
Treball Fi de Màster

Rebuilding from the ground up. The role and challenges of knowledge exchange in supporting post-disaster self-recovery in the Philippines

Erika Palmieri



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MASTER THESIS

**REBUILDING FROM
THE GROUND UP**

The role and challenges of knowledge
exchange in supporting post-disaster
self-recovery in the Philippines

2017/2018 Academic Year

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Abbreviations

ESA	Emergency shelter assistance
DRR	Disaster Risk Reduction
IP	Indigenous People
LGU	Local Government Unit
MDRRMO	Municipal Disaster Risk Reduction and Management Office
MSWD	Municipal Social Welfare and Housing Department
NCIP	National Committee of Indigenous People
NGO	Non-Governmental Organisation
NHA	National Housing Authority
TESDA	Technical Education and Skills Development Authority

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Abstract

Less than 15% of the population affected by natural disasters receive shelter assistance from humanitarian or governmental institutions; the other 85% reconstruct their own places independently. When communities have to decide to self-rebuild, risk-resistant construction techniques are generally applied in a limited way. The paradox is that when these techniques, are communicated through guidelines and training, they have a limited impact on the rebuilding process. Thus, it is necessary to better understand why existing communication patterns and methods are ineffective and which knowledge adoption factor is determining better self-recovery risk reduction standards along post-disasters reconstruction. The aim of this research is to understand why information about typhoon-resistant construction techniques is limitedly spread in the context of self-building processes for unassisted communities after Typhoon Haiyan in 2013 in the Philippines. During the fieldwork, the role of the key stakeholders and the construction processes of the houses were investigated to deepen the understanding of communication methods. The results of the study emphasize the lack of local awareness about typhoon resistant techniques, the insufficient communication in top-down support of reconstruction and the excessive complexity of certain divulgatory tools. Thus, it seems necessary to optimize the knowledge network to support the application of typhoon resistant construction techniques by communities. The research, therefore, provides useful insight into the needs of future shelter assistance and proves the relevance of knowledge in self-rebuilding after a natural disaster for both governmental and non-governmental organizations.

Keywords

knowledge exchange, self-recovery, knowledge adoption, disaster risk reduction, community resilience, post-disaster recovery

1. Introduction

While natural disasters increase in frequency and intensity, more and more people around the world are affected by them (Dominey-Howes, 2015) and support provided by NGOs is far from being complete. In particular, it has been found that **humanitarian organisations are able to provide with shelter less than one-sixth of the populations affected by natural disasters worldwide** (Parrack et al., 2014). All others (about 85%), along with the further difficulties that follow a natural event of destructive impact, need to deal with reconstruction by themselves. Some factors compete in making this process harder – in particular, many of the affected communities have limited financial resources, and are exasperated by the frequency of the calamities. The comprehension of factors of constructive risk is crucial for communities (Opdyke A., 2017; Twigg J., 2004; Catholic Relief Services, 2015) to build consciously and accordingly to risk reduction criteria, and can help reduce the consequence of future natural disaster and strengthen the community resilience. Unfortunately, the spread of such awareness and an adoption in practice of hazard resistant guidelines is experiencing a significant delay and is still far from being endemic in both policies and practice. A wider application of those principles can only be enabled by an attentive analysis of the obstacles at play (IFRC, 2013). It is also important to deploy programs with a long-term rather than emergency-only mentality; and to compare the results of interventions with the existing practices of self-reconstruction.

The case study for this thesis is the Typhoon Haiyan of 2013 in the west Philippines. After the disaster, many humanitarian organisations took part in programs on the east coast, where communities were believed to be more vulnerable: this made the processes of self-recovery higher in the west Philippines. This thesis focuses on two causes: the effectiveness of techniques and the ignorance of knowledge; it is meant to provide insight into the effectivity of knowledge exchange of currently applied support tools and to suggest alternative ones.

Practically, this thesis seeks to prove that most of the accessible communication tools are currently inadequate to provide long-term benefits for community resilience. Generally, these are limited and specific to local conditions, such as existing construction skills and communication patterns (Catholic Relief Services, 2015). Thanks to a research in several countries, CRS has found five factors that have an impact on adoption of hazard-resistant construction techniques by non-beneficiaries (Catholic Relief Services, 2015): cues for action, access, perceived risk, perceived positive consequences, and perceived self-efficacy. This thesis will deepen this knowledge.

Only few of the in-depth studies which describe self-recovery processes deepen these determinants exclusively for hazard-resistant building criteria (Catholic Relief Services, 2015; Twigg J. et al, 2017; Maynard V. et al, 2016). Other than this, no analysis regarding enhancing the local knowledge networks for self-recovery has been provided. During post-disaster recovery, limited importance has been placed on knowledge use of local actors and their opinions are inadequately represented in global decision-making (Gaillard and Mercer, 2012). The combination of technical shelter professionals with social and communication expertise can enhance to development of tools that support the adoption of hazard resistant construction techniques (Catholic Relief Services, 2015). Moreover, prioritizing learning systems becomes fundamental in disaster risk reduction (Twigg J., 2004).

In contrast with one-way transfer, the knowledge exchange is a two-way chain of knowledge transfers and leads to agreements in discussions and thus to a more resilient adoption of knowledge (Fazey I. et al., 2014). Currently, as one of the first hypotheses, the supporting tools being used gravitate towards a one-way transfer of knowledge rather than towards a mutual exchange between humanitarian agencies and local communities, which creates barriers in the adoption of further knowledge (Cadag and Gaillard, 2012). Rather than around knowledge transfer, this study is framed around the concept of knowledge exchange.

1.1 Literature Review and challenges

1.1.1. The knowledge gaps in science, policy and practice

Gaillard and Mercer (2012) propose a horizontal map outlining a model to integrate local and scientific knowledge, outside and inside actors and top-down and bottom-up actions for a valuable DRR (Figure 1). The 'road map', identifying 3 areas to bridge gaps in DRR, highlights that the two types of knowledge have to be integrated. Local knowledge needs not to be underestimated in order to optimize the process of DRR in cost-effective, participation and sustainability (Howell P., 2003). However, this would not be possible without an effective communication involving multiple stakeholders; a communication that can result in a cooperation in practice between top-down and bottom-up initiatives, supporting the ability of people to be prepared for natural disasters. The role of knowledge considerably influences this preparation; an effective use of knowledge in Disaster Risk Reduction can enhance community resilience.

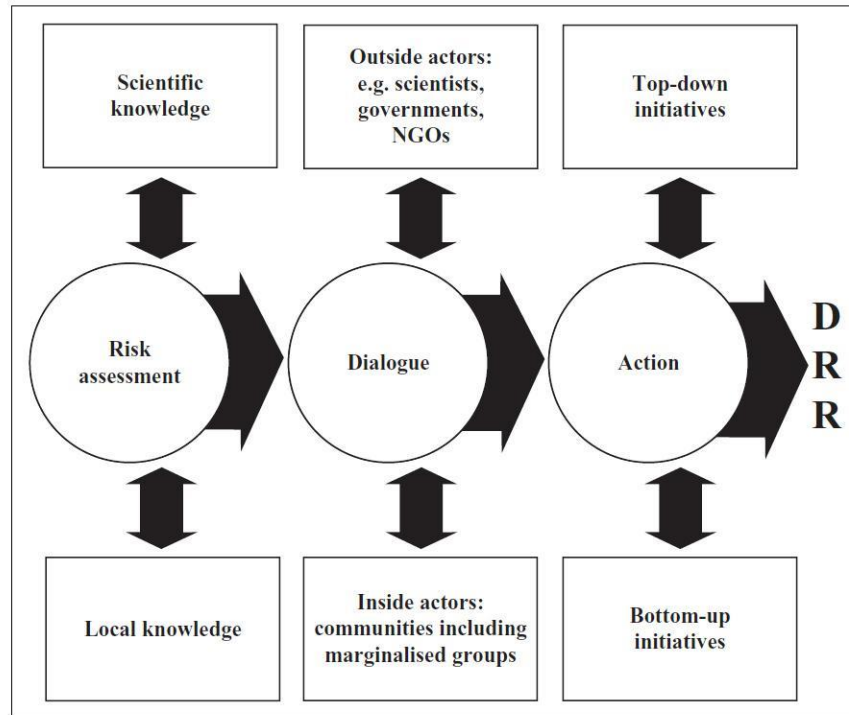


Figure 1. Road map for integrating knowledge, actions and stakeholders for disaster risk reduction.
 Source: Gaillard and Mercer, 2012

Factors and challenges interfering the adoption of knowledge in DRR have been identified by Spiekermann R. et al. through a model which reveals the hurdles in practice that lead to the dissolution of knowledge (Spiekermann R. et al., 2015) and the lack of science adequately translated into policy and practice (Figure 2). The knowledge exchange between science, policy and practice presents some risks. Spiekermann et al. include in their model recommendations to enhance the effectiveness. They recommend to promote learning by designing knowledge and involving all the possible actors in the communication process. As of today, this is not regularly the case in humanitarian aid. In order to facilitate an effective adoption in the action phase, it is vital to explore how to enable and design the interactions of knowledge exchange.

This thesis concentrates specifically on hazard-resistant building criteria adopted in practice. I have been considering two sequences: from (1) Knowledge into Translation Transfer; and from (2) Translation Transfer into Adoption.

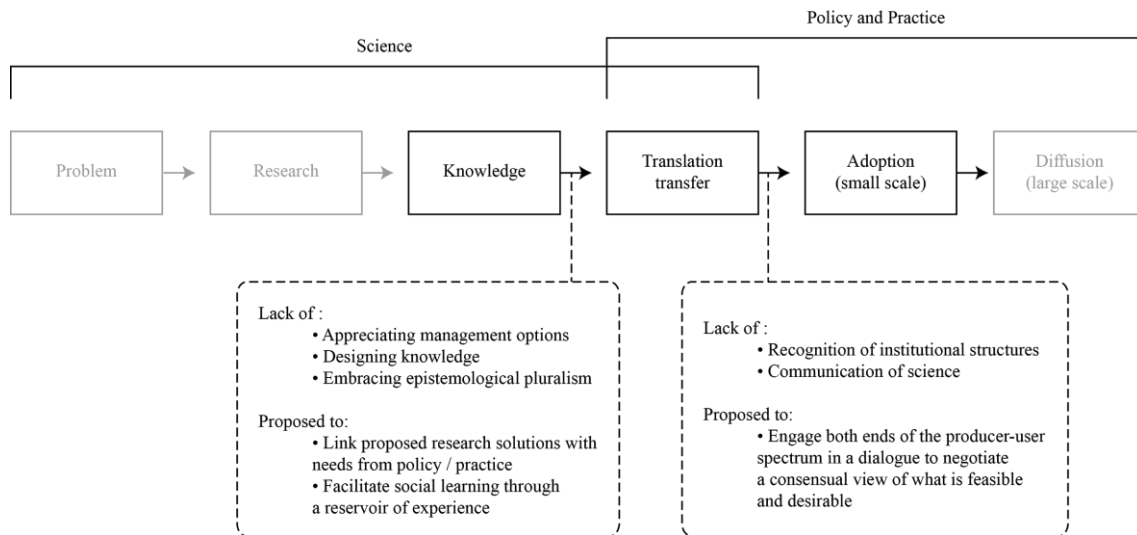


Figure 2. Steps considered in the model by Spiekermann R. et al, with lacks and propositions to enhance the adoption of knowledge in policy and practice. Source: Spiekermann et al. 2015, Elaborated by Erika Palmieri.

