

# Why do people live in high-risk areas?

- A field study in Samar, Philippines

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Varför bor människor i områden med stora risker? En fältstudie i Samar, Filippinerna

Samuel Gren & Simon Helander

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### **Abstract**

The Philippines are constantly challenged by the forces of nature. Typhoons make landfall on a yearly basis, making the island of Samar a disaster-prone area. This qualitative field study based on grounded theory examines inhabitants risk perception and the why they do live in this high-risk area. The thesis also strives to found out if education on DRR among children and youth affects the societal knowledge on disaster management. Lastly the report discusses how the results from why people live in high risk areas can be applicable for effective risk based land use planning.

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Samuel Gren & Simon Helander  
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## *Summary*

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The overall objective with this thesis is to study the reasons to why people live in the high-risk areas of Samar, Philippines. Further the study strives to find how education on DRR among youth and children is affecting the societal notion on DRR knowledge. Finally, the thesis discusses what implications the findings on why people live in high-risk areas may have on risk based land use planning.

The methodology used in this study is Grounded Theory where collected data may form new theories instead of verifying a predetermined hypothesis. Mainly the data is collected through semi structured interviews that was conducted in two separate communities on the island of Samar. From analysis of gathered data, the following four categories explain why people live in high-risk areas.

**Livelihood.** Means of subsistence is by many respondents stated as an important reason to why people choose to live in the area. The most common sources of income are farming and fishing, traditional activities that are bound to a specific place and provides the option of either selling or consuming the produce.

**Family.** Proximity to family and relatives are by many considered important reasons for not relocating. The absence of social security systems makes family vital for raising the children, and caring for the old and sick. Respondents express that it is more important that their family is safe than themselves and that the location of their family hence dictates where to live.

**Community.** Respondents state it important that they may trust those living in the area and that they feel trust in the leadership of their community. They now have access to community services such as school and may spend leisure time with friends living in the area. The community is also seen as peaceful, beautiful and embedded with memories.

**Insensibility to risk.** By different reasons some people are insensitive to the level of risk. Some respondents express that their safety is in the hand of God and that mitigating measures thus will not matter. Others express that there is no place safer than their current location and some simply do not care.

All children and youth are educated in school on how to prepare for typhoon and what to do if an earthquake strikes. Among respondents the awareness of how to prepare and evacuate is high and this support the theory that DRR education among children and youth are enhancing the societal risk management. There have been occasional DRR training also for adults, causing difficulties of verifying results.

A risk based approach on land use planning is vital in order to reduce danger to health, environment and economy. From the results on why people live in high-risk areas it is clear that such planning needs to be done as an iterative process that takes important aspects such as place attachment, extensive family networks and means of livelihood into consideration. It is also vital that such practice take a holistic perspective in the process so that risks are not just moved but actually mitigated.

# Sammanfattning

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Det övergripande målet för denna studie är att undersöka anledning till varför människor bor i högriskområdet Samar på Filippinerna. Studien försöker även svara på hur skolans nuvarande utbildning kring reducering av katastrofrisk påverkar samhällets kunskap inom området. Slutligen förs det en diskussion kring hur resultatet från varför människor bor i högriskområden kan användas till att förbättra samhällsplanering.

Studien använder sig av en kvalitativ metodik som kallas grounded theory. Detta innebär att en teori skapas helt utifrån insamlade data. Data inhämtas genom semi-strukturella intervjuer från två olika samhällen på ön Samar, östra Filippinerna. Efter att ha analyserat materialet framkom följande fyra kategorier som kan förklara varför människor bor i högriskområden.

**Försörjning.** En stor anledning till varför människor bor på Samar är möjligheten att kunna försörja sig själv och sin familj. Huvudsakliga intäkter kommer från fiske och jordbruk i de samhällen som berörs av denna studie. Dessa sysselsättningar är typiskt stationära och uppfattas ge fördelen av att antingen sälja eller själv konsumera det som produceras.

**Familj.** Närhet till familj och släkt är viktigt för många och ofta grunden till folks ovilja att flytta. Familjen har en central roll i dessa samhällen då välfärdssystemet är mycket begränsat, varvid familjen tillsammans behöver ta hand om barn, äldre och sjuka. Många personer kan inte känna sig säkra om inte hela deras familj är i säkerhet och vill därmed finnas i dessas närhet.

**Gemenskap och plats.** Det är viktigt för människor på Samar att känna förtroende till de som bor i området samt att det finns förtroende för ledarskapet. En anledning till att bo kvar är att det finns skolor i deras samhällen samt möjligheten att umgås med vänner eller njuta av närområdet. Det finns även en uppfattning av att samhällena är fridfulla, vackra och att platserna är fyllda med minnen från förr.

**Underskattning av risker.** Av olika anledningar underskattar eller rentav negligerar folk risker av olika slag. Några säger att tron på Gud är den enda säkerhet som behövs och att förebyggande åtgärder därmed är bortkastad tid. Andra anser att det inte finns några säkrare platser att bo på och ytterligare vissa påstår att de inte bryr sig om risker.

Alla som går i skolan får utbildning i hur de ska förbereda sig inför och agera under tyfon eller jordbävning. De kunskaper om katastrofhantering som barnen tillgodogörs i skolan går att återfinna även hos de vuxna i samhället men det är svårt att verifiera om denna kunskap har förts vidare från barnen. Detta då liknande kunskap även skulle kunna komma från den träning som vuxna erhåller. Vad som dock är tydligt är att även de vuxna efterfrågar ytterligare utbildning inom området.

Samhällsplanering med hänsyn till risker är viktigt för att kunna reducera risker mot hälsa, miljö och ekonomi. I det resultat som presenteras i denna uppsats är det uppenbart att samhällsplanering måste genomarbetas i en iterativ process mellan beslutstagare och invånare. Viktiga aspekter som behöver behandlas då är att människor är platsbenägna, att familj och släkt måste hållas ihop samt att det skapas ett hållbart försörjningssätt. Det är också viktigt att i denna process framhålla ett holistiskt förhållningssätt. Att flytta en risk från en plats till en annan kan hjälpa några, men samtidigt stjälpa andra.

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# 1 Introduction

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This master thesis is written for MSc. in Risk Management and Safety Engineering at the Faculty of Engineering, Lund University. The study is examining the underlying causes to why people live in high-risk areas of the island Samar, Philippines. The data was collected during nine weeks' field study in collaboration with Plan International and was made possible by the Minor Field Studies scholarship from SIDA (Swedish International Development Cooperation Agency).

## 1.1 Background

Few people can avoid the reports that media presents on disasters worldwide. This master thesis is an attempt to investigate how the life can be for people in high-risk areas, to understand social constructions, values, fears and their place attachment. The Philippines, one of the most disaster-prone countries in the world, was by this means chosen for a field study and the contrast to Sweden, one of the top five low-risk countries, as shown in World Risk Index (2014) (*Table 1*).

**Table 1. Comparison of risk indexes between Sweden and Philippines.**

COUNTRY	RANKING	WORLDRISKINDEX	EXPOSURE	VULNERABILITY	SUSCEPTIBILITY	LACK OF COPING CAPACITIES	LACK OF ADAPTIVE CAPACITIES
<b>Philippines</b>	2	28,25	52,46	53,85	33,35	80,03	48,17
<b>Sweden</b>	162	2,19	7,97	27,49	15,39	40,90	26,18

There is research on the physical phenomena of hazards and on the individual risk perception, but the authors have not traced any research on reasons why people live in high-risk areas in the Philippines. Hence, this thesis may be relevant both in a practical context and in a scientific context since this knowledge could be helpful in order to reduce risks and mitigate vulnerabilities.

One of the worst disaster that have stricken the Philippines is typhoon Yolanda (Haiyan) in November 2013, with estimates of 16 million people affected, about 6000 deaths, over one million houses destroyed and huge loss on infrastructure and agriculture (ADRC, 2016). With around 30 typhoons making landfall every year, some more destructive than others, typhoon Yolanda was the strongest on record with sustained winds of 315km/h (ADRC, 2016).

The study will only reflect on socially constructed matters, not specifically on the natural hazards. The research aims to help people living in high-risk areas primarily in three ways: the first one is to increase the knowledge on why people live in places that are prone to disasters so that future interventions may be strengthened. The second object is investigating how DRR education among children and youth can affect the societal notion of risk so that a more resilient society may be built. The third object is to discuss how the findings may be used in order to construct a better future for communities.

## 1.2 Research Questions

The purpose of this study is to understand why people live in high-risk areas and the study intends to meet this purpose by performing a field study in Samar, Philippines. To achieve this the study intends to answer the following research questions:

- Why do people live in high-risk areas of Samar, Philippines?
- Are there any notable trends that DRR\* education among youth and children is affecting the local society's notion of safety?
- What implications do the findings about why people live in high-risk areas have on risk based land use planning?

\*DRR = Disaster Risk Reduction

## 2 *Methodology & Method*

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This chapter will present the methodology chosen for this study as well as how it is defined, as well as what method is used. In the end, we will discuss potential sources of errors.

### 2.1 Methodology

Grounded Theory (hereafter presented as GT) is the scientific methodology applied in this research. In short, GT is grounded in the data collected during the field study, and a theory can emerge (Glaser & Strauss, 1967). The theory can be something expected or something that never have been imagined before (Charmaz, 2014). A quantitative methodology is believed to be inappropriate and a reason for this is that when a hypothesis is written, much important information could be lost due to distraction and/or preconception (Glaser & Strauss, 1967). This qualitative method on the other hand, would be open to all sorts of theories, and the risk of missing important results would be smaller (Glaser & Strauss, 1967).

The use of GT has been proved helpful in order to compile and analyze data but there may also be downsides due to our personal inexperience, since experience is vital in order to fully comply with all the different aspects of the GT (Charmaz, 2014). GT is a method of qualitative research first used in the 1960s by sociologists Barney Glaser and Anselm Strauss, then thoroughly presented worldwide through their release of *The discovery of grounded theory – Strategies for qualitative research* (1967). The methodology chosen for this thesis is inspired by Kathy Charmaz (2014), building on to the traditional GT by Glaser and Strauss. Charmaz version of GT differs from the original view of GT mostly on a philosophical level; she uses constructivism which in short is the idea that all obtained data is analyzed with the researchers' influence (Charmaz, 2014). The classic GT from mid-20<sup>th</sup> century believes every data is the same no matter who the researcher is and what they have experienced (Glaser & Strauss, 1967), and we think it is impossible to interpret the data without influences from the researcher. It is not crucial to strictly follow GT guidelines, since they can be adapted by the researcher in order to reach project goals (Charmaz, 2014). Nonetheless, this study will follow the guidelines as stringent as is possible. GT nurtures the analytical control and momentum to the research (Charmaz, 2014). Furthermore, the GT methodology is easy to follow with guidelines, it is flexible so that whatever occurred in the field could fit into the research and finally this methodology is well known and approved by the scientific world (Charmaz, 2014).

### 2.2 Method

This section will go through how the data is collected and how it is analyzed. The section will also discuss some of the errors and biases that may affect the study.

#### 2.2.1 Data collection

A fully structured interview can be in the form of a multiple-choice questionnaire (Strauss & Corbin, 1998). Narrowing the answers like this will not benefit the study since it may leave out vital parts that the researchers have not thought of while also forcing the respondents to answers questions that are irrelevant (Neuman, 2014). On the other side of the spectrum the fully unstructured interview has no set direction and can be described more as a normal flowing conversation (Neuman, 2014). This unstructured interview may be fruitful for an ethnographic

study where society is to be understood but in order to answer a set of research questions, the preferred method is semi-structured interviews which is used in this research (Charmaz, 2014). Other names may occur for the same method such as field interviews, open-ended interviews, informed, long and intense interviews (Neuman, 2014). An interview guide consisting of open-ended questions was used as a structural help, since the interviews might change several times (Charmaz, 2014). Important aspects while conducting the interviews are that the respondents must not be presented with leading questions (Strauss & Corbin, 1998). Furthermore, if asked questions that are possible to answer with simple *yes* or *no*, important information may be lost (Bradley & Harrell, 2009). Instead, it is better that the respondent is given space and time to explain feelings, perceptions and experience in the subject (Bradley & Harrell, 2009).

In order to receive rich data, we tried to be passive and let the respondents speak as freely as possible (Strauss & Corbin, 1998). At times, we had to redirect the respondents and set the pace for the interview (Laforest, 2009). When interviewing, probes were used in order to clarify incomplete, illogical or ambiguous answers (Neuman, 2014). Other aspects are that we tried to be affirmative, sensitive, and empathic, have understanding and not ask why-question or other negative endings since that may put the respondents in a guilt position (Charmaz, 2014). It is crucial to build and maintain trust before, during and after each session (Neuman, 2014). Especially important is that the interviewer does not leave the respondent distressed, and show humble appreciation for time and information granted, which we did (Bradley & Harrell, 2009). During the interview, we did not interrupt, correct, confront or ignore what the respondent would like to talk about, neither truncate the interview to end on time (Bradley & Harrell, 2009). If the respondents do not know the interviewer, data could be lost according to Charmaz (2014) but Plan International staff reduced this problem with good relations to the community accompanying.

Other than interviews, data was also obtained from observations and published literature (Strauss & Corbin, 1998). These sources are gainful in order to understand the complexity of the research and make valuable comparisons to the result of others (Charmaz, 2014).

