the complex which is surrounded by informal settlers living on the road and river banks.

6.2.4 Resettlement

The resettlement groups were established based on the declaration of the Albay Provincial Disaster Coordinating Council to permanently relocate people living in high-hazard-prone areas in the Municipality of Camalig. The declaration was based on the impact and damage caused by the super typhoon Reming in November 2006 that had displaced 20,000 families and where approximately 3,000 families still lived in evacuation centres as of March 2007 (Matabang et al. 2009; MSWD 2007).

Based on the surveys and data collected from the Municipal Social Welfare and Development Office, there are 520 houses at the old relocation site and 1157 at the new site (MSWD 2007).

6.2.4.1 FVR-FNM Village (Old relocation site[22])

The old relocation site was established after the eruption of Mayon Volcano on February 2, 1993 that destroyed all buildings and infrastructures in *Barangay* Anoling (located within 6 km of the Permanent Danger Zone/PDZ). Seventy-seven people were killed in the eruption and residents were evacuated for almost four months, sheltering in two schools in Camalig Municipality.

As the original settlement of Anoling was located within the PDZ and was already regulated as an area not to be permanently settled,[23] the Mayor of Camalig, Florencio N. Munoz, with President Fidel V. Ramos and the local government unit of Camalig provided a new permanent resettlement site for the relocation of the whole village.

[22] As there are now two relocation sites, the local government and local communities call FVR-FNM Village the old relocation site whereas the relocation site in Bungkaras Village, Tagaytay is called the new relocation site.
[23] After the 1993 eruption, Barangay Anoling was considered 'No man's land' (Disaster Management Office of Camalig Municipality).

The size of the old resettlement site is 9 hectares. The construction of the site was begun in 1995 and finished in 1996. The site is named the FVR-FNM Village after the initials of President Fidel V. Ramos and Mayor Florencio N. Munoz. The houses and contracts were awarded to the residents in 1997. The FVR-FNM Resettlement Site is located approximately 110 metres above sea level (Laud 2006).

6.2.4.2 Bungkaras Village, Tagaytay Resettlement Site (New resettlement site)

Following the impact and damage caused by the super typhoon Reming the Provincial Disaster Coordinating Council declared that they would permanently relocate people living in high-hazard-prone areas in the Municipality of Camalig, Sto Domingo, Daraga, Legazpi City and Guinobatan.

Unlike the old relocation site where the majority of the population were those affected by the volcanic eruption, the new relocation site was established to protect those living in areas prone to volcanic, typhoon and flood related hazards. Thus, super typhoon Reming was also the momentum for the municipality of Camalig to relocate residents who had been living on the flood plain and provide them with affordable and decent housing.[24]

Both the old and new relocation sites are adjacent to each other and located about 10 km south of the town centre, in a mountainous and agricultural area. The total land area is 1.4 hectares and from this a total of 1,157 lots were generated, each of which measures 80 m^2 (MSWD 2007).

Selection of Beneficiaries

Identification of beneficiaries was conducted by each *barangay* leader who submitted their proposed list of beneficiaries to the Local Shelter Committee and Department of Social Welfare and Development (DSWD) as mandated local government bodies to undertake the housing project. Further, surveys and interviews were conducted by DSWD (with the assistance of *barangay* officials)

[24] Interview with Municipal DSWD in July 2010.

to verify the details and conditions of applicants submitted by *barangay* officials.

The local Shelter Committee under the Local Housing Board of the LGU took overall responsibility for identifying, screening and assessing the potential beneficiaries. The criteria for selection included that beneficiaries (1) must be residents of the *barangay* in high-risk areas (2) do not own any other property situated in non-high risk areas, and (3) are underprivileged with a monthly family income below the poverty threshold based on NEDA poverty data.[25] The priority for resettlement is based on the damage to their house and the available resources for reconstruction after disasters. These conditions were communicated to the local population when they were housed at the temporary shelters following the typhoon.

Housing Conditions and Designs

Unlike the old resettlement where the majority of the settlers came from one *barangay*, the new resettlement site is divided into five different blocks, with each block comprising resettlers from different villages (Table 6-4). Each block is funded by different donors (Figure 6-11) namely: (1) Department of Social Welfare and Development of Camalig Municipality through Neighbouring Association for Shelter Assistance (DSWD/NASA). The block was later named NASA, (2) Habitat for Humanity (3) Senator Zubiri (4) The Italian Government, (5) The International Organization of Migration (IOM) through funding from the United States Agency for International Development (USAID).

The selection of who moved where at the new resettlement site was decided by the Department of Social Welfare and Development (DSWD) after coordination with the Municipality Disaster Management Office (MDMO) that had identified communities living in hazard-prone areas needing to be relocated. There were different levels of urgency of the families to be relocated (see Section *Selection*

[25] According to the National Statistical Coordination Board, the poverty threshold in the Philippines varies by province and region. For Albay Province in Bicol Region, the 2007 threshold was PhP 15,407/year in all areas. In urban areas, it is PhP 18,343/year and PhP 14,259/year in rural areas. Complete figures are available on http://www.nscb.gov.ph/poverty/2006-2007/pov_th_07.asp

of Beneficiaries). Hence, those who meet criteria were given the privilege of occupying the first homes that were completed. Those with more financial resources were mostly given houses funded by the Neighbouring Association for Shelter Assistance (NASA) that required further financial resources from the new owners to complete the house (see Table 6-5).

Table 6-4 Number of houses provided based on the original settlement

Original Settlement	NASA	IOM	Italian Gov't	Senator Zubiri	Habitat for Humanity
Barangay 1	12	-	1	1	-
Barangay 2	-	1	-	2	-
Barangay 3	3	1	4	-	3
Barangay 4	5	-	-	-	15
Barangay 5	-	-	1	-	-
Barangay 6	6	-	-	-	-
Barangay 7	-	-	2	1	-
Bariw	3	-	20	8	-
Cabangan	-	13	10	10	-
Gapo	10	19	-	11	1
Ilawod	34	136	39	23	33
Libod	-	64	1	13	16
Ligban	6	-	-	5	4
Quirangay	1	2	-	12	-
Salugan	19	84	1	11	10
Sua	-	-	-	15	-
Tagaytay	15	30	31	13	22
Tinago	-	-	1	-	32
Tumpa	-	-	14	-	-
Total	114	350	115	125	136

Since the government did not impose any standard shelter design criteria, each donor organisation provided their own design after considering their budget for shelter assistance (Matabang et al. 2009). Therefore, the construction was the full responsibility of donors including measures of safety and resistance to the impacts of natural disasters. The design structures of the houses at the relocation site employed single-detached (DSWD, IOM) and duplex design (Senator Zubiri, Italian Government, Habitat for Humanity and old relocation site).

The approximate cost per unit is 60,000-80,000 PhP (1,300-1,800 USD) with a floor area of between 18-20 m^2. The construction of the houses includes interior partitions, painted exterior finish and small toilets inside the house. Access to clean water and electricity is the responsibility of the local

government unit (DSWD 2010). The decision on who occupied which block and which types of housing was based on the needs of the beneficiaries. Thus, there are beneficiaries that live in single-detached homes with private yards for possible lateral expansion or a duplex centre with limited possibility of expansion (Figure 6-12). The donors and government officials interviewed stated that beneficiaries were informed about their housing type, and that the decision was based on priority and equality, during the social preparation for resettlement.

Table 6-5 Contribution of beneficiaries depending on donors (MSWD 2007)

Donors	Contribution
IOM	200 hours of work
Senator Zubiri	200 hours of work
Habitat for Humanity	400 hours of work
Italian Government	No contribution of labour work
NASA	Payment of construction workers

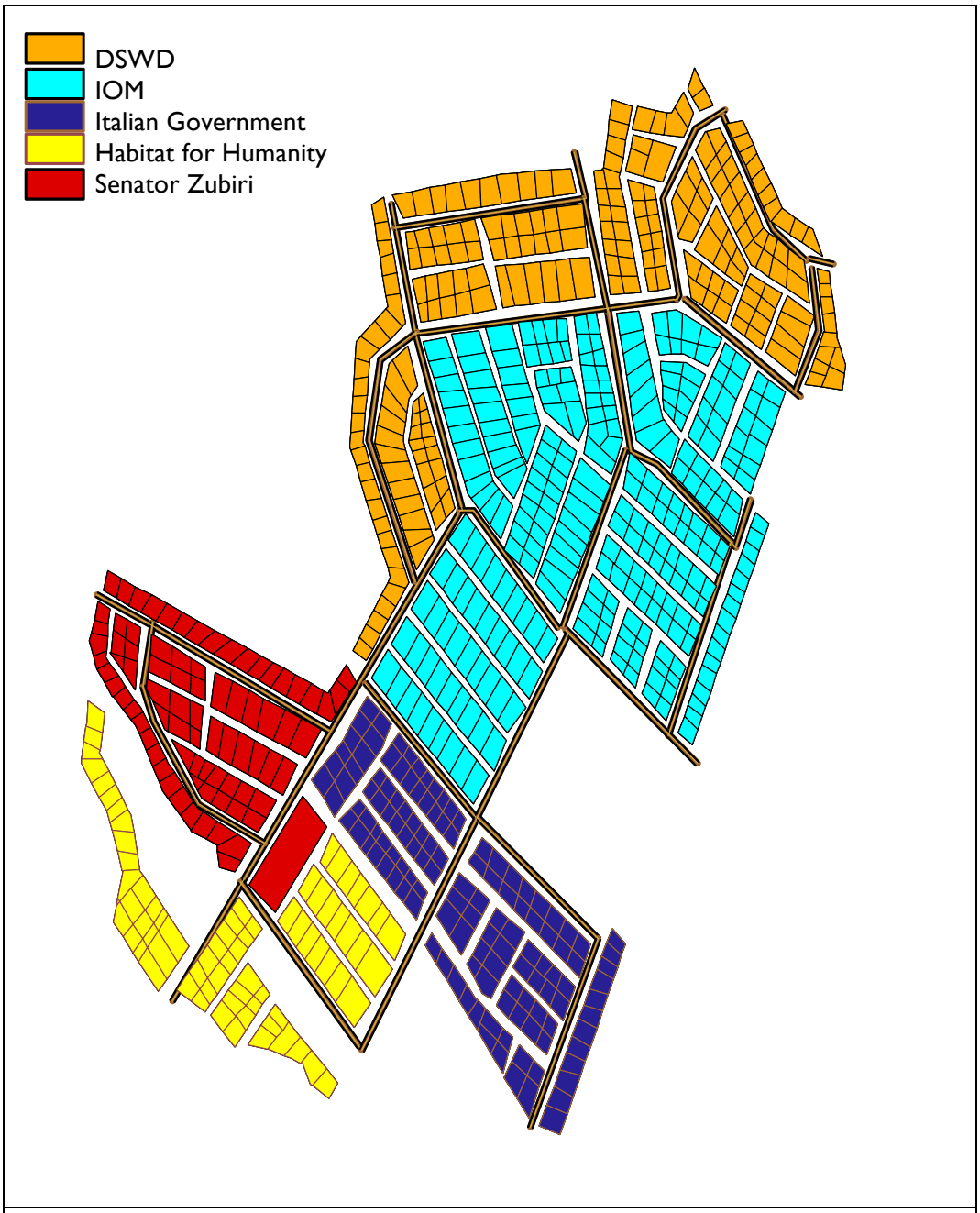


Figure 6-11 Blocks arrangement of different donors at the new relocation site (Source: Municipal Department of Social Welfare and Development; Map Not to Scale)

Rights and Obligation of Beneficiaries

During the transition period of resettlement, DSWD conducted social preparation in every *barangay* by means of a collective seminar, briefings and house-to-house interviews. The process included an explanation of the conditions of selection and an explanation of the beneficiary's rights and

obligations as explained in the housing award contract[26] that was issued by the LGU. The housing unit contract is a formal document that confirms the right of occupation of the lot at the relocation site. The contract was awarded at the DSWD office and signed by the municipal mayor, donor representative, beneficiary and two witnesses (LGU Camalig 2008). The contract details that:

- Only the awardees and their first-blood family have the rights to exclusive and continuous occupation, possession and use of the housing unit for a period of 99 years (and extendable).
- The house is to be used for residential purposes[27] and no other parties are allowed to occupy, reside or use the house including transferring the possession, occupation, use and/or rights to the housing unit or its portion.
- The awardees are responsible for the payment of utilities installed, used and consumed (i.e. electricity and water) and for the maintenance, upkeep and repair of the housing unit.
- The local government has the right to terminate or cancel the contract should the awardees violate the conditions of award or abandon the awarded housing unit, which includes acquiring another residence or returning to their original place of residence.
- The donors provided different levels of funding for the projects and thus in order for the projects to be completed; they expected varying levels of labour from the beneficiaries themselves (Table 6-5).

[26] The term 'contract' appears to be similar to leasehold status. However, Focus Group Discussion held with resettled community shows their confidence towards full ownership, despite the term 'contract' used in the housing award. In addition, this resettlement program is not viewed by the local government as a lease. Through personal interviews held in July 2010 and telephone communication held in October 2012, government official stated that the term 'contract' is used to restrict selling and transferring of rights to non first-blood families as detailed in the contract. This, therefore, differs the level of rights between resettled communities and BLISS beneficiaries (see Section 6.4.3 and Table 6-16).

[27] On the contract, it is stated that the house is prohibited from being converted to any other purpose. However, based on interviews with DSWD, small business activities are allowed to be conducted in the house.

IOM

DSWD / NASA

Senator Zubiri

Italian Government

Habitat for Humanity

Old Relocation site

Figure 6-12 Housing designs by different donors in the relocation site (Photos: author)

6.2.5 Titled Properties

Titled properties in the study area can be easily recognised by the strong structures of the houses and the tall iron fences as compared to other tenure groups. The position of the houses in the centre of *barangays* makes the titled group prominent in the study area.

About 170 out of 646 properties in *Barangay* Ilawod are titled or account for 26% of the total tenure group. In *Barangay* Tagaytay there are 216 titled properties out of 606 or 35% of the total properties, exclusive of newly-established resettlement sites.

In general, titled groups are relatively moderate to well-off families who conduct businesses at the village level, such as grocery shops, restaurants, public transport businesses and recycling centres; some are government officials.

Interviews and focus group discussions with this group reveal the different ways of acquiring the titles:

- Original titles. The original titles acquired were based on the 1920 cadastral survey. According to the survey, 129 out of 278 plots (about 46%) in *Barangay* Ilawod are titled and the rest are untitled. In *Barangay* Tagaytay, 83 of 213 plots of land are titled accounting for about 39% of the total registered plots. The titles have never been updated, except when the lots are divided and shared with other families or sold to other parties. The owner of such a title would possess legal documents issued by the court through the judicial process.
- Inheritance. Inheritance of plots of land is also a very common avenue of legally transferring land to a family member, usually to a wife or children. It usually happens after the death of the family head, under whose name the title is usually registered. It is the practice in the study area that the land is registered under the

husband's name, even if it originally belonged to his wife. Transfer of titles is done by the Land Registration Authority (LRA).

- Division of land lots to other family members. The practice of sub-dividing plots of land is very common in the rural part of the study area. In some cases, the divided land is officially registered in the provincial office of the Land Registration Authority. There are cases where the plot is sub-divided yet not registered. In reality, it can look like two different titled plots of land especially if the size of the original land is large. In past years especially during the 1920s' cadastral survey, people usually possessed larges areas of land. In some cases, the earliest settlers or farmers (before the 19th century) just invaded the land and claimed that it was theirs.
- Purchase of land from the land owner. In this case, the seller's title is recognised in the Certificate of Land Transfer.

6.3 Perception of Tenure Security

This section presents perception of tenure security in the study area. Findings presented in this section are the views of communities from each tenure group in terms of their understanding of their level of tenure security. Analysis of this section will be further discussed in Section 6.4 and 6.5 to compare the findings with broader literature review on tenure security presented in Chapter 3.

6.3.1 Perceived Tenure Security of Informal Settlers

Since all informal settlers realise that they squat on government land, eviction is one major threat that they face. All interviewees recognised such a threat; however, most of them (except those squatting along the railway) are confident that the government will not evict them in the next 5-10 years (Table 6-6).

Table 6-6 Perception on eviction of informal settlers

	Do you think that the government will evict you in the next 5-10 years?			
	Informal settlers			
	along the road (n=100)	along the railway (n =30)	along the river (n =40)	in the forest (n =20)
Yes, there is possibility of eviction	20%	90%	10%	0
No, there is no possibility of eviction	80%	10%	90%	100%

The 80% of informal settlers along the road, who believe there is no possibility of eviction, also believe that eviction could happen if:

- Laws are strictly enforced in the country. Most of the informal settlers perceive that even if the law is enforced, it usually applies in urban areas first, like Metro Manila. It takes years for the law to be enforced in rural areas where there is still a lot of empty and free land.

I know there are laws on squatters on public land. I also know that during Marcos, it was said that squatters was a crime but that only happened in Manila. That is why I moved here from Manila. I feel safe here and I claim this house as mine. I will build my house when I have capital. Noli Luces, 50, residing on main road from Ilawod to Tagaytay.

- Major development along the road is undertaken. However, they perceive that it also takes a long time for that to happen and the government will prioritise (physical) developments near the municipality in the *centro.*[28]

I don't think the road will be developed into something else. If government needs to develop something, there are plenty of lands on provincial road. In here, only rice field. The government cannot just let go all the rice farmers at the back of our house. Usually, the development takes place in the town centre. Norly Moreuda, 56, squatting on main road of Ilawod since 1980.

"In fact the government should thank us for residing on the main road. The road is not as scary as before. Because our houses bring lights in the night and provides safety to passers-by. Brenda Malate, 37, squatting on main road of Tagaytay since 2003.

[28] *Centro* is Tagalog word, derived from Spanish, that refers to barangays in the town centre.

Table 6-7 Affirmative and negative replies of informal settlers along the railway on perception of eviction

Affirmative "I know that we are living on prohibited land so I think the government will force us to move" (Mary Ann, 35, squatting since 1993). "We are living in danger area so surely we are vulnerable for eviction" (Vilma, 53, squatting since 1953). "The plot is not ours, so yes we can be evicted" (Joey, 37, squatting since 1994).
Negative "I have invested a lot of money to build my house, so this is mine. The government cannot kick us unless they provide us a new house" (Rudi, 65, squatting since 1984). "Even if we will be evicted, we will receive compensation" (Elma, 35, squatting since 1995). "I have been living here for many years and two generations and I am okay, I always sleep well, especially after the railway is not function (Romolo, 67, squatting since 1984). "I bought the house from someone and I have the receipt. So this is my house and nobody can take it" (Elvy, 34, squatting since 1994).

The provincial railway along *Barangay* Tagaytay has been inactive since the super typhoon Reming hit Albay Region in late 2006. The train system was to have been commenced again at an undefined time in the future. There are informal settlers who have been residing there since 1951 although many recognise the possibility of eviction. Even though only a small percentage of the respondents perceive no threat of eviction, their responses were, nevertheless, very strong and confident. These are the people who have been residing there for more than 20 or 30 years and have inherited the ownership of the land and house. The sense of ownership of land and houses of the informal settlers along the railway are very visible by the fences that separate each house.

In the case of informal settlements along the river, the squatters do not perceive the law and the government as major threats. 90% of the interviewees show no fear of eviction although they reside along the river bank, which is supposed to be a buffer zone. Some residents even confidently built more permanent structures on the river bank as they think it prevents river erosion of the land. In fact, they are more fearful of calamities than laws of eviction.

> *Nobody forces us to move, except calamity. Lerna Nayve, 62, squatting along the river for 40 years.*

Many of them have experienced moving after their houses were destroyed by big floods or lahars from Mayon eruptions in 2006. However, they usually build the houses again on the same land when the disaster season ends. On the other

hand, moving to different locations along the river is also one of the practices when a house is totally destroyed. Such a practice in the study area and neighbouring municipalities has created communities of 'nomad river squatters'.

> *I am nomad but usually stay in one place for 2-5 years, depending on how bad disaster is. If my house is destroyed by calamity then I look for new place to live. If it is still safe, I can build again. It is okay we start from zero again if disaster destroyed our house. Magdalena, 67, squatting on different places on river bank for 30 years.*

The informal settlers in the forest area have no fear at all of eviction. The number of houses built on government forest land is growing as the people seek new sources of livelihood where they can also reside.

The perceived security of tenure is also demonstrated by the confidence of the informal settlers in investing their capital in constructing and expanding the houses. In fact, there are a number of houses built on informal land along the main road that are of a more permanent construction. Most of these have been built by people who have been squatting there since as early as the 1940s. Though they have no formal certificate or land title, social recognition is a factor that determines the degree of perceived tenure security.

> *Everybody in this barangay knows that this is my house since long ago. Even the Barangay Captain knows it. Antonio, 65, squatting on main road since 1941.*

The confidence in investing their capital into permanent housing construction demonstrates the (perceived) high tenure security over the land they occupy. Table 5-8 signifies the confidence of informal settlers in investing their capital into the houses thus justifying their perceived security of their tenure.

Table 6-8 Perception on eviction of different informal settlers

	Do you have fear of investing your capital into housing improvements?			
	along the road (*n*=100)	along the railway (*n* =30)	along the river (*n* =40)	in the forest (*n* =20)
No	95%	20%	90%	100%
May be	5%	10%	10%	-
Yes	-	70%	20%	-

Recognition from government officials on their ownership is another factor of confidence the informal settlers have. In a small rural society like the study area, frequent visits of government officials are likely to happen more often.[29] The question asked by government officials in informal conversations with the local residents of "*How is your house?*" is understood by the squatters as recognition by the government in verbal form. However, some of the residents (mostly those who believe that they are threatened with eviction) perceive the visit of the government officials as a warning for them to evacuate their houses.

> *I am always nervous and scared if government officials come to the vicinity of my house. May be they will ask us to move. I do not want to move out of my house. Maria, 45, squatting on river bank in Ilawod since 1989.*

Interestingly, most of the informal settlers recall their experiences at the end of their stay at the evacuation centre after disasters as another proof of government recognition to their land. Many of them were asked if they would have problems returning to their settlements after disasters. A question like "*Do you have any difficulties in returning to your houses?*" that is frequently asked is perceived as another recognition from the authorities.

> *The government always asks 'Is your house destroyed?' It means that the government gives us recognition. Maribel, 43, squatting on river bank in Ilawod since 1992.*

There has never been any conflict of land grabbing or housing eviction from powerful groups that occur after disasters in the study area. Everybody recognises the land and housing ownerships, especially after disasters. The only threat they face is theft that sometimes happens during their stay at the evacuation centre. To prevent that, the husbands usually stay in the house or at least visit the house every day to make sure that only calamity destroys their possessions.

[29] Since the study area is a disaster prone area, authorities (mostly disaster management officers) frequently visit the different areas, especially flood prone areas where the informal settlers reside. The visit is conducted on a regular basis to monitor the situation, especially in the rainy season or when the Mayon volcano shows signs of activity.

Table 6-9 Perception of government recognition by different informal settlers

	Do you think that the government recognises your tenure?			
	along the road (*n*=100)	along the railway (*n* =30)	along the river (*n* =40)	in the forest (*n* =20)
Yes	100%	60%	80%	100%
May be	-	10%	-	-
No	-	30%	20%	-

The level of confidence of different types of squatters is also demonstrated by their perception towards government agreement on their settlements. The majority of interviewees are convinced that their settlements are fully recognised by the government. Their representatives (*purok* leaders) are often invited for a municipality meeting, especially on contingency planning, prior to natural disasters. This also adds to the level of confidence towards their occupation of government land.

Table 6-10 Perception of different informal settlers towards government agreement on their settlements

	Do you think that the government agrees that you squat on this land?			
	along the road (*n*=100)	along the railway (*n* =30)	along the river (*n* =40)	in the forest (*n* =20)
Yes	90%	20%	70%	100%
May be	10%	10%	20%	-
No	-	70%	10%	-

6.3.2 Perceived Tenure Security of Tenants

Like other informal settlements, eviction is also an issue among the tenant groups since their life and livelihood depend on the land owner. The difference here is that it does not involve government officials in the case of eviction as the tenants do not live on government or public land or areas that are supposed to be buffer zones.

The majority of tenant groups show the confidence towards the threat of eviction since they believe their way of life is benefiting two sides: the tenant and the owner.

> *I think the owner is also benefiting from us. Without us, they do not get additional income. Anna, 46, share-crop tenant in Barangay Ilawod.*

Table 6-11 Perception on possibility of being evicted by the land owner

	Do you think that you will be evicted by the owner? (*n* = 40)
Yes	10%
May be	10%
No	80%

As the government is not directly involved in the case of eviction, they highlighted the importance of building and maintaining good relations with the owner. This was mentioned many times during interviews and focus group discussions.

Table 6-12 Perception on possibility of direct government involvement in case of eviction

	Do you think that the government will be involved in the case of eviction? (*n* = 40)
Yes	0%
May be	5%
No	95%

However, they still perceive that the government can be mediators should conflicts or problems arise between the tenant and the owner. Although most tenants have a low educational background, they realise that they have rights as tenants and they know what to do in case of eviction. In the same way, they understand that their rights are protected by the agricultural laws. They know their lives depend on particular people but this is perceived very positively by most of the groups since the rural community in the study area is built on strong social relationships.

Table 6-13 Tenants' survey on 'what to do' in case of eviction

	Do you know what to do	
	in the case of eviction? (*n* = 40)	if the owner wants to sell the land and you cannot live there any more? (*n* = 40)
Yes	90%	65%
May be	-	25%
No	10%	10%

> *They cannot evict us not only because we are their trustees, but also because our tenancy is protected by the agrarian laws. If I am evicted, I will go to Provincial Agrarian Office to seek help. Maria, 56, tenanting in Barangay Tagaytay.*

The tenancy system in the study area does not require financial transactions as the payment is arranged in the form of crop sharing. The success of the crops will become one of the security factors that determine the sustainability of their tenancy. Their crops are grown on the volcanic soils of Mayon Volcano which supports the tenancy's sustainability, despite the threat of volcanic activity (Chapter 4 provided more detailed information).

The arrangement of tenancy is, however, different from one case to another and that depends on the owner and negotiation. Therefore, two different arrangements exist:

- Share cropping in which the owner and the tenant receive an agreed amount from the crops. In this system, agreement is made prior to cultivation on the basis of trust. However, the share can change if the land produces less harvest than expected in which case most tenants would share less than the agreed amount. The amount shared is based on a later agreement.

Mrs. Julie Navarez, 39 yo, manages 1.25 Ha of land belonging to a rich family from Legazpi. The agreement is that she shares 6 sacks of grain from each harvest or equivalent to about 12 sacks / year. The share is based on agreement and in the case of calamities, the tenant usually shares less or not at all. For two years after Supertyphoon Reming in 2006, the tenant did not share any crops as the rice field was destroyed by the typhoon and it took time for the tenant to re-establish their farming livelihood.

- Full ownership of the crop: in this arrangement the tenant receives all the crops produced on the land they manage. This is usually the case when the tenant occupies land without having any knowledge of its owners. Before the 1920s,[30] it was one of the ways of land proclamation. Negotiation occurs only when the owner discovers that their land is occupied for livelihood and living. If the owner is financially secure, then the tenant is given full rights to the land. All tenants with this arrangement highlight the culture of rural life in the Philippines that is the foundation of this kind of agreement.

*The father of Mr. Fransisco Mortega, 52 yo, first squatted on the land 50 years ago without knowing the owner of the land. The owner let them continue occupying the land after proper explanation and negotiation by Mr. Mortega's family. The owner was happy to see that the la*nd was useful to other people. Mr. Mortega is lucky enough not to have to share anything with the owner as the owner is financially secure. However, Mr. Mortega voluntarily shares the crops at each harvest as an expre*ssion of gratitude. This practice has been happening since the 1970s.*

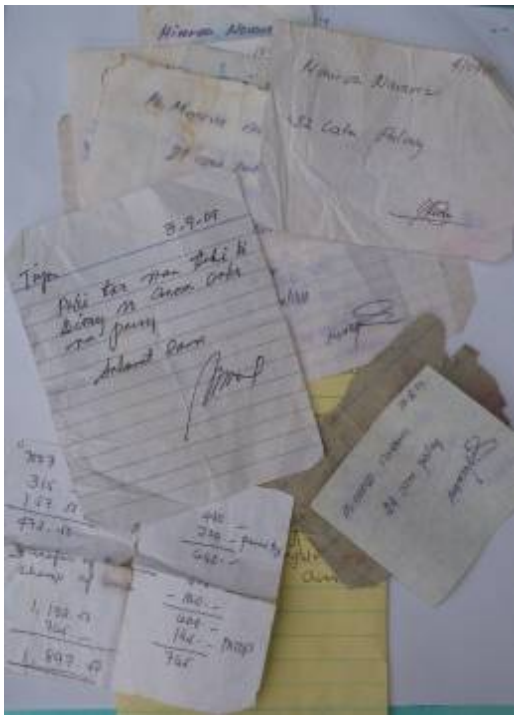
[30] Interview with official of the Provincial Office of Department of Agrarian Reform in Camalig, July 2010.

Most tenants have sufficient business acumen to know that having receipts is good proof of their security. Having receipts not only legitimises their tenancy but also demonstrates their responsibility to the land that they manage. However, this is in fact not the case (table 6-14).

Table 6-14 Perception on legitimate receipt as proof of share

	Do you think that it is important to have receipts? (*n* = 30)	Do you get receipts from the owner? (*n* = 30)	Does it bother you if the owner doesn't provide receipts? (*n* = 30)
Yes	80%	10%	5%
May be	5%	-	-
No	15%	90%	95%

If the receipts are issued by the land owner, it is provided in hand-written form. Most tenants keep their receipts very securely since they perceive them to be proof of their rights and responsibilities. The receipt usually contains the date, the tenant's name and amount of share or payment, and the owner's signature (Figure 6-13).



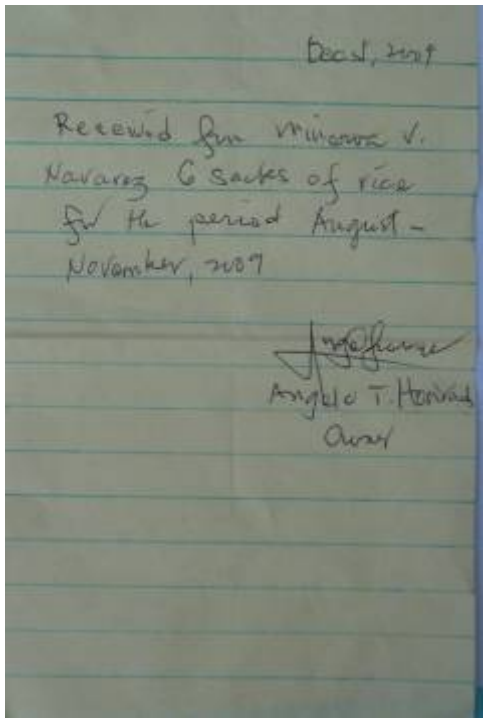


Figure 6-13 Common proof of crop sharing under trust-based tenancy.

However, about 90% of the tenants who usually keep their receipts lost them during Typhoon Reming in 2006. Though many of them see the importance of having receipts, they are not concerned if they are not provided since the arrangement is also mostly based on trust.

Most tenancy arrangements are informal, and either short term or long term. In a continuum of tenancy, the landowner seeks shorter terms and less formality while the tenant usually seeks longer terms and more formality. This is demonstrated in Figure 6-14.

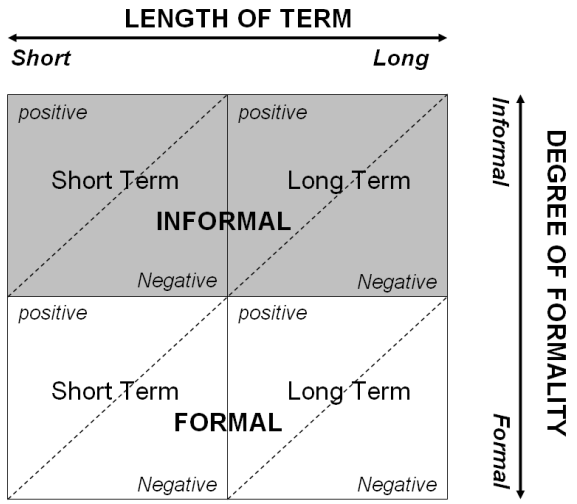


Figure 6-14 Matrix demonstrating degree of formality *vis-à-vis* length of term. Shaded quadrants demonstrate common tenancy practices in study area (source: FAO (2001))

According to the figure above, the most secure arrangement for tenancy is the one on the lower right quadrant i.e. a long-term formal arrangement. In the study area, security of tenure for such informal practices of tenancy is perceived to be dependent on the relationship between the land owner and the tenant. In addition, the economic status of the owner, degree of control over what crops to plant and the powers over the tenants are also perceived to be important determinants from the land owner's perspective. On the other hand, a degree of freedom and trust are important elements that can support their security.

In addition, informal tenancies provide flexibility. Although most tenants agree on the importance of having a formal arrangement it is perceived to be more

complicated and requires more time to start the tenancy. Further, such arrangements are perceived to be more binding with less flexibility, particularly in times of disaster when most of the crops fail to harvest. Government support in terms of provision of clear procedures for solving problems between tenants and land owners is perceived to be an important avenue for security of tenancy.

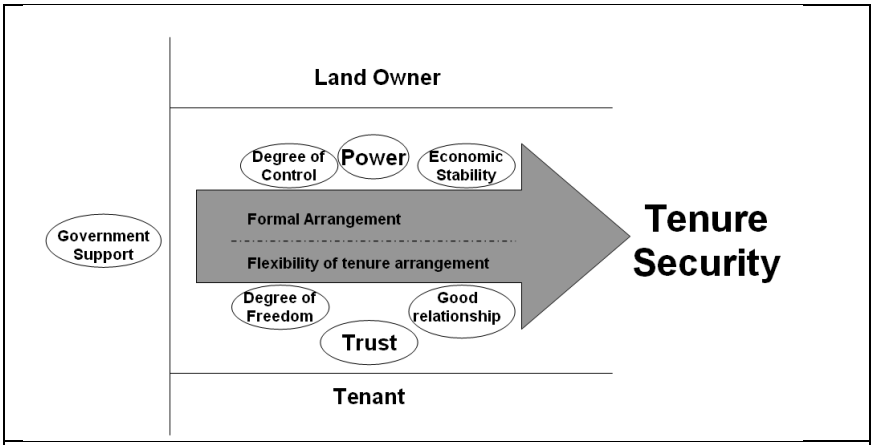


Figure 6-15 Elements of tenure security for informal tenants

6.3.3 Perceived Tenure Security of Government-assisted housing (BLISS) Beneficiaries

One of the main features of the BLISS program is re-orientation of attitudes on land ownership, use and management. The others are shelter and livelihood, community resource management, self-reliance, technology transfer, countryside mobilisation and institutional development (Domingo 2001).