This research focuses on the exchange of knowledge between local beneficiaries, aiming to rebuild their homes after a natural disaster, and professionals on hazard resistant construction from NGOs and governmental organisations with the aim of improving the local disaster resilience and hazard resistant construction knowledge. The exchange is considered effective when a community learns and improves the hazard resistance of their homes in case of further, anticipated natural disasters. What is also stated by Spiekermann et al is that this learning process should be monitored over an extensive period (Spiekermann R. et al., 2015). Consequently, this thesis focuses on the practical knowledge fundamental for DDR, related to decision making and actions (Spiekermann R. et al., 2015), and on the knowledge required to optimize construction processes, in the form of process knowledge and realization-knowledge (van Aken J.E., 2005).

1.1.2 State of the art and research questions

It has been found that few studies have sufficiently examined the needs and efficacy of knowledge exchange in post-disaster self-recovery: the related research is summarized here. Casie Venable has studied the building outcomes garnered from the Shelter Cluster key messages in Ecuador (Venable C., 2017). Diewer Druif and Jip Nelissen have studied the impact of owner-driven housing processes in post-earthquake Haiti, while Kenny Meesters has focused on knowledge management and knowledge in post-disaster recovery in Haiti, the Philippines and Nepal (Streefkerk et al., 2014). Victoria Maynard and her colleagues have studied the effectiveness and efficiency of interventions in assisted self-recovery (Maynard V. et al., 2016). Aaron Opdyke has assessed the impact of Shelter Cluster key messages in 19 assisted

shelter cases after Haiyan in the Philippines (Opdyke A., 2017); equally, Maarten van der Veen has investigated ways to strengthen information management in hazard prone areas, such as Malawi and the Philippines (van der Veen M., 2016). In addition, factors for effective knowledge transfer are found to be relevant for knowledge exchange as well (College of Humanities & Social Science, 2016).

The discrepancy between science, policy and practice highlights the issue of the frequent rejection of scientific knowledge in practice: **during post-disaster recovery scientific knowledge is mainly transferred, not exchanged.** The adoption of new knowledge is particularly significant for this research because it indicates the first step in the learning process of a whole community, which, in turn, supports the community resilience. Different studies confirm that communication has significant value for post-disaster recovery; the main question addressed in this research is ‘**What factors help or hinder knowledge adoption in post-disaster self-recovery supporting the understanding and application of hazard resistant construction principles?**’ This question will be answered thanks to the data analysis from the fieldwork conducted by E. Hendriks in 2017, that indicates that the communication of hazard resistant techniques can be considered ineffective. Also, a specific sub-question has been formulated: ‘**Why are certain guidelines to build back typhoon resistant not passed on or adopted by international and local humanitarian agencies and local engineers, and how does this limit adoption in practice by households that reconstruct their own house?’**

The thesis is structured as follows: subsequent to this introduction, Chapter 2 describes the impact of Typhoon Haiyan and the reason to choose an area of the West Philippines as a case study. In Chapter 3 I will explain the research methods used during the first phase of data analysis and the second phase of field work. Self-recovery of the community in Coron, the principal stakeholders’ decisions and the factors that hinder the adoption of typhoon resistant construction techniques through the knowledge chain are presented in Chapter 4. Finally, the discussion of results and concluding remarks are provided in Chapters 5 and 6.

2. Case Study

2.1 Typhoon Haiyan

On November 8, 2013, Typhoon Haiyan (also known locally as Typhoon Yolanda) struck the Philippines. Not only it was one of the strongest typhoons ever registered in the country: it has been considered one of the most powerful typhoons ever to make landfall in recorded history. The 600 km diameter Typhoon Haiyan crossed the Philippine archipelago, bringing widespread devastation in its path (Lagmay A. M. F et al., 2015) with strong winds, heavy rainfall, and storm surges causing extreme loss of life and widespread damage to property. With maximum winds of 235 km/hour it had devastating effects, causing destruction across the Central Philippines (WHO Philippines, 2014). In total 6,300 people died, and 4,1 million people were displaced (USAID, 2014); a total of 1,084,762 houses (partially: 595,149 and totally 489,613) were damaged during the onslaught of the hurricane (NDRRMC, 2013), and the total damages amounted to PHP 89,598,068,634 (€ 1,396,983,481.10) (NDRRMC, 2013). The difficulty in reaching all the small islands of the Philippine archipelago by non-governmental organisations has made the recovery slow, and, consequently, self-recovery processes have been seen as the only solution for those communities.

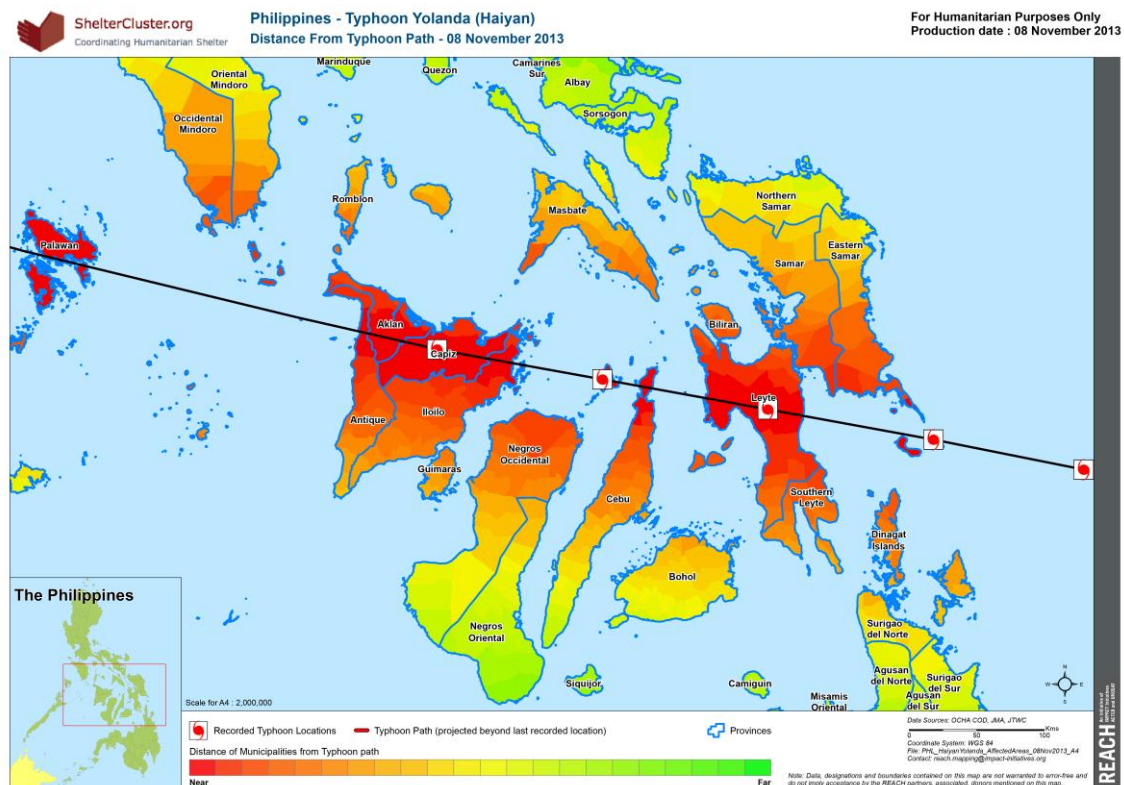


Figure 3. Direction of Typhoon Haiyan. To the West it is possible to see the area of Coron, the location of this case.
Source: Shelter Cluster Philippines, 2013.

2.2 Self-recovery in the Philippines

Evaluations from 2015 reveal that only about 25% of the demand for shelter is covered by the humanitarian sector (Swithern, S., 2015). After Typhoon Haiyan in the Philippines, the Shelter Cluster had the target to support approximately 50% of the affected households; the other half would be responsibility of the local government (Shelter Cluster). However, as shown in Figure 3, nearly 62% of households identified as being in need did not receive complete assistance (aside from ESA), whether humanitarian or governmental (Opdyke A., 2017). Insufficient funding resulted in NGOs providing with complete humanitarian shelter assistance only 70% of the original target, meaning 34% of the total affected households (Opdyke A., 2017). The lack of funds played a role in missing this target: most of the funding was allocated to emergency relief rather than to shelter recovery or to programs that would enhance the resilience long-term (Shelter Cluster Philippines, 2014). In addition, most NGOs primarily dedicated their efforts to help communities where the damage had been most severe (the east coast of the Philippines), leaving other parts (mainly the west coast) without humanitarian assistance (Van der Veen M., 2016). Data have also been affected by these priorities: while sufficient information is available on the impact of humanitarian assistance, little is known about the areas that remained outside its range.