### ***2.2.2 The analyzing of data***

The process of utilizing GT is in its core iterative (Strauss & Corbin, 1998) (*Figure 1*). In all stages of the research, one might need to go back and work through all collected data all over again in order to find data that emerge a theory (Charmaz, 2014). This means that an approach using GT might be a long iterative process where the material is analyzed many times before a theory can be presented (Charmaz, 2014).

According to Charmaz (2014) the very first step in a project is to come up with a research question that is wide enough to grasp the complexity of the area but still narrow enough to be operable (see chapter 1.2). When the research question is resolute and the implementation is explicitly described it is time for collection of data (Charmaz, 2014). Worth to note is that everything can be used as data, even though it might look worthless from a starting point of view (Charmaz, 2014).

Rich data is crucial to obtain if the analysis ought to be robust (Charmaz, 2014). Rich data is focused, detailed and full (Charmaz, 2014). Since the data mainly is dispensed from the interviews, the interviews require to be flexible and scrutinized during the whole process (Charmaz, 2014).

Alongside the data collection, initial coding is to take place (Charmaz, 2014). During the interviews, a special track that gets the researchers attention can be of great value, and hence the interview can make an unknown change of direction (Charmaz, 2014). In other cases, coding after an interview can lead the researchers into new paths, whereas the field study theory can emerge (Strauss & Corbin, 1998). A benefit of doing immediate coding is that the memories are clearer (Charmaz, 2014). Further, at the initial coding phase the researcher is open to data that fit with reoccurring themes and in so doing strengthen their significance (Charmaz, 2014).

Initial coding is an ongoing process of assigning different elements of the collected data to certain characteristics and/or themes (Charmaz, 2014). Assignment of text elements can be done as word-by-word coding, incident-by-incident coding or as line-by-line coding (Charmaz, 2014). Line-by-line coding works well for the research conducted in this thesis since it helps with both finding explicit statements and implicit concerns (Charmaz, 2014). It also gives the possibility of finding valuable patterns in a later stage of the process where data is analyzed according to new conceptual ideas (Charmaz, 2014).

After initial coding, groups of similar codes are bundled together and tagged with its attributes in order to get a better overview of the material (Neuman, 2014). They should be short, simple, spontaneous and analytical (Charmaz, 2014). If done correctly, the initial coding will present a database with all key elements from the data collection, simplifying the next element of focused coding (Charmaz, 2014).

Focused coding is an analytical application to coding (Charmaz, 2014). The main goal is to target codes from the initial coding phase that are frequent, or incomplete codes with too little data that

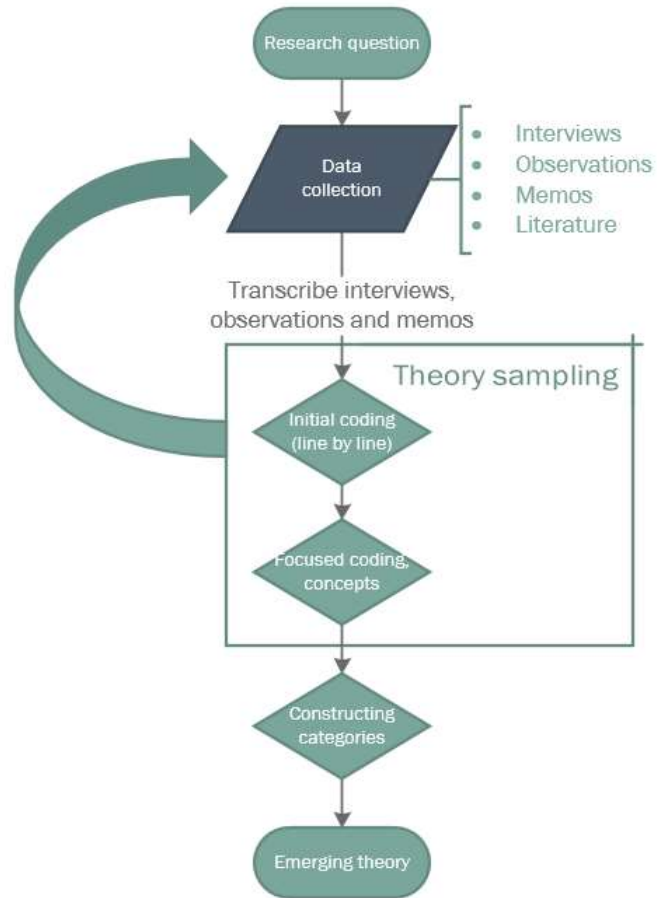


Figure 1. Process of GT from data to theory.

draws attention (Charmaz, 2014). Hence, data collection can be directed to retrieve focused codes (Charmaz, 2014). This phase is straight forward and is mainly about studying and assessing initial codes in order to know what to search for (Charmaz, 2014). Nevertheless, the researcher might create a phenomenon which people acknowledge but have not conceptualized yet (Charmaz, 2014).

During the focused coding, it is vital to compare the codes against each other to see in what way they differ (Charmaz, 2014). If they are similar or reveal same type of information, they could be conceptualized into concepts (Neuman, 2014). If some focused codes, or concepts, have enough in common, they make a category, which is the last step towards constructing theory (Neuman, 2014). If the categories are weak, lack data or cannot explain what it intends, theory sampling can be used (Charmaz, 2014). This means that collection of data has a rigid intention to explore the category, and the interviews are allowed to be altered in order to investigate this new area of interest (Charmaz, 2014).

Theory sampling is when one or more category requires being more robust (Strauss & Corbin, 1998). The whole interview guide can be changed to just examine if new properties to the category can be retrieved (Charmaz, 2014). We stop the theory sampling when we felt no new information appeared and the term for that is that theoretical saturation is achieved (*Figure 1*) (Strauss & Corbin, 1998). It must be known that saturation is only a theoretical concept, with every new interview there is always a potential for something new and exciting that might emerge, hence the theoretical saturation was not achieved in this report. A theory or many theories can be found and underlined fully by categories, depending on the research question, but at some occasion also focused codes or concepts as baseline may be sufficient (Charmaz, 2014). There is no need to find a theory that answers directly to the stated research question that initiated a GT approach (Charmaz, 2014). One of the most important steps in the process is the ongoing scrutinizing of methods and data collected (Strauss & Corbin, 1998). Furthermore, one should mind that theoretical plausibility is more important than accuracy (Charmaz, 2014). The GT method aims to reveal patterns and make them understandable, not to prove them (Charmaz, 2014).

### **2.2.3 The Interviews**

Before initiating interviews, courtesy calls were made to the majors and their Municipal Disaster Risk Reduction Management Officers (MDRRMO). The first interviews were carried out in Tigdaranao on 2016-09-26 in the local barangay hall. In Asgad the interviews were conducted in the homes of the respondents and the last interview was completed on 2016-10-12. All in all, 40 interviews were conducted, half in each area. The input data is presented in *Appendix A* and the interview guides are presented in *Appendix B*. Each interview was from 20 minutes up to 45 minutes long. Between six and seven interviews was conducted each interview day, mainly between 9 am and 5 pm and on weekdays. When the interviews were collected, we coded the data and found that the theoretical saturation had reached a sufficient level.

The local representatives were the ones choosing respondents after request from the authors. No respondents could be below 18 years of age because a parental consent would be mandatory to retrieve prior to all interviews, according to Swedish legislation. The interviews cannot be published due to the integrity of the respondents. The codes and transcriptions of each interview is assigned with a number, in that way, the identities are kept hidden.

After the interviews an additional week was spent in Tacloban at the Plan regional head office for initial coding and debriefing. There were two different translators assisting in the interpretation, one for each area, and in both communities, staff from Plan International was accompanying. When deciding on the method of sampling, quota sampling was chosen, with an even distribution of age and gender (Neuman, 2014).

### **2.3 Sources of error**

There are several potential sources of errors that can affect the accuracy of this study and known ones are brought up in this section.

A first source of error for the study is translation during the interviews. Two different translators were used in the study, imposing difficulty in the way they might interpret the mission differently. Furthermore, the interpreters may perceive a question or answer differently, by this means inducing errors in the data. During the interview the interpreters was requested to translate word by word, minimizing the translator's impact on the data. This was urged for during the introduction of the translators, because they let the respondents talk in to long chunks initially. The quotes written in this report are the words of the interpreter, not the actual quotes from the respondents. The interview guide changed between the study areas but the framework was intact. This makes the comparison of the areas a bit different, but it has primarily affected the nuances in how feelings and opinions are expressed rather than introducing completely new parts.

During the first interviews carried out in Tigdaranao, respondents that was later to be interviewed was present in the room. This was possible because we did not know who was up next to be interviewed. When people came into the room they were perceived as officials or friends and thereby authorized to be there. This may affect how the respondents have answered questions due to having been influenced by previous interviews. Also, this may mean that respondents may select to answer questions in a way that will not provoke or offend the others in the room. We believe that this may result in data from the first seven interviews to be more unanimous but still representative for the study.

During the field research, we believe that the selection of respondents might have an impact on the results since it may build on an overrepresentation of certain groups. As it was now, all interviews were conducted during one week in each community and at daytime with respondents selected through quota sampling. Suitable respondents were put forth by a Plan Internationals contact in each community and there might consequently be an overrepresentation of family, friends, and people from a certain level of the society. This also means that those working at daytime was away and could not be a part of the sample group. We believe that these factors have been affecting our results. One other limitation is that no interviews were conducted with the people who have been living in the areas but were able to move to a more low-risk area. They could have information that would be valuable for the study but was not possible to cover due to factors of logistics, finance and time deposited.

Respondents have difficulties of setting things into a wider perspective. Examples of this is whether feeling safe or not, respondents may be able to mention a multitude of risks but still hold on to a personal feeling of safety. Answers may be that they feel safe in the moment of being asked,

but when asked if they always felt like that, some change their minds and claim to feel unsafe. This could have been avoided by asking more detailed questions.

The thesis strives to be based on rich data. Some of the respondents answer in a short and compact way, leaving out richer layers and reflection. This may be caused by the actual mindset of the respondent, and sometimes due to the interviewer missing on follow up questions. Also, when the respondents said something contradictory or strange, the interviewer may not always be alert to pursue clearance in the matter.

During the interviews, short answers or replies evading the question was common. We did not always follow up on this and some data could then have been lost. The reason for this we believe is that some respondents are shy and afraid of giving the “wrong” answer. One more cause might be that a few respondents persisted in speaking English without the help of an interpreter and in so doing limited their own capability of diversifying the reply. During the interviews, we henceforth tried to improve on our own ability to follow up on short answers. We also believe that as the data collection progressed, we got more comfortable with the setup and in so doing also made the respondents more relaxed.

During the interviews the term *risk* was never used due to its broad possibilities of interpretation because there are many factors involved and the term is not universally used. It could also be a situation when respondents answer the question without knowing what risk is. Instead, the questions were subdivided into the different aspects of risks. In this way, we believe that a better result was achieved.

Prior to starting the interviews, we knew that we ought to avoid questions that could be answered with *yes* or *no* exclusively (see chapter 2.2.1). Even though having this in mind when setting the framework for the interview guide, the *yes* and *no* answers were commonly replied. Mainly this occurred when we tried to confirm if the respondent understood the question correctly, but it happened on open questions also. Every time we repeated the replies in order to confirm we understood the reply correctly, we got a *yes*. When analyzing the data and afterwards when we were traveling in the country, we found that this is a cultural behavior. To answer in an affirmative way even if it is wrong is acceptable. The reason is unknown, but we suspect that they have a pleasing attitude, and it might be shameful not to know, hence they give an affirmative answer in order to maintain their honor. This does not have to be a problem but could be a potential source of error. This could only be avoided by changing the questions and be skillful in knowing how to let the respondents repeat the replies. It could have been an idea to stress this prior to the interviews, having no answer might be more useful than an incorrect one.



## 3 *Conceptual framework*

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The concepts used in the research is stated below in order to clearly define the different aspects and theories that the result rests upon.

### 3.1 Risk

The term *risk* has developed over some centuries to become widely discussed and hence, there are numerous definitions (Lupton, 1990).

According to Renn (2008, p 63), risk can be defined as “An uncertain consequence of an event or an activity with respect to something that human’s value”. This approach implies that there is no objective meaning of risk, everyone creates their own definition of risk according to oneself. This approach differs from the techno-scientific way of looking at it: risk is based on probability. One of these ways of defining risk is 1: what can happen, 2: how likely is it to happen, 3: what are the consequences (Wamsler, 2014). Holton (2004) tried to make a universal definition of the term and claims that risk always involves two terms, uncertainty and exposure, and claims situation lacking one of those is not a risk. Renn (2008) explains that the characteristics of risk is complexity, uncertainty and ambiguity. This shows that there is no certain metric that can define risk, nor is there any objective risk since it is always colored by humans. With this in mind, the authors regard risk a something negative that may happen to people in the future. The estimates of how likely it could occur does not need to be accurate, since there is no answer to it until the time has passed already.

#### 3.1.1 *Risk perception*

Risk perception is how groups or individuals process, assimilate and evaluate risks into their own risk picture and structure. It can be through personal experience or by information given by others. Renn (2008) writes that there is a discrepancy between scientists and cognitive psychologists, where the latter claims that humans collect and create their perception by not logic reasons, but by cultural traditions, social communications, personal experience and common sense reasoning. Furthermore, he writes that uncertain events can be linked to fear, emotions, hopes, ideas, and expectations. This shows that people does not solely rely on the fundamental foundations of probability and degree of possible destruction. The implications are that certain biases come into aspect when regarding peoples risk perception, and that risk perception is impossible to measure exactly (Renn, 2008).