Regarding the attitude of land ownership, Domingo (2001, p. 12) further states that:

> The traditional value regarding land ownership views land as a commodity of trade (freehold). The program sought to reorient this into one that views land as a social resource (stewardship). This is effected through usufruct arrangement where the control, disposition, and jurisdiction of the land is in the hands of the government. Beneficiaries are only entitled to the use of the land and its fruits.

The arrangement of BLISS is that awardees are given full rights of occupation to houses through a certificate that legitimates their ownership. Hence, the certificate is the only available document that the beneficiaries keep as their

security proof. The certificate was awarded right before officially entering the house. In practice, most awardees directly occupied the houses as soon as they were ready, between the periods of 1 week to 2 months.

The perception of full security for occupation of BLISS beneficiaries is based on the housing award certificate explaining full usufruct rights attached to the beneficiaries as the legal owners of the awarded houses. Consequently, most beneficiaries perceive that eviction will never happen as this is a government initiative that is never likely to change in the future.

Table 6-15 Perception on long-term ownership over BLISS housing

	Do you feel secured over long-term ownership of your house? (*n* = 30)
Yes	95%
May be	5%
No	-

The concept of reorientation of attitudes on land ownership as conceptualised by the Ministry of Human Settlement is debated by most of the beneficiaries during focus group discussions and individual interviews. For beneficiaries, though they know that they have full usufruct rights, the concept of land stewardship is perceived as ownership based on title, not only certificate.

Though some beneficiaries are not really concerned if the titles are collectively held by the government, 80% of the respondents firmly state the importance of having individual title lots under their name (Table 6-16).

Table 6-16 Perception on importance of individual title

	Do you think that it is important to have title? (*n* = 30)	Does it bother you if the individual title is not provided? (*n* = 30)
Yes	80%	60%
May be	5%	5%
No	15%	35%

All participants stated that they have complete freedom to redevelop and reconstruct the houses into bigger and more beautiful ones. Based on observation, 98% of the houses in the BLISS complex have been transformed into stronger and bigger houses, many of which are built to 2 or 3 storeys.

Table 6-17 Perception on investing capital over BLISS housing

	With this BLISS arrangement, do you have any doubts in investing your capital into the house? (*n* = 30)
Yes	-
May be	-
No	100%

Another privilege that BLISS beneficiaries possess is the possibility to waive the rights to not only first-blood families but also distant cousins or families. The process of waiving rights involves the judicial process. The transfer process is done with the involvement of a local public notary with acknowledgement of local government officials. Out of 59 units built in 1980 in the study area, 11 had been transferred to different names who acquired the land from the original beneficiaries. The practice of land selling has also been happening showing how land transfer can be done without formal title of documents.

6.3.4 Perceived Tenure Security of Resettled Community

The majority of people at the relocation site viewed the resettlement programs as an initiative for improving tenure security through housing award contract provided by the local government. Security of tenure at their previous settlements was based on social recognition *vis-à-vis* the length of occupation. Without legal certificates of ownership at the original settlement, people were constantly fearful of the threat of forced eviction by the government, although they were aware of the obligation of the government to provide them with alternative land if evicted.

In comparison, the houses provided at the relocation site are legally protected under the housing award contract. The contract shows that (MSWD 2007: p. 4):

> the signed beneficiary, with his/her spouse, dependent parents, dependent children and other household members have the right to the exclusive and continuous occupation, possession and use of the property for a period of 99 years from the date of the contract which may be renewed for the same or another period.

A scale analysis was conducted during focus group discussions with resettlement groups on how the provision of houses at the resettlement sites

does not only provide safer settlement from natural disasters, but also provides more tenure security.

> *Full right to a house for 99 years and longer is like having a house forever. Nilo, 45 yo, resettled in the new relocation site from Barangay Anoling.*

The case of the resettlement site is very similar to the BLISS group, as both are government initiatives in which the documents are collectively kept by the government. The difference lies in the rights attached to the beneficiaries (Figure 6-16). In the resettlement site, no transfer of rights or selling is possible since the house is restricted to occupation by the beneficiaries of first-blood families. The 99 years of extendable occupation is perceived to be an unlimited occupation provided the contract is not violated. In addition, their rights to the housing provided by the government are also socially acknowledged giving the beneficiaries more legitimacy to their tenure security.

The only hindrance of developing the houses at the resettlement site is capital. Most of the residents show their confidence in investing capital into the expansion or redevelopment of their houses.

6.3.5 Perceived Tenure Security of Titled Property Owners

In the study area, land title is the most commonly recognised instrument for providing tenure security. Even though there are other factors perceived to constitute tenure security, the eventual dream of all residents is to have legitimate proof of ownership in the form of title documents.

Theoretically, titled groups are the most secure of all tenure groups and various rights attached to their titles are enjoyed by the residents. In the study area, in strictly legal terms, only formal title holders can get licenses for development and construction. This license also functions as registration and information update of their properties to the municipality. This privilege is another security factor that is of benefit to the groups thus strengthening their ownership of the lot they occupy.

The only threat that this group face is the loss of government records due to disasters. All title property owners hold formal titles of their properties in a paper form. A manual land record is also kept at the municipal office, including records of land transfers through selling and inheritance. All interviewees and participants of focus group discussions recognise the possibility of documents being destroyed by disasters, either at the local government offices or their houses. In the Municipality of Camalig all title records are still kept manually and are paper based (this will be further discussed in Section 8.2). However, having experienced living with disasters in the past, title groups do not show any fear of losing access and rights to their properties after disasters, even if their title documents are destroyed.

Initiatives for improving the land administration system in the Philippines have been happening since 2002 through Land Administration and Management Project (LAMP). One of the project components is computerisation of land records.[31] However, the study area is not a project area.

6.4 Analysis of Tenure Security

This section discusses the rights that are attached to each tenure group and the associated laws that regulate the ownership and arrangement of the various types of tenure groups.

6.4.1 Security of Tenure for Informal Settlers

The different types of informal settlements represent non-statutory tenure systems to which "*de facto*" security and rights are attached. Social recognition plays a major factor in this reality, especially in the context of the study area

[31] LAMP (Land Administration and Management Project) is a long-term (15-20 years) land administration and management program in the Philippines. It is multi-funded with inputs from the World Bank under a Learning and Innovation Loan, the Australian Government through an AusAID grant and the Government of the Philippines. Its objectives are to increase land tenure security and improve land administration services through the implementation of institutional and legal reform, the realization of an accelerated land titling program, and the establishment of a fair and uniform property valuation system. The loan was executed in two phases, starting in October 2000. This information was sourced from http://www.worldbank.org.ph/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=332982&menuPK=333014&Projectid=P073206

where social and cultural ties are very strong. The informal settlers' rights to occupy the land are actually very weak according to the law on eviction.

> Section 28, Article VII (Urban Renewal and Resettlement) on Eviction and Demolition states that "eviction and demolition as a practice shall be discouraged". However, it is further stated that eviction and demolition may be allowed under the following situations (RA No. 7279 1991: p. 13):
>
> When persons or entities occupy danger areas such as *esteros,*[32] railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and other public places such as sidewalks, roads, parks, and playgrounds;
>
> When government infrastructure projects with available funding are about to be implemented; or
>
> When there is a court order for eviction and demolition.

In addition to social recognition, what are perceived to be tenure security factors by most of the informal settlers, are the period or length of stay and the resettlement to be provided by the government following an eviction.

Section 28 of the Urban Development Housing Authority on Eviction and Demolition further states that (RA No. 7279 1991: p. 13-14):

> In the execution of eviction or demolition orders involving underprivileged and homeless citizens, the following shall be mandatory:
>
> Notice upon the effected persons or entities at least thirty (30) days prior to the date of eviction or demolition;
>
> Adequate consultations on the matter of resettlement with the duly designated representatives of the families to be resettled and the affected communities in the areas where they are to be relocated;
>
> Adequate relocation, whether temporary or permanent: Provided, however, That in cases of eviction and demolition pursuant to a court order involving underprivileged and homeless citizens, relocation shall be undertaken by the local government unit concerned and the National Housing Authority with the assistance of other government agencies within forty-five (45) days from service of notice of final judgment by the court, after which period the said order shall be executed: Provided,

[32] *Estero* is Tagalog word for inlet canals or estuary.

> further, That should relocation not be possible within the said period, financial assistance in the amount equivalent to the prevailing minimum daily wage multiplied by sixty (60) days shall be extended to the affected families by the local government unit concerned.

Therefore, the degree of legal tenure security for informal settlers is almost nothing based on the fact that the land they occupy is allocated for a buffer zone. Despite the strong perception of tenure security (Section 6.3.1), there is always threat of eviction faced by informal settlers if a major infrastructure project is implemented by the government according to Section 28, Article VII (Urban Renewal and Resettlement) on Eviction and Demolition (RA No. 7279 1991).

However, practically, inheritance of this land is possible especially for settlers who have been living there for more than 50 years. The weak law enforcement in the country supports the growth of informal settlers.

The most secure type of informal settlers are those who reside on major roads as there is a high frequency of land and housing transfer for this type of ownership, although it is not recognised by law. The degree of security is also demonstrated by the more permanent types of houses that are built on informal land along the main roads in the study area.

In the study area, the provision of public services such as electricity, public lighting on the main road, and access to water, have become evidence of tenure security, which is called proxy evidence of tenure security (De Souza 2001). Since electricity in the study area is managed by a private company, it is common to see informal settlers paying electricity bills. Even though it does not happen in the study area, in contested settlements in more developed areas, services can be extended to sewage disposal and rubbish collection (De Souza 2001).

6.4.2 Security of Tenure for Tenants

In the study area, labour tenancy and share cropping are differentiated as the rights attached to them are also different. Access to basic rights of use and occupation is also different and labour tenancy has less security compared to

share cropping. The main difference is the arrangement for labour tenants who work on other people's land on a wage basis without the privilege of occupying the land for housing. Though many cases have been demonstrated that both types of tenancy can be inherited by the next generation, tenant groups who live on the land they manage have more freedom to construct, develop and improve the houses. On the other hand, a labor tenant has to find another space to live, usually by squatting on different land depending on the location of their tenancy.

Although disputes are seldom encountered in the tenancy system, the mechanism of dispute or problem solving is regulated in Section 11 of Republic Act (RA) No. 6389. RA 6389 is the Agricultural Land Reform Code approved on September 10, 1971, which amends acts previously established through RA No. 3800 and 3840 (RA No. 6389 1971). Section 11 of RA 6389 (p. 1) states:

> Any dispute as to the reasonableness of the terms and conditions may be brought by the lessee or by the Department of Agrarian Reform (DAR) to the proper Court of Agrarian Relations which shall decide the same within sixty days from the date of the filing.

In terms of disputes, most participants understand that their rights are protected by the law and a mechanism has been established by the court and the DAR to solve them. Data from focus group discussions reveals that there are no major disputes between tenants and owners were encountered, since good relationship has been established over the time.

Table 6-18 Experience and perception on possibility of dispute with land owners

	Have you had any dispute with the owner? (*n* = 40)	Do you think disputes will arise in the future? (*n* = 40)
Yes	-	-
May be	-	10%
No	100%	90%

RA 6389 also protects the sustainability of tenants by defining the mechanism in case the land is to be sold by the owner. In the same section, it explains (RA No.6389 1971, p. 2):

> Lessee's Right of Pre-emption. - In case the agricultural lessor decides to sell the landholding, the agricultural lessee shall have the

> preferential right to buy the same under reasonable terms and conditions: Provided, That the entire landholding offered for sale must be pre-empted by the Department of Agrarian Reform upon petition of the lessee or any of them: Provided, further, That where there are two or more agricultural lessees, each shall be entitled to said preferential right only to the extent of the area actually cultivated by him. The right of pre-emption under this Section may be exercised within one hundred and eighty days from notice in writing, which shall be served by the owner on all lessees affected and the Department of Agrarian Reform.

This right is fully understood by the tenants and kept as their security. This matter is not commonly discussed prior to commencement of a tenancy or during the tenancy period. Nevertheless, this information has been spread among the tenants who still think that negotiation with the owners is the key solution in the first instance, should a conflict occur.

Table 6-19 Tenants' perception of possibility of the owner selling land

	At the first place of your contract, did you discuss the 'what-if" possibility of land sale? (*n* = 30)	Do you think the owner will first offer you the land if it is going to be sold? (*n* = 30)
Yes	-	95%
May be	-	5%
No	100%	-

On the other hand, most of the interviewed land owners understand the rights of the tenant in that regard and will implement the law. Interestingly, this willingness is not merely because of the law, but more because of the strong social bond with their tenants.

6.4.3 Security of Tenure for Government-Assisted Housing (BLISS beneficiaries and Resettled Community)

The rights of residents of government-assisted housing are protected by housing award provided by the local government. In BLISS, their rights are explained in the *housing award certificate* whereas for resettlement sites, their rights are listed on the *housing awards contract*. Since the documents are both issued by local governments, the status and conditions are more or less the same (LGU Camalig 2008: p. 3).

> The awardees with his/her spouse, dependent parents, dependent children and other household members have the rights to exclusive

> and continuous occupation, possession and use of the housing unit for a period of 99 years from the date of the contract. The possession can be renewed for the same or another period subject to terms and conditions.
>
> Except by way of hereditary succession, no other parties are allowed to occupy, reside or use the awarded house including transferring the possession, occupation, use and/or rights to the housing unit or its portion.
>
> The housing unit is to be used for residence purpose and is prohibited to be converted to any other purpose. Changes, improvements or modifications on the housing unit are allowed as long as still within the lot.
>
> The awardees are responsible to defray utilities installed, used and consumed (i.e. electricity and water) and solely responsible for the maintenance, upkeep and repair of the housing unit.
>
> The local government shall have the right to terminate or cancel the contract should the awardees violate the conditions of awards or abandon the awarded housing unit, which includes acquiring another residence or return to their original place of residence.

As mentioned in the award, beneficiaries of resettlements have full rights to the houses with the exception of transferring of houses and changing of function to purposes other than residential.[33] The house is also restricted from occupation by parties other than a direct family relation.

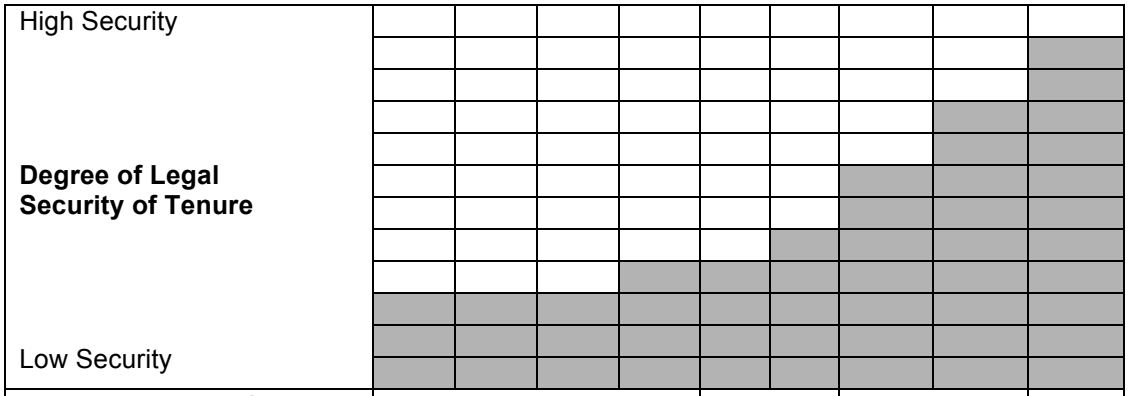
Another important fact that prevents the government-assisted housing beneficiaries from being in full status of tenure security is that the title is not given to them. All of the lots in the housing complexes are possessed by the local government and the titles are not divided into individual lots but registered as whole government land. The detailed information on the contract or award is, however, clear in terms of the detailed lot number to be given to the beneficiary.

6.4.4 Security of Tenure for Titled Group

Tenure security continues to grow to the maximum level of rights with the formal title holders. With this title document, titled groups can continue to enjoy

[33] Based on interviews with DSWD, small business activities are allowed to be conducted in the house.

their possession without the threat of eviction or land grabbing. In the situation after natural disasters, no cases of land grabbing were encountered despite the fact that many of the title properties are owned by single female households. Without restriction, titled groups can also have access to formal credit, either by government or private financial institutions, using their titles as guarantee.



Tenure Security Category / Components of Tenure Security	Informal Settlers				Tenant		Government-assisted housing		Titled
	Informal Settlements on riverbank	Informal Settlements on railway	Informal Settlements in forest	Informal Settlements on road	Labour Tenancy	Share Cropping	Resettlement Sites	BLISS	Titled groups
Usufruct (to occupy / use / enjoy)	X	X	X	X	V	X	X	X	X
To buy / sell				X		X		X	X
To transfer								X	X
To inherit	X	X	X	X	X	X	X	X	X
To develop / improve						X	X	X	X
To cultivate / produce					X	X	X	X	X
To sublet and fix rent								X	X
To access services	X	X	X	X	X	X	X	X	X
To access formal credit with housing guarantee							V	V	X*

Key
X Right available to both men and women
V Situation varies from one case to another
* Depending on situation, housing-credit scheme in the study area sometimes considers income as an assessment factor, in addition to title as a loan guarantee.

Figure 6-16 Rights attached to different tenure types and their demonstrated level of tenure security based on the rights

6.5 Discussion

6.5.1 Movement along a Continuum of Tenure Security

As discussed in Section 6.2, the dominant types of tenure system in the study area are non-formal tenures, consisting of various types of informal settlements and different arrangements of tenancy.

An aspect of this movement along a continuum is the dynamic movement of informal settlers in search of better settlement that can bring them more livelihood opportunities and/or better access to housing. Many of the informal settlers along the roads have moved from earlier temporary settlements along the river banks or from temporary dwellings in Metro Manila as the threat of eviction was strong.

> *Sally Garcia is 56 yo. In 1976, she moved from an informal settlement in Metropolitan Manila due to the threat of eviction. She and her husband moved to Ilawod for greater security of tenure. Her father-in-law was a barangay captain so he arranged purchase of land along the main road. She bought the lots for PhP 400 from the caretaker.*
> *There was an agreement letter (hand-written) from the caretaker, witnessed by the barangay captain but it was washed away during 2006 Typhoon Reming.*
> *In the earlier settlement in Metro Manila, no other rights were attached to them except for occupation. With this lot, she claims to have full rights of occupation and they slowly built the houses. She has no concerns about investing their capital into their property.*

In addition, as elaborated on Section 6.3.1, the perception of different groups of informal settlers towards government recognition of their ownership is another example of this movement along a continuum of security: from squatting, to recognised owner by government and community. In this regard, length or period of occupation plays an important factor in this movement along a continuum. On the other hand, social recognition also supports the movement.

Overall, the range of different types or forms of tenure in the study area can be seen as a *continuum* as each tenure type has different rights attached to them (Figure 6-16) that defines the degree of security (Figure 6-17). Across the whole

continuum, formal title is still considered the most legally secure system, even though different tenure groups perceive tenure security differently (see Section 6.3). In principle, movement along a continuum of tenure security occurs as additional rights are attached to their tenure system or more formal or legal recognition is given to their property.

This typology of a continuum of tenure security status can be simplified in a diagram shown below.

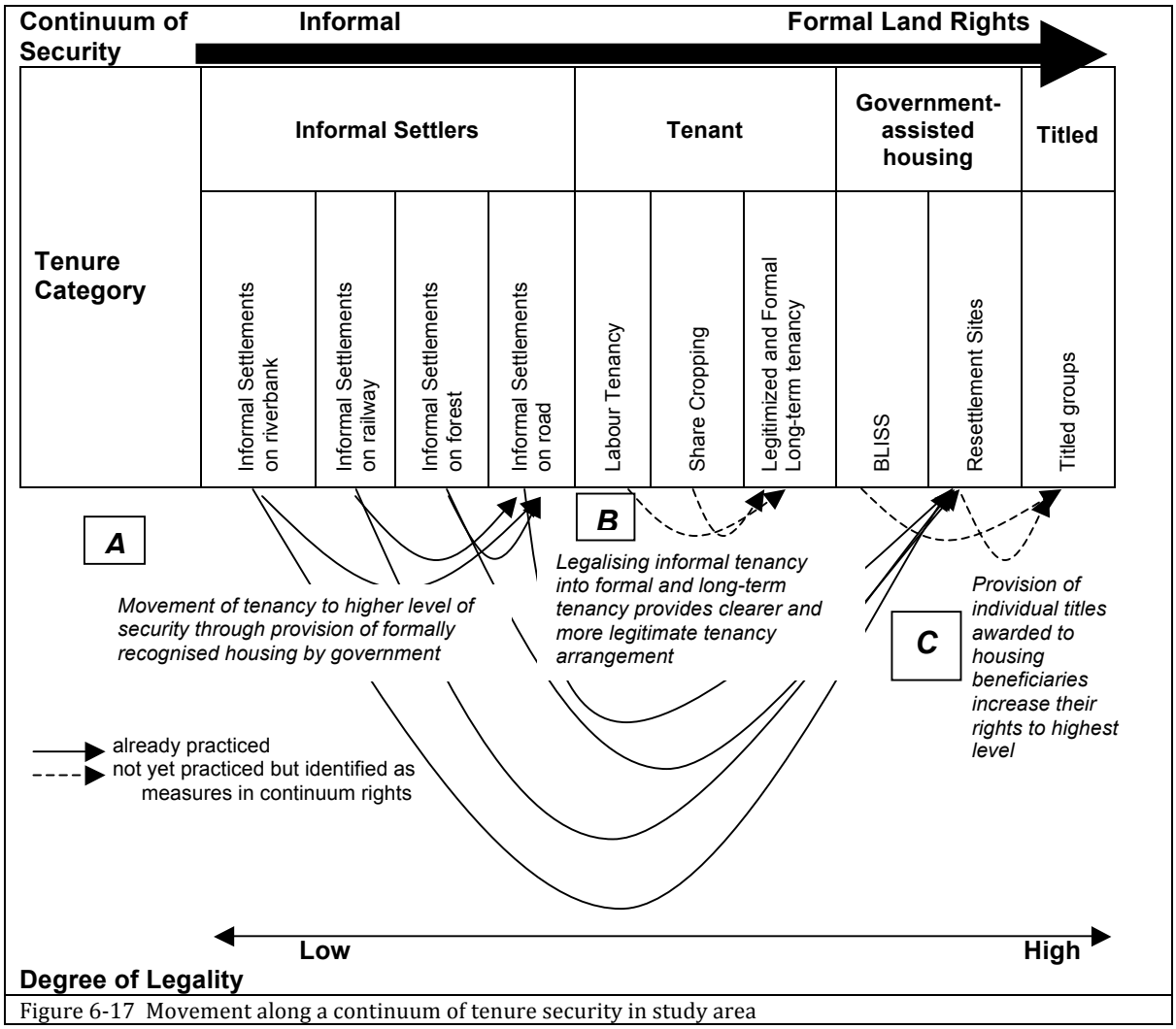


Figure 6-17 Movement along a continuum of tenure security in study area

In the same way, provision of housing by the government for the poor people (in case of BLISS) and to the people residing in disaster prone areas (in case of resettlement site) is considered an improvement of tenure security from an informal to a more formal status of ownership; hence movement along a

continuum tenure security. All beneficiaries of government-assisted housing were informal settlers from different places who now enjoy privileged rights attached to them, especially with housing registration under their names and exclusive occupation for 99 years (and extendable). Thus this scheme demonstrates movement along a continuum from different types of non-formal tenures to a legitimate form of tenure.

In this case, formality of land tenure does not require financial capital as much as in purchasing plots of land in titled properties. All BLISS beneficiaries were awarded the houses at no cost and only a few beneficiaries of the resettlement group invest their time and resources to be legitimate housing awardees (see Table 6-5).

Even though government housing awardees realise their legal legitimacy, some significant rights are still not attached to them due to restriction of title, which is held collectively by the government. In order to enjoy full benefit, particularly the right to transfer and sell the land, the home-owner organisation of BLISS brought the issue to the legislative level. In 2007, 27 years after the houses were awarded, the provision of individual title to housing beneficiaries was discussed at the legislative level of the Municipality of Camalig. With the current arrangement, the absence of individual land titles leaves them in doubt about the long-term legitimacy of their ownership on the lot they occupy.

Though most of the tenant group depend on their long-term occupation of land and trust as the main factors of security, the provision of legitimate and formal long-term tenancy is a legal avenue in providing them with more security to their tenancy system. With this movement along a continuum, a higher level of tenancy security can be achieved as demonstrated in Figure 6-18. The figure provides a comparison between the current and the expected level of tenure security of different tenure groups. In this figure, the level of security is reflected through the rights attached to each tenure group as explained in Section 6.4. For the purpose of visualisation, each component of tenure security, as shown in Figure 6.16, is represented by one dark grey box.

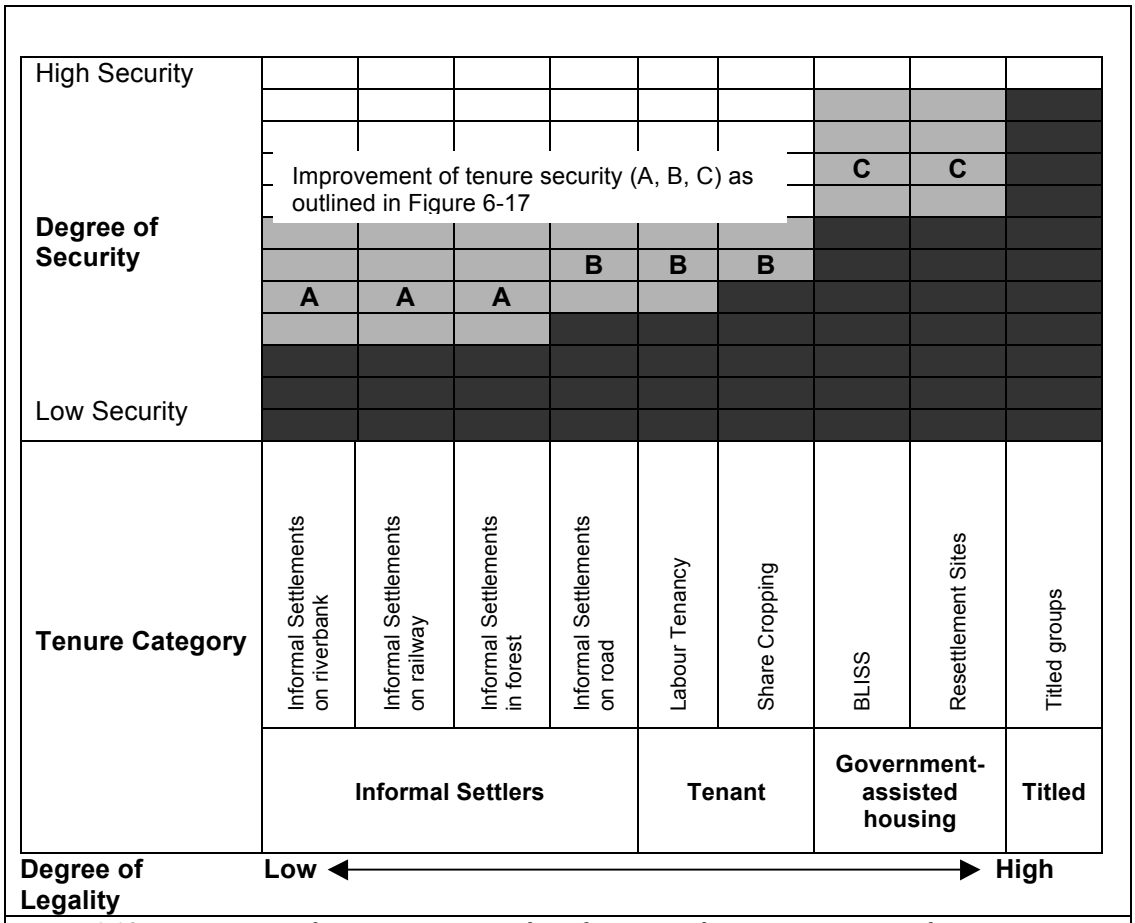


Figure 6-18 Improvement of tenure security resulting from upgrading tenure status. Dark grey: current status of tenure security based on component of tenure security shown on Figure 6-16; light grey: expected level of tenure security through movement along a continuum of tenure security (see Figure 6-17)

6.5.2 Factors Constituting Perceived Tenure Security

The outcome of this research has confirmed earlier research on perceptions of tenure security in the Philippines, demonstrating that land titles are the most commonly recognised instrument for providing security of tenure (Porio and Crisol 2004). Therefore, from a legal point of view, it is relatively easy to determine the degree of security that each tenure group possesses. In that regard, only titled property owners and government-assisted housing beneficiaries (BLISS and resettled community) possess security of tenure. In other words, 64% of the total households are living with varying degrees of tenure insecurity. Despite that fact, however, many of the community members with different tenure types perceive their life to be secured in terms of tenure (Table 6-20).

Table 6-20 General perception on tenure security based on question 'Are you secure in terms of land tenure?'

	Informal						Regularised		
	Informal Settlers				Tenant		Government-assisted housing		Titled
	along riverbank (*n* = 30)	along railway (*n* = 20)	in forest (*n* = 20)	on road (*n* = 30)	Labour Tenancy (*n* = 20)	Share Cropping (*n* = 20)	BLISS (*n* = 20)	Resettle-ment sites (*n* = 30)	Titled group (*n* = 30)
Yes	60%	70%	90%	85%	75%	90%	90%	95%	100%
May be	30%	10%	10%	10%	15%	5%	10%	5%	-
No	10%	20%	-	5%	10%	5%	-	-	-

In the context of the Philippines, and especially the study area where long-term occupation of untitled properties is common, varying factors are explored here that explain the underpinning reasons as to why people reside in untitled properties in disaster prone areas. Since the disaster factor is explained separately in Chapter 7, this chapter concludes with indicators of tenure security based on community perceptions that were explored through the various qualitative research methods discussed in Chapter 2. An exploration of factors constituting tenure security can explain the dynamics of rural life in disaster prone areas. These factors can be used as basic information for improving tenure security where legal titles are not available. They can also be used as a basis for the provision of intermediate tenure security instruments for the rural poor.

The possession of documentation in the form of title documents is still considered a primary factor for tenure security by all tenure groups. While the threat of eviction is still the core of any discussion among the non-formal tenure groups, other positive factors have been identified that constitute tenure security in the context of rural areas. Social recognition is one of the primarily-identified factors. Not surprisingly, in strong socially-bond communities such as in the study area, even people with title properties still highly value the importance of social recognition in supporting and maintaining tenure security. For informal groups, this social recognition is built upon the length of occupation and social relationship with other community members. Thus, this

has become their social legitimacy for their tenure security. On the other hand, for tenant groups, this recognition is rooted in mutual agreement and good relationships with land owners.

Table 6-21 Factors constituting tenure security based on perceptions of community from different tenure groups

Aspects	Informal					Regularized		
	Informal Settlers				Tenant	BLISS	Resettle-ment	Titled Groups
	along the railway	on river bank	in forest	on road				
Title documents								✓
Formal certificate / award of housing						✓	✓	✓
Government recognition	✓			✓		✓	✓	✓
Length of occupation	✓	✓	✓	✓	✓			
Social recognition	✓	✓	✓	✓	✓	✓	✓	✓
Security to occupy land after disasters	✓	✓	✓	✓	✓	✓	✓	✓
Agreement with owner / third party					✓			
Improvements and investment to property			✓	✓	✓	✓	✓	✓
Connection with person from institutions linked to power	✓	✓	✓	✓				
Family succession					✓	✓	✓	✓
No threat of eviction	✓	✓	✓	✓	✓			
Formal long-term arrangement						✓	✓	✓

Government recognition is demonstrated by the housing award certificate to the beneficiaries of BLISS and housing award contract to the resettled community. For the informal settlers, for example, recognition of their land for re-occupation after disasters is perceived as legitimate government recognition. There is no evidence of cases where informal settlers along main roads, river banks and railway tracks have been thwarted from re-establishing their life in their original settlement after a natural disaster. A connection with personnel attached to institutions linked to power is another factor that constitutes tenure security for, particularly, informal settlers.

Residents of informal groups also rank capital and their investment in a property as additional factors of security. The possibility of family succession as recognised by the law is also another important factor defining security for regularised groups.

6.5.3 Legal versus Social Legitimacy over Tenure Security

The identified factors that constitute tenure security discussed in the section above are related to the concept of legitimacy of rights to land, which come from different sources including legal and social recognition (Mitchell 2011). In this case, legal legitimacy is *de-jure* recognition of land indicated by clear possession of a lot or lots in the form of title documents. On the other hand, social legitimacy is certainly not based on law but by *de-facto* recognition through individual claims and through acceptance of possession by the society. Despite the informality of residing on public land, such acceptance is believed by the communities to be rooted in the length of occupation and the investment put into the houses (thus claiming their possession of the land). In addition, factors identified in Table 6-21 are reflections on how social legitimacy plays an important role in securing tenure in an environment where most residents live on informal land.

Figure 6-19 Social legitimacy provides confidence to informal settlers to invest capital to build strong and permanent house (left). Construction of fences in temporal or semi-permanent houses is a common practice that demonstrates how ownership is also validated by social legitimacy (right)

The legitimacy over tenure security is also manifested through different rights attached to their possessions, as explained separately in Section 6.6. For

instance, the level that differentiates BLISS and a resettlement site is the 'right to sell' possessed by BLISS beneficiaries and 'transfers or waive of rights' to the third party aside from family members. Interestingly, among the informal settlers, investments made to the houses, indicated by their strength and size, is perceived as one of the strongest drivers of social legitimacy.

As to the tenancy system, the houses built by the tenant on the owners' land socially gained more legitimacy compared to share cropping groups who reside on different land.

The level of tenure security of different tenure groups is graphically compared in Figure 6-20 taking into account the concept of legal versus social legitimacy.

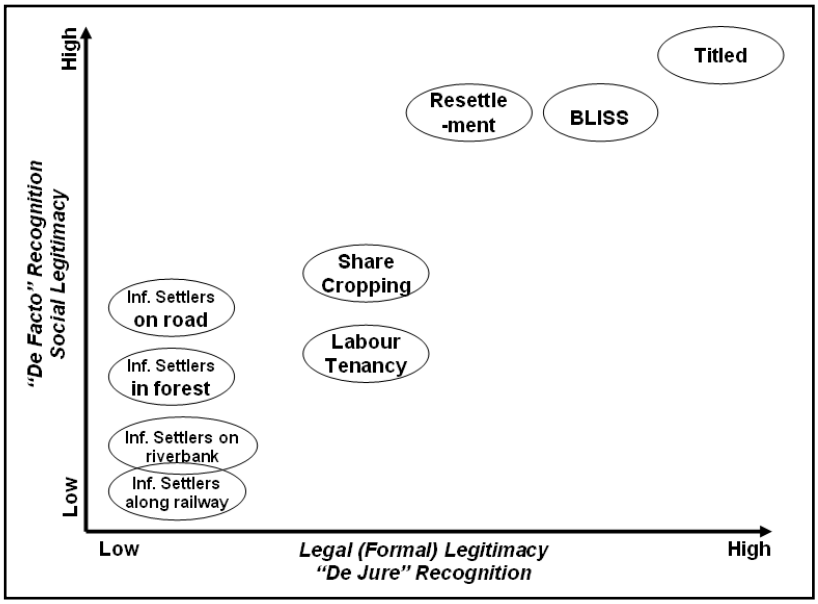


Figure 6-20 The level of tenure security based on legal vs. social legitimacy

6.6 Conclusion

This chapter has presented different types of tenure in the study area, the majority of which are of different types of informal tenure, and their perceptions on tenure security. This particular finding has responded to one of the problem statements in this research outlined in Chapter one. Tenure systems presented in this chapter demonstrates how informal settlements are

growing faster than formal settlements, which adds a contributing factor of vulnerability in the study area, as discussed in Chapter 5.