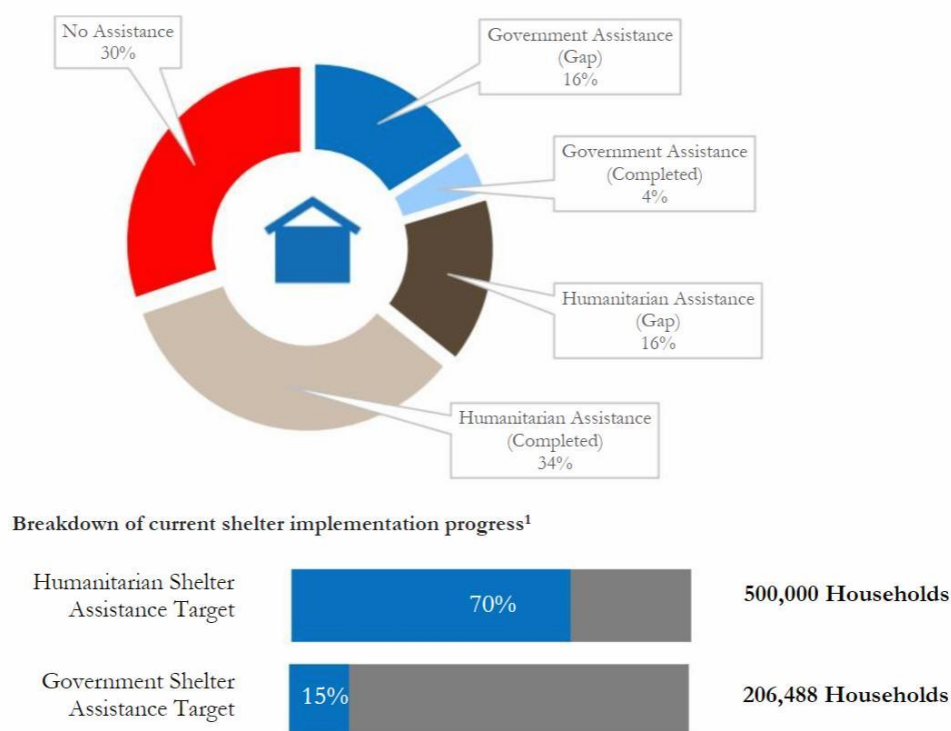


Figure 4. Humanitarian and government shelter progress as of January 2017, Source: Opdyke A., 2017

2.3 The case of West Philippines: the area of Coron, Palawan

This thesis considers communities on the west-coast of the Philippines, in the area of Coron. Despite the havoc that was wreaked in the wake of Haiyan, the region was largely overlooked for assistance. The main reason for this is that at the time when the NGOs decided where to intervene Coron had not yet been hit by the Typhoon Haiyan. In fact, NGOs have 72 hours after a disaster to decide where to help. (van der Veen, 2017) – equally, NGOs make decisions based on the first data available from a disaster, and the use of satellite images can impede attempts to accurately predict where people have been affected. The selected communities received limited shelter assistance from humanitarian or governmental organisations compared to the east coast; the region of Coron deals with a typhoon approximately once every ten years, while the east coast faces the prospect of a typhoon on an annual basis. These circumstances might have made the inhabitants more resilient as they were not dependent on humanitarian shelter assistance in the years before the typhoon. Similarly, inhabitants are expected to be less capable of building hazard resistant housing because of the lack of experience and precedent.

In the municipality of Coron, in the province of Palawan, a number of communities (*Sitios*) in different *Barangays* (districts of the municipality) have been found not to have received shelter assistance. In all communities, approval is given by the Barangay captain and the elderly.

The communities selected for the first field research are:

1. Sitio Buyot Maliit in Barangay Malawig
2. Sitio Calasag in Barangay Turda
3. Sitio Binican in Barangay San Nicolas
4. Sitio John Bucal Bucal in Barangay Guadalupe
5. Sitio Dungon in Barangay Marcilla
6. Sitio Canipo in Barangay Bulalacao

In the second field work, more Barangays were observed:

7. Barangay Poblacion 1
8. Barangay Poblacion 2
9. Barangay Poblacion 5

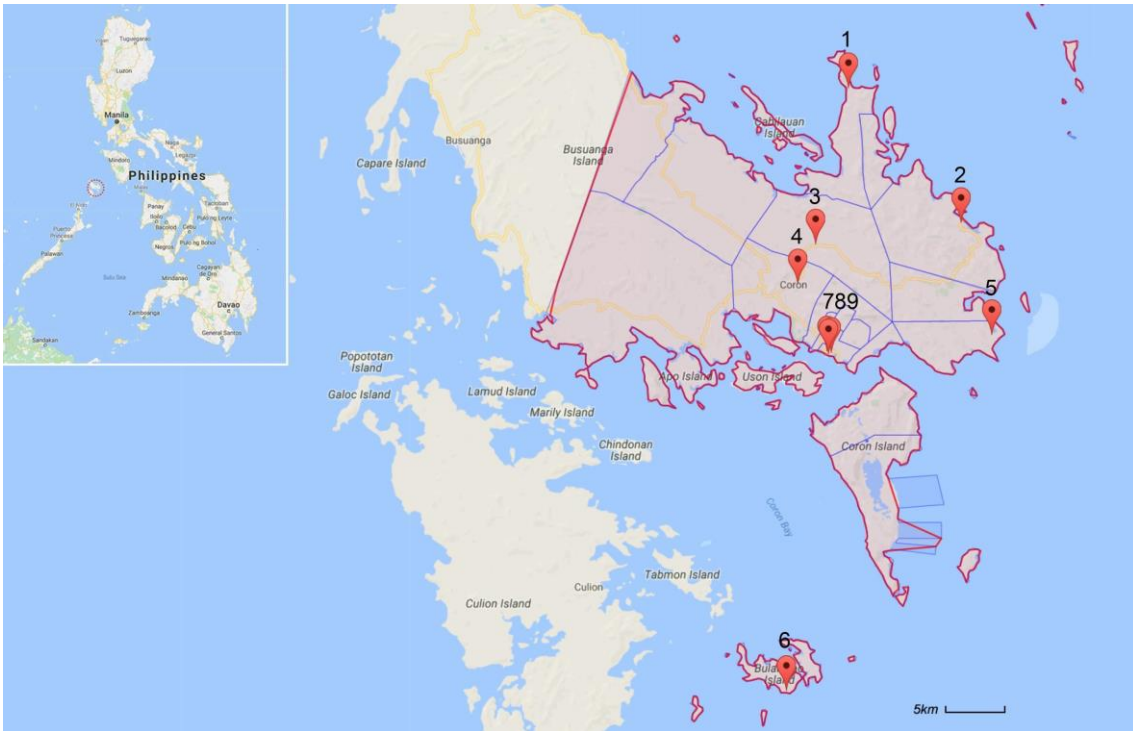


Figure 5. Map showing the area of Coron and the selected Sitios. Source: philippines-streets.openalfa.com, Google Maps, elaborated by Erika Palmieri

3. Research Method

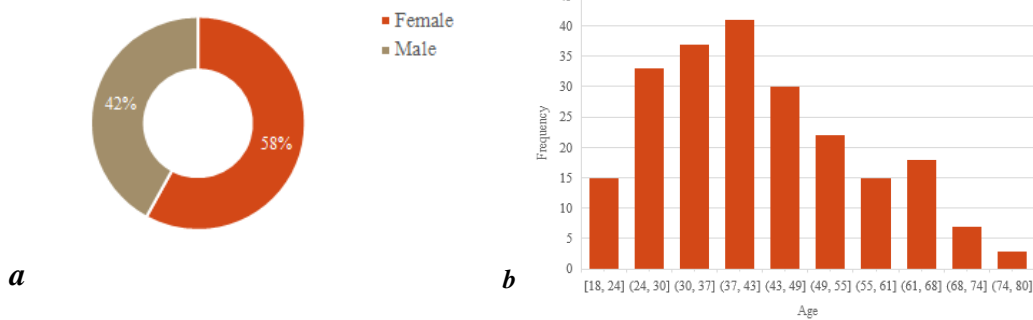
To give a comprehensive understanding of the factors and behaviours of people that affect the knowledge adoption of hazard resistant techniques and the stakeholders' role during a self-recovery process, a mixed method of data analysis and fieldwork was conducted.

The research has been framed in two phases. In the first phase, a desk research was conducted in order to analyse the data collected by Eefje Hendriks during her field research in 2017 to provide an overall view on the needs of self-recovery. In the second phase, through a triangulation method that considered the data analysis from the 2017 fieldwork and the literature, the research has investigated on a deeper level the knowledge network hurdles for an effective adoption of typhoon resistant construction techniques. The extensive fieldwork that constitutes part of the second phase took place between March and April 2018.

3.1 Phase 1: Data analysis from field research in 2017

After first contact with Eefje Hendriks and her independent research team, a starting period of four months (December 2017 - March 2018) has been dedicated to analyse secondary data from the previous field research that helped me to find the first results for the follow research question: **“what factors help or hinder knowledge adoption in post-disaster self-recovery supporting the understanding and application of hazard resistant construction principles?”** To triangulate and explain findings six qualitative and quantitative methods were used: (1) household surveys, (2) carpenters surveys, (3) focus groups, (4) key-stakeholder interviews, (5) observations, (6) geographical and community profile.

Household surveys. Across the 6 communities, 220 participants who had not receive humanitarian assistance after typhoon Yolanda were surveyed, 58% (127) of them are women and 42% (93) are men. Secondly, the age range is from 18 years old to 80. See Graph 1b for the distribution (Annex 1).



Graph 1a. Gender repartition of household survey participants, **Graph 1b.** Age distribution of household survey participants. Source: Elaborated by Erika Palmieri

Carpenters surveys. Carpenters were included because households' build back safer knowledge depends mainly on carpenters. In total, 13 carpenters were surveyed, the average is two for each community (Annex 2).

Focus groups. This specifically refers to a focus group as a gathering of people who participate in a planned discussion on a particular topic. In this case, focus groups were used to discuss three main topics: *recovery timeline*, *hazard resistance* and their *priorities* (Annex 3).

Key-stakeholder interviews. Through semi-structured interviews, all stakeholders of the expected knowledge network were involved: households that are responsible for their own construction, skilled labourers that are in some cases hired by the households, the local carpenters school (TESDA), and the local authorities involved in housing and shelter construction. (Municipal Disaster Risk Reduction Department, National Housing Authority, Municipal Social Welfare and Housing Department and the National Committee of Indigenous People).

Observations. Observation during different conversations in the field research were registered to support the research objective.