### 3.2 Hazard

Hazard is defined as “A source of potential harm or a situation with the potential to cause loss” (Renn, 2008, p 62). There is a distinctive difference between risk and hazards, where the hazard is just what event or agent that can cause harm. There are numerous hazards but in this report, man-made or man triggered hazards and natural hazards are the ones brought up. Secondary hazards are for example storm surge created by the low atmospheric pressure from a strong typhoon.

### 3.3 Vulnerability

Vulnerability is defined as “The extent to which the target can experience harm or damage as a result of the exposure” (Renn, 2008, p 65). In this, target can be anything e.g. an individual, property, environment or community. The concept is complex and there are many definitions and factors describing vulnerability. Wamsler (2014) gives three factors: exposure, sensitivity and adaptive capacity related to how a target can withstand harm. Exposure is the hazard that can strike the target. Sensitivity is the indication on how a target can be exposed and adaptive capacity the measures a target may take to mitigate a hazard e.g. material or educational sources. Since there is both contextual (location-wise) and outcome (from the three components above) vulnerability in this thesis will mostly regard the contextual aspect.

### 3.4 Disaster

Disaster is defined as “A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (UNISDR, 2009, p 9). According to Wamsler (2008) disaster risk is closely linked to the risk definition with probability and consequence but can also be said to be a combination of vulnerability and hazards.

One thing to remember is that, for example, natural hazards, such as heavy rain, can be positive for a region if it does not affect any inhabitants, it can even be wished for. But when vulnerable inhabitants or property are affected and the water is causing damages or loss which cannot be controlled, the hazard could be transformed to a disaster. Consequently, vulnerability must be present for a disaster to happen. Two more requirements: the functioning system in the affected area must be put out of order and external assistance must be summoned to get the area functioning again. The components of hazard that makes a disaster is showcased in *Figure 2*.



**Figure 2. What prerequisites that are needed for a disaster to happen.**

### **3.5 Disaster Risk Reduction**

Disaster Risk Reduction is mentioned in the report and is used by the Plan International staff both while educating and when working in the research area, and since the authors want to retrieve information from the respondents concerning DRR, this is explained. According to UNISDR (2009) it can be defined as “The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events”. One can say that it involves all measurements that aim to reduce disaster risk and consequences inflicted by disasters. It can be on micro and macro level and example of processes in DRR is risk reduction and significant parts of climate change adaptation (Wamsler, 2014).

## 4 Context of research

The island nation of Philippines is located at the seismically active edge of two tectonic plates and is at regular basis affected by both volcanic eruptions and high-energy seismic activity. The earthquakes in this region do not only strike danger to urban constructions but is also a trigger of landslides and at some occasions tsunami waves. The climate is typically tropical with temperatures seldom dropping below 20 degrees Celsius. The average rain fall is high, especially in the mountainous regions and during the monsoon season (ACTED, 2015). Typhoons generate sustained wind speed of 90 m/s as was the case with typhoon Yolanda in 2013 (EM-DAT, 2016).

The government is since the election in June 2016 led by the controversial President Rodrigo Duterte, who have promised a nationwide war on drugs and corruption. The Catholic Church are strong and most inhabitants practice the religion (Encyclopedia, 2016). The nation is experiencing a fast-growing economy at a yearly rate of about 8 %, a development closely intertwined with a large-scale urbanization in coastal areas (The World Bank, 2014).

The population is young, where the majority is attending public education (Philippines Department of Education, 2016). Compulsory education consists of one-year kindergarten, starting at the age of five, then six years of elementary education, four years of junior high school and ending with two years of senior high school, finishing at the age of 17 (Philippines Department of Education, 2016). In the national school plan Disaster Risk Reduction is an element that has to be included but various other DRR initiatives are carried out by Plan International (Box 1), and other non-governmental organizations (hereafter named as NGO's) (Philippines Department of Education, 2016).

The Philippines have a governmental structure consisting of government at the highest decision level and below them are the regional governments. Below there are the provinces and then the municipality represented by the mayor. Below municipal level is the barangays, often a community within a town or a rural setting, governed by the barangay council.



Figure 3. Philippines with Samar Island (Google maps, 2017).

**PLAN INTERNATIONAL**  
Plan International is an international non-profit organisation concentrating on children. Focus areas are child participation in communities, education, health and improvement of disaster preparedness as is the case for region of Samar.

Box 1. Plan International.

## 4.1 Samar

The field study was conducted on the island of Samar which is located in the eastern Visayas archipelago and is the third largest island in the Philippines (*Figure 3*) (Encyclopedia, 2016). The island is divided into three provinces; Samar province (in the west), Northern Samar province and Eastern Samar province (Province of Samar, 2016). The island was first sighted by explorer Ferdinand Magellan in 1521 but was populated by the indigenous long before that (Province of Samar, 2016). The main language is Waray-Waray but the majority can also speak Tagalog (Philippines official language) (Encyclopedia, 2016). The climate is characterized by having no dry season but with a pronounced rain season stretching from December to February (Province of Samar, 2016). Samar is dominated by small scale farming, mainly rice, copra (*box 2*), and fishing (Province of Samar, 2016). Due to the mountainous terrain, the majority of people reside in coastal areas, this in a region that is prone to typhoons (Province of Samar, 2016). Inhabitants in Samar does in general not speak English but it is more common among those who are old (due to the American occupation) and the young.

### COPRA

Copra is the dried meat (or kernel) from a coconut that is prepared by local farmers and then exported to larger facilities for the extraction of coconut oil.

*Box 2. Copra.*

The study was conducted in Philippines mainly due to the high-risk profile that made the area interesting. After getting in contact with Plan International and receiving input the study was decided to take place at the island of Samar in eastern Visayas. Also, compared with neighboring regions, Samar is without doubt a high-risk area and by this means interesting for the study.

Two areas were on Samar was chosen to be part of the study. Tigdaranao on the west coast, a high-risk area where Plan International had implemented DRR efforts. A second area was chosen so that a better representation of the region could be accomplished. Alog was selected as the second destination but upon arrival this was changed to Asgad due to having a higher risk profile. See *Figure 4* for the location of both areas.



Figure 4. Samar Island with Tigdaranao in red and Asgad in blue (Google maps, 2017).

#### 4.1.1 Tigdaranao - Tarangan<sup>1</sup>

Tigdaranao is an island located 1.6 km off the coast town, Tarangan. The municipality of Tarangan contains of 41 barangays and Tigdaranao is one of them. The island has a population of about 2300 inhabitants (2015) with a majority of houses situated on low lying areas along the eastern shore. The houses are mostly made from light materials and some are in bad shape, a few are made from concrete and have more than one floor. Power is distributed through a cable stretching from mainland.

The community is built around the coastal main road and without an urban plan for infrastructure, causing challenges for both effective waste management and evacuation. The fact that Tigdaranao cannot be reached by land further boosts the issue with proper waste management, emergency healthcare and in the case of an impending disaster, large scale evacuation. A majority of the adult population find their mean of subsistence on the island, with fishing and drying of fish as the dominating activity. In order to retrieve other basic provisions, trade with the mainland is essential. There is one elementary school providing for the younger

<sup>1</sup> Information from this section is obtained from local representative on scene, Sept 2016.

children, older pupils need to go to the mainland for high school and possibly further studies. Every household have been provided with sanitary measures so there is no open defecation on the island.

The worst disaster happened yet is the typhoon Ruby in 2014 with several houses destroyed. Plan International have been involved in the community with project SURGE and SCALE where education and implementation of DRR measures have been deployed to community in general or to specific members of the society.

#### ***4.1.2 Asgad - Salcedo<sup>2</sup>***

Asgad is located on the east coast of the municipality of Salcedo around 10 km from the town of Salcedo. Salcedo municipality have 41 barangays. The number of inhabitants is unknown but estimated to be lower than 2000. The main mean of subsistence is farming of coconuts and a variety of root crops. The barangay was leveled by the storm surge created from typhoon Yolanda in 2013 and was rebuilt with help from NGO's and government (see *Appendix C* for pictures). The houses are a mainly built from concrete and at what is considered as a safe distance from the shoreline. Just as in Tigdaranao, elementary school is available within the barangay but for further studies the students need to travel to Salcedo. The inhabitants have access to toilets and there is no open defecation. Transportation to and from the community is cumbersome due to difficult roads. There have been DRR efforts made by Plan International in educating and helping the citizens (mainly children and youth) to improve their DRR knowledge.

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<sup>2</sup> Information from this section is obtained from local representative on scene, Oct 2016.

# 5 Results

This section of the report present findings to answer the thesis research questions. The data is not presented in detail but as a summary of those attributes that may explain the research questions:

- Why do people live in high-risk areas of Samar, Philippines?
- Are there any notable trends that DRR education among youth and children is affecting the local society’s notion of safety?
- What implications do the findings about why people live in high-risk areas have on risk based land use planning?

The questions will be answered one by one in the following pages and then more thoroughly discussed in next chapter. Some of the data is of interest for more than one of the questions and will thus not be presented in detail more than once in order to avoid unwanted repetition. See *Appendix D* for a snapshot of how the coding is constructed.

## 5.1 Why people live in high-risk areas

The first research question is complex and cannot be answered with a simple answer. The result is instead a complex aggregation of different opinions, values, and experiences. The core categories presented in *Figure 5* and our understanding of their risk perception is both depending on each other and the same type of data is reoccurring, the aim is hence to highlight the difference and connections in this chapter.

### 5.1.1 Categories

Four main categories are identified and presented in this section. The categories are made of concepts that summarizes the collected data (*Figure 5*).

#### 5.1.1.1 Livelihood

Livelihood is frequently mentioned throughout the interviews. This may be because without income and especially food, families and individuals have a hard time to survive. This is the baseline in what makes up the category livelihood.

In Tigdaranao *fishing* is the most frequently mentioned mean of subsistence. Respondents feel fishing can generate an income that can then be

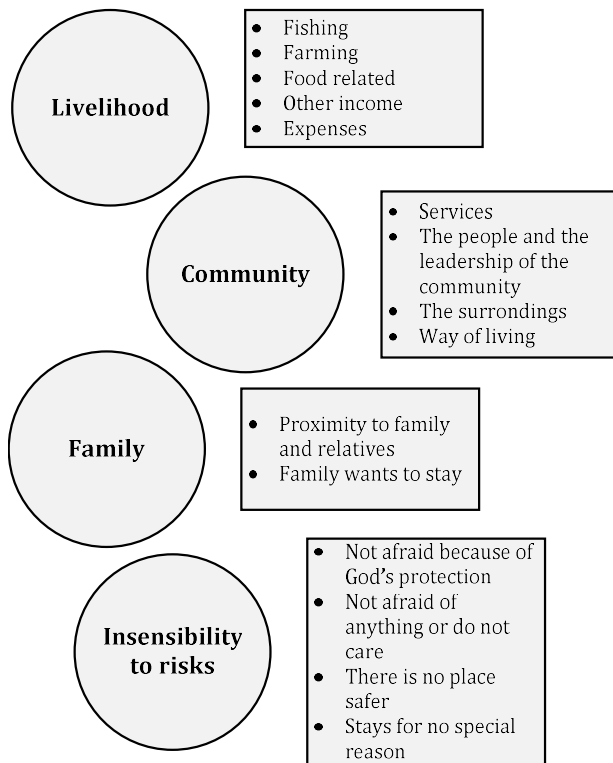


Figure 5. The categories with each of the consisting concepts.



traded with mainland for rice and other necessities that cannot be produced on the island. Fishing is less frequently mentioned in Asgad due to the open sea and weather conditions that makes fishing a less attractive alternative for subsistence.

Following quote is from respondent No. 1 (Man, 61 years old) when speaking about what advantages there is living in Tigdaranao:

- [Interviewer] *What are the advantages of living here?*

- *I think it is better because of the fishing opportunities that can feed my family.*

What is mentioned in the quote above is a common opinion that shows how important fishing is. Several respondents also stress that all the community is involved in fishing due to processing and exporting the catch as well as keeping vessels and equipment in shape. Fishing is dependent on weather and respondents express that during typhoon season their yield is reduced due to strong winds. Respondent No. 4 (Man, 72 years old) says:

- [Interviewer] *So what are the disadvantages of living here then?*

- *The income here is not fixed. It is unstable. Especially during the south monsoon like now. There are strong winds and some waves. Very difficult for fishing. It may last for several weeks. It is very difficult to go out fishing. And it lasts even for months.*

Asgad have a high ratio of *farming* and families that grow vegetables and crops, both for their own consumption and for retail. This is mainly due to the observed environmental features of Asgad, having a large flat area with sandy soil surrounding the barangay perimeter. The coastal location makes farming of coconuts a viable business. It is clear that many base their means of subsistence on copra. Respondent No. 38 (Woman, 31 years old) says:

- *The advantage is that this is our place. Also the community were we can plant whatever we want.*

Several respondents speak about the importance for them to always have food to feed their families and themselves, *food related*. They see it thus as one additional advantage with farming and fishing since they then know that they will be able to stockpile food for times in need, and always choose whether they want to sell or keep what they are producing. Farming for their own also means that the food is fresh and locally produced, an advantage that are mentioned by many.