Findings from this chapter reveal that there are two sources of tenure security in the study area: *de jure* and *de facto.* Formal tenure groups (title property owners, resettled community and BLISS beneficiaries) enjoy *de jure* recognition of their ownership. However, this research reveals that in the context of informality, *de facto* tenure security is an important factor in determining tenure security.

Both recognitions provide confidence to continue occupy the land they reside, supported by various social factor that exist within the community (see Sections 5.3.1 and 5.4.1). In addition, another key finding is how social recognition in the context of tenure informality significantly contributes to perceived tenure security. This particular finding on the social aspects of tenure security will be further elaborated in the Chapter 7 as a contributing factor of resilience.

The key findings from this chapter will add to the discussion on how perceived tenure security contributes to disaster resilience. It is the core research finding that will be further discussed in Chapter 8.

CHAPTER 7 - RESILIENCE TO MULTIPLE DISASTERS

7.1 Introduction

This chapter presents the second major finding on disaster resilience as a core theme of the research study and will focus on the second intermediate objective initially outlined in Chapter 1. This relates to the status of disaster resilience in the study area and to community perception of what constitutes resilience. Drawing from the broader literature review on disaster resilience presented in Chapter 4, this chapter firstly discusses resilience from a system analysis perspective based on four dimensions of resilience: institutional, social, economic and physical (see Section 4.4). Indicators of each resilience dimension are discussed to present the status of resilience of each dimension. Findings in this section are integrated from data presented in Chapter 5.

Section 7.3 presents resilience at the individual level highlighting household adaptation measures. It illustrates strategy in household resilience despite the economic constraints outlined in Chapter 5. Section 7.4 illustrates resilience mapping. It presents the status of resilience of each dimension with their respective indicators that were highlighted in the earlier sections of the chapter.

7.2 Disaster Resilience as a System Analysis

The definition of "system" in the Oxford English Dictionary (2011) is presented here to provide a basic understanding of what is discussed in this section on a system analysis. The word system is defined as

> ... a group or combination of interrelated, interdependent, or interacting elements forming a collective entity.

The dictionary also states that a system includes "the law and rules that control the entity or the society".

Therefore, in the context of this research study, a resilience analysis justifies how the whole system is integrated in relation to disaster management.

Referring to the scope of disaster resilience from a system perspective discussed in Section 4.4.1, the analysis covers the level of preparedness, the effectiveness of disaster responses and the relationship between geographical, political, economical and other aspects of the whole system.

In the system analysis, a top-down approach is observed. The discussion on different types of resilience in this chapter is supported by the fact that resilience is a multifaceted concept that includes social, economic, institutional, infrastructural/ physical and community elements (Cutter et al. 2008; Cutter et al. 2010; IOTWS 2007; Zhou et al. 2010). As discussed in Chapter 4, those four dimensions of social, economic, institutional and physical resilience are presented in a system analysis of disaster resilience and to explain:

- the pre-determined situation. This is the different variables of social, natural (environmental) and economic that are the main aspects that factor resilience. This also extends to the level of community competence and community structure (Cutter et al. 2008; IOTWS 2007; Sivell et al. 2008; Zhou et al. 2010).
- how the system works during disasters. This is about the organisational resilience related to the organisations and institutions that manage the systems (IOTWS 2007; Tierney and Bruneau 2007).
- the post-disaster setting of the system. This stage of analysis is still about the capacity of the system to recover following a shock and the ability to bounce back or even to build up more than the initial stage.

7.2.1 Institutional Resilience

Institutional resilience in this context refers to governance in disaster management. There are many definitions of governance, but one related to development has been selected for this study, which is that governance is

> … the process of decision-making and the process by which decisions are implemented or not implemented (UNESCAP 2011).

Therefore, institutional resilience can be described as (1) the capacity of disaster-related institutions in the whole process of governing the different tasks carried out before, during and after the strike of a natural disaster, (2) the disaster-related policies that are produced as the outcome of the governance and (3) the effectiveness of the policies at the implementation level.

There are five strong indicators as to why the Philippines, especially Albay Province, is strong in terms of institutional resilience. These indicators are adopted from different schools of thought that define the characteristics of institutional resilience (Cutter et al. 2008; Handmer et al. 1999; IOTWS 2007; Twigg 2009). These indicators are disaster management policy and political commitment; institutional mechanisms, capacities and structures; funding support for disaster management; hazard mitigation and emergency response plan; and public awareness and community participation. They are discussed in the following Sections 7.2.1.1 to 7.2.1.5.

7.2.1.1 Disaster Management Policy and Political Commitment

In terms of policy, the Philippines has a long tradition of having a formal disaster management system and structures with well-established policy, making it one of the leaders in this area in Asia (ADPC 2002). The main umbrella of the Philippines' legal, institutional and policy framework for disaster risk management was established on July 27, 2009. The law, which is established under Republic Act No. 10121, is known as the "Philippines Disaster Risk Reduction and Management Act of 2010". It is an act that strengthens the Philippine disaster risk reduction and management system, provides the national disaster risk reduction and management framework and institutionalises the national disaster risk reduction and management plan including budget planning (RA No. 10121 2010).

Though the institutional mechanism for disaster response is also regulated in the law, the Act puts a strong emphasis on regulating and addressing disaster risk reduction at the national and local level. The law demonstrates the relevant

and enabling legislation and regulations that support the DRR priorities for the whole country. In other words, the Act provides a national platform for implementing disaster-related activities aimed at reducing vulnerability and building resilience. In addition, the law also recognises that DRR and DRM measures are not isolated activities but linked to development processes and opportunities (NDRRMC 2011). Twigg (2009) argues that having an established regulation as discussed above is the foremost component of resilience.

7.2.1.2 Institutional Mechanisms, Capacities and Structures

The political consensus on the importance of DRR and its priority at all levels of government is also manifested through a clear institutional mechanism in disaster management. The platform for institutional mechanism has been present since the establishment of the NDCC as the highest policy-making body and the focal organisation for disaster management in the country. The NDCC was established under Presidential Decree (PD) 1566 in 1978, followed by the establishment of regional, provincial, city, municipal and *barangay* disaster coordinating councils (NDCC 2011).

The structure of the NDCC consists of 18 executive members from different government agencies with specific mandates and this demonstrates that the government takes an integrated approach to disaster risk management that is incorporated into different sectoral policies (see Appendix 10). The clear institutional mechanism that is mandated to different levels of disaster coordinating councils (DCC) demonstrates the mainstreaming of capacities at the local DCC level. Division of responsibility, i.e. coordination during emergencies, has been established, and it is stated in the Republic Act that the Local Disaster Risk Reduction and Management Committees (DRRMC) shall take the lead in preparing for, responding to, and recovering from the effects of any disaster based on the following criteria:

(a) The BDC, if a *barangay* is affected;

(b) The city/municipal DRRMCs, if two (2) or more *barangay*s are affected;

(c) The provincial DRRMC, if two (2) or more cities or municipalities are affected;

(d) The regional DRRMC, if two (2) or more provinces are affected; and

(e) The NDRRMC, if two (2) or more regions are affected (RA No. 10121 2010).

The roles of the different government agencies in disaster response can be seen from the responsibilities of the government offices in the disaster response phase. The NDCC implements a cluster approach as an overall strategy for disaster response functions. This initiative has been adapted from the Inter-Agency Standing Committee (IASC) of the United Nations and its humanitarian partners, and aims to ensure a more coherent and effective emergency response by mobilising groups of agencies, organisations and NGOs to respond in a strategic manner across all key sectors or areas of activity (IASC 2011).

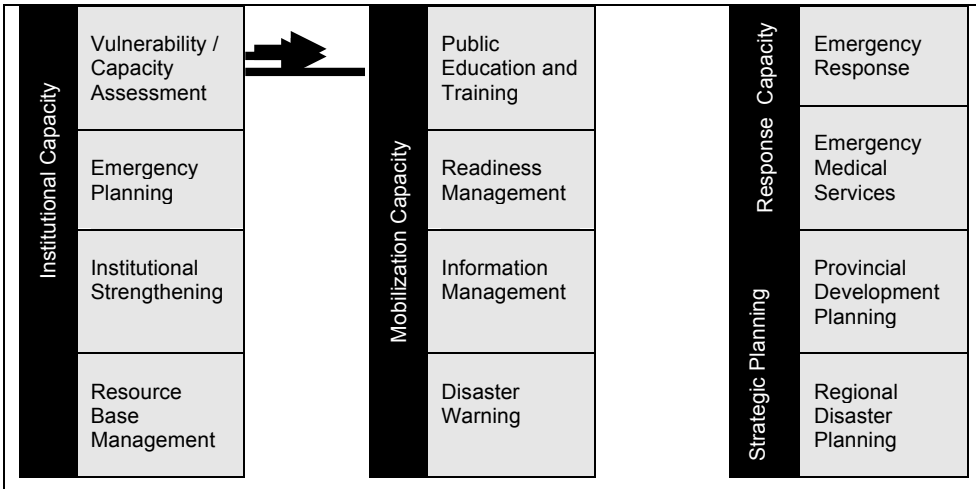


Figure 7-1 Strategic diagram of APSEMO programs (Oxfam GB 2008)

The Province of Albay is the first province in the Philippines to create a permanent disaster management office (DMO); it is a fully-fledged office with its own budget, personnel and facilities, not just a task force or an ad-hoc committee (Oxfam GB 2008). The permanent office was established in 1995 after the provincial government's institutionalisation of the Albay Public Safety and Emergency Management Office (APSEMO), which was tasked to design and

implement a disaster risk management and reduction program. Its main objective is to develop more pro-active and disaster-resilient communities in its capacity as the technical and administrative arm of the Albay Provincial Disaster Coordinating Council. Though APSEMO focuses more on pre-disaster programs (Oxfam GB 2008; Salceda 2009; UNISDR 2010), it also plays a significant role in pre-disaster, disaster and post-disaster phases in conjunction with different national and local agencies. The objectives are achieved by implementing activities focusing on strategic planning in institutional capacity, mobilization capacity and response capacity (Figure 6-1).

From a practical point of view, another objective of APSEMO is to have zero casualties from any kind of disaster that strikes the province (Salceda 2009). The institutional strengthening and the well-coordinated evacuation preparation have resulted in achievement of this objective. From 1995 till 2006, the province had zero casualties from numerous major disasters, including the strong typhoons of November 1995 and November 1998, and the Mayon Volcano eruptions in 2000, 2001 and 2006 (Oxfam GB 2008; UNISDR 2010a).

7.2.1.3 Funding Support for Disaster Management

The availability of financial resources to support disaster management activities or government commitment in supporting disaster-related activities is argued as one strong component of disaster (institutional) resilience (Cutter et al. 2008). The government's primary fund for disasters is the National Disaster Risk Reduction and Management Fund (NDRRMF, formerly known as National Calamity Fund) which is intended to supplement and complement local calamity funds. The fund is formed from the annual budget allocations and administered by NDCC. The allocation of the funding was based on Presidential Decree No. 477, in which "… two percent of annual budget appropriations should be reserved for the National Calamity Fund" (RoP 1974). Part of the annual NCF (usually 25%) is immediately allocated to a Quick Response Fund (QRF) or stand-by fund for relief and recovery programs for agencies such as the DSWD,

OCD, DPWH and DND (see Appendix 11). The QRF serves as a standby fund for use in the immediate aftermath of a disaster (Javier 2008; NDCC 2009).

At the local level, the primary source of funding is the Local Calamity Fund from the LGUs' annual local budgets. The Local Government Code of 1991, as amended by Republic Act No. 8185, emphasises the appropriation of 5% of the LGUs' budgets to a local calamity fund to be disbursed for relief, rehabilitation, reconstruction and other works and services upon the declaration of a state of calamity[34] in an area (Javier 2008; Oxfam GB 2008; World Bank 2005)

7.2.1.4 Hazard Mitigation and Emergency Response Plan

In the early warning system, linkages from national to local level have been established based on Republic Act No. 10121 on the Philippines Disaster Risk Reduction and Management System. That Act articulates a hazard warning system that includes the procedure and linkages between the disaster agencies (ADPC 2002b; RA No. 10121 2010). The corresponding functions of PDCC, MDCC and BDCC have also been highlighted in that framework (see Appendix 10).

At the municipal level, the allocation of responsibilities of the different agencies (in this case municipal departments) has been regulated by the Municipal Disaster Coordinating Council (MDCC) Task Unit (see Appendix 11). There are 12 task units assigned to different departments whose responsibilities have been outlined in the phases of pre-disaster, during and post-disaster (MDCC Camalig 2009). Though the allocations of task units are for all types of disasters, the units mostly function during volcanic eruptions and in the event of typhoons. In the event of a volcano-related disaster, which is likely to happen

[34] Based on policy on criteria for a declaration of State of Calamity established by NDCC:
"… a city, municipality, province or region is declared under a State of Calamity whenever two or more of the following conditions brought by fire of catastrophic magnitude, destructive typhoons, tornadoes, earthquakes, tsunamis, volcanic eruptions, floods lasting for at least 4 days, or drought affecting crop production are present.

1. At least 20% of the population are affected and in need of emergency assistance or those dwelling units have been destroyed.
2. At least 40% of the means of livelihood are destroyed.
3. Major roads and bridges are destroyed and impassable for at least a week.
4. Disruption of lifelines such as electricity, potable water, transport, communication system and other related systems which cannot be restored within one week, except for highly-urbanized areas where restoration of the above lifelines cannot be made within 24 hours…." (NDCC, 1998).

every two years (PHIVOLCS 2010), PHIVOLCS has five alert levels[35] that can be issued for the Mayon Volcano along with their criteria, interpretation and recommended action. Based on the alert level, the municipality has accordingly designed disaster plans involving inter-departmental coordination within the municipality in the different phases of disasters (see Appendix 11).

Typhoons and volcanic eruptions are frequent so the Municipality Disaster Management Office has developed a combined warning system and recommended actions at the local level (Appendix 6.3). The early warning system utilises sirens, whistles and local instruments for community outreach. While during volcanic eruptions mobile phones can still function, transmission is usually disrupted during typhoons. Sirens are activated from the municipal office and officials from different *barangays* use whistles while going around the villages to convey the message. *Batingaw*[36] are placed in strategic locations to make sure that all residents get the disaster message. This *batingaw* has been used as a warning device for many years as it is easily made from locally-available materials.

The municipality has also developed scenarios for evacuation from volcano eruptions, landslides, river flooding and typhoons. The plan has identified at-risk communities, pick-up points, evacuation centres, resource analysis (e.g. number of available vehicles, including trucks, and their capacity), required number of trips to transport the evacuees, distance to evacuation centres, travel time and fuel cost. Accordingly, a communication plan for each *barangay* has also been developed highlighting the roles of key officials at the *barangay* level and the communication mechanism to be used in time of disaster (Figure 7-2). The communication plan translates good institutional mechanisms as one aspect of resilience in governance. The well-established communication plan with active community participation is a demonstration of how the major roles

[35] Alert levels for active volcanoes in the Philippines are issued by PHIVOLCS and generally classified into 5 levels. List of active volcanoes and their alert levels is available at http://www.phivolcs.dost.gov.ph

[36] *Batingaw,* a Tagalog word for bell, is a traditional instrument made of bamboo. It is a percussion instrument related to a *gong* and bigger than a *Batingting (triangle,* in English). In the Philippines and many other countries where its availability is abundant, it is rung depending on the occasion but is used in mostly emergency situations, especially natural disasters, as a signal or warning device.

of local government in mediating disaster risk reduction are implemented. It demonstrates the multi-level and multi-stakeholder coordination of risk with the active engagement of local communities from provincial and municipal to *barangay* levels (UNISDR 2010b). How the community members actively participate, according to the plan, is discussed in the next section.

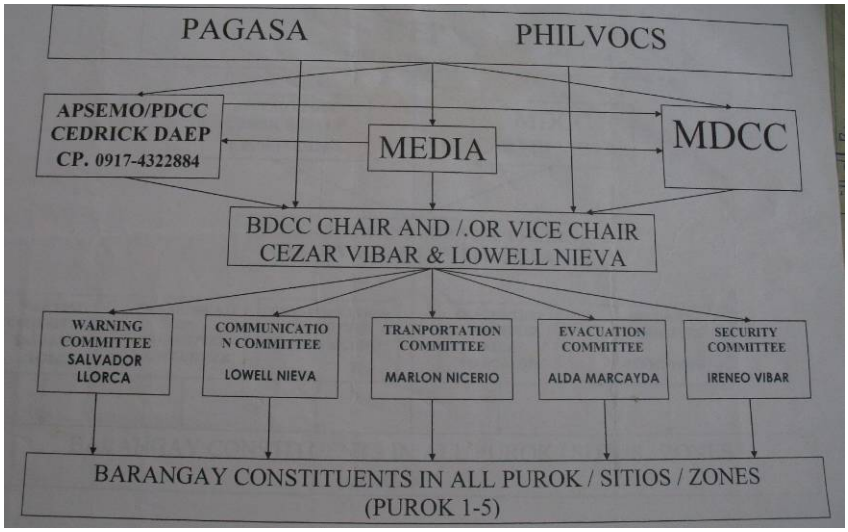


Figure 7-2 Communication plan of *Barangay* Ilawod for typhoon, flood, volcanic hazard, landslide, lahar flow

7.2.1.5 Public Awareness and Community Participation

Although many Filipinos face considerable hardship from frequent disasters each one adds to the accumulated individual and group knowledge of the community. The government has strategies in place to reduce the impacts of disasters and this demonstrates the maturity that it has developed over time in order to bring changes to the affected communities. One national initiative to raise the consciousness and awareness of the community on disasters is the National Disaster Consciousness Month (NDCM). It was initially proclaimed under Proclamation No. 296 dated July 29, 1998 which declares that the first week of July every year is Natural Disaster Consciousness Week. However, Executive Order No. 137 issued in August 1999 declared it would be the whole month of July every year as a National Disaster Consciousness Month (ADPC 2001). This was because it was recognised a month-would be needed to

promote disaster consciousness and to provide concerned agencies with more time for campaigning on the importance of disaster prevention, mitigation, and preparedness. The event organisers choose a new theme each year. The theme for 2009, for example, was "*Pag Alerto, Malayo sa Peligro*," (which literally means "when vigilant, out of danger") and it focussed on individuals taking simple but potentially life-saving steps to enhance preparedness, such as having an emergency supply kit, being informed about the appropriate response for each disaster, and being involved in their community's preparedness efforts. Alongside the message of preparing for a disaster, the month-long observance urges all concerned to take appropriate action to promote social welfare, human security, and environmental protection. It provides an opportunity to expand the awareness and deepen the understanding of people on the disasters that are likely to strike their areas (Manila Bulletin 2010).

The education sector is also involved with a focus on disaster risk reduction education. 2008 was a pioneering year for heightening awareness and consciousness among students on what to do before, during and after the occurrence of disasters, using the theme of *"Safe Ka Ba? Programa Laban sa Kalamidad Tungo sa Pag-unlad"* (this translates as Are you Safe? Program Against Disaster Toward Progress). The theme became embedded in society and is used as a simple reminder for applying safety measures in daily life. It achieved a good momentum to enforce more preparedness measures, especially for natural disasters. The theme for 2011 was *"Makialam. Makiisa. Sa Pagsugpo ng Panganib May Maitutulong Ka"* (Get involved. Participate/Help. You can help in fighting danger.) which encouraged citizen involvement and participation in fighting the threat of natural disasters.

One of the highlights of the government's disaster management plan is involvement of the community in the decision-making process. A community-based evacuation plan has been developed in the two *barangays* in the study area, which is part of the *barangay* contingency plan (Figure 7-3). As part of the plan for supporting APSEMO's no-casualties goal, disaster management at the

barangay level also includes allocation of responsibilities within the *barangay*, early warning, communication, logistics and transportation during evacuation as well as the evacuation route as part of the general plan. The plan was tested during the eruptions of Mayon Volcano in 2009 and 2010.[37]

When discussing the two eruptions, disaster management officials from the municipality advised that the community members of the two *barangays* were well informed about what to do, including when to evacuate based on signs given by municipal officials, and the pick-up points for evacuation. Another key message is that the communication flow between officials from the municipal to the *barangay* level was well-maintained so emergency coordination was improved. During the focus group discussions, community members from the two *barangays* frequently mentioned these two events as good examples of their state of well-preparedness. It exhibits awareness in the whole community through demonstration of positive attitudes and a communication plan that was suitable for all ages, genders and, most importantly, culturally appropriate (Twigg 2009).

> *During the 2009 eruption, we were well-coordinated. Community members did what was planned that we had exercised. It was like when we did a drill. We realise that the plan is not final. We have to test it again in other disasters, especially typhoon. Disaster Management Officer of Camalig Municipality.*

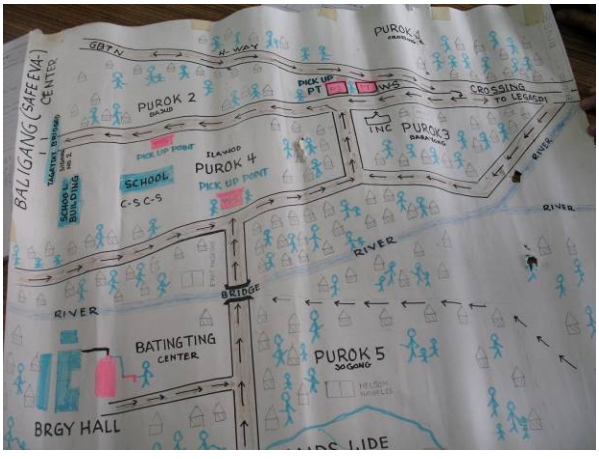


Figure 7-3 Evacuation plan developed by communities in *Barangay* Ilawod

[37] Personal communication with Municipal Disaster Management Officer, July 2010.

7.2.2 Social Resilience

In broad terms, social resilience is defined as "the capacity of a social entity (e.g. group or community) to recover from, or respond positively to, crises" (Maguire and Hagan 2007). As discussed in Section 4.4.2, social resilience mainly encompasses population and community characteristics. Adger (2000) describes it as "the ability of groups or communities to cope with external stresses and disturbances in relation to disasters". For the purposes of this study the following indicators have been adapted from the sources quoted as criteria for defining social resilience: (Adger 2000; Blyth and Roelkepartian 1993; Maguire and Hagan 2007).

1. Trust
2. Social cohesion and sense of community
3. Community involvement
4. Existing norms / attitudes / values
5. Communication and information

The application of these indicators to the study area is then discussed in Sections 7.2.2.1 to 7.2.2.5.

7.2.2.1 Trust

The issue of trust within a community itself has become an important inclusion in social resilience, especially in building connections between communities and in strengthening community bonds (Maguire and Hagan 2007; Paton 2003). Focus group discussions conducted with different community members revealed that the majority of people have a high level of trust in their community, before, during and after disasters (Table 7-1). This must play a prominent role in mediating relationships between community members when acquiring information about disasters and taking action to mitigate their impacts. Further, data from this study reveals that this is an important factor in the dissemination of early warnings prior to disasters. In the study area, the

success of early warnings also depends on the way communities communicate with each other.[38] Therefore, the issue of trust becomes an important avenue in conveying the message. This is one of the key points in achieving the objective of zero-casualties from disasters.[39]

Table 7-1 Perception of trust between community members of different tenure groups and the importance of trust in time of disasters

Do you trust your neighbours?								
	Informal Settlers				Tenants (n=20)	Government-assisted housing		Titled (n=20)
	along the road (n=50)	along the railway (n =40)	along the river (n =40)	in the forest (n =20)		BLISS (n=20)	Resettle- ment (n=40)	
Yes	90%	100%	100%	100%	100%	90%	100%	95%
No	10%	-	-	-	-	10%	-	-
Do you trust your neighbour when they convey the warning of disasters?								
Yes	100%	100%	100%	100%	100%	100%	100%	95%
No	-	-	-	-	-	-	-	-
Does this trust help you secure your property, coming back to your houses to resume life after disasters?								
Yes	100%	100%	100%	100%	100%	100%	100%	100%
No	-	-	-	-	-	-	-	-

The practice of trust is also reflected in daily life, in all tenure types, but more importantly in informal settlements, tenant and resettlement groups. In times of disaster when local communities are evacuated, some people rely on their neighbour to either stay in their house to take care of their possessions or to check their houses when their neighbours return to check their own houses.

7.2.2.2 Social Cohesion and Sense of Community

Social cohesion as part of social resilience in this chapter is referred to as the level of social connection, sense of belonging, attachment to a group, willingness to participate and to share outcomes (Jenson 2010; Markus 2011; Mulvaney-Day et al. 2007) Markus (2011) argues that social cohesion consists of two

[38] Personal communication with Disaster Management Officer of Camalig Municipality, July 2010.
[39] Personal communication with head of APSEMO, July 2010.

important elements: (1) shared vision and (2) the well-functioning of community in which they share goals and responsibilities, and readiness to co-operate with other members. There are five factors that determine strong social cohesion of the communities in the study area (adopted from Forrest and Kearns (2001)):

Common values. The community in the two *barangays* have common moral principles and possess the same codes of behaviour. This comes from the basic principles of the Filipino community who are characterised as having strong human connections and human interactions (Dolan 1991; Lapiz 2006). A good example of this is the new community at the resettlement sites who were relocated from disaster-prone areas. The fact that they were resettled for the same reasons make them respect each other. The implication of this is a strong sense of solidarity that is demonstrated in times of disasters.

> *We are all the same in here. We live in the same type of house and we always feel that we are all family. Lerna Nayve, 62, living in the old resettlement site.*

Social solidarity. The same level of vulnerability that the community face and live with in a way develops strong solidarity, adding to the basic quality of Filipinos. In times of disasters, solidarity is developed as they share the same difficulties. This level of solidarity is even demonstrated in day-to-day life with the strong social connection that is built from the genuine character of Filipinos, especially those in rural areas.

> *We always help each other. There are conflicts but this is normal. The most important thing is that we are willing to help each other in daily life, and more importantly, in times of disasters. Lerna Nayve, 62, squatting along the river for 40 years.*

Social Control. Respect for the elderly and for people in authority (especially at the *barangay* level) is an aspect that defines the social cohesion. Social control helps build trust in the authorities during disasters. This attribute helps the disaster management authority in managing people especially when evacuation

is needed. The contingency planning developed by the disaster management authority is easier to implement once this social control is achieved.

> *The good thing about our community is the respect to the elderly and the barangay authority. In times of disaster, we are doing well in terms of implementing the plan that we have developed. They listen to us. Head of Ilawod Barangay.*

Social network. A high degree of social interaction within families and communities is a strong characteristic of the community in the study area. Lapiz (2006) states that an average Filipino would have and know at least 300 relatives and this seems to be true in the study area. *Everyone knows everybody including what they do* in the two *barangays* and this becomes the basis of a strong social network. Christianity is the dominant religion in the area and people attend church regularly so this also provides a platform for a strong social network. In addition, many social groups have been established in the community thus providing avenues for regular meetings. Street corners are common places for community members to meet each other in the late afternoon or in the evening. Social life is very strong in this type of community.

> *In here, we are like family. Everybody knows everybody including what they do for work. I join many community groups for example women group, regular school parents' meeting and we visit each other from time to time. We are very social in here. Nilo, 45, living in the new resettlement site.*

Place attachment and identity. There are place-related attributes of the communities, especially who live in formal settlements, that contribute to a strong attachment to the areas they live in now. Focus group discussions with different informal groups reveal that place dependence and place attachment (for livelihood and sense of community) are two reasons as to why they still live in (or going back to) the same place even the areas have been affected by different disasters from time to time. Strong attachment to a place is also demonstrated by local communities along the 6 KM PDZ. Even though they have been resettled to new relocation sites (see Section 6.2.4), they still return to the original settlement, either for livelihood or for the perception of where home

really is. This concept of 'place identity' in relation to hazard' is a factor that also increases social connections among the local communities in the study area (Fresque-Baxter and Armitage 2012).

> *I keep coming to my old house in Anoling because my rice field is there. My house is still standing and if Mayon does not erupt, I stay here on weekend with my families. During the harvest seasons, some other people still do the same; we are like the old community. I still consider this as my house. It is always my house. Antonio, 56 yo, living at the old relocation site.*

7.2.2.3 Community Involvement

The active participation of a community is an important aspect that defines social resilience. In this regards, communities are posited as the key actors in all aspects of disaster management (Murphy 2007). The importance of community participation and involvement in building resilient community has been recognised widely (Cutter 2003; Cutter et al. 2008; Joerin et al. 2012; Twigg 2009; UNISDR 2005, 2007, 2010b). It is also recognised by the International Federation of Red Cross and Red Crescent Society (IFRC), in its Code of Conduct for Disaster Relief (IFRC 1994). The Hyogo Framework for Action 2005-2015 also emphasises and promotes community participation in disaster risk reduction and it has thus become one of the priority actions (UN-ISDR 2005).

There is active participation of the community in the study area on many occasions partly because of the social attributes that most local communities possess. It was also demonstrated during the data collection process of this research study. The number of participants in the focus group discussions was much higher than expected. Though participation was "by invitation only" (the researcher and *barangay* leader identified potential participants; see Section 2.5.3), many other community members attended the event out of curiosity. The Local Authority confirmed that this kind of participation is usually the case for many such occasions. Disaster drills are successful in terms of delivering a message because of the level of community participation. This also applies to disaster events where it eases the process of people mobilisation.

The communities here are very participative and very active. It is not really difficult to mobilize people when we want to implement disaster-related project. Some DRR projects have been successfuly implemented due to that fact. Active community participation is always encouraged and reminded every time high officials (governor or from national level) come to our municipality. It does not only apply in disaster-related matters but also to all sectors. Mayor of Camalig.

7.2.2.4 Respect for Culture and Values

One value that is embedded in the community, especially in rural areas, is *pakikisama* (getting along) and *pakikipagkapwa* or "relating" (Lapiz 2006). These two values have been translated as "smooth interpersonal relations" (Yengoyan 2004). Its positive implication is that conflicts between community members are not commonly found. If they occur, they are usually solved in a family-based manner. In addition to that, respect for elderly people is taught from a young age.[40] These are some of the core values that have become part of the culture in the society and provide a social bond between members of communities. Another event that has become part of the culture, and which brings the community together, is the "town-fiesta". It is a week-long festival of activities that is embedded in the community's social calendar. The fiesta brings critical ramifications in regard to preparation, social participation, economic and commercial activity and, most importantly, of social coherence (Yengoyan 2004). All community members are proud of this fiesta as part of their culture. Many of the communities who live outside the municipality go home to attend the fiesta which is another demonstration of their strong social bond to the community they belong to.

People here always respects the elderly people. They, in many occasions, become the key people in conveying the message during disasters, especially when warning is to be issued. People usually listen to them so we always approach them. This has become one of our approaches in disaster management. This is the strong value of our people in Camalig. We respect cultures and values of helping and saving each other. Disaster Management Officer of Camalig Municipality.

[40] This is a common fact that most participants expressed during the in-depth interview.

7.2.2.5 Communication and Information

With the attributes of communities discussed above, it is not difficult to understand that regular communication is a common practice in the study area. This is a basic attribute of Filipinos who are essentially *groupist* in nature. In that sense, Filipinos can be characterised as community people who love human interaction and company (Lapiz 2006). In their daily life, many established avenues for communication have become part of the culture in the society. The establishment of local *sari-sari* shops at various locations in the *barangay* provides a platform where people can communicate with each other. Shopping is not undertaken on a weekly or monthly basis but daily at the local shops or markets and these places provide avenues for local people to meet and interact. In the afternoons, people get together at the small kiosks or at the intersection. This does not apply only to young people but also to the elderly, and especially women. Through such regular communication practices, social bonds grow and information can be shared easily. Consequently, warnings or other disaster-related information can likewise be easily disseminated.

> *We meet at the 'sari-sari' shop and talk. We go buy food, and we talk to people. We go to the market, we talk to people. We wait at motor taxi, we talk to people. In the afternoon, we talk to people at one corners. We even sometimes go to our neighbour's house to watch TV together. Vilma, 53, squatting along the railway since 1994.*

7.2.3 Economic Resilience

Economic resilience refers to "the ability of an entity to maintain function when shocked. It is aligned with the fundamental economic problem that is efficient allocation of resources (Rose 2007). In terms of disasters, economic resilience refers to the "capacity of a system to absorb or cushion against damage or loss" (Rose 2004). Economic resilience in this case is discussed based on (1) inherent economic resilience that refers to ability under normal circumstances and (2) adaptive resilience that refers to the ability to sustain an economy in disaster situations (Rose 2007).

There are five adapted indicators of economic resilience to describe the level of resilience in the study area. They are municipal finance for disaster management, employment and wealth generation; income; savings; and diversification of livelihood (Cutter et al. 2008; Joerin and Shaw 2011). These indicators are discussed below and provide the rationale for how these aspects of resilience support the local communities so they can strengthen their economy to cope with the potential losses caused by natural disasters.

7.2.3.1 Municipal Finance for Disaster Management

While Section 7.2.1.3 discussed the local government financial commitment to disaster management, this section discusses availability versus adequacy of such funding. After the establishment of the Local Government Code of 1991, Albay Province was the first province in the country[41] to apply the financial regulation of allocating 5% of the LGUs' budgets to a local calamity fund to be disbursed for relief, rehabilitation, reconstruction and other works and services upon the declaration of a state of calamity in an area (Oxfam GB 2008). This regulation is enforced in all municipalities in the province, including Camalig Municipality.

> *We are committed to allocate local government budget for emergency assistance. This is one of our primary commitment towards building community resilience in our municipality. Mayor of Camalig.*

The regulation is also practiced at the *barangay* level where two *barangays* have their own disaster budget, which is disbursed from the 5% of the municipal and *barangay* annual budget[42]. The budget is sufficient to provide emergency assistance to the victims of disasters. However, the budget is not enough to provide subsidies and incentives to rebuild houses and to provide alternative livelihoods after a disaster.