Geographical and community profile. Pre-assessments for each *Sitio* have been completed to provide data relating to accessibility, type of shelter assistance, amount of damaged houses, services access and inhabitants occupation. (Annex 4)

3.2 Phase 2: Field work

Between March and April 2018, extensive field research was conducted, firstly to co-exist and develop immersive contact with the community and, secondly, to deepen the research with new results. The results from the 2017 fieldwork show that typhoon resistant construction techniques are not applied by the Coron communities (which will be explained further in the next chapter). Therefore, the second fieldwork was fundamental in understanding why this knowledge chain (see Figure 6) is not effective in the area. The sub-question research considered was **‘Why are certain guidelines to Build Back typhoon resistant not passed on or adopted by international and local humanitarian agencies and local engineers, and how does this limit adoption in practice by households that reconstruct their own house?’**

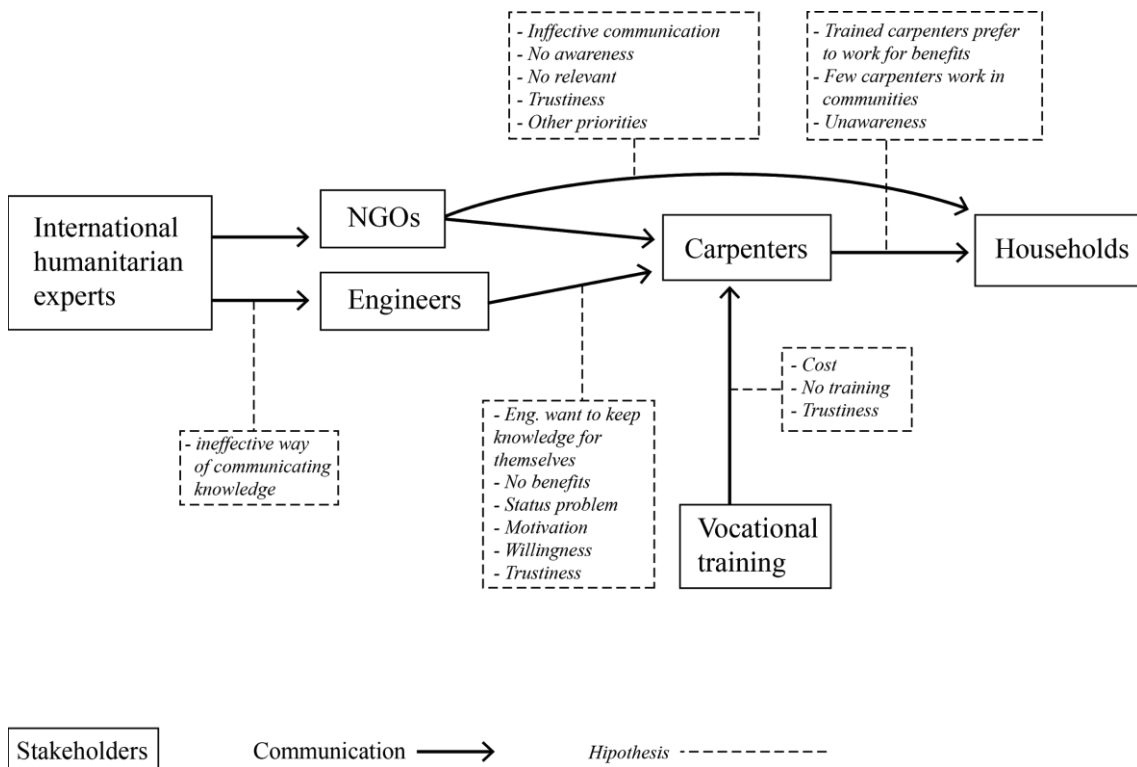


Figure 6. Knowledge chain and hypotheses about ineffectiveness of knowledge exchange, Source: Elaborated by Erika Palmieri

In Figure 6 it is possible to identify the first hypothesis which attempted to find results and to select the key-stakeholders. Therefore, five research methods were identified: (1) Observation on the constructed, (2) Engineers interview, (3) local NGOs interview, (4) International experts interview, (5) Observation.

Observation on the reconstructed. In 5 Barangays, in 50 houses, built with local and light materials as wood and bamboo, it was possible to observe which principles from the Build Back Safer Guidelines (see Annex 5 and table in Annex 6) were applied during the reconstruction. The assessment goal was to identify which information arrives at a household level and which is more difficult to exchange and to be applied.

Engineers interview. As only one figure to have access to knowledge for a safer reconstruction, engineers were interviewed to measure the level of sharing between carpenters and the community. An Interview Protocol was developed (see Annex 7) taking as example the one used for the project COMRADES after the 2015 Nepal Earthquake. This is a not-fixed guideline to help in the interview structure and in emerging discussions; in fact, it is possible to deviate from the order of topics and questions (Comes Y., Roberts S., Meesters S., 2017).

Local NGOs interviews. At a local level, two of the main NGOs (Cordaid and Caritas) were interviewed, both have offices in the area of Coron and, beyond giving shelter assistance, they included in their training and long-term assistance in their programs. The selected questions were framed with the same Interview Protocol (see Annex 8).

International humanitarian experts interview. The Philippines Country Directors of Cordaid and Build Change were interviewed to gain insights about their role in the knowledge chain and which solutions they found in enhancing the application of typhoon resistant construction techniques in the country. These two NGOs were selected because of the collaboration with TESDA, the construction training school based in Coron. The same protocol method was used but with specific question adapted to the International Organization.

Observation. Carpenters' knowledge has been observed. Moreover, during discussions trainings organised by the team from the Netherlands I was working with (in collaboration with Caritas and Cordaid); photos of the built environment helped me to analyse the knowledge applied by households and carpenters and finally moments of discussion with households gave me a better insight of their hazard risk perceptions.

4. Results

Results have been divided into two main sections. The insight into self-recovery actors and needs have been developed in the first, while the second focuses on the stakeholders' role around the knowledge exchange of typhoon resistant construction principles.

4.1. Data analysis from 2017 fieldwork

4.1.1. Understanding recovery aspects and communities' priorities

Community response right after the typhoon

Three years after Typhoon Yolanda, 77% of the participants self-built their houses, while only 10% asked carpenters to help. During the first week after the typhoon, most of the participants (63%) needed to find shelter elsewhere than at home, because their houses were too damaged, while almost half of the residents (45%) came back to their own place after one day, regardless of the damage (Table 1).

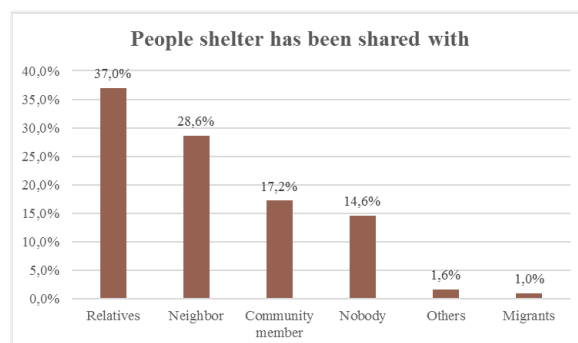


Figure 7. One of the houses affected by typhoon Haiyan, belonging to a family unable to recover by themselves, Source: Picture by Marchien Peskens

How long did you stay in the place you were sheltered?								
Community		up to 1 night	2 to 3 days	up to 1 week	1 to 2 weeks	3 weeks to 1 month	more than 1 month	Total
Barangay Bulalacao	Count	16	16	2	10	4	2	50
	% of Total	11,0%	11,0%	1,4%	6,9%	2,8%	1,4%	34,5%
Barangay San Nicolas	Count	5	1	0	6	1	2	15
	% of Total	3,4%	0,7%	0,0%	4,1%	0,7%	1,4%	10,3%
Barangay Guadalupe	Count	3	4	1	2	3	5	18
	% of Total	2,1%	2,8%	0,7%	1,4%	2,1%	3,4%	12,4%
Barangay Marcilla	Count	22	4	1	5	3	1	36
	% of Total	15,2%	2,8%	0,7%	3,4%	2,1%	0,7%	24,8%
Barangay Turda	Count	2	1	0	1	2	2	8
	% of Total	1,4%	0,7%	0,0%	0,7%	1,4%	1,4%	5,5%
Barangay Malawig	Count	17	0	0	0	1	0	18
	% of Total	11,7%	0,0%	0,0%	0,0%	0,7%	0,0%	12,4%
Total	Count	65	26	4	24	14	12	145
	% of Total	44,8%	17,9%	2,8%	16,6%	9,7%	8,3%	100,0%

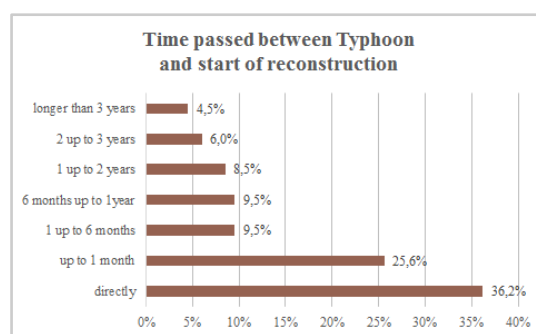
Table 1. Time passed in shelters by community. Source: Elaborated by Erika Palmieri

More than half of the people (53%) with whom they shared the shelters with, were mostly relatives (37%) and neighbors (29%), and were there because their house was too damaged (Graph 2).



Graph 2. People shelter has been shared with. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Further information suggests that a considerable proportion (19%) could not flee to a safer location because they had no available transport. Moreover, it is remarkable that few people (12 out of 145 answers) had to stay longer than one month in their shelter. Graph 3 shows that the reconstruction process started quite fast: most of the people (62%) were able to start within a month, especially in Barangay Bulalacao (18%) and Marcilla (17%)(Table 2). Almost the same number of participants (52%) returned to live in a month in their houses, which also means that they were living there during the reconstruction (Table 3).



Graph 3. Time passed between Typhoon and start of reconstruction. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

When did you start with the reconstruction of this house?									
Community		directly	up to 1 month	1 to 6 months	6 months to 1 year	1 to 2 years	2 to 3 years	longer than 3 years	Total
Barangay Bulalacao	Count	15	20	5	5	11	4	6	66
	% of Total	7,5%	10,1%	2,5%	2,5%	5,5%	2,0%	3,0%	33,2%
Barangay San Nicolas	Count	15	8	3	2	1	1	1	31
	% of Total	7,5%	4,0%	1,5%	1,0%	0,5%	0,5%	0,5%	15,6%
Barangay Guadelupe	Count	2	3	1	2	0	0	0	8
	% of Total	1,0%	1,5%	0,5%	1,0%	0,0%	0,0%	0,0%	4,0%
Barangay Marcilla	Count	25	9	7	9	4	2	1	57
	% of Total	12,6%	4,5%	3,5%	4,5%	2,0%	1,0%	0,5%	28,6%
Barangay Turda	Count	4	3	2	0	1	4	0	14
	% of Total	2,0%	1,5%	1,0%	0,0%	0,5%	2,0%	0,0%	7,0%
Barangay Malawig	Count	11	8	1	1	0	1	1	23
	% of Total	5,5%	4,0%	0,5%	0,5%	0,0%	0,5%	0,5%	11,6%
Total	Count	72	51	19	19	17	12	9	199
	% of Total	36,2%	25,6%	9,5%	9,5%	8,5%	6,0%	4,5%	100,0%

Table 2. Time passed between Typhoon and start of reconstruction - by community. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