To help those below the poverty line to sustain their daily needs the government provide some benefits. The government also give out grants to communities that have been severely damaged by for example typhoons, which needs additional funds to recover, as was the case after both typhoon Yolanda and typhoon Ruby. Two of the respondents claim that *other income* such as the governmental benefits and grants that they receive is an advantage of living where they are. Respondents also spoke about economical help from neighbors and relatives, as a way of surviving.

Even though few respondents spoke explicitly about farming or fishing as a reason for living there, work in general seems to be easy to find in the communities touched by this study. Many

respondents claim that they live in Samar because of work opportunities and there is a few that claim they moved here due to work opportunities or that the partner already have work or could find employment there. Almost everyone says that a job is required in case they would be forced to move. This shows how important livelihood is for the respondents.

Concerning livelihood, if having a monetary income, that money might not be enough if the *expenses* are too high. In both communities where interviews were conducted, low expenses are one of the key factors for the respondents for living in the area. Several respondents had Manila as an example of a place where the salaries might be higher but due to the much higher cost of food and accommodation, it still might not be enough to make a living. Few respondents say that it is good not to live in a place where you can buy a lot of stuff, meaning they have an easier time to spend money on things that are essential for survival.

Most of the respondent living in Tigdaranao says that they own the house or that a member of their family owns it. Few seem to be paying any rent and among those who pay, rent is often based on their earnings that month. In Asgad, everyone participating in the interviews owns their own house, some of them having paid for the construction themselves but most having received their new home through a relief program conducted by an international NGO.

#### *5.1.1.2 Community*

A majority of the respondents report to have been living in their present community for their entire life and have no or very limited travel experience. Community plays a vital role in why people choose to live in high-risk areas and many of its key concepts will be presented in this section. The concepts differ in the matter that it is both physical and psychological concepts that both include the importance of the community. *Services* such as having a school in the community does not only provide job opportunities and the option of children and youth to do their education close to home but several respondents also seem to see it as way for their community to survive into the future.

The communities participating in this study both have primary schools but once the kids start high school they will need to travel. When starting high school, this means longer time away from home and higher costs for transportation, costs that have to be covered by parents. This is brought up as a disadvantage with their current community. Distance to hospital and market is seen as a downside. *The people and the leadership of the community* is often brought up as a reason for living there. One respondent says that the community has good leadership and one other emphasizes how good the community is managed. One respondent mentions that the trust for the other residents is high. Respondent *No. 16* (Woman, 27 years old) puts it this way:

- *[Interviewer] What are the advantages of living here?*

- *The advantage here is that people can help each other out at all times.*

*The surroundings* include recreational reasons such as living by the ocean and are mentioned as a strong incentive for living there. Other says that the proximity to leisure activities such as visiting friends, playing basketball and recreational fishing is an advantage of living where they are now. *Way of living* includes some respondents mentioning that they feel free and can do whatever they want in their community. Several respondents appreciate the fact that they live in

a peaceful area and that life in general goes by easy and comfortable there. Some say they live where they do because once they have started a life here, it becomes their place and it has significance that their family is to experience the same. This is emphasized by respondent No. 22 (Woman, 53 years old):

- [Interviewer] *You told me about the advantages of living here, what is the main thing that makes you want to live here?*

- *Because this is the place where I raised my family. This is where I raised them and sent them to school, this place is very memorable for me.*

### **5.1.1.3 Family**

A reason to why people live in the high-risk area of Asgad and Tigdaranao is family and relatives. More than half of the respondents say that *proximity to family and relatives* is one of the main reasons to why they live where they are, respondent No. 19 (Man, 38 years old):

- [Interviewer] *Would you like to stay here or to move?*

- *I would prefer to stay here. Because of the family.*

Many emphasizes that they live in the area because of their children and the fact that their *family wants to stay*. Older men and women often claims they lived there because of the proximity to the relatives which facilitates support in many ways. Some younger men and women proclaims that they live in the area due to the husband or wife, who either have been brought up there or moved there for various reasons.

### **5.1.1.4 Insensibility to risks**

When speaking about insensibility it is either in the sense of ignorance towards the risk or through knowledge of a danger without making any active efforts to lower it. This will further be touched upon in chapter 5.1.2 (risk perception). Insensibility to risks is shown as *not afraid because of God's protection, not afraid of anything or do not care, there is no place safer and stays for no special reason*. As will be mentioned further on in the report, more than half of the respondents in Tigdaranao says that they feel safe living in the area even though having experienced severe damage. A few respondents say that they are safe because of their belief in God and hence living in the area is considered safe. Other feel safe due to being confident that help would come if something is about to happen. This feeling might be enhanced if, as was experienced at sight, inhabitants receive shelter assistance for rebuilding after a disaster. There are also a few people that know about the dangers but simply do not care, as with respondent No. 24 (Man, 28 years old):

-[Interviewer] *Are there any actions you have done to feel more secure and that will reduce any potential damages from disasters? [...]*

-*We don't think of something like that. We don't mind what the future holds.*

Some respondents are contradictive in their statements when stating both a feeling of safety and a perceived threat; such is the case for respondent No. 6 (Woman, 36 years old):

- [Interviewer] *Do you feel safe here?*

- *Yes, I feel safe here, especially when there are no calamities or disasters.*

This is interpreted as when thinking about disasters, the respondent feel unsafe but in the everyday life the thought of future disasters is not present.

About a quarter of the respondents says that they simply have no other places to go to that is safer than where they live now. This is expressed in different ways, such as “there is no safe places” or “it is dangerous everywhere”. One additional reason to why people live in high-risk areas is that some respondents just could not see any disadvantages with living at their present location.

More than half of the respondents says that they want to live there, not minding the risks. Some are very decisive, for example respondent *No. 21* (Woman, 44 years old) says:

- [Interviewer] *What sort of event would make you move from here?*

- *It is ok like if a typhoon like Haiyan comes and strikes it is not a disadvantage it is not a barrier for me to come back and stay here. So we prefer to stay here whatever happens.”*

Others do not have any real reason to why they want to live there.

The respondents also say they have nowhere to go if they are about to move. This implicates that the inhabitants do not know where to move, and if they move, they still do not know if they will get work and accommodation. They also say they are too old or lacks experiences in travels and working skills. One-half of the respondents say they want to move explicitly or indirect. It could be like respondent *No. 37* (Man, 29 years old):

- [Interviewer] *Do you want to move?*

- *If there is opportunity to other places it is ok.*

When analyzing the respondents that want to move or could think of moving, the respondents from Asgad are represented in a greater extent. The male respondents and younger respondents are also more often reoccurring.

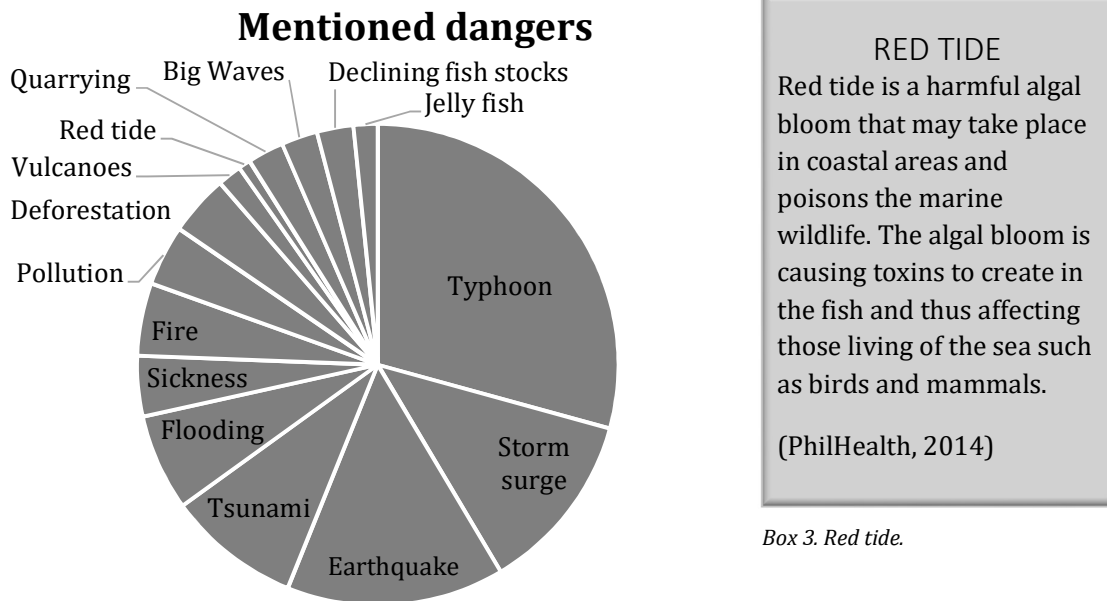
Respondents living in Asgad and Tigdaranao have seldom come across the question why they live in a high-risk area. When the authors asked the respondents how they felt during the interview about this topic many thinks the questions are relatively easy to answer but that they rarely reflect on the subject.

### ***5.1.2 Risk perception and hazard awareness***

This section presents perceived safety and takes up the different aspects of perceived risk and how it transitions. During the interviews, the expression “risk” is not explicitly used due to its broad interpretation. Instead, the terms “danger” and “safety” is used.

### 5.1.2.1 Perceived dangers

Based on the sheer number of potentially hazardous events that are brought up in the collected data, Samar is an area prone to hazardous events. Most of the disasters brought up are based on natural events such as hydro-meteorological phenomena, seismic activity and red tide but there are also those induced by man. Examples of risks induced by man are pollution, deforestation, and quarrying. Out of all perceived dangers that are identified in the study, some are similar and have then been narrowed in to the 14 dangers (*Figure 6*).



**Figure 6. Mentioned dangers in Tigdaranao and Asgad.**

Few of the respondents have been travelling abroad, having a hard time putting the level of risk that their community is exposed to in an international context. By observation, this is common on a national level, and some respondents have not been travelling outside their region of birth.

The number one event that is believed to impose a threat to the community is typhoon (*Figure 6*). Typhoon is mentioned by all respondents and out of these 90% perceives it as directly dangerous, both to health, economy, and property. Worth to notice is that few of the respondents claimed not to have a fear for typhoons since knowing that God would protect them from all harm. During the last couple of years, Samar has experienced some of the most destructive typhoons on record with the typhoon Yolanda making landfall in 2013 and typhoon Ruby in 2014. These events are often brought up, especially Yolanda where many of the respondents lost friends or members of family.

The feeling of increased number of destructive typhoons is by some thought to be caused by the changing climate. A common answer of how to lower the occurrence of typhoons is by reducing pollution and improving waste management. Three of the respondents express that big waves are a danger and another five respondents express fear for falling trees but in the context of the interviews, these are secondary hazards from typhoons. Several respondents also mention the lack of proper evacuation centers.

Another event that is seen as a threat is earthquake. In all cases of earthquake being mentioned, it is in the context of a perceived danger. One thing that is special with earthquake is the fact that few of the respondents are afraid of economic losses, mainly due to having a house built from cheaper material and few valuables. Those having houses built from concrete and stone have a higher fear for earthquakes due to the larger consequences for both health and property if their house is about to collapse. Few of the respondents have experienced seismic activity but since the tsunami outside the coast of Indonesia in 2001, the awareness of earthquakes, causing tsunamis have increased. Tsunami is mentioned as dangerous by a quarter of the respondents.

Flooding is a threat that about a quarter of the respondent's view of as dangerous and as the quote below highlights, it is thought to be caused by either rain, typhoon, or high tide. One respondent highlighted how a combination of high tide and heavy rain may enhance the danger due to hardships for excess rainwater to be transported away. Several of the respondents have experience of floods and worth mentioning is also that some expects flooding to increase in the future. Respondent *No. 9* (Woman, 69 years old) says:

- *[Interviewer] What danger do you think is the main one here?*

- *The rising of water, either if it's by rain, typhoon or high tides.*

About a third of the respondents report storm surge as one of the major threats that their community is facing. Storm surge is by many an unknown phenomenon until typhoon Yolanda hit southern Samar in 2014. According to Jibik et al. (2016) only 13 % of the people affected by the storm surge from typhoon Yolanda had knowledge of what it was prior to the event. Days before typhoon Yolanda made landfall there was warnings about storm surge but according to Neussner & Ocon (2015), both the *Philippine weather service* (PAGASA) and the *National DRR Authority* (NDRRMC) failed in making the public aware of the imminent danger.

Another perceived danger that is brought up by the respondents is pollution. It is not entirely clear if they, with pollution, mean only emission and contamination of environment or if this term also embodies littering and improper waste management. Segments of these are often occurring during the interviews. Among those who speak about pollution (mainly younger people), the main concern seems to be that it may enhance and/or intensify future hydro-meteorological events.

#### ***5.1.2.2 Perceived changes in past risk***

Hazards and perceived dangers change continuously, and the interviews have touched on how the respondents experience the alteration of risk over time.

Half of the respondents claim that dangers have increased during the stay in Samar. This is in line with the disasters that has occurred lately, namely typhoon Yolanda and typhoon Ruby. Typhoons are the most commonly mentioned danger, both their change in magnitude and damage inflicted in the communities. Several respondents emphasize that they never have experienced comparable typhoons in their whole life, even though Philippines are stricken every year with several small, and a handful of big ones. Two respondents mention that there have been typhoons with very strong winds and rain many years from now but they say the damages from storm surge in recent event far surpasses the destruction from wind. Some respondents are also concerned

that there is a higher frequency on smaller typhoons that makes landfall, making livelihood complicated and dangerous for those dependent on fishing.