> *We have specific budget for disaster assistance, which is 5% from the local government budget. The funding is used mostly in emergency assistance like food, non-food items and temporary shelters. In small disasters, we usually*

[41] Personal communication with Head of APSEMO, July 2010.
[42] Personal communication with *Barangay* Heads of Ilawod and Tagaytay, July 2010.

have no problem regarding the amount of budget and assistance provided. However, in big disasters, the budget is very limited. In any cases, the budget very rarely goes to provision of housing assistance. It goes to only emergency relief. Housing assistance is usually provided by outside institutions (from national / nternational NGOs and private sectors). Head of Disaster Management, Camalig Municipality.

The local budget at the *barangay* level is administered by a *barangay* official. Hence, once there is a disaster in the *barangay*, the first budget used is the *barangay* budget. When more financial assistance is needed, the budget from the municipality is used. This mechanism is practiced up to the national level. This is one of the practices of the clear institutional mechanism in disaster management discussed in Section 7.2.1.

7.2.3.2 Employment and Wealth Generation

The employment rate in Camalig Municipality is high at 58% and only 3.48% are unemployed. However, as shown in Figure 7-4, 39% of the population of the municipality are not in the labour force (MDCC Camalig 2009). In the Philippines context, the people who are not in the labour force are defined as those below 15 years of age and above 64 years of age(Rivera 2008).[43]

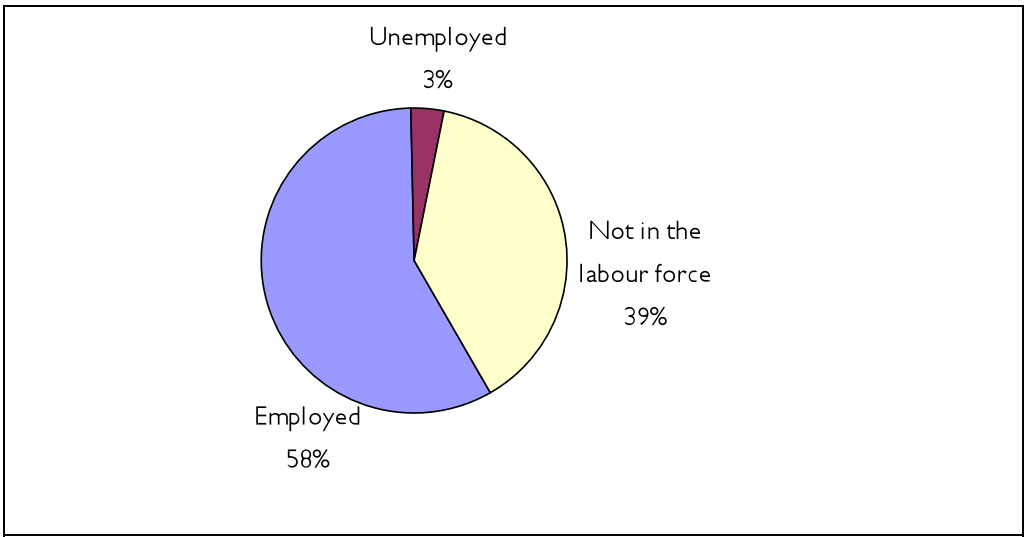


Figure 7-4 Percentage of employed and unemployed population in Camalig Municipality

[43] According to the International Labour Organization, a labour force comprises "All persons who fulfil the requirements for inclusion among the employed or the unemployed during a specified brief reference period. This does not count students, retired people, stay-at-home parents, people in prisons or similar institutions, people employed in jobs or professions with unreported income.."

Although statistically a large number of the population is employed, a large number of local communities still perceive that their employment does not provide them with a stable income. This is strongly argued by the informal settlements group as well as the tenant groups who mostly depend on agriculture. The reason is simply because of uncertain income resulting from unstable employment (Table 7-2).

> *It is true I am employed, I have job. However, the income is not certain. It changes. Sometimes, I have enough money, most of the time it is very tight. Noel Bertrand, 44, squatting along the railway since 1994, working as daily labourer.*

Table 7-2 Perception of communities of different tenure groups on economic stability in daily life

	Informal						Regularised		
	Informal Settlers				Tenants		Government-assisted housing		Titled
	along riverbank (*n* = 60)	along railway (*n* = 40)	in forest (*n* = 40)	on road (*n* = 60)	Labour Tenancy (*n* = 40)	Share Cropping (*n* = 40)	BLISS (*n* = 40)	Resettlement sites (*n* = 60)	Titled groups (*n* = 60)
Do you think you have stable economy the whole year?									
Yes	20%	20%	30%	30%	40%	50%	90%	70%	100%
No	80%	80%	70%	70%	60%	50%	10%	30%	-
Do you think that your employment provides you enough income for daily life?									
Yes	60%	40%	50%	60%	70%	70%	80%	50%	100%
No	40%	60%	50%	40%	30%	30%	20%	50%	-

* This only applies to the old resettlement site. The new resettlement sites have never been impacted by any disasters.

Farming is the main livelihood for many informal settlers and this cannot provide a stable income for the whole year. This is also recognised by the Government of Albay in its Provincial Development and Physical Framework Plan. Though 65% of the total land area in the Albay Province is devoted to agriculture, it still contributes a lower share to the provincial economy, compared to the industry and service sectors (Government of Albay 2010).

> *Farming in this area does not provide us certain income. Sometimes, we have good harvest, sometimes not. Especially after disasters, it takes us time to come back to farming. In normal season, it is enough to feed the family. However, it requires very good management. My wife helps also in getting*

additional income by working as labourer. Dioniso Napire, 62, living in resettlement site, farming in Barangay Anoling.

Diversification of livelihood, as explained further in Section 7.2.5, helps local communities to gain a higher income, sometimes from alternative income sources. However, the seasonality of all sources of livelihood still brings uncertainty to many of the informal groups. More established employment or more permanent jobs are held by the titled group providing them with more economic security (Table 7-3).

Table 7-3 General pattern of employment and livelihood sources of different tenure types[44]

Tenure type	Employment type / livelihood sources
Titled group	Government employee, grocery shop, restaurant, private business
BLISS	Government employee, private business
Resettled Community	Farming (at the original settlement), handicraft making, beauty parlours, grocery shop, motorcycle taxi
Tenant	Farming
Informal Settlers	Wage labour (at cement factory), handicraft making, farming labour, locally-migrated workers

7.2.3.3 Income

In general, income in the Province of Albay is low and it is considered a low economic province in the country, indicated by the fact that 42% of the total population of the province live below the poverty line (Oxfam GB 2008) (see Chapter 4). Irregular and un-fixed income is an important issue that was raised by many of the community members during in-depth interviews and focus group discussions. Except for the titled groups, other tenure groups live with irregularity of income that can seriously affect their lives (Table 7-3). However, they are able to deal with this as they have strong social connections in the community and they provide financial assistance to each other.

We do not have regular income. It is just enough for us to live, enough for us to eat. We do not always have standard food but we never been in hunger. We have resources and we have families, friends or neighbors whom we share resources. Estela N. Napay, 79 y.o., squatting along the river bank since 1943.

[44] This is obtained from focus group discussions at different tenure types, in-depth interview and participant observation. The author does not intend to present the percentage of different livelihood but to list common livelihood options done by local communities in different tenure types.

Mostly, communities from titled and BLISS groups are the most stable in terms of income as they mostly work for more stable institutions (e.g. government or private companies). Informal settlements (whose income mostly depends on wage labour) and tenant groups (whose income depends on the success of harvests) are the most at risk group.

7.2.3.4 Savings

As the majority of the people in the informal settlements and in the tenant groups have low and irregular incomes, they are unable to accumulate any significant savings that they could use to rebuild their lives after disasters. Time after time they rebuild their houses using local resources and their own limited savings (Table 7-4).

Table 7-4 Facts on regular income and savings from different tenure groups

	Informal						Regularised		
	Informal Settlers				Tenants		Government-assisted housing		Titled
	along riverbank (*n* = 60)	along railway (*n* = 40)	in forest (*n* = 40)	on road (*n* = 60)	Labour Tenancy (*n* = 40)	Share Cropping (*n* = 40)	BLISS (*n* = 40)	Resettle-ment sites* (*n* = 60)	Titled groups (*n* = 60)
Do you receive regular income?									
Yes	30%	40%	10%	30%	15%	10%	90%	50%	100%
No	70%	60%	90%	70%	85%	90%	10%	50%	-
Do you have regular savings?									
Yes	10%	10%	10%	20%	10%	10%	70%	60%	100%
No	90%	90%	90%	80%	90%	90%	30%	40%	-
Are your savings enough to recover from damages after disasters?									
Yes	0%	10%	0%	20%	10%	10%	70%	20%*	95%
No	100%	90%	100%	80%	90%	90%	30%	80%	5%

- This only applies to the old resettlement site. Based on data, there is no evidence that the new resettlement sites have been impacted by any disasters.

Since their savings are not adequate enough to re-build their houses and to also have some capital to re-establish their lives, these two most at-risk groups depend on assistance from outside their area (i.e. government assistance or international donations).

In daily life, we are resourceful. After disasters, we mostly depend on outside assistance. Until we get assistance (from government), we use whatever available resources to recover from damages or we get assistance from families or friends. We always find a way to make things work and we always bounce back from whatever has held us down. Melcor Vibar, 63, squatting inside forest area in Barangay Ilawod since 1980.

7.2.3.5 Diversification of Livelihood

Diversification of livelihood is an important aspect of creating a sustainable livelihood which in turn supports the process of recovery after disasters (IOTWS 2007).

A definition of livelihood and sustainable livelihood that is adopted for this study is as follows (Scoones 1998: p. 5):

> A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.

Further, a number of researchers and organisations argue that a sustainable livelihood supports disaster resilience as it determines to what degree a community can cope with and recover from natural disasters (Adger 2006; Buckle et al. 2000; Cutter et al. 2008; DHS Victoria 2000; IOTWS 2007). In addition to the above sustainable livelihood definition, the issue of access to all the aspects is also argued by Ellis (2000) as a strong component of a livelihood in determining the living gained by the individual or household.

Given the context of the study area which is (1) a medium class municipality with low economic growth where there are not many job opportunities available *vis a vis* the average education attainment (see Section 5.2) and (2) a high-frequency area for natural disasters (see Section 5.3), the concept of sustainable livelihood in this context is defined as a diversification of livelihood practiced by many local communities.

The practice of short-term migration to the capital or different areas for work or to gain additional income is also part of diversification of livelihood. Therefore, since most livelihoods are affected by disasters, they tend to depend on more than one livelihood (Table 7-5 and Figure 7-5).

Table 7-5 Dependency on more than one livelihood option as one strategy of resilience

	Do you depend on one type of livelihood?	
	Barangay Ilawod (*n*=100)	*Barangay* Tagaytay (*n*=100)
Yes	35%	40%
No	65%	60%

The pattern of diversification shown in Figure 7-5 demonstrates a household survival strategy. An interesting highlight is the local and migratory wage labour that is practiced by many households. Some community members at the new resettlement site still go back to their original settlement to maintain their farming livelihood, in addition to establishing small businesses at the resettlement site. There are a number of households that also migrate to areas outside the municipality or province for a livelihood and then come back when the disaster season ends as the opportunity for agriculture production opens up.

> *Sediments deposited by volcano not only destroy the house but also our crops. It brings fertility to soil but disrupts the rice field. During disaster season, I go to Manila to look for job and go back when it is safe. By then, the land is more fertile. Antonio, 46, Barangay Tagaytay.*

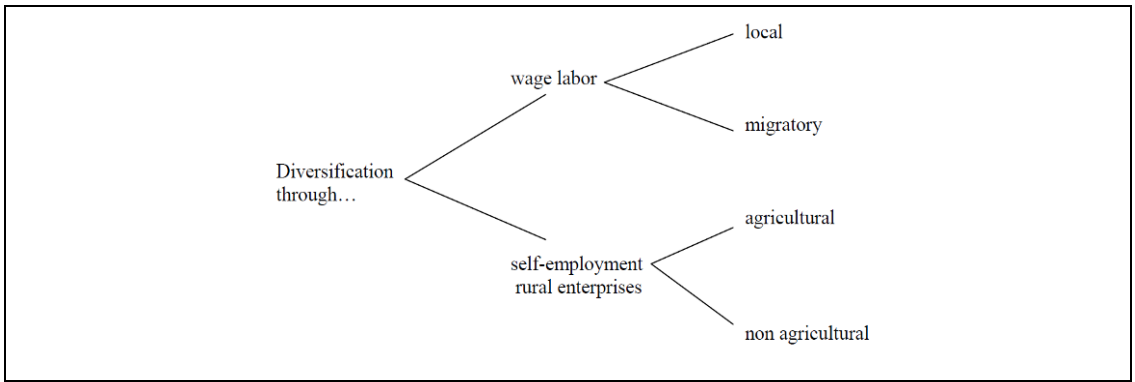


Figure 7-5 Pattern of livelihood diversification strategy in the study area (source: (Warren 2002))

Folke (2006) argues that this type of livelihood adaptation is a measure to still maintain function in the presence of shocks, which is a strong component of economic resilience. The strategy also justifies the households' ability to cope

with or adapt to the effects of disasters, arguably being a strong component of resilience (IOTWS 2007; Pelling 2003).

7.2.4 Physical Resilience

The concept of physical resilience in this thesis adapts the concept of technical resilience proposed by Tierney and Bruneau (2007). Indicators presented in this section also adapts the concept of infrastructure domain related to disaster management (Cutter et al. 2008). That domain also includes transport, health and housing characteristics. Therefore, five indicators of physical resilience are adapted from the above sources (see Section 4.4.2. The application of these indicators to the study area is then discussed in Sections 7.2.4.1 to 7.2.4.5.

7.2.4.1 Housing

There have been no detailed official surveys on the physical vulnerability of houses in Camalig Municipality so any information on housing resistance to different types of disasters is based on community experiences and perceptions of their housing units. The majority of the occupied housing units in the two *barangays* are made of light materials which need major repair after typhoons affected the province (MDCC Camalig 2009). As discussed in Chapter 5, the most vulnerable houses are those belonging to informal settlers who utilise local construction materials such as bamboo and *nipa* trees. Depending on their perceived tenure security and available capital to invest, some people have upgraded their houses into more permanent structures, which have been proven to be more physically resilient to the impact of disasters. The houses of the people in the BLISS and titled groups are built of bricks and are often strong enough to withstand regular typhoons. In addition, their houses are located away from the flood-prone areas, a considerable advantage in comparison to the informal settlers along the river bank and railway tracks (See Section 7.2).

The municipality has no building code;[45] however, when rebuilding houses after disasters, local communities try to build stronger houses that can withstand the impacts of disasters but that is subject to availability of financial resources. Those without enough financial resources usually strengthen their houses by putting heavy materials on the roof to prevent them being blown away by the wind (Figure 7-6). This simple measure helps maintain the shelter in times of typhoon and preserves the housing materials so that communities do not have to spend more financial resources than necessary to rebuild after disasters.

Figure 7-6 Common practice to strengthen the houses to withstand strong wind that frequently buffets the study area

From all the tenure groups, the only official or formal assessment available on the houses is for those at the new resettlement site (See Section 6.2.4). The four-sided hip roofs of DSWD houses are the least vulnerable to damage from wind forces because they face less upward pressure. Houses built by Senator Zubiri, Italian Government, Habitat for Humanity and those at the old resettlement site are pitched-roof designs, which are also less vulnerable to damage and collapse from ash loadings (Matabang et al. 2009). The roofs are made of sheet metal

[45] Personal interview with Municipal DSWD and Municipal Disaster Management Officer.

and are more likely to shed volcanic ash (USGS 2009). The IOM houses with sloping concrete roof slabs are the most resistant to being uprooted or overturned by strong wind (Matabang et al. 2009). Therefore, people residing at the new relocation site no longer fear the threat of natural disasters (Usamah and Haynes 2012).

7.2.4.2 Transportation Network

One critical infrastructure that is considered an important element in physical resilience is accessibility of roads, especially during disaster events (Cutter et al. 2008; Joerin and Shaw 2011). In addition to roads, utility lifeline systems also play an essential role especially during response and recovery (Tierney and Bruneau 2007). These two aspects are discussed in this section.

In general, all major roads in Camalig Municipality are paved. The roads in the two *barangays* are also paved and well-connected. The road connections are sometimes interrupted during or after intense rainfall as they are inundated by high water. In most cases, after the typhoons, roads are covered with mud and require intensive cleaning that can take years to return to their original state. The road network connecting the two *barangays* that was destroyed during the 2006 typhoon was still being repaired during fieldwork for this study in 2010 (Figure 7-7). There is no constraint over the road accessibility to different parts of the two *barangays.* Even during disasters, despite the normally bad road conditions, roads are not blocked. The only constraint perhaps is the rising water that may hinder accessibility to certain areas. However, the municipality has encouraged all *barangays* in Camalig to conduct capacity assessment for evacuation purposes. In *Barangays* Ilawod and Tagaytay, evacuation plans have been established that include designated pick-up points in each *barangay* and safe evacuation centres. Availability of big trucks in the two *barangays* is part of the evacuation plan to ensure that available resources can accommodate the timely evacuation of local communities.

Figure 7-7 Road connecting the two *barangays* that are constantly under repair (left). Typical paved road in the *barangay* (right). Vulnerable electricity towers prone to typhoons/strong winds are visible in both pictures

7.2.4.3 Lifeline Facilities

Electricity, water and availability of communication facilities are important aspects that are discussed in this section in regard to physical resilience (Cutter et al. 2008; Joerin and Shaw 2011). Provision of electricity in the municipality is managed by a private company that distributes and supplies it throughout the municipality. All municipalities have electricity coverage including the two *barangays* in the study area. Almost all houses have access to electricity including the informal settlements along the river bank and railway lines. In normal situations, there are usually no problems with access to electricity. In other words, the availability and supply capacity of electricity in the study area is not an issue regardless of the block-out that sometimes occurs.[46] Focus group discussions and in-depth interviews reveal that, in general, local communities can afford the installation of electricity and the monthly payments.

Availability of and access to clean water is also not an issue in the two *barangays (except the case at the new relocation site, which is discussed later in this section).* There are spring water sources that supply water to the whole municipality which are located in high risk areas (MDCC Camalig 2009). However, local communities mostly use ground water for daily use. Each

[46] Personal communication with Municipal DWSD Officer.

household has one well at the back of their houses for daily consumption. Households of titled and BLISS groups mostly use electric pumps. Hand-pumps are used by communities in the informal settlements and tenant groups.

Figure 7-8 Common water pump used by local communities in study area (A). Many people also build water tanks in their houses to store water especially in the dry seasons (B). Common practice of sharing water pump at the relocation sites (C, D)

At the new resettlement site, electricity was not available even two years after its establishment. The same also applies to access to clean water as a well was not provided in each house. Consequently, sharing a well is the general practice

at the new relocation site where wells are built for use by approximately 10 households (Figure 7-8).

The threat that the municipality faces in regard to electricity is mainly because the electricity lines were not installed based on worst-case scenarios of disasters, especially strong typhoons. The lines are prone to damage by strong wind and are hit by disasters from time to time. However, the authority sees this phenomenon as a regular risk that has to be faced by the municipality. Restoration of electricity is a high priority after disasters and action is taken quickly.[47] In times of disasters, usually local communities have no electricity for a few days (three days to a week). Electricity is usually restored by the time local communities return to their houses after being temporarily relocated either to evacuation centres or their families' houses. There is no issue with water quality and accessibility during disasters, except that the pumps may be damaged.[48]

In regard to communication, many people in the study area use mobile phones. Although there is no official figure of mobile phone usage, it was observed that almost all people above 17 years old have a mobile phone. The availability of cheap text and call packages provided by telephone providers encourages the use of mobile phones in daily life. In times of disasters, this device is an important instrument in conveying disaster warnings.[49]

7.2.4.4 Health and Sanitation

Health and sanitation are also factors that build physical resilience and can be examined from a number of perspectives including access to health facilities, state of sanitation and general waste management (Joerin and Shaw 2011). The municipality in this study has one municipal health office (MHO) and nine *barangay* health stations. One is located in *Barangay* Ilawod but not in *Barangay* Tagaytay (MDCC Camalig 2009). However, communities in *Barangay* Tagaytay

[47] Personal communication with Municipal DSWD officer, July 2010.
[48] Common facts gathered from focus group discussion and in-depth interview.
[49] Personal communication with Municipal Disaster Management Officer, July 2010.

usually use the health service facility at Ilawod, neighbouring *Barangay* Bariw or at the municipality.[50]

The MHO is composed of a health physician, a general dentist, nurses, midwives, a nutritionist, and a health worker. Generally, local communities have access to daily health care at the *barangay*.

Figure 7-9 Open-pit unit used by informal settlement groups along the river bank or tenant groups in the forest.

Focus group discussions and in-depth interviews revealed the high level of awareness at the two *barangays* of health issues. Local communities can rely on the health facility at both the *barangay* and municipality level. Access and payment are not issues as generally the service is subsidised by the municipality.

In terms of household sanitation, generally, communities of titled groups and the BLISS group have water-sealed latrine units in their houses. Though some informal groups with permanent brick houses have installed water-sealed latrine units, those residing near the river banks and along the railway mostly use open pit units. The units are mostly installed in their back yards (Figure 7-9).

The drainage system in the study area is characterised by a river system that is deposited with sediment from the flanks of the Mayon Volcano as well as

[50] Personal communication with Head of *Barangay* Tagaytay, July 2010.

garbage disposed of by local residents (Figure 7-10). This practice of dumping garbage in the river exacerbates the problem of the sediment deposits as together they limit the waterways thus creating flooding in the surrounding areas. In some parts of the river network, compacted sediment on the riverbank is used as space for settlement (see Section 6.2.1). Regular drainage and cleaning is not maintained by the local government except after disasters.

Figure 7-10 River channels filled with sediment and garbage in *Barangay* Ilawod (left). Clean up river as a prevention measure before disasters resulting in piles of sediments mixed with garbage deposit (right)

During the rainy season, the lack of a proper sewerage management system stimulates unhealthy sanitary conditions for households, especially those residing near the river. Runoff and ground water get contaminated adding to the risk of waterborne diseases.

7.2.4.5 Structural Mitigation Efforts

The only structural mitigation measures in the municipality are dikes along the main rivers in both *barangays*. They are meant to prevent flooding from extreme rainfall or flooding associated with typhoons. In the event of overflowing caused by a typhoon, which happens frequently, the dikes slow down the speed and velocity of the water so that the local communities have more warning time. Most participants in the focus group discussions highlighted the difference the dikes make. Before their establishment, local communities

had minimal time to save their belongings before they were washed away by the flood waters; the embankment has changed this.

Figure 7-11 The original state of the dikes that are considered low elevation (left). Destruction and restoration of dikes after the 2006 Typhoon and Mayon eruption. Elevating the dikes is part of the restoration work (right)

The state of the dikes are observed and reported to be in a vulnerable condition since they are frequently destroyed by massive flooding (MDCC Camalig 2009). Erosion from the flanks of the Mayon Volcano accumulates in the riverbed and over time destroys the dikes. The 2006 typhoon was also associated with a volcanic eruption and together they destroyed significant dikes in the study area. Disaster management officials also realise that the dikes are low so restoration of the destroyed dikes now includes elevating them (Figure 7-11). The dikes were built essentially to channel the volume of water coming from the Mayon Volcano. Due to the frequency of eruption, sediment is also deposited along the river bank. The sediment has widened the dikes into the river body and reduced the capacity of the river, hence more flooding. Lack of law enforcement on human habitation in the buffer zone has encouraged informal settlements to grow along the river bank (Figure 7-12).

The major provincial and government assessments on structural mitigation measures reveal the limited number of flood control and drainage structures in the area (Government of Albay 2010; MDCC Camalig 2009). Repair of damaged structures are primarily attributed to a capital intensive. Consequently, it may

result in the design of structures for a very low return period. Most of the structural constructions (dikes and bridges) do not take account of the worst possible scenarios of hazards. Therefore, one of the government's priorities is to re-visit the design standards for flood control structures, including bridges, to suit the changing hydro-meteorological conditions (Government of Albay 2010).

Figure 7-12 Typical built-up environment along the river bank (left) and destroyed house built along the dikes

7.3 Resilience at the Household Level

The status of resilience at the household level is based on the concept of proactive and reactive adaptation as a subset of resilience (Handmer and Dovers 1996; Pelling 2011). Proactive adaptation refers to measures taken prior to a risk manifesting into a hazard (disaster risk reduction) while reactive adaptation (disaster response and rehabilitation) is concerned with measures taken during or after disaster events (Pelling 2011). Section 7.3.1 illustrates how individuals at the household level are likely to be able and willing to adapt to reduce the risk of being exposed to disruptive events. To set that in context two very basic characteristics of the communities in the study area will be discussed first. They are (1) general social culture and family bond and (2) the strong perception of disasters as part of life that generates the concept of a "built-in" resilience among the people in the study area. These two characteristics are factors that construct household adaptation measures towards disaster resilience.

7.3.1 Philippines Society: social culture & family bond

The rationale of describing the Philippines' basic social culture and bond (especially in rural areas) is underpinned by the argument that the first step to qualify resilience is to measure inherent resilience (Cutter et al. 2008). This thesis debates that the strong social culture and bond in Philippines society is part of the inherent resilience itself.

Philippines society is characterised by many positive traits. Some of the major characteristics are a high regard for self-esteem, human connections with the perennial *akbay* (putting an arm around another's shoulder), *hawak* (hold), *yakap* (embrace) and the smooth interpersonal relationships (Dolan 1991; Lapiz 2006).

Filipinos, who love human interaction, live their life on a *bayanihan* (mutual help) basis (Lapiz 2006). This builds strong ties among people and during disasters that strong tie is even more pronounced. In some areas where people live in a compact settlement, the tie is even closer since many of them share the same front or back yard so they are part of a family in a compound. Though this can be seen as a factor that reduces privacy (Usamah and Haynes 2012), in disaster events, this turns into a positive aspect since the social tie is an important factor in the development of personal alliance systems. In other words, a willingness to help each other provides the strong rationale for a strong relationship (Lapiz 2006).

> *I live in an informal settlement along the road. My neighbours are like my family since we live literally very close to each other. We sometimes bring food outside and eat on the (abandoned) railway. In the afternoon, we always have a chat while taking care of children. When one person is sick, everybody will know as the news spreads. Maribel, 45, Barangay Tagaytay.*

> *When there is a disaster alert, the news spreads quickly as people are so close to each other. The strong social tie in the society helps spread the message quickly. Disaster Management Officer of Camalig Municipality.*

7.3.2 "Built-in" Resilience

The capacity of Philippines society to absorb the disturbance to their lives caused by natural disasters is acknowledged nationally and even mentioned in government legislation. The first two lines of Presidential Decree 1566 – "Strengthening the Philippine Disaster Control, Capability and Establishing the National Program on Community Disaster Preparedness" – states that

> … the Filipino has always endured the hardship of a hostile environment and has continually sought survival against typhoons, floods, earthquakes, epidemics, fires and other major calamities… (NDCC 2009: p. 1).

Since the decree took effect, the Philippines continues to be a "laboratory" of major disasters, thus, Filipinos have struggled their way to safety and survival (NDCC 2009). This strength is also recognised at the household level. Most participants in this study showed full confidence in having a strong degree of resilience for disasters based on their experiences. In the same way, the poverty[51] that many of the rural people face in the study area is considered a strength for facing a hard life after the strike of natural disasters. The author's view of the poverty faced by these people is that it is indeed very hard as they have difficulty accessing regular and proper meals and a decent standard of hygiene.

> *Life is difficult after the natural disasters but we are used to live like that. Even though (various) disasters always hit the areas, we are used to that. Salvador, 67, Barangay Ilawod.*

This type of strong ability to bounce back after the strike of various natural disasters corresponds with the concept of inherent resilience (Rose 2007). Rose (2007: p. 385) argues that:

> … Inherent resilience refers to the ordinary ability to deal with crises (e.g. the ability of individual to substitute other inputs for those curtailed by an external shock).

[51] According to the National Statistical Coordination Board, the poverty threshold in the Philippines is different in each province in different regions. For Albay Province in Bicol Region, the 2007 threshold was PhP 15,407/year in all areas. In urban areas, it was PhP 18,343/year and PhP 14,259/year in rural areas. Complete figures are available on http://www.nscb.gov.ph/poverty/2006-2007/pov_th_07.asp

The actualisation of this definition is demonstrated by the community's perception of their capability and strength to deal with the frequency of disasters that hit the areas.

> *(Natural) disasters are part of our life and we are living with disasters. We are always prepared for disasters, we are born with it. Maria, 56, Barangay Tagaytay.*

> *Life is always difficult after disasters. However, we are building back soon after that. We usually start with small things like fixing the broken house and then continue life as usual. Disasters are part of our life so we continue life after that. Nothing stops our life. Mario, 45, Barangay Ilawod.*

The strong perception of resilience demonstrated in this section also corresponds to the characteristics of individual resilience that are demonstrated by (1) the level of preparedness, (2) desire / commitment to survive and (3) experience gained from the usual disaster encounters (Torrent Resilient Institute 2009).

7.3.3 Household Adaptation towards Disaster Resilience

The fact that different disasters hit the area on a regular basis (as discussed in Chapter 5) the community has developed different adaptation practices. At the household level, local communities have established and practiced anticipated measures to avoid losses caused by disasters. Though community-level adaptation has been established and practiced, the effectiveness of their adaptation level is also influenced by the early warning system from the national and provincial governments. Another aspect that has established the good practice adaptation and the confidence towards disaster resilience is the general community perception of disasters as part of life. A detailed inventory of household adaptation towards minimising the impact of different disasters is presented in Table 7-6. The different adaptation measures presented in this section are derived from focus group discussions and in-depth interviews with local communities adapting aspects and indicators from existing literature (Guarin 2008; World Bank 2012).

The relationship between the perception of natural disasters as part of life and the adaptation measures that have been established for generations in the study area confirms that the issue of adaptability is an important element of resilience (Norris et al. 2008; Pelling 2011). It has been demonstrated that on more or less the same level of disturbance (frequent disasters), households who are able and willing to adapt are more likely to be able to reduce the impacts of such risk and exposure. In fact, the domino effect of the community perception of 'disaster as part of life' brings the conclusion that the perceived threat is a *transient dysfunction* (Torrens Resilient Institute 2010). Most households, if not all, recognise the dysfunction yet strongly perceive it as a normal reaction to an abnormal event and a temporary reaction that will be followed by a return to normal functioning. The attributes discussed in this section, which are possessed by the households in the study area, are of relevance to many concepts of resilience components discussed in Chapter 4.

Table 7-6 General adaptation measures at the household levels

Period / Aspect	Before Disasters	During Disasters	After Disasters
Housing	*General measures:* - Building stronger house. - Reinforcing wooden/ thatched houses by tying them with wires or nylon. - Nailing or double nailing windows. - Collecting local materials to repair houses after the disasters. This includes collection of stones from the river or the flanks of mountains. *Strong wind, typhoon and volcano:* Reinforcing house: - Putting heavy materials on the roof to avoid roof failures. *Flooding:* - Elevating the houses. - Installing sand sacks in the door or other waterways to the house.	- Securing access to houses to avoid debris and waste intrusion. - Vacating the house if necessary (depending on the warning level). - If vacated, regular visits to the house are maintained (usually in the case of typhoon or flooding where water level still allows walking). In the case of volcano, up to warning level 3 (see Section 6.2), local residents sometimes come back to check the level of deposited sediment and to secure the house assets to the best that they can.	- Mapping the damage - Mapping (local) resources to cover the damage. - Repairing damaged house / damaged part of the house - Mutual assistance with family members / neighbours. Quite often, organised work is held by the *barangay* official. - Stronger houses are built based on damage experience.
Food	- Stocking food to avoid scarcity and increase of food prices. - Storing some basic non-perishable food items (rice, sugar, salt, canned goods). - Collecting and storing wood as alternative source of fuel anticipating the non-availability of gas as cooking fuel.	- Purchasing food items in bulk from supermarket or nearby shop. - Procuring cheap ready-to-eat cooked food in the market. - Relying on relief food from government or aid agencies. - Sharing food among friends / families / neighbours. - Relying on local resources / locally-grown food.	- Sharing local resources / raw food among friends / families / neighbours. - Sharing food among friends / families / neighbours. - Storing food in safer / drier place to avoid invasion by animals (rats). - Collecting food items from government and relief agencies.
Livelihood	- Diversification of livelihood. - Gathering seeds for the next planting season. - Securing place for business.	- Migrating locally for a wage labour. - Temporarily shifting local livelihood, e.g. from farming to handicraft production. This is also part of diversification of livelihood. - Small shop owners temporarily change the shop location (e.g. move to second floor). - Securing animals on elevated ground (for farming / husbandry groups) - Utilising saving.	- Re-establishing livelihood according to season. - Seeking assistance from local government for farming groups. - Gaining additional income by selling materials from damaged houses or rubble. - Borrowing money / resources from friends, family or neighbours. - Pawning appliances and other valuables.
Health / sanitation	- Maintaining health emphasising more on awareness of eating healthy diets. - Having first-aid medicine.	- Practicing proper personal hygiene measures. - Drinking boiled water. - Staying dry.	- Cleaning waterway / local drainage. - Cleaning communal health facilities in *barangay.* - Drinking boiled water. - Consulting assistance from health workers. - Seeking basic medicines from local health officers.
General Safety	- Following disaster forecast from concerned agencies (PAGASA for weather-related disasters and PHIVOLCS for volcano and earthquake). - Participate in regular mass cleaning programs in the neighbourhood, organised by municipality and *barangay* officials. During the event, information sharing is conducted among local community. - Neighbourhood watch for general neighbourhood safety measures.	- Following official instruction from disaster management officers from local government and *barangay* officials. - Reducing frequency of going out of the house. - Children not attending school unless safe notification is declared. - Prioritising the safety of more vulnerable groups (children, elderly, disabled) by early evacuation to safer place (e.g. houses of relatives) even without evacuation order from disaster officials.	- Neighbourhood watch for general safety measures to avoid looting and theft. - Soliciting support from friends, relatives or local government. - Participating in community recovery activities.

7.4 Resilience Mapping

Resilience mapping in this section is conducted by visualising the different indicators of resilience dimension in a diagram plot or radar graph adopting the

methodologies used by IOTWS (2007) and Joerin and Shaw (2011). The different indicators of four dimensions of institutional, social, economic and physical resilience are marked as low, medium and high based on the established criteria (Table 7-7).

Table 7-7 Trending system for each indicator

Mark	Justification
Low	No policy / regulation established; major weakness or gaps between the policy / regulation and local situation
Medium	Policy / regulation is established; not enough resources available; weak implementation level
High	Policy / regulation is established; strongly practiced with strong resources and capacity to implement.