When did you start to live in this house?											
Community		directly	up to 1 month	1 up to 6 months	6 months up to 1 year	1 up to 2 years	2 up to 3 years	longer than 3 years	stayed in their house	built temporary shelter first	Total
Barangay Bulalacao	Count	17	19	5	4	3	4	3	5	2	62
	% of Total	8,7%	9,7%	2,6%	2,1%	1,5%	2,1%	1,5%	2,6%	1,0%	31,8%
Barangay San Nicolas	Count	5	7	3	5	1	4	1	4	1	31
	% of Total	2,6%	3,6%	1,5%	2,6%	0,5%	2,1%	0,5%	2,1%	0,5%	15,9%
Barangay Guadelupe	Count	3	2	0	2	0	0	0	1	0	8
	% of Total	1,5%	1,0%	0,0%	1,0%	0,0%	0,0%	0,0%	0,5%	0,0%	4,1%
Barangay Marcilla	Count	14	13	4	8	3	2	1	9	2	56
	% of Total	7,2%	6,7%	2,1%	4,1%	1,5%	1,0%	0,5%	4,6%	1,0%	28,7%
Barangay Turda	Count	5	1	4	0	0	0	3	1	0	14
	% of Total	2,6%	0,5%	2,1%	0,0%	0,0%	0,0%	1,5%	0,5%	0,0%	7,2%
Barangay Malawig	Count	4	11	0	2	1	1	1	1	3	24
	% of Total	2,1%	5,6%	0,0%	1,0%	0,5%	0,5%	0,5%	0,5%	1,5%	12,3%
Total	Count	48	53	16	21	8	11	9	21	8	195
	% of Total	24,6%	27,2%	8,2%	10,8%	4,1%	5,6%	4,6%	10,8%	4,1%	100,0%

Table 3. Time passed between Typhoon and moment people started to live in reconstructed house - by community, Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Governmental aid

Remote communities are hardly aware of governmental programs they can apply for. This is one of first reasons why most households (62%) lack the financial means to start reconstructing earlier. It is especially non-IPs who find support in the microfinance program of CARD to slowly rebuild their houses. Governmental programs have been too slow in the provision of permanent shelter assistance: being on a beneficiary list means receiving aid with construction materials after 2 or 3 years, slowing down the recovery and encouraging people to wait for the reconstruction. In several Barangays, it has also been discovered that governmental aid has been somewhat limited, often only amounting to receiving metal sheets to repair roof damage.

Priorities

As it possible to see in Table 4, shelter is not the **first priority** of the community members.

Food is a first concern after the typhoon, and a concern which still persists. A second concern is the recovery of livelihood, which is essential to provide food and the education for children.

Priorities	Bucal Bucal		Binican		Canipo		Buyot		Calasag		Dungon	
	m	f	m	f	m	f	m	f	m	f	m	f
Faith				7	7	12						50
Livelihood or permanent work	5	16	22	18	8	14	15	12	31		49	43
Permanent job	9											
Secondary livelihood										15		
Housing / shelter					34			13	9	6	9	35
Strong and safe housing		22	29	13		18	21					
Food	3	22		7		11		24		14		23
Health	6	15	15	5	6	14	14	12	11	10	10	16
Clean Water / Water (system)		12	17		4	4		13	20	17	44	25
Disaster Risk Reduction											9	
Environmental policy and protection	6				4	9		9		3	3	
Good location		15										
Transport			16						7	5	1	4
Electricity			13		4		22					
Communication			7									2
Education		15	14	6	5	21	22	13		7	30	15
Vocational training program	4		15		7		9		4		4	
Maintain your knowledge	4											
Togetherness of family and community	5	19	10	10		9	14	14	7	4		
Help each other						10						
Help the family financially to go to school	6											
Support of the government				4								
Money and saving	6	12	28		8							
Have land titles	6										16	
Have your own house	7											

Table 4. Results of priorities in resilience. Source: Data from Eefje Hendriks 2017, elaborated by Erika Palmieri

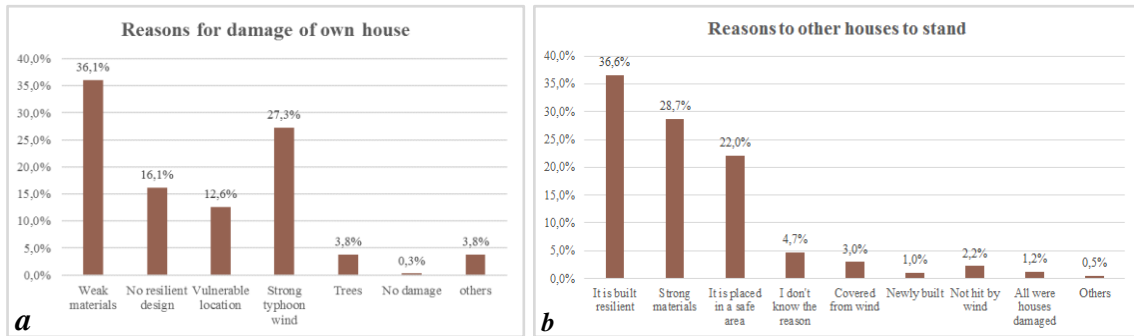


Figure 8. Brainstorm during a focus group about community resilience and what it means for the community.
 Source: Picture by Eefje Hendriks

We can surmise that, in the immediate impact of typhoon, most of the community members (71%) did not solicit help from carpenters about repairing their house. There was a general lack of specialist carpenters, and the aid from the government did not reach all the communities, with the necessary consequence that they had to start self-reconstructing their own houses.

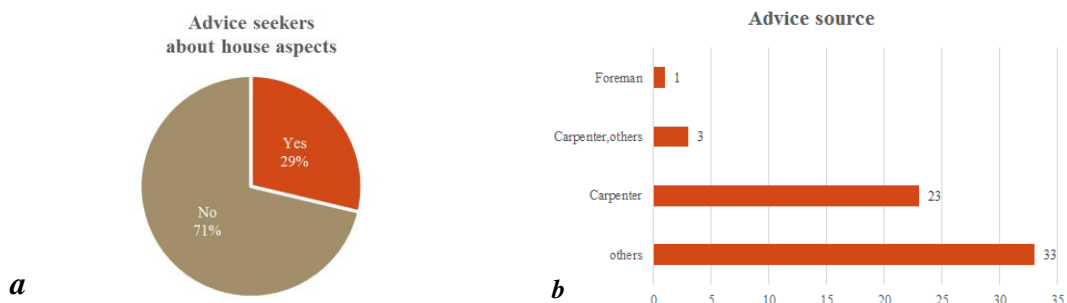
4.1.2 Safety awareness and the challenges of self-recovery

Different factors are perceived by households to be the cause of houses being destroyed. More than one third (36%) consider **material weakness** the first cause of house destruction (Graph 4a). Weak materials concern more women (W62% - M37%), while men have more awareness about the importance of location. A reason often given (27%) is that **Typhoon Yolanda was too strong** to leave any houses standing. Only 16% stated that the **house design was wrong**, but 36% believe that other houses were still standing because they were built in the right way (Graph 4b).



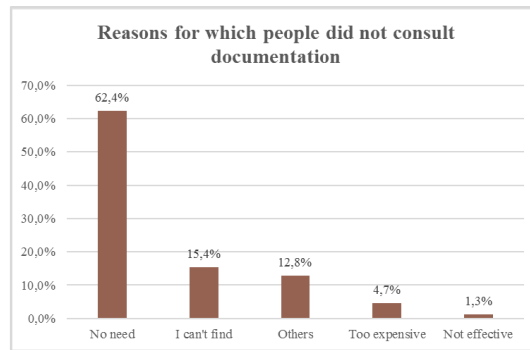
Graph 4a. Reasons for damage of own house, **Graph 4b.** Reasons for other houses to stand. Source: Data by Eefje Hendriks, Elaborated by Erika Palmieri

More than 73% of the respondents started building without a plan and almost the same proportion (71%) did not ask for advice about their house aspects (Graph 5a). Therefore, it results in a reconstruction based on the knowledge people already have; as Graph 5b shows, if they ask for advice they refer to carpenters. The demographic of ‘others’ in Graph 5b stands for a specific name or a relative, thus, as a personal connection. Therefore, carpenters are the closest professional figure they can find. None of the respondents claimed that they had turned to architects or engineers for advice. Nevertheless, those few who asked for advice and help, found satisfying answers (81%).



Graph 5a. Advice seekers about house aspects, **Graph 5b.** Advice source, Source: Data by Eefje Hendriks, Elaborated by Erika Palmieri

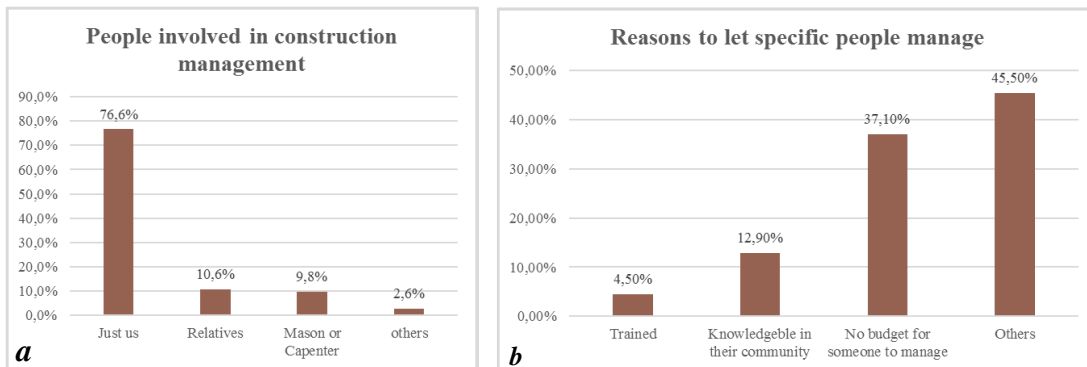
People who think there is no guidance also needed to think that there is no need for documentation in the field of reconstruction. Only 10 out of 218, affirm to have searched for written documentation, while 62% did not need to look for that (Graph 6). It seems to be evident that households normally only search for information through local contacts; moreover, only 50% of people that look for written information can understand it. Also observation confirms that (particularly IPs) are generally illiterate.



Graph 6. Reasons for which people did not consult documentation, Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Construction actors

Most of the construction is managed by the family members themselves (77%), while only few households have hired a carpenter (10%) (Graph 7a).

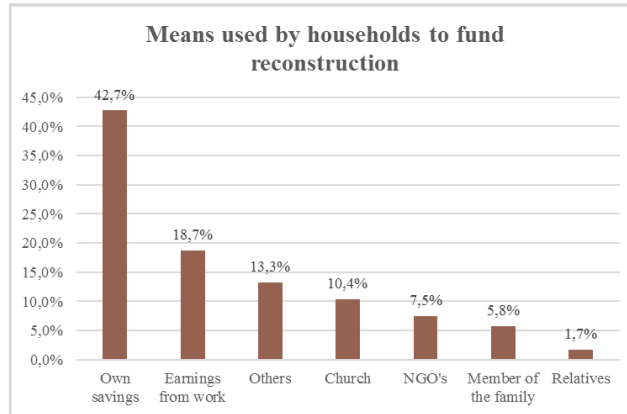


Graph 7a. People involved in construction management, **Graph 7b.** Reasons to let specific people manage. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Concerning the reason to let the chosen person manage the construction, 37% do not have the budget to hire someone else, while most of them replied with “others” (87%) referring to nobody (Graph 7b). The labourers selection is principally made by trustworthiness. Most of the 165 respondents say they have knowledge (24%), that they trust them (14%) or that they are known to be an expert (12%). Families by themselves provide the quality supervision (56%) or they refer to a close family member (30%), only in few cases a carpenter do it (11%).