Another danger that has increased is the depletion of fish stock. A few respondents claim they have noticed a difference in the fish stock from when they were young and that this is now one of the major threats to their mean of subsistence. One other threat from the sea that has increased is jellyfish that now keeps people from swimming in the ocean due to fear of being stung.

Many respondents talk in general about pollution and littering as a problem, but does not explicitly say if it is a danger that have increased or if it has been this way for long. One emerging danger that was mentioned a few times in Tigdaranao is sand quarrying where the common belief seems to be that foreign boats come up close to their shore in nighttime to harvest sand before disappearing and selling the product elsewhere. Some of the older respondent's mentions that as of lately, strangers have started to appear in the community without anyone knowing who they are or what business they have. One respondent talked about the declining respect towards elders as a danger that has increased lately.

Among declining dangers, two is mentioned. Even though littering might have increased, the waste management has improved and so the negative effects of littering. Another declining danger is acute deficit of food. Even though livelihood and food stocks are not stable, the inhabitants seem to have food for sharing, compared to when some were young and had to endure a daily struggle of providing for themselves and their family.

Five male respondents mention that their perceived risks have been the same during their stay on Samar. The majority among these are from Tigdaranao where the effect from recent years' disasters have been less than for the southern part of Samar.

### ***5.1.2.3 Perceived future risk***

Disaster will happen in the future according to many respondents interviewed in Samar. The majority says they know or is very certain that future disasters will occur and that the intensity of these events will likely strengthen. Some respondents are more specific and think next major event will be typhoon or earthquake while others rank sickness as the major threat. Some respondents say that they did not know if there will be more disasters in the future, and one respondent stated that future disasters did not bother him. Not a single respondent claim that there might be less or no more disasters in the future.

### ***5.1.2.4 Perceived safety***

About half of the respondents are highlighting that they feel relatively safe where they live and among these, many are from Tigdaranao. Exactly what the feeling of safety is based on is individual but some of what came up is faith in God and evacuation centers. It is more common for the young to feel safe and the old to feel unsafe. About a third of the respondent say they do not feel safe. It is often due to living in coastal areas where consequences from typhoons or tsunamis might be larger.

As to those having children, the most common belief is that the children have the same perceived hazards as their parents. Neighbors feel the same way, the majority claims that what they perceive as dangerous is the same for other neighbors. In several cases, the respondents perceive

themselves as better on handling a disaster situation since claiming that their neighbors more easily panic.

When being questioned on what other places that is perceived as more dangerous than their present place of residence, almost half of the respondents claim that there is such a place. Among these, Manila and the region of Mindanao are the ones most often coming to mind, mainly due to drugs, theft, and antagonistic violence. About a quarter of the respondents do not know of a place more dangerous, implying that they live at the most dangerous place and as many again claim that there is no safe place.

#### 5.1.2.5 Changes in safety feeling

Not every respondent got the question *how safe are you today compared to before*, but 14 respondents answered the question as is presented in Figure 7.

As Figure 7 shows, it is hard to draw any clear conclusions about the changes on feeling of safety. When analyzing the answers, neither age nor education provides any clear trends. The only difference found is that males have a higher percentage in *Feel safer now* compared to *Felt safer before*.

Those expressing *Feel safer now* is mainly due to them feeling that they are more trained now and know how to handle in different situations. Respondents also say that they feel more safe now due to when being young their possibility of affecting their own safety was limited.

The group *Felt safer before* says they were safer in earlier stage of life due to an increased danger now compared to before. They also stated that they felt safer when young because they were not aware of dangers.



Figure 7. Result from safety feeling in Tigdaranao and Asgad.

## 5.2 DRR trainings effect on society

Education on DRR may affect society in various ways and in its effort to lower risk. Among the more common deviations would be changed behaviors and/or more physical mitigating measures.

### 5.2.1 DRR education

As have been outlined earlier in the report, all respondents are above 18 years of age and most of them now have families of their own. For those having children of their own, a large majority states that their children have been educated on DRR, either as a part of the school curriculum or as separate training. For these respondents, the education on disaster preparedness is emphasized. The education is exemplified as explaining how different hydro-meteorological or seismic events are created and what their consequences may be. According to some of the parents, their children have also been educated on climate change and how this may affect future



disasters. Six of the respondents do not know whether their children have been educated on DRR, a majority of these are seniors.

In second year of primary school, the children receive practical exercises, such as drills, about what to do when earthquake, strong winds, storm surge, flooding, landslide, and fire becomes an immediate threat. The education does not include how disasters come up or how climate change may affect future disasters. Waste management is part of the education as well as education about cleanliness. In the higher grades, which are not easily accessible in the areas covered, the pupils have DRR education as part of the curriculum, with both practical and theoretical education including climate change and early warning systems. Plan International has been educating students in the covered areas both practically and theoretically, covering the areas of contingency plans and community hazard maps, as well as letting children attend the community evacuation drills.

When it comes to the respondents own training, more than two thirds of the respondents speak of having attended DRR education. Out of those having experienced DRR education college graduates are overrepresented. No such patterns can be seen when it comes to gender or age. Several respondents made clear statements on how they felt education and training on DRR had enhanced their feeling of safety, primarily male.

From the data, it stands clear that interest for more DRR education is high, finding support from almost half of the respondents. For some, the reason is that they have previously not been able to attend sessions due to sickness or other responsibilities. Also for those already educated in DRR the interest of further training is relatively large. A common request for further DRR education is to have more knowledge about how they can prepare themselves when a typhoon is approaching as is highlighted in the quote from respondent *No. 38* (Woman, 31 years old):

*- [Interviewer] What additional education or training concerning DRR do you believe is needed?*

*- If I would be given a chance to attend a training I would prefer to choose a training to learn how to prevent and do after a typhoon.*

The data shows that most respondents speak about DRR with their family and out of those, more than half claim that it is a mutual exchange of information. Further, there are eight respondents stating that it is only the parents teaching the young and a few seniors claiming that most of the teaching is from children to parent. Respondent *No. 26* (Woman, 33 years old) says:

*- [Interviewer] Is DRR discussed in the family?*

*- [...] now during typhoon comes the children says, mum, let's prepare for a coming typhoon so that in the situation my children know what to do. So now we don't talk about it anymore, only when typhoon is close.*

A few respondents claim that they do not speak about DRR in the family even though it is promoted in school.

## 5.2.2 Mitigating measures

There are many ways of lowering perceived risk. Among the suggestions that have been brought up by the respondents of this study, most is about minimizing the consequences of typhoon. The investment that is most commonly brought up is the establishing of an evacuation center where people can seek refuge in case of an approaching typhoon (as of today, neither Asgad or Tigdaranao has such a facility but the latter do have one under construction). This is suggested by about a third of the respondents and vital prerequisites of such an establishment are for it to be located on high ground and large enough to fit all members of the community. One respondent claim that the construction of better roads to the community can improve response time in case of an emergency. Other investments that are brought up in the interviews are construction of sea walls and planting of trees, both to reduce the impact from wind and waves.

One other type of mitigating measure that can be singled out from the data is those based on policy and education. An example of this is that some respondents request further information campaigns to reduce pollution and inadequate waste management. By tying down the roofs and fortifying the house structures, some of the respondents have strengthened their own homes, mainly for reducing property damage. Lastly, some respondents rely on prayers to reduce damage.

A mitigating measure does not have to be a change in behavior or an investment but it can also be in the form of insurance where the consequence (especially to health and property) is reduced. Among the respondents around 50 % does not have any insurance. The most common insurance is PhilHealth (box 4), followed by being included in the Social Security System (SSS). It is also these that are most sought after among those lacking any insurance. Insurances that cover other expenses than health such as property insurance, life insurance and educational insurance is uncommon among respondents, mainly due to not being able to pay such fees.

When interviewing, disaster preparedness is mentioned several times and it is most often in the context of evacuation, for example respondent No. 4 (Man, 72 years old):

- *[Interviewer] Are there any bad things with evacuating? Leaving your homes and boats.*

- *Some are left behind but most go away to the evacuating center and brings food, flashlight, clothing. All the families should have a bucket with rice and food that they can bring to the shelter. During Ruby I took five containers, tied them together with rope as a floater. Emptied plastic cans may work as an improvised floating device.*

Others say they would bring medicine and important documents. This shows that people have learned from either NGOs, government or from own experience in combination with recent typhoons that greatly damaged the area.

**PHILHEALTH**  
PhilHealth is a national program that strives to provide all Filipino citizens with affordable and accessible healthcare through a payment system based on income. The program includes emergency care, medical service, outpatient visits, surgeries and preventive care for participants with limited financial means.  
  
(PhilHealth, 2014)

Box 4. Philhealth.



## 6 *Discussion*

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It is ironic that even though the modern society are expanding its efforts to make people more safe, the public have become more concerned about risk (Slovic, 2001). When speaking about risk, the respondents are speaking about disadvantages of living in the region of Samar. Some of these downsides that come up are: local hazards, insecurity of livelihood and isolation. Contradictive to this is that livelihoods, means of subsistence, family and the place attachment are also mentioned as reasons to why people live in Samar. Some respondents cannot imagine or perceive moving as an option, and some of the known reasons to this will be further discussed in this chapter. The discussion will also take up the generalizations that may affect the accuracy of the study and what implications the result may have on risk based land use planning.

### 6.1 **Livelihood**

One often occurring theme to why people live in a high-risk area is livelihood. When speaking about livelihood it is easy to think of a straight correlation to financial means but throughout the study, also access to food and other necessities emerged as key components. For the areas where interviews were conducted most adults engage in farming or fishing, in so doing providing the alternatives of selling their products in times of plenty and consume it in times of need. This we believe is adding to the feeling of safety and in that way act as a cause of living there. To put it in perspective the option for a farmer would most probably be moving to an urban area and work within the fast-growing Philippine industry. An employment that, if found, would in most cases generate a larger income than present mean of subsistence but with the risk of losing the job and be left with no income, especially if times are hard. One way of lowering the risk connected to livelihood that is often overlooked is to send away one or a few of the family members for work (Stark & Levhari, 1982). This may lower the combined risk due to diversifying the family's source of income and is common among Filipinos.

The ability to provide for family and friends is a drive that keeps people working on the sea or in their farms. Some respondents state that they cannot move due to lack of working skills, we believe that there might be such an education deficit but that due to Philippines fast growing production economy there might be work opportunities also for those lacking professional skills. One other way of providing for the family is through shelter assistance that is paid out by the government when a community has taken heavy damage. A few respondents claimed this to be one of the upsides with living at their present location and the approach does by this means encourage people living there to do nothing about the risk (Oliver-Smith, 1996). This approach does lower the feeling of danger but without lowering the risks and might then lead to an even larger future loss.

For some of the respondents their mean of subsistence is just enough to sustain themselves and their family. What this means for feeling safe and their exposure of risk is that few would have the ability to save the money and, for example, reinforce their houses. On the other hand, those with a higher dispensable income would have larger opportunities for making changes and by this further enhancing the inequality of society. This could lead to a diversification of society where the poor and less educated live in the higher risk areas with low chances of mitigating this process. Due to the data only consisting of interviews from rural high-risk communities this theory cannot be verified but such patterns have been identified in Manila (Boquet, 2015).

## 6.2 The role of family and community

Family is one of the categories that emerged from the data and is also explicitly mentioned as a main reason for living there. During the field study, we learned that the family has a far more vital role in society than what is the case e.g. Sweden. Partly we believe this is due to that the Philippines do not have the same social safety system that have been developed in the west. Instead, the family has a central role in taking care of children, providing for a member who gets sick, to take care of the older generation and so on. Instead of just having a core family of parents and their children, relatives usually live under the same roof and participate in a shared household. In this sense, a larger group of people are dependent on everyone helping since laziness would hurt others than just the individual.

Some of the respondents have stated that they wanted to move when they were younger, but then came family. What they mean with this is that they were needed back home to take care of the children and once being finished being a parent it was time to take care of their own parents and potential grandchildren. There are many ways in which the respondents feel like they can contribute to their families' wellbeing. The most obvious might be through monetary means and this is more touched upon in the discussion on livelihood but contributions in terms of babysitting, care for those that are sick and supporting the senior members of the family requires closeness. Consequently, we believe people are live there because of family and/or relatives doing so and that this choice of not moving then further enhances the cement that bonds family and relatives together.

As is stated above family might be one of the strongest incentives for living there but this do not only mean that people will stay. We have no data on those that have moved away from the community but what we do know is that those that have moved to the community have all except for one, done so due to being in a relationship with someone from that community. This implies that even though family is what makes some people stay it is also one of the major reasons to why people come there in the first place.

Closely related to the above discussion is the matter of what impact the social construction we call community have. As stated in the results, the respondents feel like the community makes additional services available that would be a lot more difficult to achieve by oneself. For example, tasks that need special skills or collaboration would be very cumbersome for someone to obtain alone. When in a community, the contribution that each member adds builds a more resilient and versatile society. One service that is greatly valued is the proximity and access to school and jobs. If seeing it from a risk perspective, it is of course a good idea to collaborate but this trend of building stationary communities also adds risk due their inability to adapt to sudden changes. The construction of a stationary community can thus be said to both enhance and reduce risk.