All indicators are marked based on a qualitative assessment. Marking is done based on a comparison of benchmark of each indicator *vis-à-vis* the local situation in the study area. In other words, the mark presents the status and progression of each indicator from concept to implementation at the *barangay* level. The benchmark is adapted from existing resilience literature (Cutter et al. 2008; IOTWS 2007; Twigg 2009). The benchmark and status of each indicator is presented in Table 7-8.

Table 7-8 Benchmark of each indicator of different resilience dimension and their statuses

Resilience Indicator	Benchmark	Status
Institutional		
Disaster management policy and political commitment	Established legal framework and institutions provide enabling conditions for resilience through community involvement with government.	High
Institutional mechanisms, capacities and structures	Clear and established institutional mechanism in different phases of disasters. This includes clear allocation of responsibilities and collaboration / involvement of different agencies in different phases of disasters.	High
Funding support for disaster management	Established legal framework pertaining to disaster funding and availability of financial support from government to support disaster-related activities, from disaster risk reduction to disaster response.	Medium
Hazard mitigation and emergency response plan	Mechanism and networks are established and maintained to respond quickly to disasters and address emergency needs at the community level. This includes establishment of emergency response plan.	High
Public awareness and community participation	Established strategies on public awareness and existence of disaster drills. High community involvement / participation in different public awareness efforts.	High
Social		
Trust	Strong trust among local communities. This is perceived to be a strong social instrument in warning dissemination and security of houses during disasters.	High
Social cohesion and sense of community	Strong sense of community that builds strong social cohesion. This is manifested in daily life where local communities are supporting each other in different sectors of life.	High
Community involvement	High involvement of community members in various social activities, especially those related to public awareness activities, including disaster drills.	High
Respect for culture and values	Strong level of respect to basic culture of 'helping each other' and authority. This in a way builds trust in authority before and during disasters.	High
Communication and information	Regular communication between local communities is maintained in daily life. Information is disseminated in timely manner particularly during disasters. Various instruments of local communication are available and mechanism of dissemination of information is established at the *barangay* level and between different households.	High
Economic		
Municipal finance for disaster management	Local government commitment to provision of budget for disaster management, from municipal to *barangay* level.	Medium
Employment and wealth generation	Availability of employment; the level of employment and community's efforts on wealth generation.	Low
Income	Sufficient income to cover daily life and their state of economic stability during and immediately after disasters.	Low
Savings practice	Strong savings practice and its sufficiency to support return to normal life after the strike of natural disasters.	Low
Diversification of livelihood	Diversification of livelihood is practiced as an effort to support the economy at household level. Self-sufficient community is achieved through this.	Medium
Physical		
Housing	Established building standards incorporating measures to reduce risks from hazards. Disaster-resistant houses are built based on that standard.	Low
Transportation network	Road network and its quality are maintained and are accessible during disasters.	Medium
Structural mitigation efforts	Structural mitigation measures are in place to minimise impacts of disasters. Related structures are maintained.	Medium
Lifeline facilities	Availability and accessibility of basic life line facilities (e.g. clean water and electricity) and their levels of functioning during and immediately after disasters.	Medium
Health and sanitation	High awareness of families on maintaining healthy life and good sanitation. Access to sufficient quantity and quality of water during disasters.	Medium

The indicators and benchmarks presented in this section are reflective of the current situation in the study area that illustrate (1) the status of social, cultural and economic institutions in normal situations; (2) the capacity of existing systems to anticipate, minimise and deal with the effects of frequent and different disasters that strike the areas and (3) the ability to recover and bounce back after the event and retain more or less the same structure. In the same way, the indicators discussed above demonstrate the state of readiness of the whole system and their strategy for minimising the impact of natural disasters. The status of each indicator is visualised in a diagram plot that summarises the discussion on different resilience dimensions presented in this chapter. The diagram plot of the four dimensions of institutional, social, economic and physical resilience is presented in Figure 7-13.

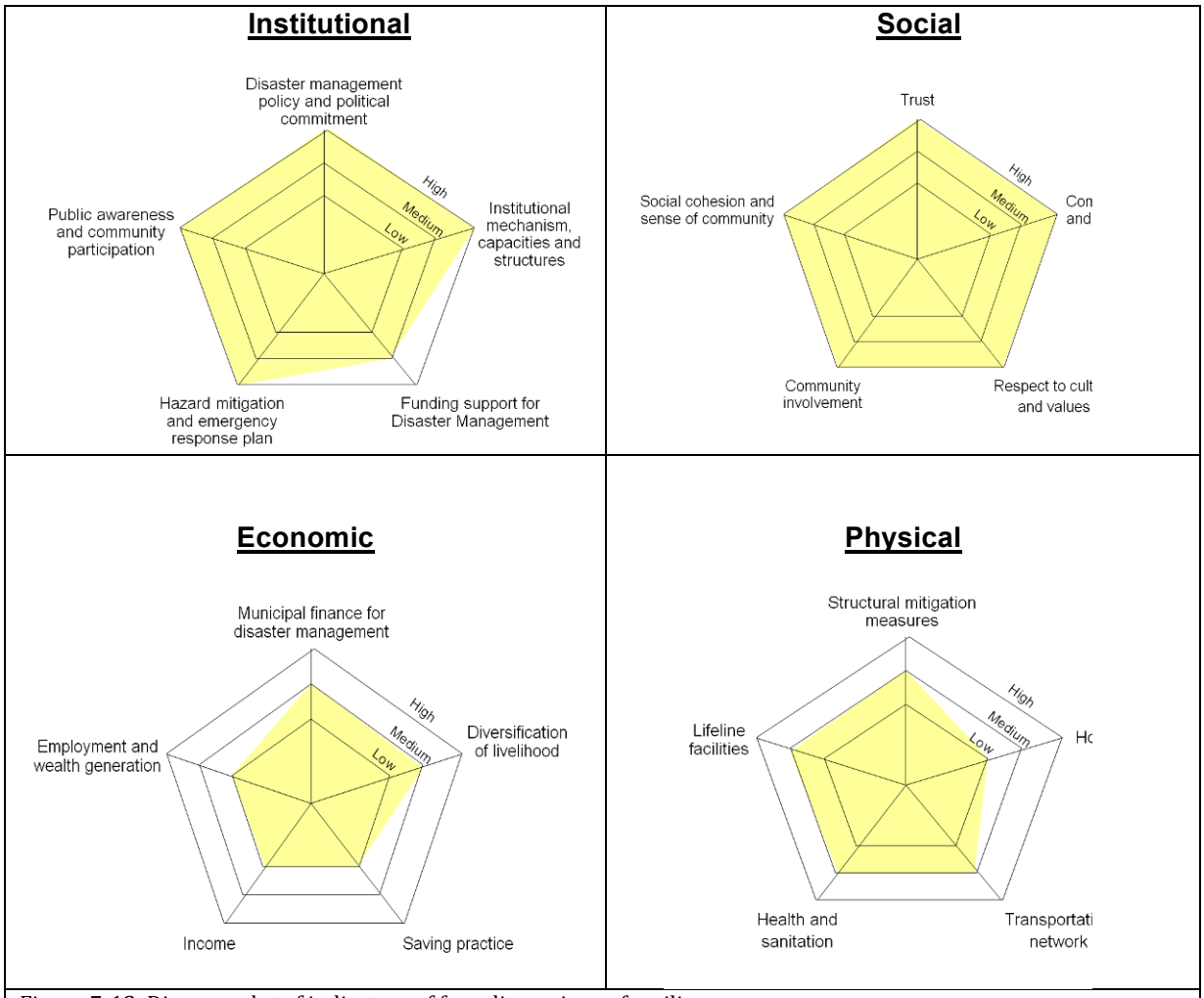


Figure 7-13 Diagram plot of indicators of four dimensions of resilience

The diagram above demonstrates that social resilience is the strongest dimension of resilience in the study area. It is characterised by strong social cohesion and a high sense of community that is built through trust among the community members. Those two characteristics build strong bonds in the community as they encourage mutual assistance that then constructs a social network and the support mechanisms needed to support the various disaster-related activities. High community involvement in various public awareness activities and drills conducted by the municipality disaster office is another factor that increases community resilience. The general perception of 'natural disasters as part of life' increases their psychological strength in difficult times. In the same way, this characteristic builds the community's ability to absorb, maintain and bounce back after the strike of natural disasters.

Strong institutional resilience is characterised by an established disaster management policy and strong political commitment to engaging different stakeholders from different sectors in building a resilience strategy. An established emergency plan and hazard mitigation to the lowest level of administration is another factor that builds up this resilience dimension. The weakest point of the institutional system is the inadequacy of funding to disaster management activities. Though systems have been in place by allocating 5% of the municipal budget to disaster-related activities, in reality it is far from adequate to address the different needs. This is an important indicator that determines the low level of economic resilience, in addition to the low employment level and income at the two *barangays.* The fact that the region has the largest number of poor families and individuals (Oxfam GB 2008) justifies the low economic resilience in the whole region in comparison to the Philippines standard. However, different measures practiced by local communities in strengthening their economies are another aspect that demonstrated an adaptation strategy for increasing economic resilience.

The vulnerability of houses in the two *barangays* indicates the low physical resilience, adding to the weak implementation of the land use plan established

by the municipality. This is another factor that supports the significant growth of informal settlers in different areas in the municipality. Their occupation on riverbanks has resulted in the destruction of the buffer zone. Continued sediment deposits from Mayon Volcano have affected channel storage capacity. Embankments and dikes have become less effective thus increasing the flooding risk. Economic factors have become the reason for the limited number of flood control and drainage structures. Repairing them after disasters requires high capital and results in design structures for a low return period (Government of Albay 2010).

In general, institutional and social are the strongest dimensions of resilience in the study area (Figure 7-14). They are demonstrated by an established (and tested) disaster management plan and the community's strong cohesiveness and bonds.

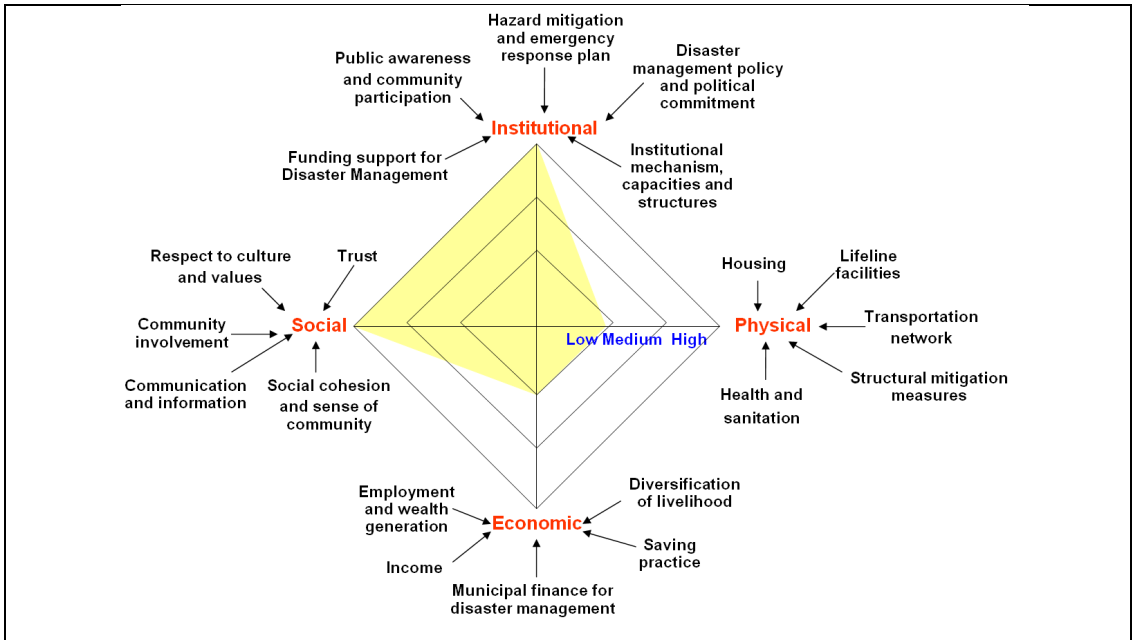


Figure 7-14 Diagram plot of status of different dimensions of resilience

7.5 Conclusion

This chapter has demonstrated how the concept of resilience is conceptualised based on the risk and vulnerability level of the study area, the capacity and the

level of adaptability. This chapter supports the views of (Cutter et al. 2008; Manyena 2006; Pelling 2011; Sivell et al. 2008; Tierney and Bruneau 2007; Waller 2001) discussed in Chapter 4, which argue that resilience cannot be looked at as one aspect or dimension. Instead, as this chapter demonstrated, it is an integrated concept composed of different dimensions and indicators. Findings from this research show that one aspect of resilience can be stronger than the others, and vice versa. Throughout this study, it has been demonstrated that social and institutional resilience are the two strongest dimensions, in comparison to economic and physical resilience. This demonstrates the importance of social resilience in mitigating the impacts natural disasters to reduce the loss and damage of disasters.

The suggested indicators discussed in this chapter demonstrate the important inclusion of vulnerability factor into a resilience analysis. Hence, this chapter highlighted the importance of a basic vulnerability analysis which was also discussed in Chapter 5.

This chapter provides an important basis for discussion on the relationship of tenure security and disaster resilience which is the main objective of this research study. Factors that overlap between the two, given the social characteristics of community in the study area, will be discussed in Chapter 8.

CHAPTER 8 - LAND TENURE SECURITY AND RESILIENCE

8.1 Introduction

Drawing on the analysis from Chapters 6 and 7, this chapter presents the relationship between tenure security and disaster resilience by linking findings from the previous two chapters. This chapter seeks to answer the main research question presented in Chapter 1: *How can tenure security contribute to disaster resilience?*

In discussing the relationship between tenure security and resilience, the vulnerability aspect cannot be overlooked since, as discussed in Section 4.2.3, vulnerability and resilience are related concepts. Therefore, in revealing the relationship, two aspects of the concepts will be discussed in this chapter: tenure insecurity and tenure security. They are subsequently presented in two sections.

The first section discusses tenure insecurity and how it becomes a vulnerability factor, which Klein et al. (2003) argue is the flip side of resilience. Nevertheless, this chapter reveals that there is an overlap between vulnerability (resulting from tenure insecurity) and resilience. This part of the chapter discusses in which way tenure insecurity contributes to resilience. This discussion leads to an understanding of the relationship between vulnerability and resilience, particularly the linkages where the context of insecurity of tenure and disaster resilience intersect.

The second part of the chapter discusses tenure security. It presents how "perceived" tenure security increases disaster resilience. To strengthen the argument, tenure-related determinants that mediate disaster resilience are presented. The centre of the discussion in this section is (i) the intersecting factors that bridge the line between tenure security and resilience and (ii) the

way in which different determinants of tenure security contribute to different dimensions of resilience.

8.2 Tenure Insecurity and Vulnerability

Land tenure or tenure insecurity itself has been argued as a factor that contributes to vulnerability (e.g. (Mitchell 2011; Reale and Handmer 2011; UN-HABITAT 2010)). In the same way, assessment of vulnerability often includes the land tenure issue (i.e. access to land) that is regarded as the basic factor for human shelter, food production and other economic activities (UN-HABITAT 2006b).

Despite the perceived tenure security discussed in Section 6.3, it is important to set the context that tenure insecurity, which is discussed in this section, occurs due to the following reasons:

- Unavailability of title or contract documents. In the study area, about 60% of all properties are held informally. Therefore, the insecurity of tenure in this regard is about the unavailability of legal documents for the property where the local communities reside. The same goes for tenants, most of whom do not have contract documents.
- The possible threat of eviction due to the location where informal settlements reside, especially after disasters. Among the four types of informal settlers, the most vulnerable ones are those squatting along the river bank (within a 5-15 meter strip of the river) and within a 15 meter strip near the railway (see Section 6.2.1).

In the study area, there are four identified land-related predictors that contribute to vulnerability to natural disasters. The four aspects, which will be discussed below, are summarised in Table 8-1.

Table 8-1 Characteristics of land-related vulnerability factors to natural disasters in the study area (adapted and modified after UN-HABITAT (2010)

Characteristics	Nature of Disaster Vulnerability
Unsustainable land use	Settlements on buffer zone (i.e. river bank), more risk to flooding Land degradation in the buffer zone as the impacts of farming for livelihood Farming / gardening on slope hills, risk to landslide Unsafe settlements
Poor urban planning	Unsafe settlements Weak implementation of zoning regulations No building codes
Non existence of building codes	Poor quality of housing construction
Weak land administration	Incomplete land registration Out-of-date registration data Unavailability of back-up of land registration

- *Unsustainable land use*. Poor settlements are mushrooming on flood plains, water catchments or other areas that are considered as buffer zones. Consequently, natural protections are destroyed and communities face the risk of the impacts of natural disasters (Figure 8-2).

- *Poor urban / rural planning.* Zoning by-laws are not yet implemented in the study area. Though mapping and delineation of high hazard areas in the whole municipality has been conducted (see Chapter 5 for more details) and despite the established laws and regulations, local communities still continue living in hazard areas due to weak law enforcement (this will be explained further in Section 8.2.2.3). The exception to this is the strict implementation of no-habitation on the six-kilometre PDZ around Mayon Volcano. Implementation of disaster-proof housing has also been enforced in resettlement initiatives by local government. Resettlement sites in the municipalities are built on the land that is free from geological/seismic hazards (Laud 2006). All communities at the resettlement site perceive that their houses provide safety from the threat of natural disasters (See Section 6.3.4).

- *Non existence of building codes.* As a result, constructed houses in the study area are of poor quality. Despite the threat of various disasters

in the study area, there is no existing guideline on building disaster-resistant houses.

- *Weak land administration.* It is characterised by the small number of titled / registered parcels of land, which is 35% of the total 574 plots of land. The registered parcels are based on 1920s survey that is not yet updated. Therefore, the boundaries between different types of land may not be sufficiently and precisely defined. In addition to that, data on those registered parcels is poorly recorded. Record is kept manually without any electronic back up hence the risk of loss or damage of land records in the municipality (Figure 8-1).

Figure 8-1 Some land-related characteristics of disaster vulnerability in the study area. Left: mushrooming settlements along the river bank. Right: manual land record in the municipality

The linkages between land-related factors of vulnerability that define tenure insecurity to different tenure groups are illustrated in Figure 8-2. The nested circle illustrates how tenure insecurity is a factor of vulnerability with a set of vulnerability predictors, which are represented and justified in a bigger circle of vulnerability.

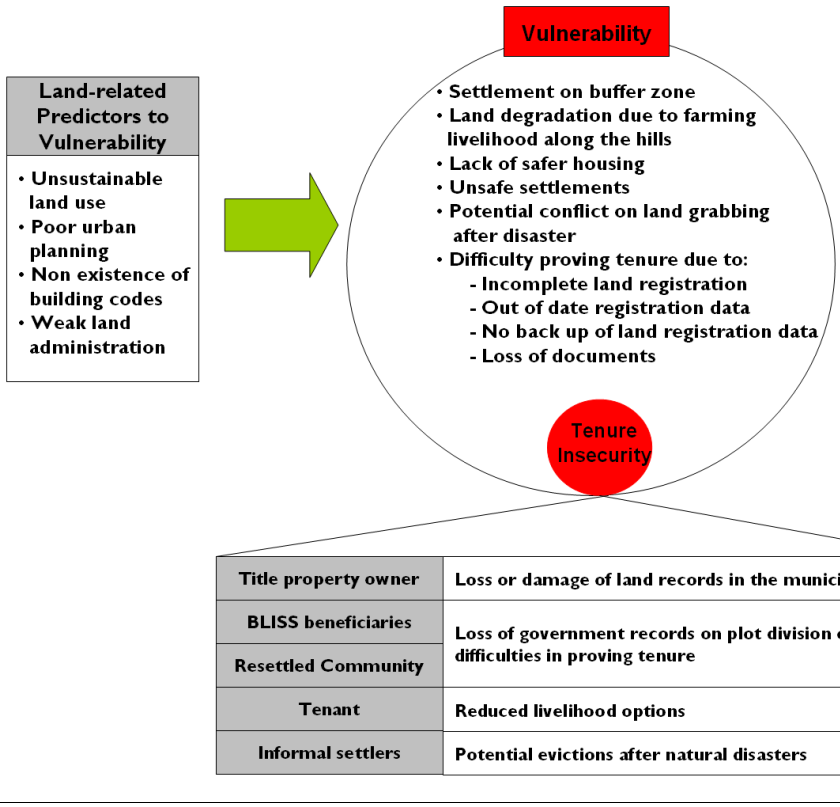


Figure 8-2 Land-related predictors that contribute to land vulnerability in the study areas. Tenure insecurity is shown as a component of vulnerability

8.2.1 The overlap between Tenure Insecurity and Resilience: In what way does tenure insecurity impact resilience?

Despite the insecurity and vulnerability explained in the previous section, i.e. given the current situation of tenure insecurity, the community perceives that they are resilient to various natural disasters that frequently affect the areas. The survey and focus group discussion conducted with different tenure groups found that they were confident about their state of resilience to natural disasters (Table 8.2).

Table 8-2 Community perception on resilience and tenure insecurity based on question 'Are you resilient to disasters given the current tenure situation?'

	Informal						Regularised		
	Informal Settlers				Tenants		Government-assisted housing		Titled
	along riverbank (*n* = 30)	along railway (*n* = 20)	in forest (*n* = 20)	on road (*n* = 30)	Labour Tenant (*n* = 20)	Share Cropping (*n* = 20)	BLISS (*n* = 20)	Rsettle-ment sites (*n* = 30)	Titled groups (*n* = 30)
Yes	70%	80%	100%	95%	85%	90%	95%	95%	100%
No	30%	20%	-	5%	11%	10%	5%	5%	-

The responses of the community members presented in the table above demonstrate that there is an overlap within the concept of tenure insecurity and resilience. It therefore proves that in the context of the study area where land vulnerability is high, there are factors that justify if vulnerability and resilience overlap. In other words, this research has demonstrated that the concept of tenure insecurity and resilience are "not totally mutually exclusive nor totally mutually inclusive" (Cutter et al. 2008).

The next section presents and discusses five identified factors that explain how tenure insecurity overlaps with the resilience to natural disasters.

8.2.1.1 "Built-in" Resilience: Economic vulnerability versus psychological resilience

Communities from vulnerable groups (i.e. low-income groups[52] who are mostly from informal settlements, tenants and from the resettlement sites) expressed their confidence towards resilience to disasters. Specific interviews and focus group discussions with those vulnerable groups revealed that living with economic hardship has built their resistance to shocks. Therefore, in times of disasters, they can deal with hardship and difficult situations without losing hope.

> *The difficulties in life that we face everyday have built our strength. We are used to live with limited facilities so in times of disasters we are used to that.*

[52] According to the National Statistical Coordination Board, the poverty threshold in the Philippines varies by province and region. For Albay Province in Bicol Region, the 2007 threshold is PhP 15,407/year in all areas. In urban areas, it is PhP 18,343/year and PhP 14,259/year in rural areas. Complete figure are available on http://www.nscb.gov.ph/poverty/2006-2007/pov_th_07.asp

Impacts of disasters always give us difficult time but we are used to that. We are resilient. Leria Nayve, 62, squatting along the river bank since 1970.

Even though it is generally argued that economic hardship is associated with lower level of happiness and often leads to depression (Seccombe 2002), this does not seem to happen in the community from the low-income group. This attribute corresponds to one principle of human resilience that demonstrates the low level of depression of an individual or family (Lachman and Weaver 1998; Reich 2006). The scope of discussion here is strongly related to psychological resilience. In that concept, there are three factors that frame the resilience within the context of a low-income background (Seccombe 2002):

- *Individual personality traits.* These include a positive self-concept, sociability, autonomy, self-esteem, problem-solving skills, humour and good mental and physical health (Seccombe 2002). The communities from the low-economic class mostly possess these basic traits. They were demonstrated during the data collection process when almost all participants were always cheerful and joked throughout the process. Participant observation employed in this research confirms the individual strength possessed by the community members and their perception of economic hardship and impacts of disasters. Some of the quotes demonstrating this are presented in Table 8-3.

Table 8-3 Selected affirmative quotes depicting individual strength in the face of economic hardship

We are used to live like this, so it is okay, Joey Imbat, 28, tenant.
Life is always difficult after disasters but this is how our life is. Noli Luces, 50, squatting on river bank.
I know I am poor but we are okay. We can eat and children can go to school. That is the most important thing. Joel, 61, squatting on the main road.

- *Family.* Some key characteristics of resilient families displayed by communities in the study area are warmth, affection, cohesion, commitment and emotional support of each other (Seccombe 2002). These characteristics have been embedded in daily life and especially

practiced before, during and after disasters. They have shaped the family's ability to endure hardship in the face of risks. The bond of families also extends to next of kin as often cousins, grandparents, aunties and other extended family members offer assistance in difficult times. Not only that, this kind of relationship is practiced in daily life. This general practice is a strong attribute of resilient families who share core values around financial management even when money and time are in short supply (McCubbin and McCubbin 1998).

Table 8-4 Selected affirmative quotes depicting family strength and bond in the face of economic hardship

We always help each other from sharing food, housing materials, to paying my children's education. My brother gives money for my children education. Pilar Narito, 73, tenant.
Before disasters, instead of waiting to be evacuated, the whole families go to our cousin's house in Legazpi. Melcor Vibar, 63, squatting inside forest areas.
In difficult time, there are families that help us. We help each other. Joey, 37, squatting along the railway.

- *Society/community* is also a factor that builds resilience in the situation where people live with low incomes. There are three key community strengths that are practiced by the community in the study area that define a strong community bond, despite the economic vulnerability that they face (Blyth and Roelkepartian 1993):

1. *Strong participation in community life.* Various groups are established in the two *barangays*. Extra curricular activities are available in schools, including scouting and religious youth groups. A church group is one of the most prominent groups that can bond community members. In addition, cooperative and informal gatherings among groups are also practiced on a regular basis.
2. *Avenues to contribute to the welfare of others.* A basis of Filipino society is to love human interaction and thus the smooth interpersonal relationships among them is the foundation of this care for the welfare of

others (Dolan 1991; Lapiz 2006). These characteristics have been discussed in Section 7.3.2 as well as in the above sections.

3. *Opportunity to connect with peers and others.* Various groups established in the community have provided opportunity to connect with others within the society. The basic characteristics of Filipinos, which are sociable and open, also support the avenue to connect with others.
4. *Adequate access to community facilities and events.* The Philippines is also known for festival traditions which are embedded in the society. In Camalig Municipality itself, an annual week-long festival is held every July. It attracts all age groups from the whole community as it offers different activities and is held from morning to night. The festival was on during the data collection process so the researcher had the chance of being part of it. Some of the activities include school marching along the main road in the municipality, thematic music performances (for teenagers and elderly people), karaoke and beauty pageants. This has become a factor that bonds the community since almost all people participate in the events (Figure 8-3).

Figure 8-3 Some of the practices that create interaction among people amidst the economic vulnerability. Communal water pump in *Barangay* Tagaytay that is used by resettled community (A). Typical small grocery shops (that also sell coffee) where local community usually gathers (B and C). The annual *Pinangat* Festival (D).

8.2.1.2 Social system and resilience in the context of tenure insecurity

Despite the vulnerability factor of tenure insecurity discussed in Section 8.2.1, the situation where informal settlements live in tenure insecurity and unsafe situations can be turned into a factor that builds resilience. The situation where most informal settlers live in compact settlements has become a factor that strengthens the social system among the vulnerable groups living as informal settlers. This factor adds to the already strong status of general Filipino society who are known for their strong human connection and mutual help (Dolan 1991; Lapiz 2006). Three factors have been identified as variables in supporting resilience in the context of tenure insecurity. These factors explain how tenure

insecurity has built a social system that becomes an important factor of resilience as explained in Section 6.3 (see Table 8-5).

- Sense of Community. The compact settlements of residents in an informal setting have, in a way, turned into a stronger social factor that binds them even closer. Even without this situation, Filipinos, especially those in rural areas, are very much sociable people (Abinales and Amoroso 2005). Moreover, in a setting like the study area, they are more bonded to each other as they possess high social competence, which is defined as the ability to interact successfully with others (Abelev 2009). The setting of open houses (see Section 6.2.1) in the informal settlements has increased the sense of togetherness in their daily life. In addition, their frequent experiences in disasters have made them into a stronger community (see Section 8.2.2.1).

- Social trust. Positive consequences of this type of informal community are recognition of ownership despite there being no formal documents. Consequently, conflicts hardly occur among community members especially after disasters. Community members show their confidence towards recognition of house ownership and there are no reports on land grabbing after disasters. When they stay in the house in the event of disasters, they also watch out for their neighbours' belongings.

- Community participation and collective action of preparedness, response, relief and rehabilitation. The strong social attributes demonstrated above are most importantly used as a strong resource in times of disaster. The government reveals that it is not difficult to get community involvement in implementing community awareness or other disaster preparedness activities.[53] The strong social attitude is the reason behind this. Even during data collection, participation

[53] Personal communication with Municipal Disaster Management Officer, July 2010.

of the community was very high and the number of participants was more than expected.

Table 8-5 Selected quotes demonstrating how social system supports resilience in the context of tenure insecurity

I live in an informal settlement along the railway. We live next to each other. We are separated only by small fence and we share the same backyard. We know what people do and eat everyday. This is life in here; we are like living in one house. Its implication, during disasters, it is easy for us to help each other because our neighbours are like our families. We care each other. We help disseminate warning and during disasters, we make sure everyone is evacuated. Brenda Malate, 77, squatting along the railway.
Everyone knows everybody here and everybody helps everybody here. Melcor Vibar, 63, squatting inside forest areas.
Even we live in informal settlements, we do not have problems with rebuilding back our life. It is true we face economic problem but we usually can overcome it. People help each other when we are rebuilding our houses after disasters. In regards to housing, everyone knows whose houses are where. That is the most important thing, we recognise each other and we are bonded with each other. Estela N. Napay, 79, squatting along the river bank.
Because we are like family, we always have access to our neighbours houses. We just say "knock knock" and we can come inside, like in our house. This especially helps during disasters. Norly Moreuda, 56, squatting along the railway.

8.2.1.3 Government recognition and weak law enforcement

The perceived tenure security contributing to resilience is in a way supported by the two strong external factors that come from government. These factors are recognition from government and weak law enforcement. The growth of informal settlements has been recognised for many years. This does not only apply in the study area but also to different areas prone to disasters in Albay Province. Such mushrooming growth of informal settlements is recognised by the Albay provincial government.[54] The Albay Provincial Development and Physical Framework Plan includes enforcement of various established laws

[54] Personal communication with Albay Provincial Planning Officer and APSEMO Officer, July 2010.

concerning land use and disaster management, especially on the settlement of communities in the disaster-prone areas or in the buffer zones along the river and in the human habitation of mangrove areas (Government of Albay 2010).[55]

Various laws and regulations are listed in Table 8-6, including their status of implementation. Among all, the strictest regulation is implemented is the prohibition of human settlements in the 6 KM Permanent Danger Zone around the Mayon Volcano.

[55] Though there are no recorded numbers of households in the whole province, the government recognises the growth of such settlements that resulted from fishing activities in the buffer zone like mangroves (interview with Albay Provincial Planning Officer, July 2010).

Table 8-6 Some of the key established laws and regulations pertaining to habitation in disaster areas and their implementation status in the study area.

Law / Regulation	Description	Status of Implementation
Republic Act 7586, 1991, The National Integrated Protected Areas System (NIPAS).	An act for the classification and administration of all designated protected areas.	The encroachment of communities in protection ands had not been prevented in the past and had become well-entrenched. In some NIPAS areas of Albay like Mt. Mayon, severe disasters have caused the voluntary evacuation of communities but not totally. In other protection lands, NIPAS or Non-NIPAS, communities have settled over the years even with government interventions.
PHIVOLCS	Establishment of 6 KM Permanent Danger Zone that prohibits habitation along the 6 KM radius of Mayon Volcano.	In study area, all residents in *Barangay* Anoling were relocated to the resettlement site. No habitation is strictly implemented on permanent basis. However, due to dependency on livelihood, local communities still go back to their original village. Some stay there during safe season.
Administrative Order of Dept. of Environment and Natural Resources (DENR) No. 98-12, March 1998.	No houses are to be built within the 15 metres of railway and road and 50 metres within water body.	Informal settlements are mushrooming in the 15 metres strip on each side of the railways and roads. Communities squat along the river bank. Some even build houses on the river side (see Section 6.3.1).
Republic Act 7279, 1991; An act to provide for a comprehensive and continuing urban development and housing program, establish the mechanism for its implementation, and for other purposes.	Section 28 on Eviction and Demolition justifies that "eviction and demolition as a practice shall be discouraged"; however, may be allowed in following situations: When persons or entities occupy danger areas such as *esteros*[56], railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and other public places such as sidewalks, roads, parks, and playgrounds; when there is a court order for eviction and demolition.	The informal settlements keep growing and in fact, dominate the majority of settlements in the study area. Though informal settlers believe that eviction may happen, they have strong perception that it will not happen. Some have been living there for more than 40 years (see Section 6.3.1).
	Sec. 29. Resettlement. — Within two (2) years from the effectivity of this Act, the local government units, in coordination with the National Housing Authority, shall implement the relocation and resettlement of persons living in danger areas described above.	The resettlement program only applies to people residing in the 6 KM Permanent Danger Zone (PDZ). Residents along the riverbank and railroads still live there. In fact, it has become a more permanent settlement due to the length of occupation and the perceived tenure security (see Section 6.3).

8.2.2 Intersection of Tenure Insecurity and Resilience

The basic individual, family and community characteristics of Filipinos that build a strong social system and social cohesion are the factors that in turn build the strong community perception of resilience, despite the vulnerability factor

[56] *Estero* is Tagalog word for inlet canals or estuary.

built by tenure insecurity that was discussed in the previous section. This research argues this is an overlapping of tenure insecurity and resilience. This overlap is built by two factors that come from internal community (endogenous) as well as from outside the community (exogenous).

The embedded attitudes of the community as discussed in Section 8.2.2.1 is argued as the strong internal (endogenous) factor possessed by communities who mostly perceive disasters as part of life. The strong social system that was discussed in Sections 7.2.2 and 8.2.2.2 is another endogenous factor that builds the intersection of tenure insecurity and resilience. On the other side, the intersection is also built by exogenous factors. Government recognition towards their informality and weak law enforcements are also identified as supporting factors that determine the intersection of tenure insecurity and resilience.

Supported by these factors, communities in the study area have developed adaptive capacity and coping mechanism that helps build their resilience. This adaptive capacity is one strong determinant that justifies community resilience at the household level (for more details, refer to Section 7.3.1). In this relationship, adaptive capacity and coping mechanism are represented by the two circles in that intersecting circle in Figure 8.4.

This section concludes that tenure insecurity is a factor of vulnerability (refer to Section 8.2). On the other hand, tenure insecurity faced by local communities has enabled them to develop adaptive capacity that contributes to resilience (refer to Section 8.2.1). The intersection between vulnerability and resilience is presented in a diagram that justifies how tenure insecurity can contribute to resilience, demonstrated in Figure 8-4.