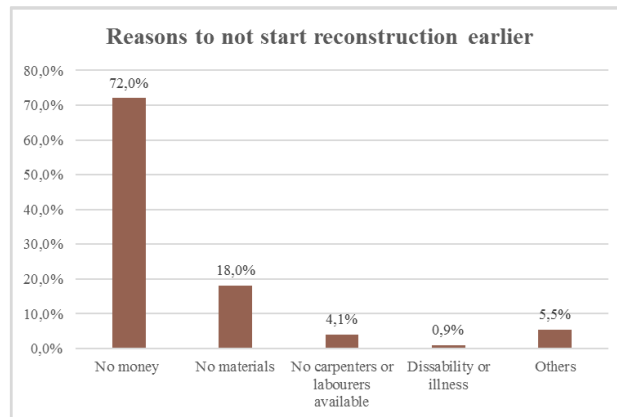
Finance and reconstruction's limits

The reconstruction process depends almost exclusively on previous savings from (61%), while just 18% of the money is provided by NGOs or the Church (Graph 8).



Graph 8. Means used by households to fund reconstruction. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

These results provide evidence (Graph 9) that financial means have mainly (72%) limited the community members to start their reconstruction earlier; in some cases, people have been waiting for the materials promised by governmental assistance. It is possible to state that very few community members (4%) find crucial carpenters help, noting the lack of labour, while 74% stated that they were able to solve their problems by themselves.

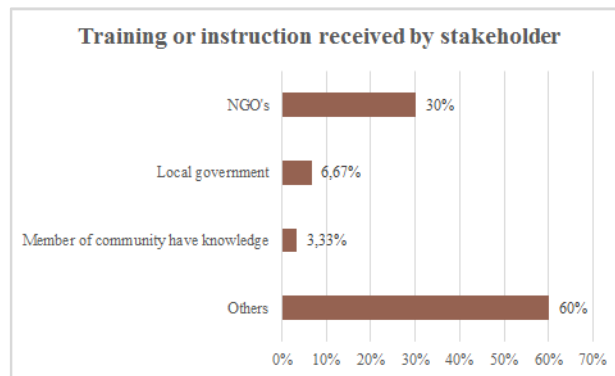


Graph 9. Reasons to not start reconstruction earlier, Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

4.1.3 Construction knowledge and reconstruction process

Construction knowledge and application of typhoon resistant guidelines

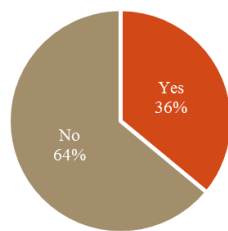
Few people between households are trained in typhoon resistant guidelines, in fact only 14% of the respondents have received some training or instruction, given principally by an NGO (Graph 10), or, in other cases, local government (7%), a community member (3%) and others (60%).



Graph 10. Training or instructions received by stakeholder, Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

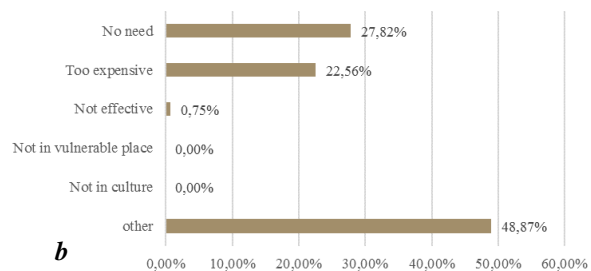
During the training, most the imparted information explained how to build in a resilient way (56%) and how to choose right materials (23%); location is not seen as an essential topic (12%).

Application of hazard resistant construction techniques



a

Reasons for which hazard resistant construction techniques have not been applied



b

Graph 11a. Application of hazard resistant construction techniques, **Graph 11b.** Reasons for which hazard resistant construction techniques have not been applied. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Just over one third confirm (36%) that it is necessary to apply hazard resistant techniques. If they are not applied, results show that it depends on the lack of need (28%) and the cost (23%) (Graph 11b). However, there is a strong intention for most of the community members (88%) to apply them in the future. For those who not intend to apply, 44% declared that it is not needed, it is too expensive (14%) or it is not effective (7%).

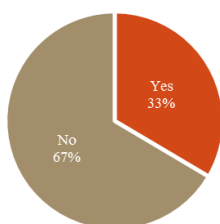
Materials

Houses were rebuilt with material bought in a store (48%), and 19% have gathered materials from their surroundings. Only a small percentage (14%) bought the materials from IPs or from MSWD. Materials provided by MSWD (that households can select themselves from a list) have been sold for food as they do not always correspond to the **local way of living**. Remote IPs for instance to use galvanised steel plates do not have sufficient income to hire a carpenter as they do not have the knowledge to install them and fear the behaviour during storms. In fact, the most common construction material is wood.

Location choice and land ownership

Most of the community members (67%) did not have a choice in the site selection for their houses (Graph 12); when they had a choice, they chose a place close to their livelihood. Only in Barangay San Nicolas did respondents consider a safe place as first priority. Meanwhile, in Barangay Guadalupe, the land ownership was the first factor for the site selection (Table 5).

Location choice for reconstruction



		If yes, why did you select this location?					
Community		<i>Its near in livelihood</i>	<i>Safe place</i>	<i>Own land</i>	<i>No choice</i>	<i>Others</i>	<i>Total</i>
Barangay Bulacao	Count	7	1	1	0	6	15
	% of Total	7,3%	1,0%	1,0%	0,0%	6,3%	15,6%
Barangay San Nicolas	Count	4	5	3	2	3	17
	% of Total	4,2%	5,2%	3,1%	2,1%	3,1%	17,7%
Barangay Guadalupe	Count	2	2	3	2	3	12
	% of Total	2,1%	2,1%	3,1%	2,1%	3,1%	12,5%
Barangay Marcilla	Count	15	1	4	1	2	23
	% of Total	15,6%	1,0%	4,2%	1,0%	2,1%	24,0%
Barangay Turda	Count	4	2	1	0	2	9
	% of Total	4,2%	2,1%	1,0%	0,0%	2,1%	9,4%
Barangay Malawig	Count	7	1	2	0	10	20
	% of Total	7,3%	1,0%	2,1%	0,0%	10,4%	20,8%
Total	Count	39	12	14	5	26	96
	% of Total	40,6%	12,5%	14,6%	5,2%	27,1%	100,0%

Graph 12. Location choice for reconstruction, **Table 5** Reasons to select a specific location, Source: Data by Eefje Hendriks, Elaborated by Erika Palmieri.

To sum up, people are more aware of material qualities than the value of site selection. Another issue relating to the site comes with the “no-build zone”: those sites on the coastal area which are most affected, cannot be selected as the beneficiary for material provision or housing projects; even though fishermen depend on this location for their livelihood. Moreover, location is not necessarily crucial because, for instance in Dungon, participants believe God protects the houses in which people take shelter during a typhoon or storm.

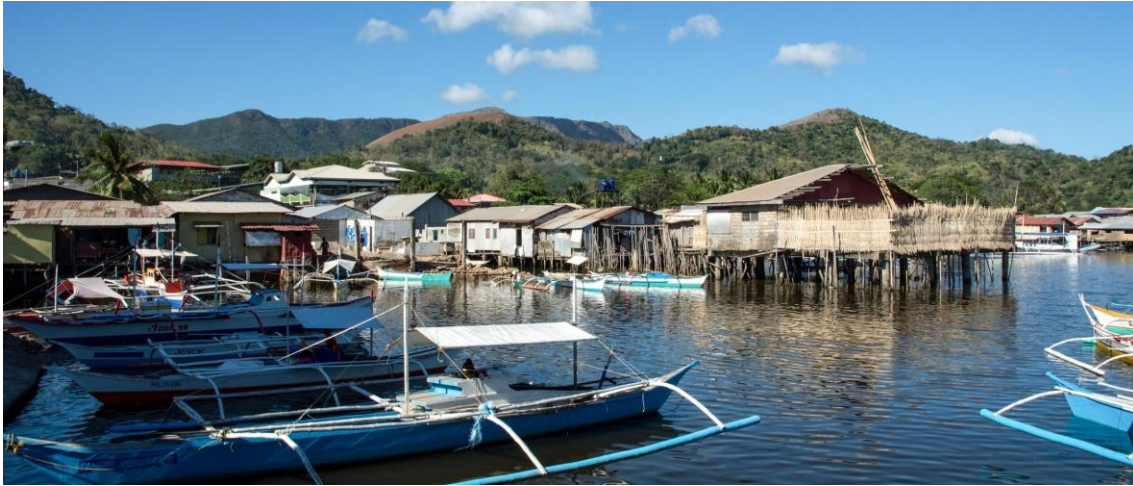
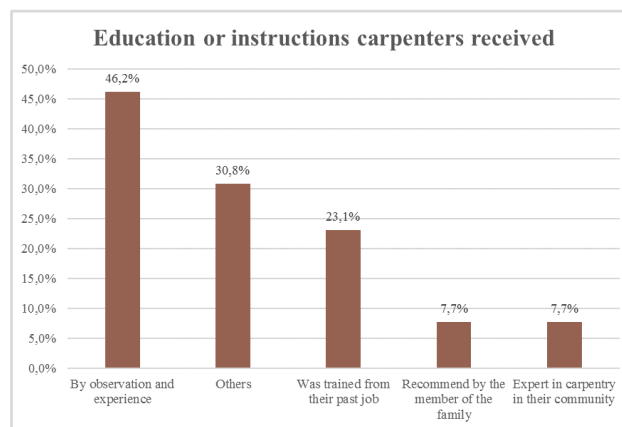


Figure 9. Coastal houses in Barangay 2. Source: Picture by Erika Palmieri

4.1.4. Carpenters’ capacity building and Typhoon resistant construction knowledge

The reliability of carpenters is the main reason they are chosen, rather than their knowledge of construction. Results show that most of the carpenters (47%) take this job based on previous experience and observation (Graph 13), without having a qualification related to carpentry or housing. Thus, their knowledge depends strictly on the other carpenters they work with.