If taking it down to a level of the individual, the community is by many experienced as inclusive and embracing. Respondents claimed that the leadership in the communities were good and they trusted them in their roles to lead their way forward. Further, neighbors and friends contribute socially and can boost both the common and individual feeling of safety. It may for that reason be interesting to discuss what is most important, the risk that the individual is subject to or the feeling of safety, more of this is discussed in *chapter 6.3*. For society, as a whole to be successful we believe that a focus on lowering risk is the more gainful but we also doubt that such society would be a place worth living in. Our personal perspective of this would be that the quality of life

would be higher if enjoying the feeling of safety and from what we can read of the data the same can be said for people living on Samar.

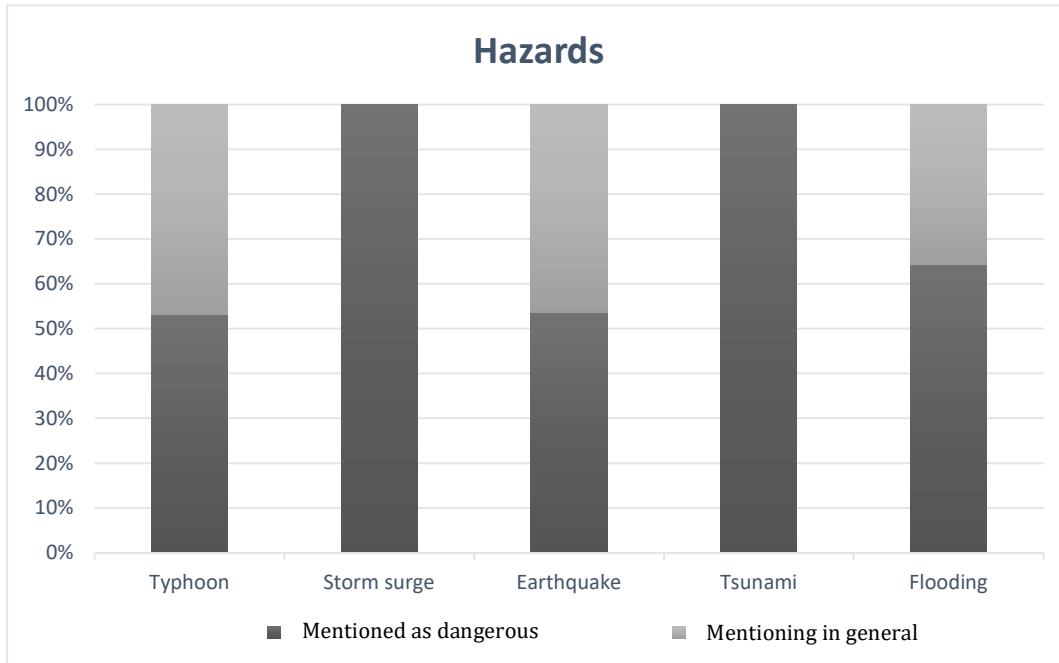
Most of the respondents have been a part of the same community for their entire life and this we believe leaves an imprint on the result. Risk perception have much to do with place attachment (Bonaiuto, Alves, Dominicis, & Petruccelli, 2016) and we can relate to having a special place that is dear for no other reason than memories. The same of course applies to the respondents of this study and several times there are implications in the direction of wanting to stay because of all the good memories he or she has. This emotional attachment to a certain place is further connected to how some respondents speak about the beauty and calmness that they experience. Others felt that freedom to do leisure and just walk around is important and that this community and location consequently is providing something that cannot be found elsewhere.

### **6.3 Risk perception**

As can be read in chapter 5.1.2, we have identified 14 different risks that the respondents have mentioned and out of these typhoon, earthquake, storm surge, flooding and tsunami is the most pronounced. It might be an easy option to discard the low frequency events as non-relevant but from the way that the data was collected they might still be interesting. The reason for this is that the interviews only captured the perceived risks that came close to mind for the respondents. The test of displaying several less obvious risks that is presented earlier in the report showed that there are many more events that are perceived as dangerous than what is mentioned in a quick answer. Mainly this difference is for risks that have a less catastrophic impact such as red tide, jelly fish and declining fish stocks. The fact that events with historically low probability such as volcano eruption and tsunami waves are more frequently spoken of suggests that the respondents base their perception of risk on a tradeoff between consequence and probability where consequence have the higher significance as is also supported by Slovic, Finucane, Peters, & MacGregor (2004).

According to Johnson & Levin (2009) we are more likely to react to a threat when it reaches us personally, rather than through media. Further they claim that the reaction is enhanced if the event is negative (such as a disaster) rather than positive. This is confirming the fact that so many speak about typhoon but it also contradicts the data on tsunami. Since there are no respondents that claim to have experienced tsunami and few can be expected to get in contact with individuals of that experience we conclude that it is based on media.

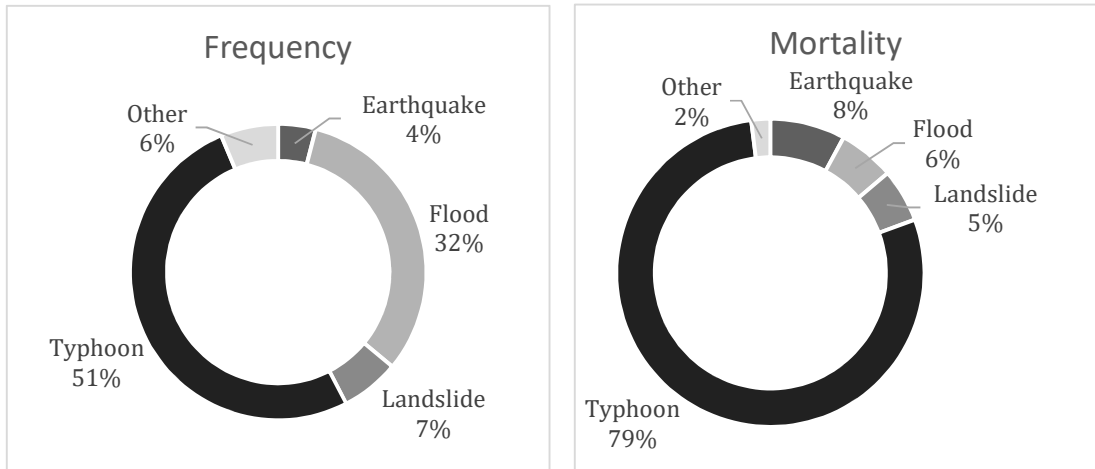
From the graph below it is clear that storm surge and tsunami stands out from the other, having been mentioned as explicitly dangerous by all those talking about the events. Both tsunami and storm surge are new phenomena for the population of Samar where the tsunami outside Indonesia 2001 and typhoon Yolanda in 2013 sparked the knowledge for many (HPN, 2015). This differs to typhoons that are experienced several times every year and that the people thus have learned to prepare for and handle in a more confident way.



**Figure 8. Result of how many times a natural disaster is perceived as dangerous. The gray area is when a natural disaster is mentioned but not as a dangerous event.**

The by far most often occurring event that is perceived dangerous is typhoon. Typhoon is being mentioned more than 140 times in the interviews and about 50% of these entries in the context of typhoon being hazardous for health, property, or environment (*Figure 8*). As been mentioned above it is likely that the high frequency for mentioning typhoon is partially due to the quite recent typhoon Yolanda. Explicitly this is for the community of Asgad where the entire town was leveled by the storm surge and several lives were lost. One other aspect that may have impact on the results is that the interviews were carried out during late September and October, a time during the year that is by locals referred to as “typhoon season”.

What is perceived as a risk is not always in line with what quantitative models present. *Figure 9* is a visualization of frequency and mortality as presented by EM-DAT (2016). If comparing this to what is perceived as dangerous among the respondents, there is a clear difference in for example landslide where few perceive it as dangerous but the actual mortality is as high as for floods and earthquake. We also find it interesting to see how the perceived danger of typhoon is very much in line with the frequency but seems to be underestimating the danger if comparing to mortality. It should also be said the question of what is invoking a feeling of danger is different from the actual danger and a more viable comparison would have been with what is perceived as the largest danger.



**Figure 9. Frequency and mortality from the EM-DAT register.**

Future disasters cannot be foreseen, only guessed. Every risk assessment deals with the problem of uncertainty and will also be colored by the one doing them, making each risk assessment unique (Renn, 1998). In order to make the best estimates and decisions, access to adequate data is important (Becker, 2014). We can see that the communities are aware of this through people requesting both more updates and information from the early warning systems and in how they request further education on the matter.

Closely related to the perceived risk is the feeling of safety (Slovic, Finucane, Peters, & MacGregor, 2004). Being based on a combination of personal experience, culture, and societal awareness it is the one thing that we believe often makes the largest impact on whether to stay or leave. At first, we believed feeling of safety to be closely intertwined with individualism but as have been touched upon earlier in the discussion, personal interests may in this culture often step aside when it comes to the safety of family. More support for this theory is found when respondents are asked why certain events spark fear and many participants in the study replies that it is for the safety of their family that they are afraid.

### **6.3.1 *Insensibility to risks***

In difference to above mentioned priorities (livelihood, community and family), insensibility to risk is not about making an active decision of staying but rather explaining a lack of such. One of the more surprising findings from the field research is that several respondents claimed that they did not care about the future and what may happen. This can be seen as something positive since it implies a feeling of safety and a satisfaction with present conditions. Downside is that such a baseline makes investments on mitigating risks difficult due to the individual not relating to long-term gains (Slovic, Finucane, Peters, & MacGregor, 2004).

Several respondents expect the future frequency and damage from typhoons to increase while also stating that they feel safe. This is very much in line with the optimism bias as explained by Johnsson & Levin (2009) where respondents do not see themselves as exposed to an increasing risk even though others are. This may also find support in the data from asking what place is considered as safer or more dangerous. Close to none could name a place safer than their present location while most could name a place more dangerous. We consequently believe that optimism



bias may be one of the explanations to why people live in high-risk areas. They simply see their present location as less dangerous than other places. Moreover, optimism bias may produce the feeling of relief after a negative event, implying that after something negative have happened the danger is over (Harris & Hahn, 2011). Put in the context of previously dangerous events this might be one more cause of why people live in the area.

One other bias that may play a role in explaining why people live in high-risk areas is the status quo bias as explained by Samuelson & Zeckhauser (1988). Status quo bias is an emotional bias that implies a preference for keeping things as they currently are. Few of the respondent's report any will to migrate from where they currently reside and we understand this as strive to avoid what could be considered as "transition fees". Examples of this is the strictly monetary question of how to afford a new home if moving, even though wanting to move. One more example is the costs in time and energy that would have to be invested in order to find a new job and getting to know a new community. It is easy to relate to this feeling of contentment with living at status quo just to avoid the immediate expenditure that a change would provoke.

As discussed above there are several psychological biases and cognitive aspects that have implications in how people perceive and react on risk. Worth to notice is that these biases do not explicitly belong to people living in high-risk areas, but to mankind in general. Hence, these aspects can give a hint to why people live in Samar, but cannot alone be the explanation. We believe that the social and economic aspects as described in *livelihood, family and community* are the main findings to answer why people live in high risk areas.

## 6.4 DRR education

Education is important in order to achieve sustainable development (UNICEF, 2016; UNISDR 2008). Sustainable development is a wide concept but according to Wisner (2006), DRR education is one of its most vital parts and should be included in tuition, worldwide.

From the schools, we know that all children and youth are taught how to prepare for an upcoming event and what to do during an earthquake. Kearney (2015, p 41) says that: "[...] children have unique knowledge and ideas about risks in the communities and how to address them." Further highlighting the importance of discussing risks and make children a part of this conversation. Among adults, there is a relatively high awareness of what DRR education their children are provided with. The fact that six of the respondents did not know whether their children have had any DRR education, we believe, is because the children went to school prior to typhoon Yolanda. But even if most parents do know what their children learned we believe that it does not mean they always would act according to what their children are taught. We believe it implies that the knowledge does not stay only among children but is spread throughout the families.

From the result presented in previous chapter it is clear that preparing oneself and family for evacuation as instructed in school is the most common mitigating measure. This is interesting since it implies flight, (evacuation), rather than fight (staying), as the most attractive option. Asgad had several casualties from typhoon Yolanda, for example did respondent *No. 26* (Woman, 26 years old) lose both of her parents when they decided to stay in their home rather than evacuate. Experiences like this should further enhance the general notion of preparing oneself for evacuation rather than stay and endure, meaning that it may not fully be due to successful DRR education.

One of the difficulties for knowing whether the adults DRR knowledge comes from their children is that similar type of DRR education is also carried out for adults. During the interviews, we checked for this by asking all respondents if they had undergone any training themselves and almost two thirds of the respondents claimed to have some sort of training as adults. The fact that so many of the respondents have attended training themselves impose a difficulty for the accuracy of this study since making the distinction between societal DRR knowledge and DRR education among youth less clear. Other difficulties are that DRR education may have become a part of the general curriculum at different times in different schools. We do know that DRR awareness increased after typhoon Yolanda but if this was the tipping point for initiating DRR education it might now be too early to establishing any clear trends. We believe that a good way to investigate how DRR education is spread throughout the community would be to make a longitudinal study. This was not possible at this time due to limitations in time and resources.

One additional finding is that the respondents in their own language use English abbreviations such as DRR, DRM, NGO and other disaster related terms with ease. It has probably been introduced by the efforts from NGO's and government and shows that knowledge on DRR have been rooted in the area to such degree that it now is a part of their standard vocabulary.