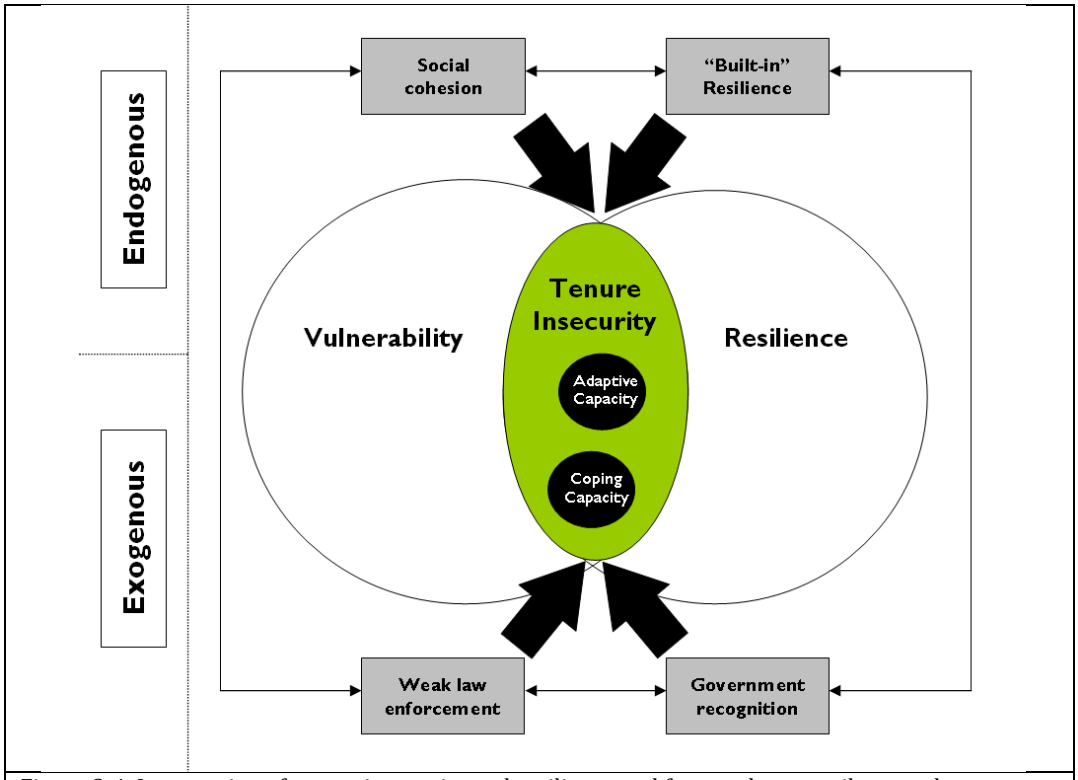


Figure 8-4 Intersecting of tenure insecurity and resilience and factors that contribute to the overlapping of the two factors

8.3 How can Tenure Security increase Resilience?

Chapter 6 of this thesis has revealed that tenure security, at the very fundamental level, provides recognition to the land of community with different tenure groups. More legalised tenure systems (titled groups, BLISS and resettlement groups) enjoy *de jure* tenure security proven by a legal certificate of title and a housing award certificate provided by the government. On the other hand, irregular tenure systems consisting of different types of tenure groups (informal settlers along the road, along the riverbank, along the railway lines and in the forest) enjoy strong *de facto* social recognition. Though mainly supported by strong social bonds, government recognition of this informality also contributes to perceived tenure security by these different tenure groups.

Findings discussed in Chapter 6 reveal that perceived tenure security is a foundation for building resilience as it provides access to housing and shelter as well as livelihood. Those two aspects are discussed further in Sections 8.3.1 and 8.3.2. Findings presented in this section were explored through focus group discussions and in-depth interviews from community members from different tenure groups.

8.3.1 Tenure Security and Access to Housing and Shelter

Perceived tenure security provides recognition and thus confidence and assurance to continue occupying the house and managing the land on which the houses are built.

In pre-disaster situations, living with no threat of eviction provides opportunity for a local community to establish life and further access other services associated with shelter and houses. This is the basic foundation of why most local residents continue to live in the same areas, regardless of the risk of the disasters that they perceive as part of life.

> *Security of land and housing is the first factor that gives me confidence in life. Even though we live in disaster areas, it gives us sense of belonging to my house. Without this, I cannot still live in here. At the beginning, I and my husband constructed a house made of nipa trees. Now, it is of bricks, strong house. We have connection to electricity since 10 years ago, like many of our neighbours. My children go to school near by, we all go to church every Sunday and we establish connection with our neighbours. We participate in meeting in barangay. My husband is part of community representative. He has voice in village meeting, especially in disaster-related matters. Garcia, 53 yo, residing along the river bank in Barangay Ilawod.*

During a disaster and during the early-recovery phase, without security of tenure, many of the local communities would spend a longer time at the evacuation centres. If they are not allowed to go back to their land after the disaster or have no security of tenure, many will still stay in evacuation centres causing long-term establishment of emergency shelters. Consequently, disaster rehabilitation will be hindered or it will take longer.

Even after 2006 typhoon, many people did not spend long time at the evacuation centres. As soon as the situation was safe, everyone immediately going back to their houses. Usually, emergency shelters did not stand long, even though we are prepared to house many more people during disasters and we are still building more evacuation shelters with the help of international donors. Disaster Management Officer of Camalig Municipality.

I think nobody likes to stay at the evacuation centres. I always come back to my house immediately when the situation is safe. Anthony, 65, informal settler along the river bank.

The quote above demonstrates how tenure security is perceived as a strong foundation for returning to their informal property. This perception is as strongly perceived by communities with formal title documents (see Section 6.3). Therefore, regardless of the source, a local community with perceived security of tenure will show confidence in returning to their property after a disaster which enables them to resume and re-establish their life.

8.3.2 Tenure Security Factors Mediating Access to Housing and Shelters

This section presents five tenure security factors that mediate secure access to housing and how each of these factors plays a role in building resilience of local communities. The finding of this particular section was explored through Focus Group Discussion with different tenure groups and in-depth interviews with community members.

8.3.2.1 Social Recognition

The first and foremost aspect that underlines the basic principle of resilience, in relation to tenure security is undoubtedly the recognition of ownership, although this may be in different forms. While conceptually the title document is the one to aim for all tenure groups, in practice, recognition of ownership is not solely determined by a title document (see Chapter 6, particularly Section 6.5.3). Informal groups enjoy *de facto* tenure security through social recognition. Recognition of ownership lies in the foundation of tenure security as it provides a platform that enables local communities to go back to their properties after

the disasters strike, regardless of the intensity of the events and the severity of damage. In this regard, recognition of ownership leads to *building back after disasters* and the ability of communities to return to its original state following a perturbation. In other words, this recognition supports *the ability of an individual and local community to return to their original state* (Klein et al. 2003). Hence, the direct connection between tenure security and resilience can be drawn. Based on experiences in the study area, social recognition leads to security of occupation over both the short and long term period.

> *Noli Luces Garcia, 50, lives in an informal settlement on the river bank. In 2006, his house was completely destroyed following the typhoon and Mayon Eruption. While his immediate neighbours' houses were still standing, what he had left was only the remnants of the fence. During disasters, he went to his relative's house in another province. Four months after that, he went back and nobody occupied the plot where he had lived despite its strategic location. It was protected by the social recognition. He then slowly built and occupied the house in the same space he used to live.*

8.3.2.2 Government Recognition and Support

Government recognition is another aspect beyond the legal and social aspects of tenure security. This government recognition in regard to tenure security and resilience mostly applies to informal settlements. This is strongly perceived as a mediating factor in building confidence towards (1) returning to their properties and (2) rebuilding them after disasters. Specific focus group discussions with the informal settlement group revealed two major facts as to why they perceived that they hold full government recognition:

- The government did not stop the informal settlers from returning to their settlements after disasters. The process of returning to their properties is the same as that of titled groups. The social system leaning towards ownership recognition of the informal settlers and the weak law enforcement are the two supporting aspects in this case (see Section 8.2.2). However, there is an exception in the case of *Barangay* Anoling as it was declared unsuitable for habitation

because of its proximity to the crater of Mayon Volcano (see Section 6.2.4).

I never have problem going back to my house after disasters. My neighbours know that it is mine and no one ever tries to occupy the plot I occupy before disasters, even if it is flattened by typhoon. The government never forbids me to continue living here. Lerna Nayve, 62 squatting along the river for 40 years.

- After the big[57] disaster incidents, the government provides them with basic materials to rebuild their houses. This is strongly perceived as government support for returning to their life in their previous settlements. In resilience concept, this is in line with the implementation of system resilience, where a platform is provided to support the community in retaining life during disasters and returning to life after disasters (see Section 6.3.1).

After big disasters, the government sometimes provides us with basic building materials to rebuild our houses. It means, they know that this is our house and they have no problem with that. During the government visit after disaster, they even asked me 'How is your house?'[58] *Maribel, 43 squatting on river bank in Ilawod since 1992.*

8.3.2.3 Disaster-proof Housing and Household Wealth

In the study area, most residents with titled properties are from the relatively moderate to well-off families with prominent structures for their houses, mostly made of bricks with iron fences (see Section 6.2.5). Communities with titled property perceive that household wealth is an important factor that indirectly contributes to the attainment of tenure security through legal recognition.

[57] Local communities perceive 'big disasters' as incidents that force them to leave the house for more than 7 days when they leave their houses unoccupied and they spend most of the time in evacuation centres or in their relatives' houses outside the *barangay* or municipality. Quite often incidents of 'big disasters' damage half of their houses in which external assistance is needed to rebuild (especially applicable for informal settlement groups). The assistance can be from (national and local) government as well as international and national / local aid agencies. For tenant groups, assistance is usually expected from the land owners who are mostly from titled groups residing in and out of the municipality. There have never been any major impacts of disasters affecting the houses of the resettlement group at the resettlement sites. For the BLISS group incidents of blown roofs is common after a typhoon or sediment deposited from volcanic eruptions.

[58] This is a powerful question that is strongly perceived by most informal settlements as government's full support to their 'ownership' of land and the houses they occupy (see Section 5.3.1).

In relation to resilience, all tenure groups at the focus group discussions perceived that household wealth is considered an important factor in building tenure security and resilience as it leads to investments and improvements of their property located in hazard-prone areas. Not until recently were disaster-proof houses enforced and factors leading to that are considered by local communities when building their houses. Most owners of titled property are confident that their strong houses are resilient to the threat of the impact of hazards which have been proven during a few disasters. Therefore, the recent trend (since ~20 years ago) of building houses in the study area is directed towards the use of bricks and cement, instead of using timber. They have learned the lesson that cement houses can withstand the effects of typhoons and volcanic ash.

From this aspect, all tenure groups perceive that the security of tenure (regardless of the form) provides the confidence towards building *physical* resilience through disaster-proof housing.

> *If we have strong house, we feel safe. So I am now slowly building my house with cements and bricks. My two old houses (of wooden walls and bamboo pillars) in two different locations were always washed away by floods and their roofs easily blown away when there is strong wind. Establishing the house is the first step of resilience. Antonio, 65, squatting on main road.*

Figure 8-5 Confidence in upgrading and building disaster-proof housing after the perceived tenure security. Strong house of titled property perceived to be resistant to multi-hazard impacts, a common demonstration of linear relationship between household wealth and disaster-proof housing (left). Upgrading timber and bamboo house to a brick and cement one in order to minimise the impacts of disasters, after the perceived tenure security and improved economy (right).

8.3.2.4 Social Cohesion

The growth of different types of informal settlers in different areas, i.e. on the main road, along the riverbank, or near the railway line, has in a way created compacted settlements (see Section 6.2.1). Despite this, they still have a clear boundary of land ownership. Though not registered by law, communities have respect for the ownership of their neighbours. This has tied and built strong relationships among the informal settlers. In the bigger picture, as they all face the same tenure insecurity for residing in a buffer zone, a strong social cohesion has been developed.

This has been demonstrated during various disaster incidents where mutual help was practiced. Dissemination of warnings, for instance, is made easier as they live next to each other. As usually the concept of *everybody knows everyone* is practiced, it leads to human security in times of disasters, especially in recognising and prioritising the most vulnerable groups. During disasters, the male group who sometimes stays in the house for the sake of security, also guards their neighbours' houses. Assistance to each other during evacuation is also demonstrated during this stage. Simple things that can be observed in daily life is the practice of sharing food.

It is also practiced during and after disasters when the community sometimes faces food scarcity due to economic constraints. After the disaster, it is common for people to share resources and help each other in (re)building houses.

Therefore, this research reveals that this practice is one strong component of social resilience (see Section 7.2.2). Despite the *informality,* the perceived tenure security by informal settlers supports building the foundation of the resilience. This aspect then emphasises the importance of social resilience in times of disaster that is built on the *fundamental quality of groups to respond to the disruption* (Horne and Orr 1998). This quality (as also discussed in Section 7.3) justifies the inherent quality possessed by informal settlers in *building adaptive capacity in crisis situation* (Rose 2004, 2007).

Yes, it is true that we do not posses land title. We are insecure in a way but our strong social bond make us confident. We have sort of formed a strong group of squatters and it is recognised by Provincial Office of Department of Agriculture. We know what to do if we are evicted. During disasters, since we live close by, we help each other, we are families. Villa Orlain, 53, squatting on railway in Barangay Tagaytay.

8.3.3 Tenure Security and Access to Livelihood

Perceived tenure security possessed by community members also provides access to livelihood sources that can support the economy of local communities. In other words, secure access to livelihood can enhance economic stability that is considered a fundamental aspect for economic recovery after disasters (UN-HABITAT 2010).

Though local communities with different sources of recognition (legal or social) have more or less the same level of confidence in tenure security towards housing and shelter, it is different in terms of livelihood. This can be demonstrated by the confidence in establishing livelihood options on their property. Communities with documents showing legal title and beneficiaries of government housing (BLISS and resettlement sites) have more confidence in investing capital to establish livelihood options on their property.

I moved here in 2001 after we bought this property from our friend's friend. We had a legal agreement and the transaction was done at a legal office in Legazpi. We have the title. Our plan was to establish a fence-making business. We moved here as soon as the business was running. Leonard, 56, owning a title property house in Barangay Ilawod.

I was a farmer living in Barangay Anoling. I and my family moved to the new resettlement site in 2007. In the original settlement, we had a grocery shop for almost 10 years. Half of the economy was mainly supported by grocery shop. As we moved to the new house provided by government, we immediately re-establish their grocery shop at their new house. Literally on the first days when we moved here. It is one of the first grocery shops at the new resettlement site. Nilo, 45, residing at the new resettlement site.

There is a time factor that builds up confidence of informal settlers. It takes some time, at least until social recognition is achieved, for informal settlers to want to invest capital in their property to establish a livelihood option.

> *I moved from Manila in 1990. There, I had a beauty salon that I plan to re-establish when I moved here on the main road in Barangay Tagaytay. The land was offered by my husband's friend. We knew that it was not good to open a shop directly. We were fear of government too because we knew it was government's land. Therefore, when we moved there, we did not directly re-open our beauty salon. Only after 6 months we re-establish it. By that time, local communities knew us and government recognised our property. Elis Morena, 40, informal settler along the main road, Barangay Tagaytay.*

Tenure security also provides confidence to local communities in applying diversification of livelihood as a strategy to support their household finances. This can lead to a stronger economy that supports their confidence in recovery after disasters (see Section 7.2.3). At a fundamental level, tenure security is also important for access to common property resources, including forests and fisheries (UN-HABITAT 2010).

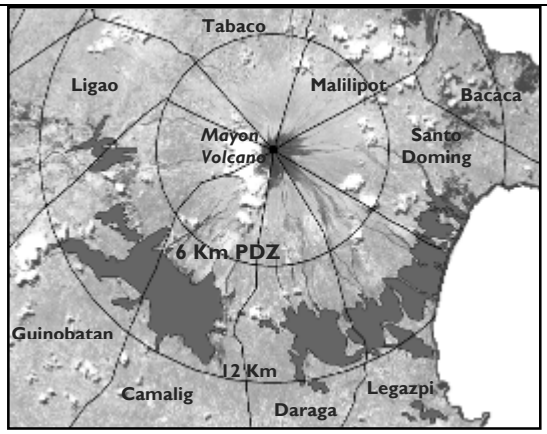


Figure 8-6 Tenure security and access to livelihood are demonstrated in farming communities along the flank of Mayon Volcano that were relocated to the resettlement sites. It demonstrates recognition beyond the housing but extended to the farming activity at the original settlement that has been declared a no-habitation area. The left picture shows the boundary extent of the 6 KM Permanent Danger Zone where the land is still being used for livelihood activity. The right picture shows typical livelihood / farming activity surrounding Mayon Volcano (Map by NAMRIA, photo by author)

In the study area, perceived tenure security leads to confidence in accessing government land for livelihood use. An example of this is the case of the resettlement sites, from which most beneficiaries were from farming

communities and/or animal husbandry. Social recognition of their farming land at their original settlement along the 6 KM PDZ (where occupation was prohibited) provides them with confidence to still continue farming. Therefore, many of the resettlement beneficiaries still go back to their original settlement for livelihood activities. It therefore demonstrates the total recognition of tenure goes beyond housing to farming fields that are located on the flanks of Mayon Volcano (Figure 8-6). Even though there is no clear demarcation at the farm along the flank of the volcano, there has been no conflict on farm land or reported cases of land grabbing. As discussed in Section 8.2.2.3, farming communities only utilise the land during the safe season; they follow the government's regulation on no entry to PDZ during the heightened activity of the volcano.

> *I moved here in 1994 from Barangay Anoling (6 km PDZ). I tried to establish grocery shop here at the new relocation site but it did not work. I only know farming so I go back to my old settlement for farming during safe season. My rice field is still mine and everybody knows that it is mine. Domingo, 70, living in the new relocation site.*

8.4 Intersection of Tenure-Security Determinants and Disaster Resilience

In defining the relationship between tenure security and resilience, determinants of tenure security discussed in the previous section are intersected with different dimensions of resilience and they were presented in Chapter 7. It identifies tenure security determinants that contribute to and support the different dimensions of resilience.

The discussion of their intersection is based on the findings discussed in Chapters 6, 7 and 8, which are synthesised as follows:

- Tenure security, regardless of tenure types, is not supported by only one aspect. There are different factors that build perceived tenure security (refer to Chapter 6 for more details)

- Resilience has multi-faceted aspects that consist of different dimensions, each of which is composed of different indicators (refer to Chapter 7 for more details)

As demonstrated in earlier sections in this chapter, determinants of tenure security are not individually variable. They intersect to each other.

This research reveals that different determinants of tenure security contribute to different types of resilience. Their intersection can be illustrated in a relationship between tenure security determinants and corresponding dimension of resilience. It is presented in Figure 8-7.

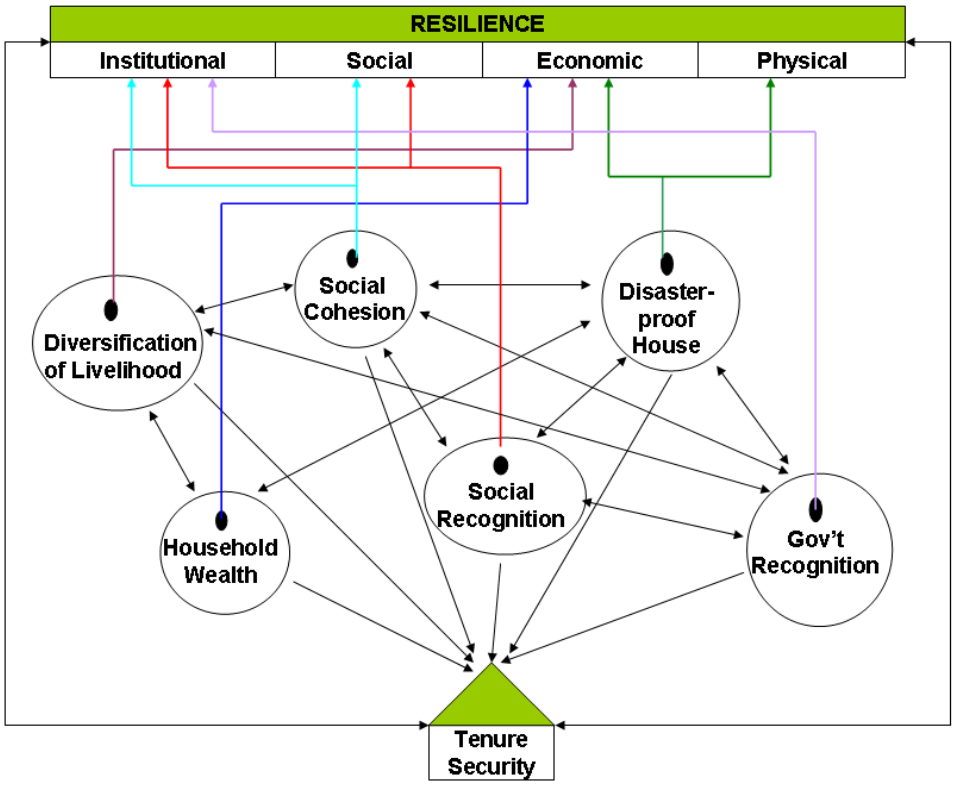


Figure 8-7 Tenure-related factors that intersect and contribute to corresponding dimensions of resilience

The diagram shows that tenure security determinants are related to each other. Moreover, each tenure factor can lead to a particular type of resilience. For example, social cohesion, which leads to recognition of ownership, is a base factor that builds social resilience. Through different experiences of local

communities presented in this thesis, it has been demonstrated that despite the unavailability of legal title documents, tenure security can be achieved through social recognition. The same can be said for the livelihood aspect which is a factor that contributes to economic resilience.

In the same way, more than one tenure security determinant can mediate a particular type of resilience. The availability of livelihood options or strategy of livelihood diversification in a secured tenure can lead to household wealth that defines economic resilience. Similarly, social recognition and government recognition towards ownership of a tenure type can lead to confidence in building disaster-proof houses that can increase the physical resilience of a community.

The intersecting concept between tenure security determinants and different dimensions of resilience is further detailed and presented in Table 8-7. It shows what attribute of tenure security determinant corresponds to what dimension of resilience. Based on that, a concept of how different determinants of tenure security contribute to disaster resilience can be drawn.

Table 8-7 Tenure-related factors of different tenure groups and their intersecting definition to resilience

Tenure-related determinants	Applicability to different tenure groups					Intersecting definition of resilience vs. tenure security-related determinants	Applicability to Resilience Type
	Titled Group	BLISS	Reset-tlement	Ten-ant	Inf. Settlers		
Recognition ownership	✓	✓	✓	✓	✓	The full right, either from legal or social point of view, attached to the local communities in securing ownership during normal situation. It also provides them security in going back to their property after disasters, to resume life.	Institutional, social
Government recognition	✓	✓	✓	-	-	The formal recognition of government towards the property in the form of title and housing award certificate.	Institutional
Household wealth	✓	✓	✓	✓	✓	Economic factor that supports re-establishment of life after natural disasters. This is perceived to be an important aspect in building disaster-proof housing and in post-disaster situation; this aspect is particularly applicable to resuming life, most importantly in recovery and reconstruction phases.	Economic
Disaster-proof housing	✓	✓	-	-	✓*	The perceived disaster-proof houses from the threats of natural disasters that can minimise the damage to the property and the impact to the community.	Economic, physical
Social cohesion	-	✓	✓	-	✓	Social ties within a community group that enables physical and psychological support to other community members before, during and after disasters. This cohesion helps to disseminate early warnings fast during the disaster events.	Social, Institutional
Diversification of livelihood	✓	✓	✓	-	-	The availability of jobs, or other local income-generating activities, or local resources accessible to local community that supports the (economic) recovery process following the strike of natural disasters.	Economic

* Some informal settlers, who have occupied the land for more than 20 years and have established economic stability have built strong houses that are perceived to be disaster-proof (see Section 6.2.1).

8.5 Conclusion

Analysis of the data for this research study has revealed two important findings. The first is about the linear relationship between tenure security and resilience. It has been demonstrated in this chapter that both *de jure* tenure security and perceived (*de facto*) tenure security promote disaster resilience by providing secure access to land for housing and livelihood and provide a platform for disaster risk reduction and a better recovery program. It is achieved through community and government recognition towards ownership as well as strong social cohesion that builds confidence towards building more disaster-proof housing. This has allowed local communities to have confidence in their properties thus allowing them to return to their properties after natural disasters.

The second finding is about the overlap between tenure insecurity and resilience. Though this research argues that tenure insecurity is a factor of vulnerability, on the other hand, it has also found that in the study area where most of the community live in informality of tenure, there is an overlap between tenure insecurity (vulnerability) and resilience. The overlap is supported by social domains in the study area. They are (i) 'built-in' resilience resulting from the perceived disasters as part of life, (ii) strong social bonds and (iii) government recognition of various types of informal settlements.

CHAPTER 9 - DISCUSSION, CONCLUSION AND WAYS FORWARD

9.1 Introduction

This thesis has presented the story of two communities in Camalig Municipality in the Philippines who are affected annually by different types of natural disasters and live with different forms of tenure systems. The literature reviews and discussions presented in Chapters 1, 5, and 6 revealed that these communities are vulnerable in two aspects: most residents live in various forms of informal settlements and their geographical location exposes them to natural disasters.

The preceding chapters presented the rationale and methodologies of the research and basic information pertaining to life in the two communities as well as key findings and critical analysis of the research. This chapter concludes the discussion of the major themes presented in Chapters 6, 7 and 8.

This thesis is an exploration of the intricate relationship between tenure security and resilience and their closely-related terms of tenure insecurity and vulnerability, which some discourse analysis may consider to be the opposite in meaning.

This chapter summarizes the main thesis objective and intermediate objectives outlined in Chapter 1, which are: (1) perception of tenure security, (2) the status of disaster resilience and (3) the relationship between tenure security and resilience. Accordingly, this chapter also sets out research implications and the ways forward for policy-makers and related stakeholders.

9.2 Intermediate Objective 1: What constitutes (perceived) Tenure Security?

This research attempts to provide a conclusion on whether land title is the main instrument in the provision of tenure security and whether land titles are the most secure tenure in the case study area. The discussion seeks to address the question of *what constitutes tenure security,* the level of *de jure* tenure security and the perceptions of tenure security by various tenure groups. In answering that question, various qualitative methods, mainly focus group discussion and in-depth interviews were utilised to obtain data. These methods were used to explore the confidence of local communities towards the basic principle of tenure security outlined in Section 3.4, which is an assurance that an occupier of land will continue to occupy, control, and manage the land and benefit from the resources of the land without threat or risk of involuntary removal (FAO 2005; IFAD 2008; UN-HABITAT 2008b).

Therefore, this research shows that land titles are not the only instrument in securing tenure in the study area. In the absence of a title document, factors mentioned below are what build communities' perception on tenure security:

- Security of occupation for a long period.
- Confidence that land users will not be arbitrarily evicted.
- Certainty that land users' property rights will be recognised by others.
- The right to have effective government protection against forced evictions.
- The right for land users to exercise property rights, such as selling, renting, transferring and inheriting.

There are two sources of tenure security that are respected by the local communities and the government: *de jure* and *de facto* tenure security (Figure 9-1). Communities with legal title documents and residents of government-

assisted housing (BLISS and resettlement sites) enjoy the benefit of *de jure* tenure security since their occupation can be proved by legal title documents or formal certificate housing award issued by the government.

The second source is *de facto* tenure security. This research confirms that even among communities living as informal settlers, *de facto* tenure security, through community and government recognition, is almost as important as *de jure* or legal recognition in determining tenure security.

In other words, this research reveals that despite the informality that most community members live, there is a strong perception of tenure security. Despite the absence of title documents, the land rights possessed and exclusively enjoyed by the community members (for many years and even after disasters), are a demonstration of how perceived tenure security is almost as important as legal status to households with informal tenure.

Although theoretically, eviction is a major threat that informal settlers may face (Berner 2012; Smart 2012; Turnbull 2008), the ranges of *de facto* factors identified in this research increase their confidence to the level of security of tenure (see Sections 6.5.2 and 6.5.3). Their perceived safety from eviction, despite settling in buffer zones or on public land, is built from strong social recognition. Hence, despite the informality and threats of natural disasters, most communities still reside in the same areas and live with the same level of hazard vulnerability (see Section 8.2). Most communities perceive that the only factor that can *evict* them is natural disasters that frequently strike the areas. Though the same concept does not necessarily apply in the urban areas, this research demonstrates how informal tenure groups can have confidence in securing tenure, due to the existing strong social bonds and the structure of the community. In addition, their tenure security is also supported by the fact that there is no indication if their areas are to be transformed into commercial land. This is the difference between tenure security for informal settlements in rural and urban areas, where there is more possibility for commercial development

and more demand for the land. In major urban areas, informal settlements have been destroyed to make way for development.

This research concludes that those that have *de jure* tenure security, i.e. title property owners and resettled communities (BLISS and resettlement sites) also have strong *de facto* tenure security. This is slightly better than having only *de facto* tenure security (i.e. tenant groups and informal settlers) as legal documents can be used as an additional level of proof after disasters.

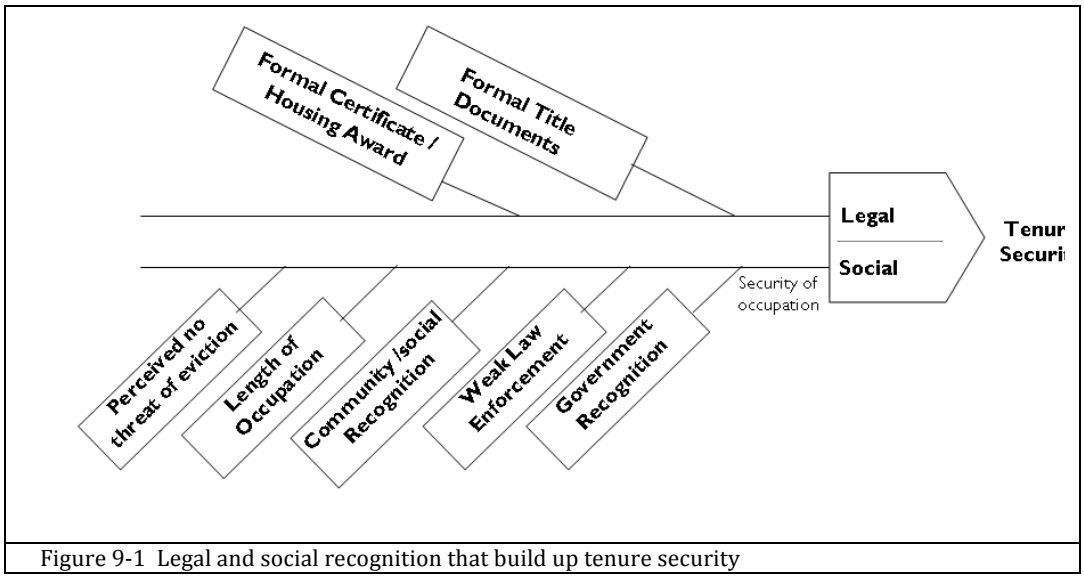


Figure 9-1 Legal and social recognition that build up tenure security

Government Initiatives in Providing Tenure Security

Building more resettlement sites has become a priority program for Albay Province. This is an opportunity for better disaster risk reduction. The resettlement program that was discussed in Chapter 6 is an example of an alternative approach to providing tenure security for communities with no formal title documents. Such a program provides safer settlement and tenure security in the form of *de jure* and *de facto* recognition. It is a demonstration of a movement along a continuum of tenure security (see Section 6.5.1).

Referring to the discussion in Section 3.6.3, the practices mentioned below are a demonstration of other innovative government approaches in providing tenure security:

- The first and foremost action by the government is the recognition itself. Findings from this research demonstrate how the government treats informal settlers as having a 'right in the municipality'. The discussion in Section 8.3.2.2 illustrated such recognition since government does not forbid informal settlers to return to their properties after disasters and they receive assistance from the government to rebuild their houses after disasters. Assistance from relief and rehabilitation programs after disasters often includes informal settlers as priority beneficiaries[59], demonstrating how informal settlers are included in planning and decision-making based on equality.

- The government provides basic services, such as electricity and water, to informal settlers. Road access to different groups of informal settlements was also provided as well as inclusion in the maintenance plan for provincial roads. Roads to informal settlements are mostly paved. Some evacuation pick-up points have even been designated in informal settlements (see Section 7.2.1.5).

- A special area for subsidised and social housing has been allocated in the municipality in the form of BLISS (see Section 6.2.3). There is a plan for this nationally-implemented initiative to be replicated in other areas in the province and the municipality[60].

- An affordable and subsidised housing scheme is also demonstrated in the case of resettlement sites. In that program, payment schemes are determined based on the beneficiaries' level of income. Some beneficiaries receive a house without any payment; on the other hand some have to contribute working hours (see Section 6.2.4).

[59] Based on in-depth interview with Municipal Disaster Management Officer, July 2010.
[60] Based on in-depth interview with official from Housing and Urban Development Coordinating Council (HUDCC), Manila and Housing and Land Use Regulatory Board (HLURB) Region V Regional Office in Legazpi, Albay, July 2010.

- The government, in a way, does not show any discrimination in rights and access to land. Requirements for beneficiaries of resettlement sites are based on the priority and the degree of geographical vulnerability. Priority was given to informal settlers residing in hazard-prone areas (see Section 6.2.4).

9.3 Intermediate Objective 2: What constitute resilience to multiple disasters?

Resilience cannot be looked at from any single perspective (see Section 4.3). Based on different concepts of resilience dimensions discussed in Section 4.3.2, this research adapts four dimensions of resilience that can transform the stories and experiences of local communities in the study area into a theoretical perspective. The four dimensions of resilience are institutional, economic, social and physical resilience (discussed more details in Section 7.2). Different indicators under each dimension have been developed, adapted from different resilience theories presented in Chapter 4 that were integrated with community perception of resilience as well as information extracted from in-depth interviews with stakeholders. This research identified four indicators under each resilience dimension, which demonstrates the multi-dimensional aspect of resilience (Figure 9-2).