Graph 13. Education or instructions carpenters received. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

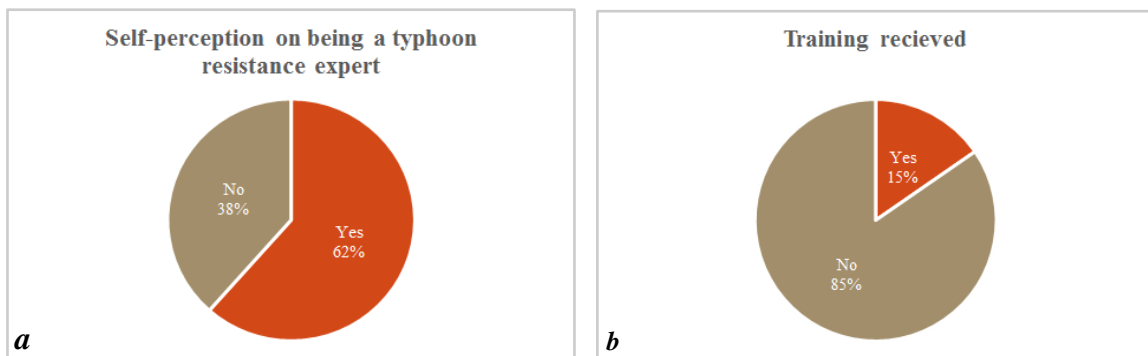
Furthermore, it has been found that the quality of the work is checked only by the owner (46%) or will not be checked at all (4 out of 13). Also for supervising, most of the people chosen get their knowledge from experience (61%), while only 15% learn how to supervise from studies.

Knowledge related

Research results indicate that 60% of the participants consider themselves an expert on typhoon resistant constructions (Graph 14a). However, only 15% of the participants undertook a training course or examination (Graph 14b).

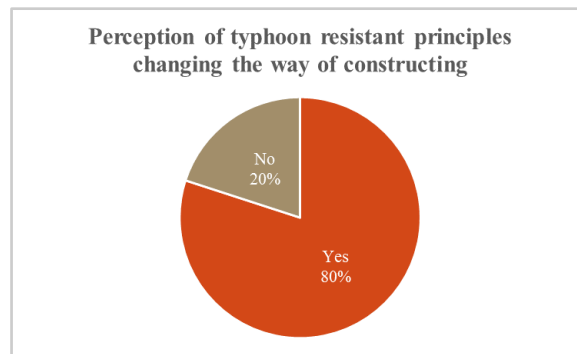


Figure 10. Carpenters during knowledge exchange training in collaboration with NGO Cordaid.
Source: Pictures by Erika Palmieri



Graph 14a. Self-perception on being a typhoon resistance expert, **Graph 14b.** Training received. Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

Under further scrutiny, it can be said that for only 1 carpenter out of 13, their training was provided by a humanitarian unit, and in other cases by an engineer. Almost all participants (90%) are willing to apply these principles on typhoon resistant construction: safety of the house (40%) is given as the first reason to follow these principles, while 30% are motivated to receive more projects. Additionally, the application of those rules appears to drastically modify the way in which carpenters build and restore houses; building a stronger house, labour procedure, or building stronger foundations, are some of the changes that are applied.



Graph 15. Perception of typhoon resistant principles changing the way of constructing, Source: Data by Eefje Hendriks, elaborated by Erika Palmieri

As aforementioned, carpenters learn mostly by experiencing and observing (Graph. 13), thus it is possible to find a reason to why only approximately one third (31%) of the carpenters searched for written documentation. Those who did not look for documentation found it too expensive or too hard to find. Furthermore, half of the participants have questions regarding how to build a stronger house, however, they only ask nearby people. In the future, participants would like to have training or teaching.

Building perception

Half of the participants claim that their specialty lies in using their materials. Only a single respondent said that the way he constructs the houses would be strong enough to survive a typhoon. 54% of the participants aim to specialise the construction of the house to make it more durable during a typhoon and to keep their family safe, the rest (46%) hope they will be hired for more jobs. On the other hand, the results show that only 23% of the carpenters interviewed think the houses that they have built will stand after another heavy typhoon, and only 1 participant stated that the house he/she has constructed is built upon typhoon resistant principles.

To sum up, the 13 carpenters interviewed in the area of Coron are unaware of how to build a house resistant enough to survive a typhoon. Moreover, they trust the quality of materials without knowing the optimum way is to use those materials.

4.1.5 Stakeholders' role in knowledge exchange

This section introduces the main stakeholders responsible for disaster recovery and education in the area of Coron. Eng. Fernando Lopez from the Municipal of Disaster Risk Reduction Management Office (MDRRMO) exposed the little knowledge there is on typhoon resistant construction methods among professionals. The Department of Public Welfare is instructed to give training by the national government; unfortunately, it has been discovered that the DPSW does not share information with the MDRRMO. The guidelines shared by the NGOs from Shelter Cluster are believed to be understandable, but no NGOs offer training. The MDRRMO confirmed that the only institution in town that can offer carpentry courses is the Technical Education and Skills Development Authority (TESDA), which are state funded: 500 people have been trained in total, but none have been trained in Coron since 2015. Field research in March 2018 has revealed that TESDA no longer offers carpentry courses. The National Housing Authority is another stakeholder with the potential for sharing reconstruction information. Once LGU has purchased building land, NHA's team of architects and engineers designs the houses and monitors construction. Conversely, the Municipal Social Welfare and Housing Department (MSWHD) has an agreement to provide assistance to NGOs excluding those affected without land ownership. In this case, the National Committee for Indigenous People (NCIP) try to assist them in receiving institutional help.

4.2. Results from fieldwork 2018

As was explained in the preceding chapter, community members have the perception that they do not need guidelines or advice, and that no one has received training on typhoon resistant construction since 2015. Therefore, the role of stakeholders in sharing knowledge effectively becomes increasingly fundamental. Starting from the hypothesis explained in the research methods, 50 houses were observed, 3 engineers, 2 local NGOs, 2 international humanitarian experts and 1 training school were interviewed to understand the reasons why typhoon resistant construction techniques have not been shared effectively.

4.2.1 Application of typhoon resistant techniques: does the information reach households and carpenters?

Among the 50 houses observed no one can be considered fully safe (Graph 16). For the foundations, only in 13 cases were the timber posts positioned away from water (Figure 11b).

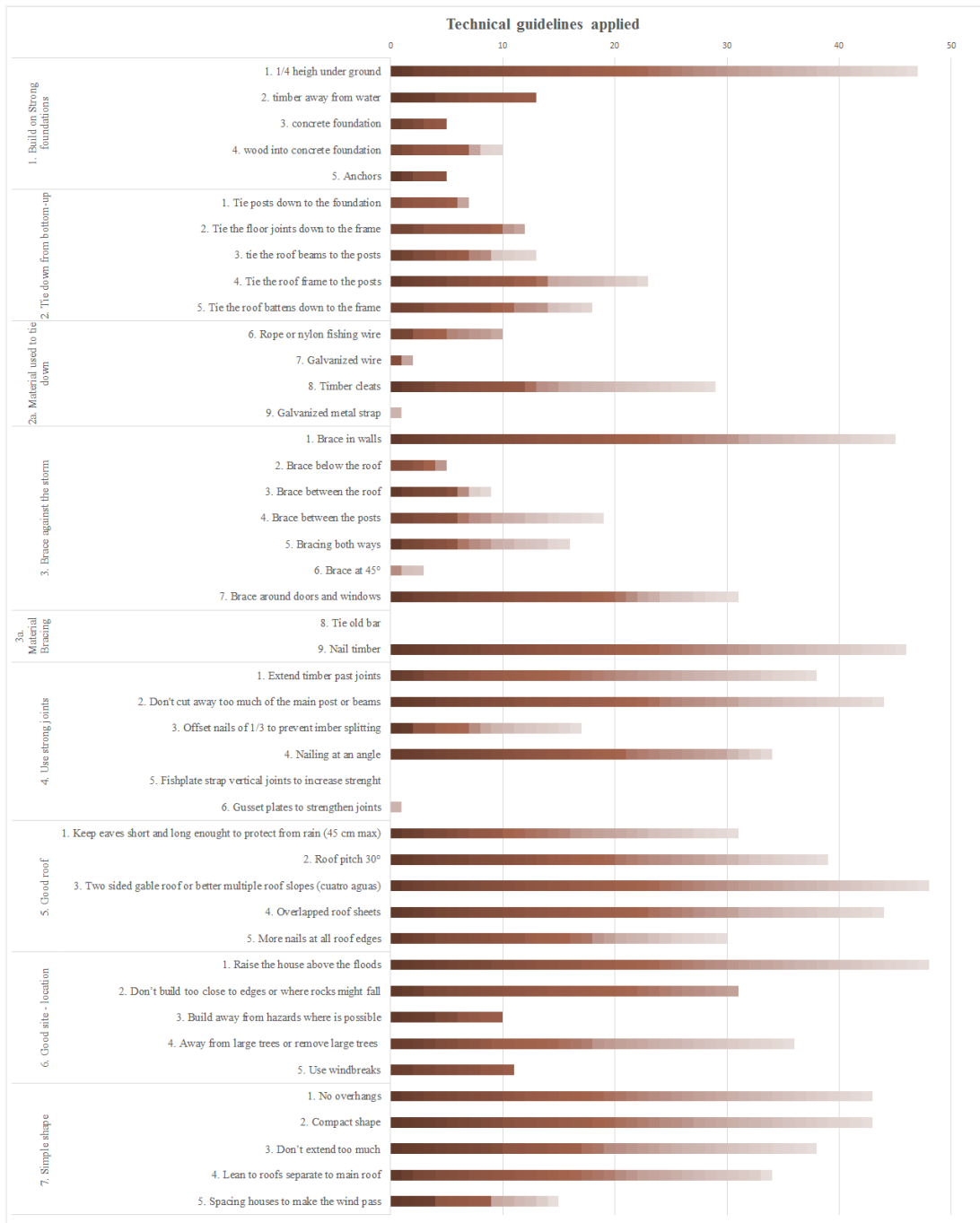


Figure 11a. Coastal settlement of Barangay 1, **Figure 11b.** Example of typical timber post built directly in the water.
Source: Pictures by Erika Palmieri

The roof frame and the battens are tied-down in a more effective way than in another structural connections. In fact, during the typhoon the roof was the first part blown away by the powerful winds; in terms of materials, timber cleats are the most used, while galvanized metal strap has been found in only one example.