## **6.5 Risk based land use planning**

The island nation of Philippines is an area with multiple challenges when it comes to building a resilient society. According to INFORM-Index Philippines is ranked as fourth on hazards and exposure and with an up going trend due to climate change (INFORM, 2016). If, to this, adding an ongoing urbanization and increasing population density of coastal areas, it is not an understatement that the nation will stand a few challenges in the future. In this section of the chapter we will discuss how the finding of why people live in high-risk areas can be of use for risk based land use planning.

Even though the important role of urban planning for adaptation and risk reduction is most often recognized, practices are still poorly developed and there is much to do within the area (Wamsler, 2014). We believe that a good functioning societal risk reduction can only be achieved if it is to become an inherent part of the risk based land use planning process. It is thus not sufficient to come in at the end of the process and address what can be done but risk management need to be continuous and iterative. As learned from the study, the trust in community officials is high and it would consequently be important that these are closely involved in the process. Once such a plan has been set up it is important not to confuse the planning with a written plan since planning is a never-ending iterative process while a written plan can only be seen as a snapshot of that process at a specific time (Lindell & Perry, 2003).

Family proximity is stated to be important by a large part of the respondents and we believe that this is also closely intertwined with the feeling of belonging that a closely-knit community provides. Previous efforts have clearly showed the difficulties of moving people out of their community to new places due to losing the network that previously was the framework of their working society (Terminski, 2013; Smith, 1996). By this means we find it wise to always go through a risk based land use planning process before people even move to a new place.

From the results, it is clear that few of those living in the high-risk area of Samar would move voluntarily. The same we believe can be said for most residents around the world. If to this adding

the immense costs that would be associated with moving an entire community or building physical barriers for protection, the importance of risk based land use planning is further enhanced.

Appliance of risk based land use planning would demand resources, mainly from the government and municipality while also reduce the speed by which expansions and changes could be made. Other negative aspects of such an implementation we believe is that it would reduce the flexibility and maneuverability in a quickly developing society, possibly restricting economic growth. On the other hand, would such an approach to economic development reduce the volatile shifts that a high-risk alternative would yield, thus be a better option overall. We in so doing conclude that risk based land use planning may have both negative and positive outcomes on short term but overall it is the better of options.

There are difficulties with implementing risk based land use planning since the areas deemed to be unfit for human settlements would reduce the suitable land for a growing population. This would lead to an increase in the population density of other areas meaning that the risk profile for this new area would increase and the problems for people living in high-risk areas remain. We can see no clear solution to this problem other than that there are many factors that needs to be taken into consideration when performing risk based land use planning.

Risk based land use planning is not only about physical features so when building a resilient society, we believe it is vital that all community members have a true picture of existing risks. Renn (2008) characterizes good risk communication with the following two key points that we believe could be a foundation for increasing societal preparedness:

- 1. Those who are central to risk framing, risk appraisal or risk management understand what is happening, how they are to be involved, and, where appropriate, what their responsibilities are; and,*
- 2. Others outside the immediate risk appraisal or risk management process are informed and engaged (page 316).*

Exactly how the communication is to be framed is up to what perceived risks that exists, the context and how the risks are changing (Renn, 2008).

From the data, we find that the more education a respondent has attended the more likely that he or she has attended DRR training in their adult life. Besides this, those with more education have a generally higher interest of moving to a low risk area. A study made by Wamsler, Brink & Rantala (2012) says that formal education has implications on DRR knowledge even if not touching on the specific subject of DRR. Examples of improved capacities among those with a formal education are (Wamsler, Brink & Rantala, 2012, p 36):

- Increased access to information about risks and risk reduction information.*
- Provide authorities with information and the assessment about own risk*
- Moving out of a risk area, and in general a greater mobility.*
- More acceptance to warnings, evacuation and emerging centers.*

This shows that also formal education is important for the ability of reducing occurrence and consequence from future events and securing the availability to education when planning an area may hence be vital for reducing risk.

Several respondents have a pessimistic viewpoint on future risks and expect them to increase. For many this notion is based on the concern that climate change is enhancing the destructive weather systems while also raising the sea level. When planning populated areas for the future it is thus vital to have this in mind.

Wamsler (2014, p 35) suggests that the following three measures are difficult when reducing risk:

- *Vulnerability reduction or disaster mitigation: to reduce current and future susceptibility in order to better withstand potential hazard impacts.*
- *Preparedness for response: to create functioning and flexible mechanisms and structures to respond to potential hazards/ disasters.*
- *Preparedness for recovery: to create functioning and flexible mechanisms and structures to recover from potential hazards/disasters*

Since the measures for reducing risks and vulnerability affects the whole population in the specific area, it is crucial to understand the population. The result in this thesis shows some aspects of the population, both why they live in high risk areas and our understanding of their risk perception. There must also be taken into consideration that the decision makers are having power over the resources and they must know and understand the population and vice versa. This study does not cover that and further research on the subject would be of interest to answer the research questions.

## **6.6 Generalizations and Biases**

The Samar region is surveyed with two sampling communities. This raised the question of whether findings can be representative for the whole of Samar. Since we use a qualitative research method, results are generated in an analytical way and cannot be statistically verified. One way of increasing representation for the entire island would be to include more than two communities. Downside with including more communities is that this could compromise the theoretical saturation for each area (which is not fully achieved anyway). Hence, we believe that the findings are applicable to the whole of Samar in a general context. In fact, we found in literature that the livelihood category could be applicable for the whole of Philippines, but with local variations and settings (Scoones, 1998; Santana, 2008; FAO, 2013; Jaspars & O'Callaghan, 2010; Mutahara, Haque, Alam Khan, Warner, & Wester, 2016).

The interviews were conducted during typhoon season which could lead the respondents to speak more about typhoons and reduce interest for other hazards. Recent events might leave a strong imprint on the individual and by this means enhancing the tendency to overestimate the event of probability (Johnson & Levin, 2009). This bias is called availability bias and is more common when respondent have a strong emotional connection to the event (Johnson & Levin, 2009). This also means that dangers that is not covered by media or seldom come up are less likely to appear during interviews.

Three random interviews were extended with an extra element that was designed to see the difference between hazard awareness and what is perceived as dangerous. The procedure is that we presented several potentially harmful events for the respondents that are less frequent in the everyday discussion such as red tide, tidal wave, and jelly fish. The result from the test is that people are aware of more dangers than they present themselves. It was also obvious that they changed their ranking of dangers after being reminded about the less obvious dangers. This could be explained by the availability bias and should be considered when evaluating the result of this study.

## 7 Conclusion

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Throughout the report, the following three research questions have been processed through data collection, coding, analyzing, result presentation and finally discussed:

- Why do people live in high-risk areas of Samar, Philippines?
- Are there any notable trends that DRR education among youth and children is affecting the local society's notion of safety?
- What implications do the findings about why people live in high-risk areas have on risk based land use planning?

The first and primary question does not have an absolute answer. Instead one has to look on the situation from a holistic and contextual aspect. The best way to grasp what the respondents have expressed throughout the interviews is through following categories:

- **Livelihood.** Work and a way of subsistence is what often brought up as important by respondents when saying what they value. Fishing and farming are the more common means of subsistence, these activities does also provide the option of either selling or consuming the produce. Other types of income were also mentioned, such as relief funds, house chores and allowance from family and relatives. Low expenses are of importance for most people and this means both food, daily necessities and accommodation.
- **Family.** The relatively low access to social security systems make the family unit vital for raising the kids, and caring for the old or sick. The family unit is also the way for many to learn a profession and inherit vital local knowledge from elders. Proximity to family members are for these reasons an important aspect of living in a high-risk area.
- **Community.** The respondents emphasize the importance of being able to trust neighbors and community leadership. Respondents also feel that services are important, such as the ability to send children to school within their community. The community is also seen as peaceful, beautiful and embedded with memories.
- **Insensibility to risks.** Through different reasons some people living in high-risk areas are insensitive to the level of risk do not include risk in the everyday life partially due to avoiding any transition fees. Some feel like their safety is in the hands of God and mitigating measures will consequently not matter. Others feel like there is no place safer than their current location and some people live in high-risk areas simply because they do not care about the risks.

It is clear that not everyone wants to stay at their current location and there are some psychological biases and cognitive aspects that can explain how they rationalize the decision to live in the high-risk areas. The findings of this field study however indicate that stronger incentives are the categories stated above. Most respondents perceive the area as dangerous and what they specifically express as dangerous are those hazards that would yield high consequence such as typhoon, earthquake and tsunami. In general, young people are less afraid but if this depends on an unawareness of risks or on having less responsibility is not possible to determine from this study. Most people also feel future risks are uncertain but the broad perception is that they are increasing.

All children and youth are educated in school on how to prepare for typhoon and what to do if an earthquake strikes but it is not possible to assess any clear trends on whether DRR education increases the societal notion of safety. Most parents are aware that their children are trained in DRR and also express that it is a subject that is discussed in the home. Different types of DRR training is known to be conducted also for adults, primarily for officials and men, making it hard to verify where the knowledge comes from. The interest for further training is expressed positively by a majority and this is good news since DRR training would bring benefits for the society and is said to be a requirement to achieve the sustainable development goals.

Land use planning need to take risk into account in order to build sustainable communities that may reduce danger to health, environment and economy. From the results on why people live in high-risk areas it is clear that such planning needs to be done as an iterative process that takes important aspects such as place attachment, extensive family networks and means of livelihood into consideration. A large part of the population believe that future may bring more disasters and thus it is important that the feeling of safety is prioritized in planning processes. It is also vital that such practice take a holistic perspective in the process so that risks are not just moved but actually reduced.

It is reasonable to say that the topics that are investigated would require more research. Especially of interest would be to know how the results from this study compare to other areas of the Philippines. As of now, the results presented are viable for Samar Island but also here is the generalization questionable since both participating communities are coastal. Further it would be interesting to investigate how much of an impact availability bias have on the respondents due to typhoon Yolanda and typhoon Ruby striking so recently.

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## 9 *Appendix A - Respondents*

<b>Respondents No</b>	<b>Gender</b>	<b>Age</b>	<b>Age group</b>	<b>Education</b>	<b>Location</b>
1	Male	61	45-79	Elementary school	Tigdaranao
2	Male	67	45-79	Elementary school	Tigdaranao
3	Male	56	45-79	Elementary school	Tigdaranao
4	Male	72	45-79	Elementary school	Tigdaranao
5	Female	49	45-79	Elementary school	Tigdaranao
6	Female	36	18-44	Unknown	Tigdaranao
7	Female	27	18-44	High school	Tigdaranao
8	Female	46	45-79	High school	Tigdaranao
9	Female	69	45-79	Elementary school	Tigdaranao
10	Female	52	45-79	Collage/University	Tigdaranao
11	Female	75	45-79	High school	Tigdaranao
12	Male	18	18-44	High school	Tigdaranao
13	Female	79	45-79	Elementary school	Tigdaranao
14	Male	38	18-44	Collage/University	Tigdaranao
15	Male	27	18-44	High school	Tigdaranao
16	Female	27	18-44	Elementary school	Tigdaranao
17	Male	27	18-44	Elementary school	Tigdaranao
18	Female	22	18-44	High school	Tigdaranao
19	Male	38	18-44	Elementary school	Tigdaranao
20	Male	50	45-79	High school	Tigdaranao
21	Female	44	18-44	Collage/University	Asgad
22	Female	53	45-79	Collage/University	Asgad
23	Male	53	45-79	Elementary school	Asgad
24	Male	28	18-44	Collage/University	Asgad
25	Female	49	45-79	Collage/University	Asgad
26	Female	33	18-44	Collage/University	Asgad
27	Female	74	45-79	Elementary school	Asgad
28	Female	29	18-44	Elementary school	Asgad
29	Female	23	18-44	Collage/University	Asgad
30	Male	18	18-44	High school	Asgad
31	Male	37	18-44	Collage/University	Asgad
32	Male	49	45-79	Collage/University	Asgad
33	Male	71	45-79	Elementary school	Asgad
34	Male	63	45-79	Elementary school	Asgad
35	Female	57	45-79	High school	Asgad
36	Female	28	18-44	Collage/University	Asgad
37	Male	29	18-44	Collage/University	Asgad
38	Female	31	18-44	Collage/University	Asgad
39	Male	34	18-44	Elementary school	Asgad
40	Female	36	18-44	Elementary school	Asgad

## 10 *Appendix B - Interview Guide*

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The first interview guide used in Tigdaranao is be presented below.

*We are happy to be here in your hometown, have you lived here for long?*

*Where are you from?*

*If you have moved from somewhere else to here, what made you choose this place?*

*What are the advantages of living here?*

*What are the disadvantages of living here?*

*Have you moved much in the nearby area?*

*Do you want to move or stay? What makes you want to stay/move?*

*What is your main reason for staying?*

*If you were asked to move somewhere else what would the new place require?*

*Do you own your house yourself?*

*What do you do? Occupation, means of subsistence, where and when? Alternatives?*

*Do you have any insurance?*

*Do you feel safe in this area? If not, is it for your own or others health?*

*Do you feel like you are exposed to less dangers/hazards than most Filipino, why?*

*Do you think that your neighbors are afraid of the same things as you are?*

*What can you do to feel more secure?*

*Have you taken any mitigating measures or preventive actions?*

*What disasters/dangers have you experienced? Do you think new disasters may arise?*

*What is causing the disasters? What requires to happen for them to stop?*

*You've said this and this makes you afraid, can you say what you are most afraid of?  
Can you rank/say how much afraid you are of the others.*

*Has the area been more dangerous before?*

*Have any dangers appeared and/or substantially increased?*

*Who would you say have the largest responsibility for reducing dangers?*

*Have you had/recall any DRR education? From where?*

*What role does the school have in DRR education?*

*If you had questions about DRR, who would you ask?*

*If you have kids, in what school did they go to? Do you know if they had any disaster risk programs?*

*Have you heard about Plan International? Their Work and their programs?*

The second interview guide was used in Asgad and is presented below.