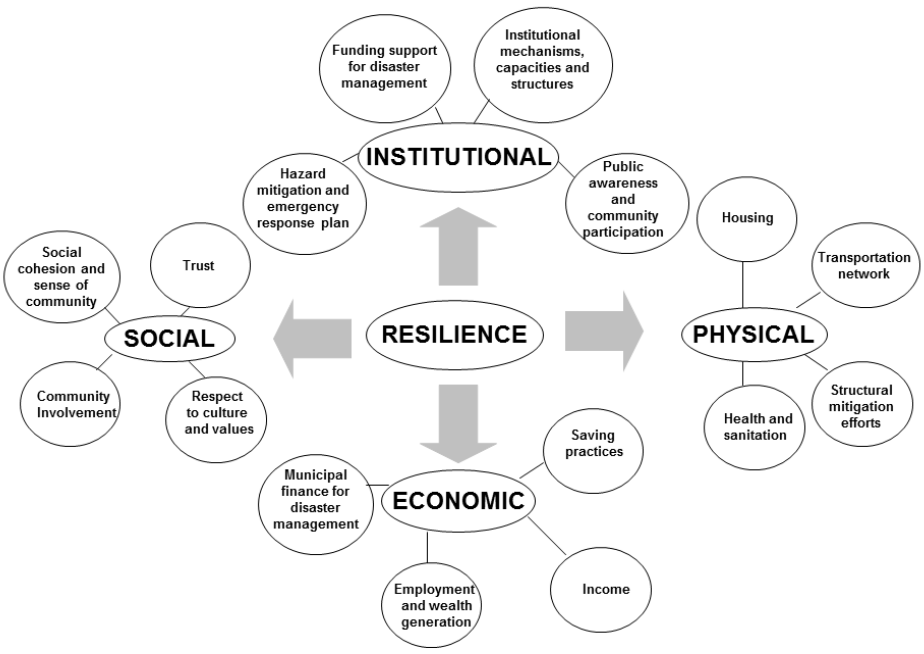


Figure 9-2 Multi-dimensional resilience demonstrated in this research

The different resilience dimensions and their indicators presented in this research are not a fixed solution that addresses the complexity and multiplicity of the resilience concept as discussed in Chapter 4. Instead, it demonstrates how different concepts of resilience are adopted and integrated with the local perspectives.

Findings from this research show that one dimension of the resilience can be stronger than the others, and vice versa. Since the basic resilience definition adopted in this thesis is *strength* in the presence of *stress* (Johnson and Wiechelt 2004; Rolf 1999), this research has demonstrated that social resilience is the strongest dimension that builds a community's perception and level of resilience. They are built through strong social cohesion and a sense of community, trust among the community members, community involvement and respect for existing cultures and values. It has shown that amidst the economic drawbacks and geographic vulnerability (discussed in Chapter 5), communities still possess a strong perception of resilience. In fact, through focus group

discussions and in-depth interviews, it was revealed that the frequency of natural disasters that hit the area has created a strong perception among community members that 'natural disasters are part of their life'.

The frequency of disasters in the study area has in a way developed a capacity of local government to be able to develop a strong disaster management structure in the study area. The disaster management strategy developed at the provincial level has been a national model in disaster mitigation and has gained recognition at the international level (Oxfam GB 2008; UN-ISDR 2007). It demonstrates strong institutional resilience in the study area.

This institutional resilience is, however, faced with economic constraints in which some of the institutional-related programmes are difficult to implement. The main drawback of implementing a disaster management strategy in the study area is the inadequacy of funding for disaster management activities in relation to the general economic situation.

Albay Province has a good system of allocating 5% of the municipal budget for disaster-related activities. However, this budget is not enough to provide assistance to all affected families and individuals during and after disasters[61]. This is due to the fact that the Province of Albay has a higher number of poor families and individuals compared to the other provinces in the region (Oxfam GB 2008). This then, is identified as one indicator of low economic resilience in addition to employment, wealth generation, income of local communities and saving practices.

For the larger area beyond the community, the economic factor has affected implementation of physical structures that can minimise the damage caused by natural disasters. At the community level, it is also one of the root causes of the mushrooming growth of informal settlements thus increasing the number of informal settlers living with 'tenure insecurity'.

[61] Personal communication with Head of APSEMO, July 2010

In spite of the low level of economic and physical resilience, at the household level communities have developed different adaptive strategies as presented in Section 7.3.1. This demonstrates the importance of integrating different levels of information in defining resilience and considering the different aspects in the discourse of resilience analysis.

9.4 Main Thesis Objective: How does tenure security contribute to resilience?

Secured access to land over a long period of time is what defines tenure security in this thesis (refer to Section 9.2). As discussed in Chapter 3, tenure security, on a very fundamental level, provides access to land, housing and shelter as well as livelihoods, which are an essential pre-condition for economic development (UN-HABITAT 2008b). The importance of tenure security for poverty reduction is also reflected in much of the literature (e.g. World Bank (2006), Payne (2002), Deininger (2003), UN-HABITAT (2008b)).

On the other hand, as demonstrated in Chapter 7, analysis of disaster resilience incorporates *strength* and other attributes discussed in Chapter 3 in pre-, during and post-disaster situations. In the pre-disaster situation, i.e. in a normal situation, security of tenure provides confidence in secure land rights and tenure. This provides the opportunity for livelihood options for economic growth. This confidence is the first factor that signifies willingness to construct a more permanent house or a stronger one that can withstand more of the impacts of natural disasters (Figure 9-3). Therefore, at a fundamental level, tenure security provides an opportunity to implement Disaster Risk Reduction measures.

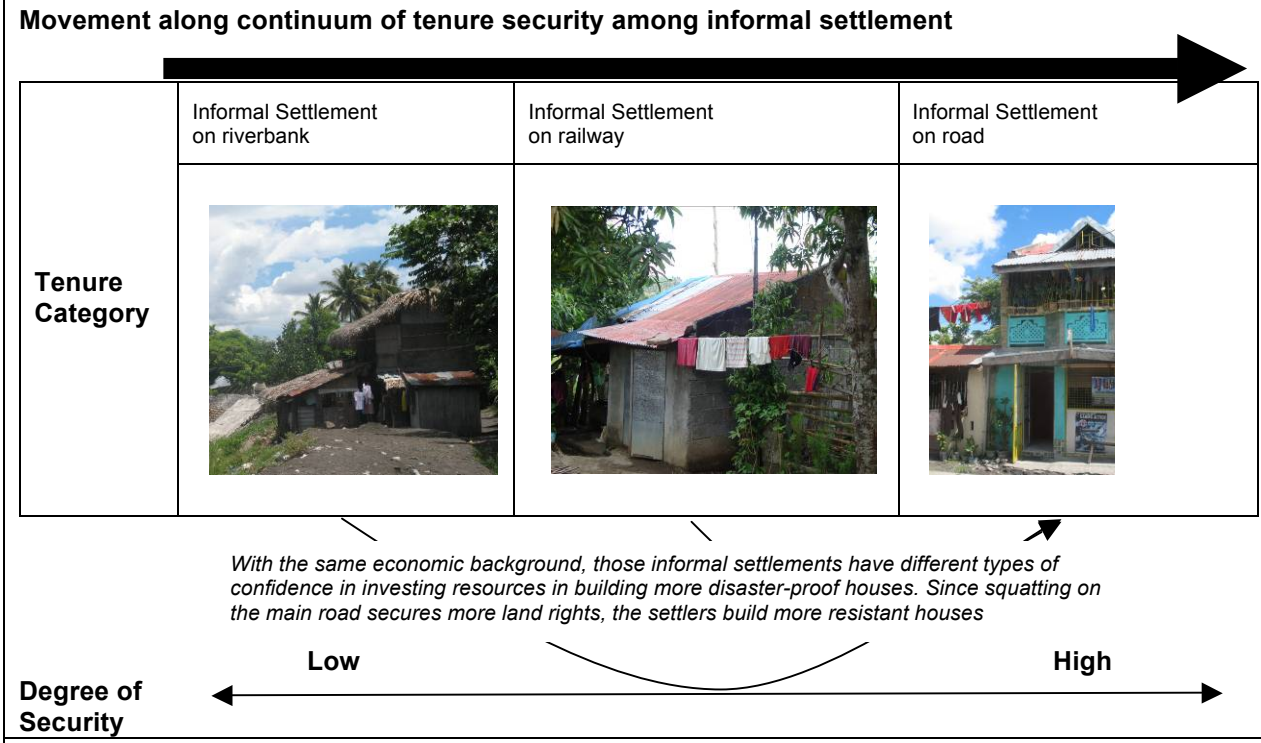


Figure 9-3 Movement along a Continuum of tenure security among informal settlements and the level of confidence towards building more physical resilience

Movement along a continuum of tenure security, as explained in Section 6.5.1, is a concrete example of how tenure security provides a strong platform for a better step towards building resilience. This can be observed at the informal settlements along the main road where the houses are relatively stronger in comparison to the houses of informal settlers on the riverbank.[62] It is reasoned through two factors:

1. They have more access and greater diversity to livelihoods. Opening a small *sari-sari* shop along the main road, for example, attracts more buyers than opening a shop along the riverbank hence more income generation. In addition, there are more options for income generation along the road compared to along the railway and near the riverbank. Therefore, the experience of informal settlements in the study area demonstrates the

[62] Focus group discussions and in-depth interviews reveal that local communities perceive that houses made of bricks are stronger than traditional houses made of *nipa* (see Section 8.3.2.3). It requires more (financial) resources to build a brick house.

direct linkage between tenure security and livelihood opportunities: stronger security of tenure provides more livelihood opportunities.

2. They have more confidence in investing capital into stronger houses. In other words, more confidence towards housing security provides more opportunity for access to a livelihood that helps improve their economic condition and provides opportunity for implementing Disaster Risk Reduction measures.

Tenure security also impacts early recovery and reconstruction efforts. Confidence in having secure access to land affects the relief and early recovery process. In the study area, for example, based on focus group discussions and in-depth interviews with community members, no evidence was found where local community members could not return to their land after disasters. Quotes and experiences of local communities provided in Chapter 8 are good examples of how their confidence can help their early recovery for there is no problem with property claims. Claiming land and dwellings after disasters is always clear since the society recognises *whose right where* based on strong community trust and recognition. Though formal cadastre does not exist *per se,* especially in informal tenures, social factors discussed in Chapters 7 and 8 provide confidence to local communities to go back to their land and houses after disasters. How tenure security contributes to resilience is demonstrated in Figure 9-4:

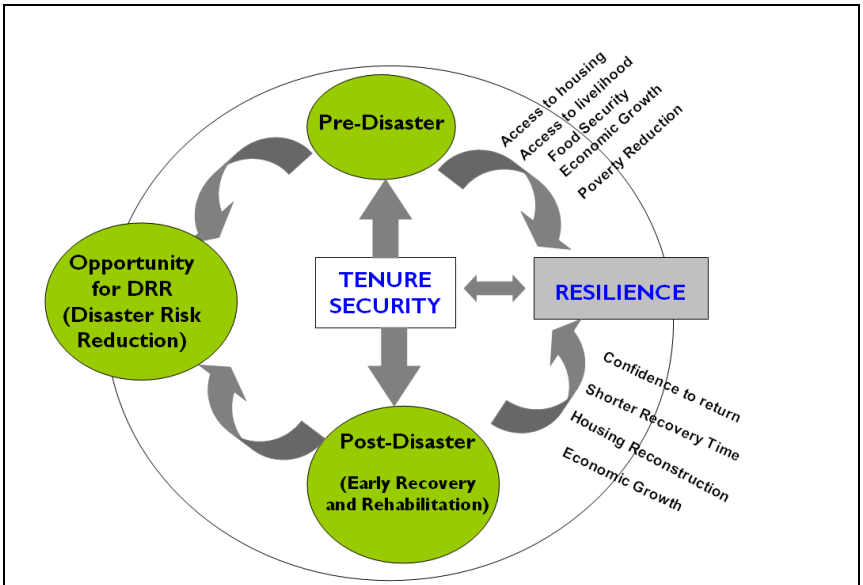


Figure 9-4 Relationship between tenure security and resilience in pre-disaster and early-recovery and rehabilitation

The figure above illustrates how tenure security provides a strong platform for disaster resilience since, in the normal situations, it provides access and rights to land and housing. In post-disaster situations, (perceived) tenure security as discussed in Chapter 5 provides secure access to land and housing. The key message that is delivered here is the confidence to return to the original settlements without having any fear of losing the land during the disaster. It has been demonstrated in this research that even with the absence of formal title documents, perceived tenure security functions as strongly as formal title documents after a disaster.

Social aspects of the society, as discussed in Chapters 6, 7 and 8, provide the bridge between resilience and tenure security. Aspects like a strong sense of community and social trust play important roles in securing tenure thus subsequently providing a platform for building resilience. In such situations where economic vulnerability persists, this research thus demonstrates the importance of having strong community cohesion and strong social bonds in securing tenure and building resilience. The relationship of these is illustrated in Figure 9-5.

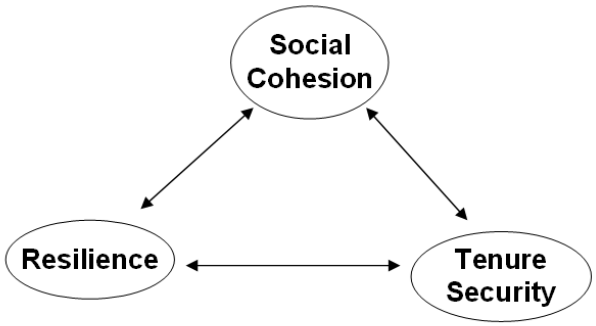


Figure 9-5 Social cohesion mediating perceived tenure security and resilience

9.5 Research Conclusion

This thesis has presented the story and experiences of communities in two *barangays* with a varied range of tenure systems, from informal to formal tenures.

Four terms, which are related to each other, are used to describe their state and perception of tenure security and resilience in order to relate and compare the findings of this research versus theories on disasters and tenure security. Those four key words are *tenure security, tenure insecurity, resilience* and *vulnerability.*

- As discussed in Chapter 5, communities are not only faced with geographical but also physical and economic vulnerability given their low economic status. The discussion on the concept of resilience presented in Chapter 4 reveals that in some of the literature, vulnerability is considered as the 'flip side' of resilience: people who are very vulnerable may not be very resilient (Folke et al. 2002; Klein et al. 2003). For visualisation, the two concepts are presented in two different circles that are opposite each other (see Figure 9-6). This assumes that communities faced with different forms of vulnerability, are not resilient.

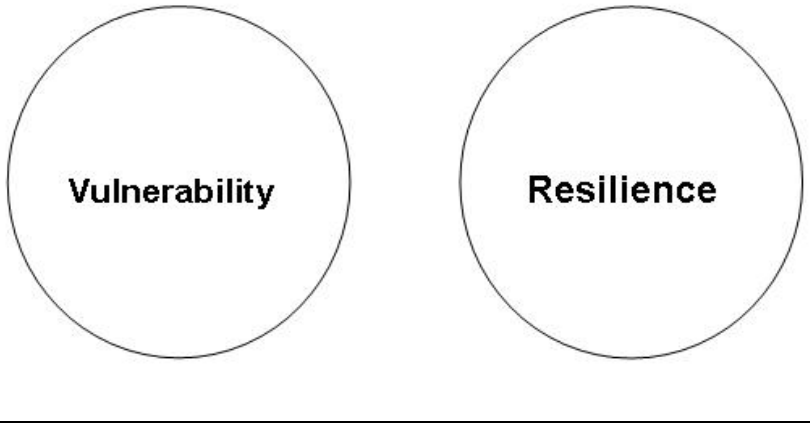


Figure 9-6 Vulnerability as the flip side of resilience

- As discussed in Section 8.2, informal tenures in the study area are faced with tenure insecurity due to unavailability of formal title documents and the possibility of eviction. This thesis argues that tenure insecurity is a factor of vulnerability along with the following characteristics of the settlement patterns in the study area:

  - Unsustainable land use: settlements in buffer zone that increase risk of flooding and contribute to land degradation.
  - Poor urban planning due to weak implementation of zoning regulation.
  - Non-existence of building codes characterised by poor quality of housing construction.

  Therefore, settlement patterns with tenure insecurity in the study area are a vulnerability factor to natural disasters. A nested circle in Figure 9-7 illustrates this. If the concept of *those who are vulnerable are not resilient* is applied in this context, then it can be concluded that communities in the study area are not resilient.

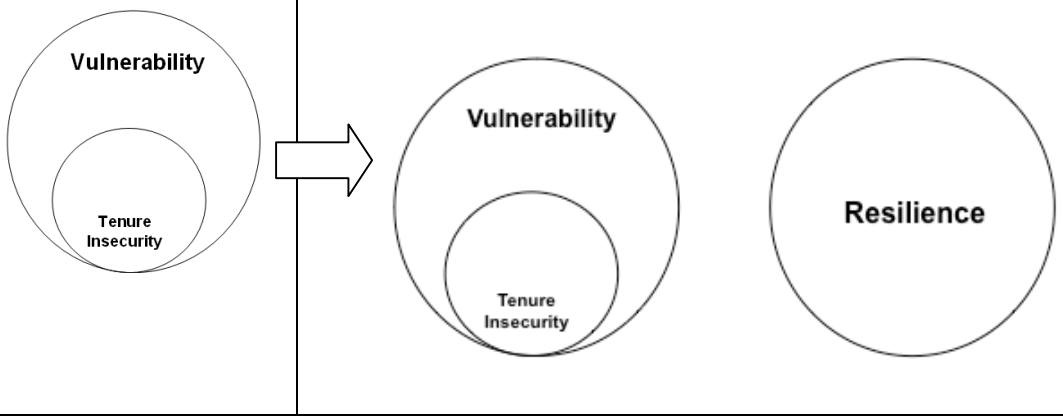


Figure 9-7 Tenure insecurity as a factor of disaster vulnerability

- Experiences of local communities discussed in this research have demonstrated that there is an overlap between vulnerability and resilience.
  - Despite the different forms of vulnerability where that communities face, there is still a strong perception of resilience (see Sections 7.3). Section 8.2.2 also discusses the factor of inherent resilience that has developed the 'built-in' resilience of the communities. It is demonstrated by various measures of adaptive capacity that were presented in Section 7.3.
  - Strong social bonds and social cohesion support community recognition towards land and housing ownership. The government's recognition of the informal settlements in the study area through various innovative approaches towards increasing tenure security are factors that provide confidence towards secure access to land and housing (see Section 9.2).

The relationship between vulnerability and resilience is demonstrated in Figure 9-8. Four factors that support the overlapping relationship between vulnerability and resilience are identified and presented in the overlapping circles. Those factors are discussed further in Sections 7.3.2, 7.3.3, 8.2.2 and 8.3.2.

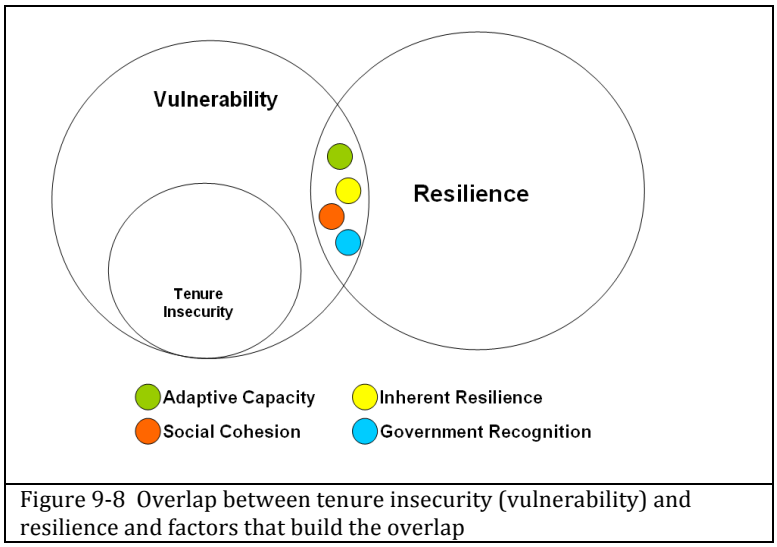


Figure 9-8 Overlap between tenure insecurity (vulnerability) and resilience and factors that build the overlap

This research has demonstrated that although communities are faced with geographical, economic and land vulnerability itself, they still perceive themselves to be resilient to the multiple natural disasters that frequently affect the areas. Hence, this study has shown an overlap between vulnerability and resilience and concluded that *not all who are vulnerable are not resilient*. In other words, *those who are vulnerable can be resilient too*.

Experiences and perceptions of communities discussed in this research have demonstrated the importance of social aspects in providing confidence in perceived tenure security that contributes to their state of resilience to multiple disasters.

9.6 Research Implications and Ways Forward

9.6.1 Tenure security

In the context of rural areas, formal title documents are not the only solution to secure tenure. In a rural context such as that demonstrated in the study area, security of tenure really is a matter of perception (FAO 2005). The social aspect of tenure security is what this research highlights as an important factor in the course of land administration. Therefore, one key implication that this research brings is that government recognition in providing tenure security is not merely

the provision of formal title documents and certificates of ownership as demonstrated for BLISS beneficiaries and resettled communities. Communication and consultation by government and the provision of basic services such as road networks to different forms of informal settlements, electricity lines and water are also considered as recognition of ownership. As a comparison, there is a greater risk of eviction of informal settlers in urban areas (Berner 2012; Smart 2012; Turnbull 2008) but in Metro Manila, the provision of basic services is considered as a factor that constitutes tenure security (Porio and Crisol 2004).

Despite the factors that build perceived tenure security (see Sections 6.3.1, 6.4.1 and 9.2), these communities face with the threat of eviction should a government implement an infrastructure project. This is a strong threat as it is regulated in the Urban Renewal and Resettlement Act (as discussed in Section 6.4.1). In other words, they have security until the government decides to initiate a project. A recent case[63] of forced eviction in Metro Manila in September 2012 demonstrates the possibility of a similar threat in the future. However, the informal settlers in the case study area perceive such laws are only enforced in urban areas (see Section 6.3.1). In addition, informal settlers also perceive that development will not take place in high hazard-prone areas where they reside.

9.6.2 Disaster Resilience

Within the social construction of Filipino society with its innate attitudes of perennial *akbay* (putting an arm around another's shoulder), *hawak* (hold), *yakap* (embrace) (Dolan 1991; Lapiz 2006), provides the foundation for strong community bonds that positively affect and contribute to the perceived resilience. The social resilience perceived by communities in the study area

[63] On 12 September 2012, about 100 houses in informal settlements in East Manila were demolished for a commercial development. Although there is no exact number of eviction cases in 2012, this is one of the several informal settlements that have been destroyed and the people evicted to make way for infrastructure and property projects
(Source: BBC, 2012 http://www.bbc.co.uk/news/world-asia-19664687, accessed 22 September 2012)

signifies the importance of stressing the social aspect in natural disasters discourse. As demonstrated in this thesis, this social factor is a key to improving disaster resilience. Therefore, this research once again emphasises the importance of social resilience in the presence of other vulnerability factors that were discussed in Chapter 4 and Chapter 8. Strong social resilience implies that building resilience includes understanding of what potentially affected communities can do for themselves to withstand the impacts of disasters. This research suggests the importance of building strong internal structures in the society.

9.6.3 Tenure security and disaster resilience

Perceived tenure security provides a platform to exercise Disaster Risk Reduction measures. Access to livelihoods and the confidence gained to build more-resistant houses are some of the implications of the tenure security in building resilience.

Social construction of the community is the key that builds the bridge between tenure security and resilience. It is the social aspect that significantly contributes to the perceived tenure security and resilience.

In addressing the two major elements of informal tenure and tenure security presented in this thesis, a conclusion is that a resettlement program could be a viable option. The case of resettlement in the study area, for instance, addresses the two fundamental issues studied in this research:

- The move from an informal settlement to a resettlement house demonstrates a movement along a continuum of tenure security. It provides greater formal rights to the land and housing provided to the local community. In this case, *de facto* and *de jure* tenure security is achieved, a move beyond perceived tenure security.
- A resettlement program provides safer houses from disasters with low or no cost involved to the local community.

On the other hand, experiences of local communities demonstrated in this research reveal that not all people want to be resettled. In other words, people living in informal settlements are confident with the 'insecurity' of tenure on their land or residence. Available access to land and housing and dependency on a livelihood are two factors that encourage local communities to still reside in high-risk areas that are supposed to be buffer zones. For better land use planning, this research recommends the prohibition of habitation in high-risk areas.

However, if undertaken, resettlement programmes should be considered as an opportunity for preventive measure in a comprehensive risk reduction and building resilience framework (Correa et al. 2011).

This research also demonstrates that social factors are important in perceived tenure security and resilience. Implementing a resettlement programme should ensure that measures to facilitate community development are included. In the context of the study area, tenure security and resilience is more than the provision of formal land titles and houses. Such knowledge is essential, and therefore it is important to understand and support community response strategies in improving tenure security and resilience in the long-term.

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Land Tenure Security and Resilience to Natural Disasters in Camalig Municipality, the Philippines

Land-related and land tenure security

1. What are usually land-related problems encountered after big disasters? How do government deal with those problems?
2. Are there identified land issues especially in hazard prone areas? How are those land related problems dealt?
3. What are government initiatives in securing land tenure in rural areas especially for informal settlers?
4. What are usually difficulties encountered by communities in resuming to normal life after disasters?
5. What is the general status of land ownership in the country / province / district?
6. Is there any nationally-defined land tenure security? How is it defined from land ownership perspective?
7. How are usually public land occupied after disasters?
8. Are there identified land / plots reserved by government to be used as temporary shelters? Or what are strategies / regulation for anticipating the needs of space for IDPs caused by disasters?
9. Have evacuation plans been established?
10. How many evacuation centres are available in the area? If there are no specific allocated evacuation centres, what are usually used as evacuation centres?
11. Have there been any titling projects by the authority? What are the initiatives of the government / foreign-assisted projects on land titling in the country?
12. Are existing land titling activities based on the hazard maps, meaning that priority of titling is given to the most hazard-prone areas?

Resilience

1. How is resilience perceived from decision makers' point of view? Is there any time dimension of resilience concept applicable to the situation after disasters?
2. From your points of view, what constitutes community resilience?
3. What are government initiatives in building community resilience to multiple disasters?
4. Have the involvement of different agencies in the whole cycle of disasters been considered effective? What needs to be improved?
5. Have corresponding early-warnings been established for different types of hazards? What are existing warning and evacuation infrastructure?
6. Which (different) agencies are involved in disseminating warnings?

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[Iinsert Date]
Invitation to Participate in a research project

Land Tenure Security and Resilience to Natural Disasters in Camalig Municipality, the Philippines

My name is Muhibuddin Usamah and I am a PhD candidate in the School of Mathematical and Geospatial Sciences at RMIT University, Melbourne, Australia. As part of my research, I am conducting a research project titled "*Land Tenure Security and Resilience to Natural Disasters in Camalig Municipality, the Philippines***,** undertaken under the supervision of Professor John Handmer and Dr. David Mitchell from Geospatial Sciences.

This letter is an invitation to you to participate in my research. The research aims at unravelling the relationship between land tenure security and resilience to multiple disasters in Camalig Municipality, Province of Albay, the Philippines. As part of the project, I am especially interested in interviewing experts / actors in disaster management and related institutions in the country and the study area. The interviews, taking approximately 60-90 minutes, will explore experiences of your organization in dealing with multiple disasters that hit the area.

The anonymity and confidentiality of you and your organisation will be protected to the fullest extent. Neither you nor your organisation will be referred to by name in any resulting publication. The data collected in this survey will be analysed and aggregated for publishing in a PhD thesis. Research results may also be presented at academic conferences, and in scholarly publications. All information gathered in this survey, including data and records of interview will be securely stored for 5 years after publication of research funding, in compliance with university requirement. Information you provide will only be accessible to me and my supervisors. However, during the period, individual may access to the contributing information by contacting the researcher.

The information you provide will be valuable as the collected information will be used as basis for developing methodology in building community resilience to natural disasters with the emphasis of land tenure security. Thus, sharing your experiences and views will make a substantial contribution to this research.

Please note that your participation is voluntary and you are free to withdraw yourself, or any unprocessed data, at anytime simply by stopping the completion of the questionnaire. There will be no disadvantage if you decided not to complete the interview.

Should you require any further information, please feel free to either contact myself or one of my supervisors at RMIT University.

Professor John Handmer

Email: john.handmer@rmit.edu.au
Ph. +61 3 9925 2307

Dr. David Mitchell
Email: david.mitchell@rmit.edu.au
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Ph. +61 3 9925 3277

In the Philippines:
c/o. Disaster Management Unit of Camalig Municipality
Ph. +63 (0) 939 142 0301

This research project has been approved by the RMIT University Human Research Ethics Committee. HREC Approval Number 16/10.

Should you have concerns about your rights as a participant in this research or about the manner in which the research is conducted, you can either directly talk to me, address the concern to my supervisors listed above or directly to RMIT University's Ethics Executive Officer, RMIT Human Research Ethics Committee, c/o. Research & Innovation, RMIT University City Campus, Building 91, Level 2, Room 4B, Melbourne, Australia, Ph. +31 3 9925 2251.

I thank you in anticipation of your time and cooperation.

Yours sincerely,

Muhibuddin Usamah

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This letter is an invitation to you to participate in my research. The research aims at unravelling the relationship between land tenure security and resilience to multiple disasters in Camalig Municipality, Province of Albay, the Philippines. As part of the project, I am especially interested in interviewing people from *Barangay*s of Ilawod and Tagaytay for being hit frequently by multiple disasters.

The interviews, which will take approximately 45-60 minutes, will explore community experience in dealing with multiple disasters that hit the area and their perception on land tenure security and resilience.

I will protect the anonymity and confidentiality of you to the fullest extent, within the limits of the law. Your name will not be referred in any resulting publication. Any references to personal information and identifying details that might allow someone to guess your identity, or the identity of your organisation, will be removed. Nevertheless, the small sample size will affect the level of anonymity. Please note that your participation is voluntary. You are free to withdraw yourself at anytime. Analysis of interviews will be presented and outcome of the research will be a shared document.

Information you provide will only be accessible to me and my supervisors. University protocol requires that research data and records be securely stored in compliance with university and legislative requirements, and confidentially destroyed five years after the end of the research period. The interpreter assisting in this interview has signed a confidentiality agreement and will not convey or distribute any information s/he is privy to in the course of interviews.

The information you provide will be invaluable, as the collected information will be used as basis for developing methodology in building community resilience to natural disasters. Thus, sharing your experiences and views will make a substantial contribution to this research.

Should you require any further information, please feel free to either contact myself or one of my supervisors at RMIT University.
Professor John Handmer

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Dr. David Mitchell
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I thank you in anticipation of your time and cooperation.

Yours sincerely,

Muhibuddin Usamah

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[Ilagay ang Petsa Rito]
Imbitasyon para Makilahok sa Isang Pananaliksik

Ang Kaligtasan at Katatagan ng mga Lupain Laban sa mga Likas na Sakuna sa Bayan ng Camalig sa Pilipinas

Ako po si Muhibuddin Usamah at ako po ay isang mag-aaral ng PhD sa School of Mathematical and Geospatial Sciences sa RMIT University sa Melbourne sa Australia. Bilang bahagi ng ng aking pag-aaral sa PhD, ako po ay nagsasagawa ng pananaliksik na pinamagatang "Land Tenure Security and Resilience to Natural Disasters in the Municipality of Camalig, Philippines (Ang Kaligtasan at Katatagan ng mga Lupain Laban sa mga Likas na Sakuna sa Bayan ng Camalig sa Pilipinas)", sa pamamatnubay ni Professor John Handmer at Dr. David Mitchell ng Geospatial Sciences.

Ang sulat na ito ay isang imbitasyon para po sa inyong paglahok sa aking pananaliksik. Bilang rekomendasyon ng inyong punong-bayan, kayo po ay pinalad na napili upang makilahok. Ang pananaliksik na ito ay naglalayong liwanagin ang ugnayan sa pagitan ng kaligtasan at katatagan ng mga lupain at ng malimit na sakuna sa bayan ng Camalig sa probinsiya ng Albay sa Pilipinas. Tutuklasin ng mga panayam ang inyong mga karanasan sa mga paghahandang isinasagawa at ang pagharap sa mga malimit na sakunang dumadaan sa inyong lugar at ang inyong kaalaman tungkol sa kaligtasan at katatagan ng mga lupain.

Lubos na nauunawaan ng mananaliksik na ilan sa mga katanungan ay maaring magdulot ng dalamhati, pagkabalisa at abala dahil ipapaalala ng mga ito ang mahirap na panahong kinaharap sa panahon ng sakuna. Hindi intensyon ng pananaliksik na magdulot ng mga ganitong damdamin; kaya ang talaan ng mga katanungang ito ay idinesenyo hindi para dalhin kayo sa sitwasyong iyon. Dahil dito, ang panayam na ito ay isang pagbabahagi ng mga impormasyon at karanasan sa pagharap sa epekto ng mga likas na sakuna.

Kung kayo po ay sumasang-ayong makikilahok, kinakailangan ni'yo pong pumirma sa pormularyo ng pahintulot at kumpletuhing sagutan ang mga katanungan sa pananaliksik
na magtatagal ng humigit-kumulang 45 hanggang 60 minuto.
Pakitandaan na ang inyo pong paglahok ay kusang-loob at kayo po ay malayang umurong sa kahit na anong oras sa pamamagitan ng simpleng hindi pagkumpleto sa talaan ng mga katanungan. Bilang kalahok, kayo rin po ay may karapatang iurong at ipasira ang anumang di-nakumpletong impormasyon. Ang inyong pag-urong ay maaaring isagawa sa pamamagitan ng tuwirang pagpapaalam sa akin. Walang pong mawawala kung mapagpasiyahang hindi kumpletuhin ang panayam.

Ang inyong pagkakakilanlan ay pangangalagaan ko sa abot ng aking makakaya. Samakatwid, ang inyong pangalan ay hindi tutukuyin sa anumang pagpapalimbag na magiging resulta ng ating panayam. Ang mga impormasyong malilikom sa pagsisiyasat na ito ay susuriin at pagsasama-samahin para sa pagpapalimbag ng thesis ng PhD. Ang mga resulta ng pananaliksik na ito ay maari ring tanghalin sa mga pagpupulong na intelektuwal at sa mga pangdalubhasang aklat at pahayagan. Lahat ng impormasyong malilikom sa pananaliksik na ito, kasama ang mga impormasyon at tala ng panayam, ay sisiguruhing nakatago sa loob ng 5 taon pagkatapos ng pagpapalimbag ng pananaliksik bilang pagsunod sa mga hinihingi ng pamantasan. Tanging ako lamang at ang aking mga tagapatnubay ang magkakaroon ng karapatan sa mga impormasyong ibabahagi ni'yo sa akin. Gayunpaman, sa loob ng nasabing panahon, magkakaroon po kayo ng karapatan sa mga inambag ni'yong impormasyon sa pamamagitan ng pakikipag-ugnayan sa akin, ang inyong mananaliksik. Anumang impormasyon

na inyong ibabahagi ay maibubunyag lamang kung (1) ito ay upang mapangalagaan kayo o ang iba mula sa kapahamakan, (2) nagpalabas ang hukuman ng kautusan, o (3) bibigyan ni'yo ang mga mananaliksik ng kasulatan kung saan nakasaad ang inyong pahintulot.

Wala pong tuwirang pakinabang ang inyong paglahok. Ganunpaman, ang impormasyong inyo pong ibinabahagi ay mahalaga dahil ang lahat ng nakalap na impormasyon ay gagamitin bilang batayan para isulong ang metodolohiya magtatayo ng isang matatag na bayan laban sa mga likas na sakuna na magbibigay-diin sa kaligtasan ng mga lupain. Sa gayon, ang pagbabahagi ng inyong mga karanasan at kuru-kuro ay magbibigay ng napakahalagang kontribusyon sa pananaliksik na ito.

Kung kakailanganin pa po ninyo ng mas maraming impormasyon, malaya po kayong makipag-unayan sa akin o sa kung kaninuman sa aking mga tagapatnubay sa RMIT University.

Professor John Handmer
Email: john.handmer@rmit.edu.au, Tel.: +61 3 9925 2307

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Ang proyektong ito ng pananaliksik ay naaprubahan na ng RMIT University Human Research Ethics Committee, Bilang 16/10.

Para sa anumang reklamo ukol sa inyong paglahok sa proyektong ito, maaring tuwirang makipag-ugnayan lamang sa: RMIT University's Ethics Executive Officer, RMIT Human Research Ethics Committee, c/o. Research & Innovation, RMIT University City Campus, Building 91, Level 2, Room 4B, Melbourne, Australia, Tel. +31 3 9925 2251. Ang mga detalye para sa hakbang sa pagsampa ng reklamo ay makikita sa http://www.rmit.edu.au/research/hrec_complaints

Marami pong salamat sa inyong oras at pakikipagtulungan.

Lubos na gumagalang,

Muhibuddin Usamah

Land Tenure Security and Resilience to Natural Disasters in Camalig Municipality, the Philippines

Demographic Information

1. What is your gender? ☐ Male ☐ Female

2. What is your age group?
   - ☐ 21 – 30 years
   - ☐ 31 – 40 years
   - ☐ 41 – 50 years
   - ☐ 51 – 60 years
   - ☐ > 60 years

3. What is your level of education?
   - ☐ None
   - ☐ Elementary School
   - ☐ High School
   - ☐ Vocational School
   - ☐ College
   - ☐ University

4. Who do you live with?
   or Do you have any dependents?
   - ☐ None
   - ☐ Parents
   - ☐ Grandparents
   - ☐ Spouse
   - ☐ Children

   How many boy _____
   How many girl/s _____
   - ☐ Others _____

5. Which community do you live in now? *Barangay* _____

Land and housing related Information

6. How many years have you been living here?
   - ☐ <1 years
   - ☐ 1-2 years
   - ☐ 2-4 years
   - ☐ 4-6 years
   - ☐ 6-8 years
   - ☐ 8-10 years
   - ☐ > 10 years

7. What is the type of housing you dwell in?
   - ☐ Nipa and bamboo
   - ☐ Nipa and wood
   - ☐ Bricks
   - ☐ Duplex
   - ☐ Others _____

8. How many floor does your housing unit have? ☐ 1 ☐ 2 ☐ 3 ☐ Others ____

9. What is the status of your housing
   - ☐ Privately Owned
   - ☐ Rent
   - ☐ Mortgage
   - ☐ Others _____

If you own the house, do you have certificate of ownership? ☐ Yes ☐ No

10. If you rent it, how much is the rent per month? _____
Is it hard for you to afford the rent? ☐ Yes ☐ No
Comment _____

11. How many times have you moved from one house to another? _____
Have you experienced eviction before? ☐ Yes ☐ No
Comment _____

12. Do you still stay in your house during disaster? ☐ Yes ☐ No
Comment _____
_____
_____

13. What land-related problems do you usually encounter after disasters?
_____
_____
_____

14. How do you usually cope with the above land-related problems?
_____
_____
_____

Land Tenure Security

15. Do you feel secured with the current housing status? ☐ Yes ☐ No
Comment _____
_____
_____

16. How do you define land tenure security? What aspects are important in defining land tenure security?
_____
_____
_____
_____
_____

Livelihood and Economic Base

17. What is your major occupation or livelihood? _____
What is the occupation of your spouse? _____

18. Do you have other source/s of income?
☐ Other occupation
☐ Support from children
☐ Sale of livestock/s
☐ Fishing
☐ Others _____
☐ Coconut plantation
☐ Catering / cook
☐ Carpentry
☐ Farming

19. If doing farming and farm not owned, what is the tenurial arrangement?
_____

20. In normal situation or before disasters, is your household income sufficient for day-to-day consumption? ☐ Yes ☐ No

Comment _____

21. Is your livelihood usually affected by disaster? ☐ Yes ☐ No
Comment _____

22. If you answer yes to question 21, how do you usually cope with that?
_____
_____
_____
_____
_____

Understanding of Disaster

23.Please circle the most appropriate coded response

(6) Strongly Agree
(5) Agree
(4) Neither Agree nor Disagree
(3) Disagree
(2) Strongly Disagree
(1) Don"t Know

How do you perceive disaster? (You can check as many as apply)

a) Disaster is God's act or punishment	6	5	4	3	2	1
b) Disaster is related to natural calamity	6	5	4	3	2	1
c) Disaster is unexpected events	6	5	4	3	2	1
d) Disaster is related to poverty	6	5	4	3	2	1
e) Disaster is related to human-made activity	6	5	4	3	2	1
f) Disaster is related to natural calamity	6	5	4	3	2	1
g) Disaster is unexpected events	6	5	4	3	2	1
h) Disaster is related to poverty	6	5	4	3	2	1

24.What are common disasters that you experience? (please check as many as apply)

☐ Typhoon / strong wind
☐ River Flooding
☐ Sea flooding
☐ Volcanic eruption
☐ Landslide
☐ Fire
☐ Drought
☐ Others _____

25.What are the causes of disasters? (please check as many as apply)

☐ God's will
☐ Heavy rain
☐ Illegal logging / cutting of trees
☐ Poverty / inequality
☐ Man-made
☐ Others _____

Resilience

26.What do you usually do when disasters strike?

_____

27.Please circle the most appropriate coded response

(6) Strongly Agree
(5) Agree
(4) Neither Agree nor Disagree
(3) Disagree
(2) Strongly Disagree
(1) Don"t Know

The following are reliable or effective sources of advisories and alert systems for typhoon

a) Radio	6	5	4	3	2	1
b) Television	6	5	4	3	2	1
c) Observation of the wind, rain, clouds, sea, thunder	6	5	4	3	2	1
d) Weather bureau (PAGASA)	6	5	4	3	2	1
e) Animal behaviours Please mention _____ _____	6	5	4	3	2	1
f) Through neighbours or warning by *barangay* officials	6	5	4	3	2	1
g) Newspaper	6	5	4	3	2	1
h) Information drive	6	5	4	3	2	1
i) Following seasonality	6	5	4	3	2	1

28. The following are effective warning and communication systems

a) Verbal warning by neighbours, door to door and *barangay* officials	6	5	4	3	2	1
b) Handheld radio and telephone	6	5	4	3	2	1
c) Radio	6	5	4	3	2	1
d) Weather bureau (PAGASA)	6	5	4	3	2	1
e) Warning devices in danger zones	6	5	4	3	2	1
f) Through neighbours or warning by *barangay* officials	6	5	4	3	2	1
g) Television	6	5	4	3	2	1
h) Church bells or bells from *barangay* office	6	5	4	3	2	1

i) Monitoring water levels	6	5	4	3	2	1
j) Meetings and consultative discussion	6	5	4	3	2	1

29. Do you know if there are existing disaster warnings established by the local authority? Please mention below

_____
_____
_____

30. Are there any community groups in the area? ☐Yes ☐No
Please mention _____
_____
_____

31. Do you think that the community groups are beneficial in time of disaster? ☐Yes ☐No
Can you share some experiences?

_____
_____
_____
_____

32. How do people usually help each other in time of and after disasters?

_____
_____
_____
_____

33. What were your losses due to disasters?
- ☐ Farmlands, crops, decreased production and income
- ☐ Housing assets
- ☐ Destroyed houses
- ☐ Personal effects
- ☐ Livelihood equipments (e.g. motorcycle, machine tools, etc)
- ☐ Others _____

34. What measures do you usually undertake to recover the losses?
- ☐ Having self-confidence and self-reliance
- ☐ Waiting for government and other outside assistance
- ☐ Asking assistance from relatives
- ☐ Purchasing new items
- ☐ Neighbour mutual assistance / cooperation
- ☐ Others _____

Ang Kaligtasan at Katatagan ng mga Lupain Laban sa mga Likas na Sakuna sa Bayan ng Camalig sa Pilipinas

Mga Personal na Impormasyon

1. Kasarian ☐ Lalaki ☐ Babae

2. Edad
   - ☐ 21-30 taong gulang
   - ☐ 31-40 taong gulang
   - ☐ 41-50 taong gulang
   - ☐ 51-60 taong gulang
   - ☐ Mahigit sa 60 taong gulang

3. Antas ng Edukasyong Natapos
   - ☐ Wala
   - ☐ Elementarya
   - ☐ Sekundarya
   - ☐ Bokasyunal
   - ☐ Kolehiyo

4. Mga Kasama sa Bahay mga Taong Umaasa po sa Inyo
   - ☐ Wala
   - ☐ Mga magulang
   - ☐ Mga lolo't lola
   - ☐ Asawa
   - ☐ Mga anak
     Ilan po ang mga lalaki? _____
     Ilan po ang mga babae? _____
   - ☐ Iba pa _____

5. Saang baranggay po kayo nakatira ngayon? _____

Mga Impormasyon Ukol sa Tinitirhang Lupa at Bahay

6. Ilang taon na po kayong nakatira sa bahay?
   - ☐ Kulang sa 1 taon
   - ☐ 1-2 taon
   - ☐ 2-4 taon
   - ☐ 4-6 taon
   - ☐ 6-8 taon
   - ☐ 8-10 taon
   - ☐ Mahigit sa 10 taon

7. Saan po gawa ang inyong bahay?
   - ☐ Nipa at kawayan
   - ☐ Nipa at kahoy
   - ☐ Ladrilyo
   - ☐ Duplex
   - ☐ Iba pang materyales _____
     _____

8. Ilang palapag po ang inyong bahay? ☐ 1 ☐ 2 ☐ 3 ☐ Iba pa _____

9. Pag-aari ni'yo po ba ang bahay? ☐ Oo ☐ Hindi
   Kung hindi, pakimarkahan ang kasalukuyang estado nito
   - ☐ Nirerentahan
   - ☐ Nakasanla
   - ☐ Iba pa _____

Kung sa inyo po ang bahay, meron po ba kayong titulo nito?
☐ Meron ☐ Wala

10. Kung nirerentahan po, magkano ang renta kada buwan? _____

Mahal po ba ang renta para sa inyo? ☐ Oo ☐ Hindi
Komentaryo_____
_____
_____.

11. Ilang beses na po kayong lumipat ng bahay? _____
Nasubukan ni'yo na po bang mapalayas dati? ☐ Oo ☐ Hindi
Komentaryo_____
_____
_____.

12. Naglalagi pa rin po ba kayo sa bahay ninyo kahit sa panahon ng sakuna?
☐ Oo ☐ Hindi
Komentaryo_____
_____
_____.

13. Ano pong mga problema sa lupa ang karaniwang kinakaharap ninyo pagkatapos ng mga sakuna?
_____
_____
_____
_____
_____

14. Paano po ninyo tinutugunan ang mga nakasaad na problema sa lupa?
_____
_____
_____
_____
_____
_____

Ang Kaligtasan ng mga Lupain

15. Sa tingin ni'yo po ba ay ligtas ang kinalalagyan ng inyong bahay? ☐ Oo ☐ Hindi
Komentaryo_____
_____
_____
_____

16. Ano po ang masasabi ninyo tungkol sa kaligtasan ng mga lupain?
_____
_____
_____
_____

Anu-ano ang mga importanteng aspeto sa pagtukoy ng kaligtasan ng mga lupain?
_____
_____
_____

Mga Aspetong Pangkabuhayan

17. Ano po ang inyong trabaho?_____
Ano po ang trabaho ng inyong asawa? _____

18. Anu-ano pa po ang ibang inaasahang ikinabubuhay?
- ☐ Taniman ng kopra
- ☐ Pagluluto
- ☐ Pagkakarpintero
- ☐ Iba pang ikinabubuhay _____
- ☐ Tulong galing sa mga anak
- ☐ Babuyan / Manukan
- ☐ Pagsasaka

19. Kung kayo po ay nagsasaka at ang inyong sinasaka ay di pag-aari, ano po ang inyong kasunduan?
_____
_____
_____.

20. Sa mga sitwasyong normal o bago magkaroon ng sakuna, sapat po ba ang kinikita ni'yo para sa pang-araw-araw na pangangailangan? ☐ Oo ☐ Hindi
Komentaryo_____
_____
_____

21. Ang inyo po bang ikinabubuhay ay madalas maapektuhan ng sakuna?
☐ Oo ☐ Hindi
Komentaryo_____
_____
_____

22. Kung ang sagot sa ika-21 katanungan ay oo, paano po ninyo tinutugunan ito?
_____
_____
_____

Kaalaman Tungkol sa Sakuna

23. Pakibilugan po lamang ang pinaka-angkop na sagot.
(6) Sobrang sang-ayon
(5) Sang-ayon
(4) Walang opinyon
(3) Hindi sumasang-ayon
(2) Sobrang hindi sumasang-ayon
(1) Hindi ko alam

Ano po ang masasabi ninyo sa sakuna? (Pakimarkahan po lahat ng pwedeng sagot)

a. Ang sakuna ay likha ng Diyos o kaparusahan	6	5	4	3	2	1
b. Ang sakuna ay may kaugnayan sa kalamidad	6	5	4	3	2	1
c. Ang sakuna ay mga hindi inaasahang pangyayari	6	5	4	3	2	1
d. Ang sakuna ay may kaugnayan sa kahirapan	6	5	4	3	2	1
e. Ang sakuna ay may kaugnayan sa mga gawaing pantao	6	5	4	3	2	1
f. Ang sakuna ay may kaugnayan sa kalamidad	6	5	4	3	2	1

g. Ang sakuna ay mga hindi inaasahang pangyayari 6 5 4 3 2 1

h. Ang sakuna ay may kaugnayan sa kahirapan 6 5 4 3 2 1

24. Anu-ano po ang mga sakunang karaniwang nararanasan ninyo? (Pakimarkahan po lahat ng pwedeng sagot)

- ☐ Bagyo / Malakas na hangin
- ☐ Pagtaas ng tubig ng ilog
- ☐ Pagtaas ng tubig ng dagat
- ☐ Pagputok ng bulkan
- ☐ Pagguho ng lupa
- ☐ Sunog
- ☐ Tagtuyot
- ☐ Iba pang mga sakuna _____

25. Anu-ano po ang mga sanhi ng sakuna? (Pakimarkahan po lahat ng pwedeng sagot)

- ☐ Kalooban ng Diyos
- ☐ Malakas na ulan
- ☐ Iligal na pagputol ng puno
- ☐ Kagagawan ng tao
- ☐ Iba pang sanhi _____

Katatagan

26. Ano po ang karaniwang ginagawa ninyo kapag may dumarating na sakuna?
_____
_____
_____.

27. Pakibilugan po ang pinaka-angkop na sagot

(6) Sobrang sang-ayon
(5) Sang-ayon
(4) Walang opinyon
(3) Hindi sumasang-ayon
(2) Sobrang hindi sumasang-ayon
(1) Hindi ko alam

Ang mga sumusunod ay mabibisa at mapagkakatiwalaang pinagmumulan ng mga patalastas at babala para sa bagyo.

a. Radyo 6 5 4 3 2 1

b. Telebisyon 6 5 4 3 2 1

c. Pagmamasid sa hangin, ulan, mga ulap, dagat at kulog 6 5 4 3 2 1

d. PAGASA 6 5 4 3 2 1

e. Kilos ng mga hayop 6 5 4 3 2 1
Anu-ano ang mga ito?
_____
_____

f. Sa pamamagitan ng mga kapitbahay 6 5 4 3 2 1

g. Diyaryo 6 5 4 3 2 1

h. Pagpapalawak ng kaalaman ng mga tao 6 5 4 3 2 1

i. Pagsubaybay sa panahon 6 5 4 3 2 1

28. Ang mga sumusunod ay mabibisang pagpapatalastas at pagpapahatid ng balita

a) Babala sa pamamagitan ng mga kapitbahay at mga pinuno ng baranggay at pagbabahay-bahay 6 5 4 3 2 1

b. Radyong pangkomunikasyon at telepono 6 5 4 3 2 1

c. Radyo 6 5 4 3 2 1

d. PAGASA 6 5 4 3 2 1

e. Mga kagamitan sa pagbibigay ng mga babala sa mga lugar na delikado

6 5 4 3 2 1

f. Sa pamamagitan ng mga kapitbahay o ng mga pinuno ng baranggay

6 5 4 3 2 1

g. Telebisyon 6 5 4 3 2 1

h. Mga kampana ng simbahan o ng upisina ng baranggay 6 5 4 3 2 1

i. Pagmamanman sa pagtaas ng tubig 6 5 4 3 2 1

j. Mga pulong at pasangguning pagtalakay 6 5 4 3 2 1

29. Alam ni'yo po ba kung may mga umiiral ng kagamitang nagbibigay ng babala na inilagay ng mga pinuno ng pamahalaan? ☐ Oo ☐ Hindi
Anu-ano ang mga ito?

_____
_____
_____
_____

30. Meron po bang mga grupong nangangalaga sa lugar? ☐ Meron ☐ Wala
Anu-ano ang mga ito?

_____
_____
_____
_____
_____

31. Sa tingin ni'yo po ba ay kapaki-pakinabang ang mga grupong ito sa panahon ng sakuna?
☐ Oo ☐ Hindi

Maaari ni'yo po bang ibahagi ang ilan sa inyong mga karanasan?

_____
_____
_____
_____
_____

32. Paano po kayo karaniwang nagtutulungan sa panahon ng sakuna at pagkatapos nito?

_____
_____
_____

33. Anu-ano ang mga nawala at nasira sa inyo dahil sa mga sakuna?
- ☐ Sakahan, mga pananim, kabawasan sa ani at kita
- ☐ Mga ari-arian
- ☐ Bahay
- ☐ Mga kagamitang personal
- ☐ Mga kagamitang pangkabuhayan (hal. motorsiklo, makina, atbp.)

34. Anu-anong mga paraan ang karaniwang ginagawa para mabawi ang mga nawala?
- ☐ Ang pagkakaroon ng tiwala sa sarili at sa sariling kakayahan
- ☐ Ang paghihintay ng tulong mula sa gobyerno at sa iba pang tao
- ☐ Ang paghingi ng tulong mula sa mga kamag-anak
- ☐ Ang pagbili ng mga bagong kagamitan
- ☐ Bayanihan
- ☐ Iba pang paraan _____

Appendix 7. Interview Guide for Focus Group Discussions with Community Members

1. What are common disasters that you experience? Please list
2. What are the causes of disasters?
3. Can you list big disaster in the last 10 years?
4. How do usually disasters affect your livelihood?
5. What are your losses due to disasters?
6. What measures do you take to cover the losses?

Losses	Measures taken to cover the losses
1.	
2.	

7. Who copes well in disasters, why?
   Who do not? Why?

8. Who is most / least resilient? Why?

9. Are you (disaster) resilient? Why?

10. What constitutes resilience?

11. Are there any social / community groups in your area? List if there are.
12. What are the roles of community groups in time of disasters?

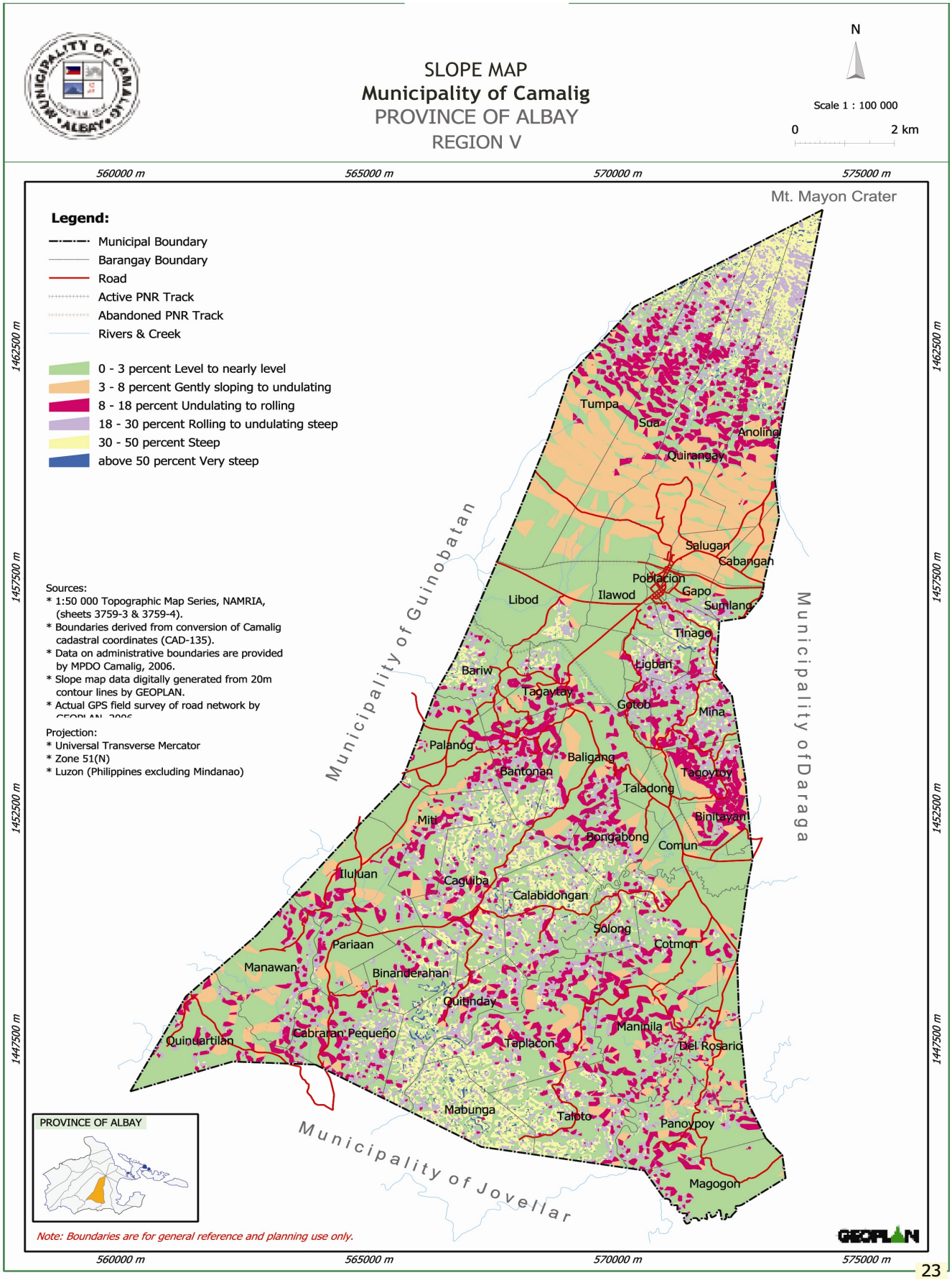
13. What is land tenure security?
14. What is security to housing?
15. Are you secured in terms of land tenure?
16. Are you secured in terms of housing tenure?

17. What are land-related problems (or land ownership) do you usually encounter after disasters?
18. How do you usually cope with those problems?

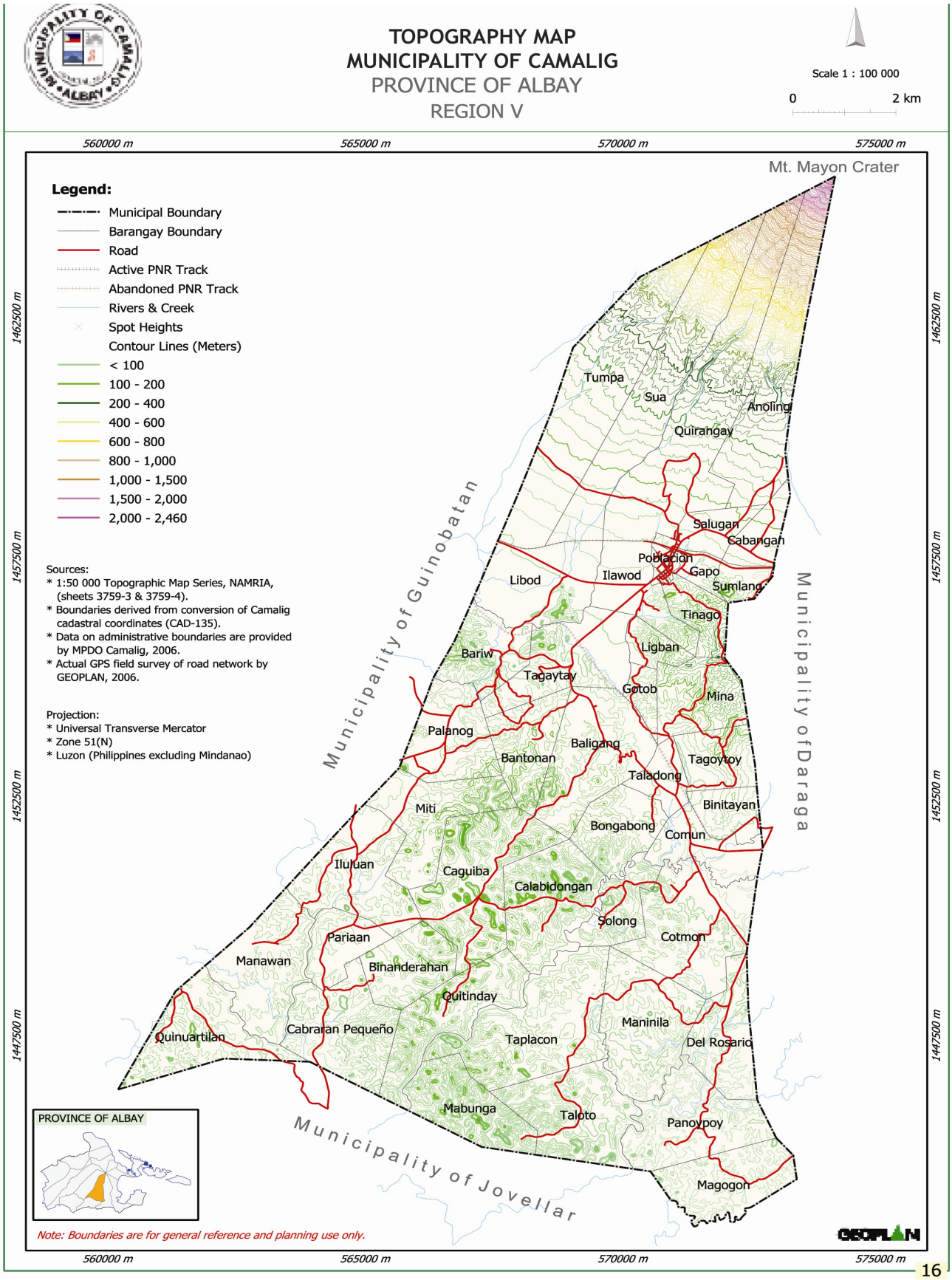
Identified Problems	Coping Mechanism
1.	
2.	

19. How does your land tenure security impact your resilience?

Appendix 8. Slope Map of Camalig Municipality (source: MDCC Camalig (2009)



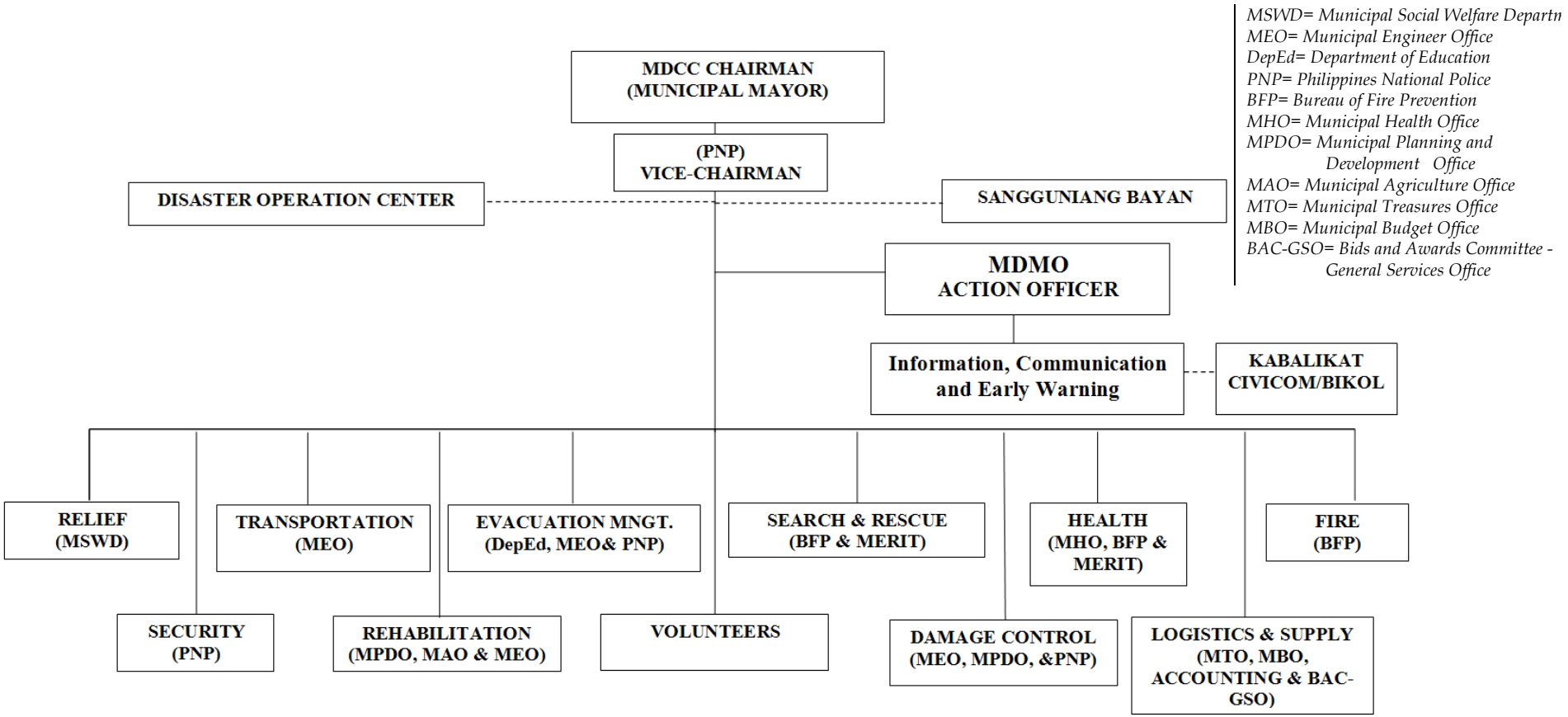
Appendix 9. Topography Map of Camalig Municipality (source: MDCC Camalig (2009)



Appendix 10. Multi-agency members of NDCC and their specific tasks (modified after (Javier 2008; World Bank 2005))

Members	Tasks
Chairman, Secretary of National Defence	convenes NDCC as necessary and calls on other government agencies and private sector when need arises;
Secretary of Public Works & Highway	restores destroyed public structures, such as flood control, waterworks, roads, bridges and other vertical/horizontal facilities; provides equipment for rescue, relief and recovery;
Secretary of Transportation & Communications	restores destroyed communication and transportation facilities such as railroads and vertical structures; organises national transport services;
Secretary of Science & Technology	(*Philippine Atmospheric, Geophysical and Astronomical Services) PAGASA* – continuing watch on environmental conditions to prepare daily weather forecasts, typhoon watches and flood outlooks. *Philippine Institute of Vulcanology & Seismology PHIVOLCS* – issues advisories on earthquakes, volcanic activity and tsunamis; identifies appropriate evacuation sites and organises disaster control groups and reaction teams. *Philippine Nuclear Research Institute* – issues advisories on radioactive fallout, contamination and radiation incidents; organises disaster control groups and reaction teams;
Secretary of Social Welfare & Development	extends relief assistance and social services to victims and provides rehabilitation;
Secretary of Agriculture	undertakes surveys in disaster-prone areas and actual disaster areas to determine extent of damage of agricultural crops, livestock and fisheries; technical assistance to disaster victims;
Secretary of Education, Culture & Sports	provides assistance in public education and campaigns regarding disaster preparedness, prevention and mitigation through integration of relevant subjects in school curriculum; makes school buildings available as evacuation centres; trains education staff in disaster preparedness;
Secretary of Finance	issues rules and regulations regarding funding by local governments of DCC requirements; with DBM issues rules and regulations on preparation of local government budget and utilization of the 2% reserve for disaster operations;
Secretary of Labour & Employment	organises and trains Disaster Control Groups in factories and industrial complexes; provides emergency employment opportunities to disaster victims and implements industrial civil defence programs and measures;
Secretary of Trade & Industry	maintains normal level of commodity prices during emergencies and organises disaster control groups and reaction teams in large commercial and recreational premises;
Secretary of Interior & Local Government	oversees organization of local DCCs, the establishment of Disaster Operations Canters (DOCs) of all local governments, and the training of DCC members in coordination with OCD, DSWD and other relevant agencies;
Secretary of Health	provides health services during emergencies and organises reaction teams; also issues public health warning notices;
Secretary of Environment & Natural Resources	responsible for reforestation and control of areas prone to flood, landslide, mudflow and ground subsidence; also technical assistance on environmental pollution;
Secretary of Tourism	organises and trains disaster control groups and reaction teams in hotels, pension houses, restaurants and other tourist-oriented facilities;
Secretary of Budget & Management	releases funds required by departments for disaster operations;
Secretary of Philippine Information Agency	provides public information service through dissemination of mitigation and preparedness measures;
Secretary-General, Philippine Red Cross	conducts disaster leadership training courses, assists in DCC training at all levels; helps in provision of emergency relief;
National Housing Authority	assessment of housing requirements of displaced persons; provision of temporary housing and rebuilding of destroyed areas;
Chief of Staff, Armed Forces of the Philippines (AFP),	responsible for provision of security in disaster area and assistance in reconstruction; provides transportation for relief supplies and personnel;
Director-General, National Economic Development Authority	responsible for determination and analysis of effects of disasters on socio-economic programs, and the development of damage assessment schemes;
Administrator, Office of Civil Defence	acts as NDCC Executive Officer; coordinates activities and functions to implement policies and programs, and advises Chairman on disaster management matters). The OCD serves as the operating arm of NDCC.

Appendix 11. Organisational Structure of Camalig MDCC



MSWD= Municipal Social Welfare Departn
MEO= Municipal Engineer Office
DepEd= Department of Education
PNP= Philippines National Police
BFP= Bureau of Fire Prevention
MHO= Municipal Health Office
MPDO= Municipal Planning and Development Office
MAO= Municipal Agriculture Office
MTO= Municipal Treasures Office
MBO= Municipal Budget Office
BAC-GSO= Bids and Awards Committee - General Services Office