*How long have you lived here?*

*Where are you from if not from here?*

*If you have moved from somewhere else to here, what made you choose this place, and were you aware of any dangers or risks associated with this place?*

*What are the advantages of living here? Can be anything.*

*What are the disadvantages of living here?*

*Would you prefer to move or to stay? Main reasons?*

*If you were asked to move somewhere else what would that new place require?*

*At what point you would you think you have to move? Destroyed house/large threat/no income etc.?*

*Do you have any insurance?*

*What kind of insurance would you like to have if cost was not a factor?*

*When you think of Salcedo, what kind of events, natural or man-made, do you recall as dangerous to health and lifestyle, economy, property and environment?*

*What danger do you think of as the worst one?*

*Can you rank the rest (if more than two)?*

*What disasters/dangers have you experienced? How bad was the damages from it?*

*Do you feel safe in this area?*

*If you have children, what are they afraid of?*

*Is it more or less safe/dangerous to live here now compare to before?*

*Do you think that your neighbors are afraid of the same things as you are?*

*Are there actions you have done to feel more secure and safe and that will reduce potential damage from disasters?*

*Can you think of other places in the Philippines that are more dangerous or safer?*

*Do you think there will be more disasters in the future?*

*Who would you say have the largest responsibility for reducing damages of disasters?*

*When did you first encounter education or training concerning disasters?*

*Would you like to have more education/training concerning DRR and how disasters come up? Would it in that case be by theoretical materials or practical? Would you like to have some sorts of books or videos that you can rehearse on whenever you want to?*

*Would it be great to have an exchange between barangays about disasters and their experiences?*

*What role does the school have in societal DRR education?*

*If you had questions about DRR, who would you ask?*

*What investments could be made in this community to increase safety?*

*Do you know if your children have been educated about disasters?*

*Is DRR a subject discussed in the family? Exchange between young and old?*

*What kind of media do you have? Radio, newspaper, TV, Internet (computer/cell phones)?*

*Have you visited other places that Samar in the Philippines?*

*Can you read? Is there a problem with the different dialects concerning intake of information?*

*If you are religious, do you think you would stay longer here compared than if you had no faith?*



**Figure 10.** This is the Asgad shoreline. All houses were here before the storm surge from super typhoon Yolanda wiped out all houses.



**Figure 11.** The old church was totally demolished. In the picture one can see the remnants of the community church that are left.



**Figure 12. The new church under construction just a few meters away from the previous one.**



## 12 *Appendix D - Coding*

Coding is done in two separate files where the first has a focus on answering why people live in high-risk areas and the second on DRR education. Sources are the number of interviews that touch upon the subject and references are the total number of references. For example, 22 respondents spoke about Family, 38 times in total.

Coding for why people live in high risk areas are presented below.

Name	Sources	References
Community	22	27
Family	22	38
Livelihood	30	73
Misaellaneous	37	57
The impact of safety feeling	23	34

**Figure 13. Categories of why people live in high risk areas.**

Name	Sources	References
Community	22	27
Adv community helps out all the time	1	1
Adv community is clean	1	1
Adv is used to place, easy living, know	1	1
Adv prefer to stay coz used to life and	2	2
Adv the community is well managed	1	1
Comfortable living makes me want to s	1	1
Community helpful, I trust all of them	1	1
Currently living at a peaceful place	6	6
Easy living here	2	2
Even though limited budget, communi	1	1
It's comfortable here	1	1
Leisure is a advantage of living here	3	3
Like living by ocean due to recreationa	1	1
Nice barangay officials in Asgad	1	1
School	0	0
Satisfied with having a school in th	2	2
Staying because children in school	2	2
Want to stay because having life here	1	1
Wants to stay because area is memora	2	2
We are free here	1	1

**Figure 14. Community components as explaining why people live in high risk areas.**

Name	Sources	References
Family	22	38
Main reason for staying here is that I rai	1	1
Family is advantages of staying	6	8
Family main reason for staying	7	7
Family proximity is important	15	20
I am with family in case of emergency,	1	1
Nothing wished for here, happy with fa	1	1

Figure 15. Family components as explaining why people live in high risk areas.

Name	Sources	References
Livelihood	30	73
Expenses	21	32
Advantage that there is not much t	2	2
Cheap accommodation	21	23
Cheap here vs Calbayog, don't nee	1	1
Cheaper to live here	1	1
City is expensive	1	1
It's cheaper than Manila here	1	1
Little expenses	1	1
Minimal expenses	1	1
Would like to move but does't hav	1	1
Source of income and food	23	41
Farming	6	6
Adv - we can plant any thing w	1	1
Adv - coconuts business and fa	1	1
Adv - farming, agri prod like co	1	1
Growing vegetables for support	1	1
One reason for moving back w	1	1
Sustain family by copra, farmin	1	1

Figure 16. Livelihood components as explaining why people live in high risk areas.

Name	Sources	References
Livelihood	30	73
Expenses	21	32
Source of income and food	23	41
Farming	6	6
Fishing	5	6
Fishing is better than other jobs	1	1
Fishing is important in commun	2	2
Fishing to sustaining family	2	3
Food related	6	10
Cheap food is important	3	3
Easy foodwise	1	1
Food can be bought here	2	2
Food is fresh here	1	1
Food is produced here	2	2
Neighbors supply with food	1	1

Figure 17. Livelihood components as explaining why people live in high risk areas.

Name	Sources	References
Livelihood	30	73
Expenses	21	32
Source of income and food	23	41
Farming	6	6
Fishing	5	6
Food related	6	10
Other income	11	15
Barangay could help with emer	1	1
Earning good money here	1	1
Easy to make a livelihood here	5	5
Income below poverty treshold,	1	2
Livelihood is local advantage	3	3
Retired finding extra income	1	1
Support money from children a	1	1
Tig is good because we recieve	1	1
Stays because of job location	3	3
We can produce rice, meat and fish	1	1

Figure 18. Livelihood components as explaining why people live in high risk areas.

Name	Sources	References
Misaellaneous	37	57
Born in Asgad	16	17
Born in Tig	11	11
Not aware of risk before moving to As	2	2
Parents lived here before me	1	1
Resons for moving to Tig (vänta med d	9	11
Don't know where to go elsewhere or	5	7
Can't move to safer grounds becau	1	1
Don't know how to get work el sew	1	1
Never been elsewhere	1	1
No possibilty of moving so built a s	1	1
Too old to move	1	2
Want to do farming, only thing I kn	1	1
Live here because there is no disadvan	7	8
Enjoyable living here, no dis	1	1
No disadvantages	7	7

Figure 19. Miscellaneous components as explaining why people live in high risk areas.

Name	Sources	References
The impact of safety feeling	23	34
Living here because it is safe	20	25
Feeling safe	13	14
If endangered, someone will come a	1	1
Religious belief	8	9
Believe that god can prevent dis	5	5
God brings feeling of safety	3	3
Hardcore religious	1	1
This is a safe place	1	1
Living here becuase there is no safer pla	8	9
As dangerous to live by CA as moun	1	1
Just as dangerous anywhere	2	2
There are no safe places	6	6

Figure 20. Feeling of safety and what makes people want to stay.

Coding for education, how family communicate DRR and perceived risks are presented below.

Name	Sources	References
DRR education	41	85
Children have DRR education	20	21
Community gets safe when educated, more education needed	1	1
Do not know if school teach DRR	6	6
DRR education enhance feeling of safety	4	4
DRR training & education experience	26	34
Have no DRR education	12	12
How education should be done	1	1
More education about CC is required	1	1
More training & education now	6	6
Parents are important for DRR education	1	1
School is important for DRR education	22	22
Wants more education on DRR	18	20

Figure 21. Codes that describe what is said about DRR education.

Name	Sources	References
Family talk DRR	36	38
Children teaching adults	4	4
Do not speak about DRR in family	2	2
Have no kids but speak about DRR	3	3
Interaction of DRR knowledge	18	18
Parents speak about DRR alone	1	1
Parents teaching children	8	8

Figure 22. Codes that describe how DRR is communicated within the family.

Name	Sources	References
Past and future	0	0
CC is causing hot weather and fires	1	1
Changed perception over time	27	30
Dangers have increased and their intensity have increased I	19	20
Earthquake never experienced	1	1
Emerged danger is sand quarreling	1	1
Emerged danger is strangers	1	1
Experienced fire when young, not again	1	1
Have experienced one (big) typhoon before ruby, Willmeng	1	1
Lack of food have declined in later years	1	1
No danger difference over time	5	5
No experience of disasters when young, but when old	1	1
Pollution (hazard) have declined	1	1
Social context - repect to elders have decreased	1	1
Typhoons made damages when young also	1	1
Dangers same during stay	3	3
Hygiene may reduce future disasters	1	1
More dangerous now	15	15
People are more hungry for info	1	1
Same level of fear even if more disasters	1	1

Figure 23. Codes that explain how risk and feeling of safety is changing and have changed at their present location.

Name	Sources	References
Perceived hazards	40	323
Big waves perceived as dangerous	3	3
Declining fish stock perceived as dangerous	3	3
Earthquake	19	56
Earthquake experience	3	3
Earthquake not dangerous	2	2
Earthquake perceived as dangerous	18	30
Falling trees	5	5
Falling trees are prevented	1	1
Falling trees perceived as dangerous	3	3
Falling trees perceived more dangerous by elder	0	0
Fire	7	9
Fire experience	3	4
Fire not perceived as dangerous	1	1
Fire perceived as dangerous	6	7

Figure 24. The different perceived hazards and in what context they are mentioned.

Name	Sources	References
<ul style="list-style-type: none"> <li>☐ Flooding <ul style="list-style-type: none"> <li>○ Flooding can be caused by...</li> <li>○ Flooding experience</li> <li>○ Flooding in the future</li> <li>○ Flooding not perceived as dangerous</li> <li>○ Flooding perceived as dangerous</li> </ul> </li> </ul>	10	14
<ul style="list-style-type: none"> <li>☐ Heavy rain <ul style="list-style-type: none"> <li>○ Heavy rain cause flooding</li> </ul> </li> </ul>	5	6
<ul style="list-style-type: none"> <li>☐ High tides <ul style="list-style-type: none"> <li>○ High tide experience</li> <li>○ High tides cause flooding</li> </ul> </li> </ul>	4	7
○ Jelly fish perceived as dangerous	2	2
<ul style="list-style-type: none"> <li>☐ Landslide <ul style="list-style-type: none"> <li>○ Landslide is caused by logging</li> <li>○ Landslide not possible in the vicinity</li> </ul> </li> </ul>	6	7
○ Ozon layer can be fixed by planting trees	1	1
<ul style="list-style-type: none"> <li>☐ Pollution <ul style="list-style-type: none"> <li>○ Pollution causing disasters</li> <li>○ Pollution causing sickness</li> </ul> </li> </ul>	5	6

Figure 25. The different perceived hazards and in what context they are mentioned.



Name	Sources	References
Quarrying	3	4
Illegal quarrying	2	3
Quarrying causing disasters	3	4
Red tide perceived as dangerous	1	1
Sickness	9	14
Sickness affecting the economy	3	5
Sickness causing a higher risk	1	1
Sickness due to environmental issues	2	2
Sickness experience	3	3
Sickness may cause future problems	1	1
Sickness perceived as dangerous	5	7
Storm surge perceived as dangerous	15	20
Traffic is dangerous in other places	1	1
Transition of landscape is dangerous	1	1
Tsunami	11	13
Have had tsunami education	1	1
Tsunami can not appear	1	1
Tsunami perceived as dangerous	11	13

Figure 26. The different perceived hazards and in what context they are mentioned.

Name	Sources	References
Typhoon	40	143
Typhoon affects the livelihood	15	17
Typhoon caused by climate change	2	2
Typhoon causing trauma	1	1
Typhoon education	8	9
Typhoon experience	31	47
Typhoon less dangerous when young	1	1
Typhoon perceived as dangerous	36	76
Typhoon prep and evacuation	13	17
Typhoons are intensifying	8	9
Typhoons consequences does not matter	2	2
Weather	4	4
Monsoon affects livelihood	3	3
Thunder & Lightning is frightening	1	1
Volcanoes	3	3
Volcanoes perceived dangerous if living close	2	2

Figure 27. The different perceived hazards and in what context they are mentioned.

Name	Sources	References
Perceived safety feeling	40	139
Children fear	18	18
Feeling of safety	38	62
Do not know if feeling safe	3	3
Feeling safe	16	17
Not feeling safe	12	14
Previous city was more safe	1	1
God brings feeling of safety	3	3
I can only feel safe if my family is safe	6	6
Neighbors fear	34	35
Other places perceived dangerous or safe	15	15
Do not know	9	10
Feels less safe than most Filipino	5	5
Knows of a more dangerous place	18	18
Knows of a more safe place	4	4
The evacuations center is a safe spot	2	2
The mountains is a safe spot	4	4
There are no safe places	9	9
This is a safe place	9	9

Figure 28. The different perceived hazards and in what context they are mentioned.