Figure 12. Examples of effective timber connections in the roof. Source: Pictures by Erika Palmieri



Graph 16. Results from observation checklist: technical guidelines applied. Source: Elaborated by Erika Palmieri

The bracing of nail timber is almost always applied, although only in three cases were braces installed with a 45 degree angle: a stronger solution even without any adding cost to round those timber pieces. Braces between the posts are applied in 38% of the cases, while braces between the roof have been visible only 9 times. (Figure 13a)



Figure 13a. Example of strong brace between roof trusses. Source: Picture by Erika Palmieri, **Figure 13b.** Technical drawing of roof brace from Shelter Cluster guidelines, Source: Shelter Cluster Philippines guidelines

In 38 cases out of 50 the timber is extended past joints while the nail offset of $\frac{1}{3}$ is applied just 16 times. In fact, it is often fortified with just one nail, because of their cost. In almost in all cases, the roof shape is built with a two-sided gable (48/50), however the roof pitch at 30° is not applied every time (39 out of 50). During the carpenters training, which was organised by the research team I was with, carpenters asked us how to recognize a 30° roof pitch because they were not able to measure the angle. More than half (31 out of 50) keep the eaves long enough to protect from rain and the overlapping of roof sheets is nearly ubiquitous (88% of houses). Concerning the site location, most of the houses were in a risk area (within 40 m of the sea), however all of them were raised and, from those interviewed in 2017, there have been claims that they have had no choice in where to build. At least, 36 houses were built far enough from large trees.

4.2.2 The role of engineers and technical schools in the knowledge network

Engineers

Engineers are the professionals who have access to, and awareness of, the knowledge to build back safer, and so it is fundamental to understand what hinders them to share their knowledge. The engineers that are selected are involved in recovery programs through monitoring (NHA, NCIP), housing models proposing and construction assistance (NCIP). Engineers from MDRRMO are involved in sharing DSWD guidelines (Annex 5) with Barangays officials and posting them in the Barangay Hall. NHA's Engineer stated to follow guidelines from the central office, but in the manual there was no information about light materials typhoon resistant housing. Eng. Dana Dunnol, from the NCIP, has explained that they always strive to act on a local level, that is, deploying a reconstruction program together with IPs, hiring carpenters and selecting supervisors from the same area. Not one of the engineers interviewed offer training to carpenters, instead NHA's engineers refers them to TESDA accredited schools and training centres. Talking with a School Director involved in education with TESDA in Coron, it was claimed that there no proper training is being organised in the region. The three engineers selected for interview believe that trained carpenters are aware of typhoon resistant construction techniques, putting their full trust in training methods without actually being personally involved in education programs. Fernando Lopez (MDRRMO) highlights that what hinders them most is the budget and the materials available. Besides economic problems, the NCIP-affiliated engineer stated that some of the principles are not applicable for them as they often trust their experience more than official criteria. When it was asked if they were trusted as experts, they responded with a resounding confirmation of their expertise and integrity.



Figure 14. Eng. Fernando Lopez of MDRRMO attending carpenters knowledge exchange training.

Source: Picture by Erika Palmieri

Interestingly, during the conversation with Mr. Lopez it emerged that he is developing the “Barangay Disaster Risk Reduction Plan and Management” framework; through this tool he will organise training for carpenters to increase community risk awareness. Dana Dunnol gave more insights into the considerations of trustworthiness and expertise: “They look at you as an expert so they will follow everything you say; before you give instructions **you have to explain all the design**, the position, the size of the posts, so when they understand next time they will follow it. [...] When you say you are an eng. it comes with the **trust of the agency**” (D. Dunnol, personal communication, April 22, 2018). According to the engineer from the NHA, she never shared her knowledge with households: in her opinion, the most effective way is sharing practical knowledge on the construction sites. In contrast, MDRRMO’s engineer stated that he normally organises discussion groups to explain typhoon resistant guidelines. Moreover, NCIP’s engineer underlined the importance of gathering all the community members together, especially the leaders and elders, because of their hierarchical structure. Another problem met by her is that “if we go in the area and we inform we will come to teach, for an IP **he or she will prioritize his or her usual activity** like going to fishing, because they don't use to do it everyday; the basic needs are more important”(D. Dunnol, personal communication, April 22, 2018). Furthermore, locational isolation is considered a strong factor that could hinder knowledge sharing.

Technical School TESDA

TESDA is potentially the main actor in carpenters training in Coron; however, they depend on demand or government fundings, and this year they have not received any. To identify if there is demand or not Mr. Atanosa explains they have 3 possibilities: initiative from the community, initiative from the LGU and from the TESDA funding program. In the last case, they will conduct the survey to the community. Thus, awareness of community on carpentry expertise becomes important for the starting of a carpentry course.



*Figure 15. Edwin A. Atanosa. School Director of GEFI school and TESDA registered trainer.
Source: Picture by Erika Palmieri*

Another reason to start a course appears to be the research of carpenters commissioned by construction companies – the lack of demand could depend on recruiting from other schools. A follow up question identified that it is also the cost of the course that prevents people from being enrolled in this private school program, furthermore, Mr. Atanosa stated himself that having a course is currently a second priority because of their own investment. When it was asked if communities apply typhoon resistant principles, geographical difference was identified as the main point of contention: in the area within the city are applied because of the monitoring and in remote communities are not. The school director identifies his role for effectively disseminating safety principles to support the program and motivate people to understand safety issues; but “actually the effective way is to coordinate with the local government because they are in the position to serve the people. Government should still focus on the regular dissemination of information.” Moreover, “when it happens to control the typhoon resistant construction principle is matter of the contractor to decide about using those”(E. Atanosa, personal communication, April 23, 2018). Concerning the training organisation, TESDA has a module for teaching typhoon resistant housing, however it is not a priority because in the majority of cases the client will decide the design and then the engineers will merely sign it off to take advantage of the economic benefits.

4.2.3 NGOs involved in the recovery and development processes

Cordaid and Caritas are the main NGOs that decided to implement development projects in Coron, where they established their offices. Build Change has been included in the selection as, together with Cordaid and TESDA, it has started a collaboration to provide carpentry training programs.



Figure 16. NGOs involved in the recovery and development program in Coron.

Providing training is considered fundamental for community resilience by all the three NGOs. The responsible of the Cordaid liaison office in Coron, Eric Lopez, specifies the positive approach of “learning by doing” by involving the community in the construction processes, and building a “**community house model**” with all the hazard resistant principles applied.



Figure 17. Cordaid model house. Source: Cordaid

Also Anat Prag, the country director of Cordaid, confirms this method as an alternative to guidelines. She recommends engaging with the community process and assisting with building and monitoring. For Anat Prag, “Going out, sitting down and having conversation with the communities is the most effective. If we give printed material there are the language barriers, the inability to read the materials; visual illustration is very powerful. This is a recognizing investment, this is a big challenge for the government to really do” (A. Prag, personal communication, April 17, 2018). According to the Caritas Project Manager based in Coron, the best way to communicate effectively is through talking and explaining in *Tagalog* (the local language): verbal communication is apparently more successful because of illiteracy. A limit of technical written guidelines comes to the surface: “There are some technical guidelines that are not applied, [...] because this is an IP community and they have so many beliefs. If you use nails they will tell you just use the minimum because [...] it will also help you to make your life more difficult. So, more nails you put more miserable will be your life.” (R. Gariguez, personal communication, April 24, 2018) To overcome those cultural barriers, they have different, special designs for IPs that use nylon or cable wire.

Build Change, when organizing their training programs, divides its trainees into two groups: carpenters and household. Carpenters are taught general and hazard resistant construction techniques while households, are trained in safety awareness and typhoon resistant principles. An interesting topic emerged during the interview with Anat Prag, the Cordaid Country Director, when the question of “What conditions supported the information diffusion at the different levels?” was posed to her. Besides giving training, it is important to award certificates and qualifications – giving recognition, she explains, can enhance the social commitment and their employability. In answer to the same, Eric Lopez highlighted the lack of a carpenter professional organization to support the technical updating and the spreading of knowledge at a community level. Prag insisted on this topic putting forward evidence for **investing in the people**. “Not only the disaster response saves lives and is able to uplift the condition, but being

able to anchor that learning in a long-term development and get the government to start to invest on that. Policies are fundamental but also the implication on the ground, and it requires a lot of commitment of resources”(A. Prag, personal communication, April 17, 2018). She strongly recommended working to gather more evidence to show to LGUs the worth and value of the DRR policies, programs, and practice in the region. Advocacy is also considered very valuable; it is impossible to guarantee the application of those principles working only at an international level (with policies and guidelines), while it is fundamental to work at a municipal level to complete the LGU and the local organization (especially in terms of funding allocation).

Throughout the entire conversation, Prag kept reiterating about the importance of linking development with long-term resilience programs. “That’s a quite important consideration that we don’t just come in for a project to build houses and we walk away and expect everything sorted out” (A. Prag, personal communication, April 17, 2018). Furthermore, talking about time bound and recovery decisions, it arose also the challenge during disaster response programs to educate donors about the slow running of community processes. Kate Landry (Build Change) explains that one of the points of strength of the coordination with Cordaid is that, Build Change works at a national level, spreading technical guidance to governmental agencies and the engineering community, while Cordaid is responsible for the municipal level.

5. Discussion

There is combination of two sequential research questions: firstly ‘*what factors help or hinder knowledge adoption in post-disaster self-recovery supporting the understanding and application of hazard resistant construction principles?*’, and, secondly, ‘*why are certain guidelines to build back typhoon resistant not passed on or adopted by international and local humanitarian agencies and local engineers, and how does this limit adoption in practice by households that reconstruct their own house?*’. Both of these questions aim to deepen the social reasons and the stakeholders’ limits in helping the knowledge adoption during self-recovery processes. The thesis contributes to a reflection on contexts where assistance is lacking and which opportunities would improve the communication of hazard resistant construction knowledge in supporting post-disaster recovery. Four main factors have been found to affect the knowledge adoption during a self-recovery situation: local context and trustiness, local perception of risk and safety awareness, vertical communication and policies enforcement by institutions.

From the results gathered in the first fieldwork, it appears that carpenters are already confident in their skills and knowledge, and are therefore uninterested in receiving either advice or written documentation about hazard resistant construction techniques (see Graph 6). They base their judgment on observation and previous experience (see Graph 13), which frequently leads to a misconception when building with safety standards. Consequently, it is possible to state that, firstly, due to the attitude of people towards information and help most of the population do not obtain the knowledge needed to build adequate houses. Secondly, the **role of local context** affects the adoption effectiveness and in particular, when “individuals and groups, who need to interact and work together, have **similar knowledge capacities**” (Goh S., 2002, p.24). Additionally, it is therefore also possible to state that the nature of the relationship between provider and beneficiary can be of great importance for effectiveness and efficiency (Goh S. 2002). This leads to a conceptualizing of implementing educational programs that avoid hierarchical levels, which are unhelpful for effective knowledge exchange (Nonaka I., 1994) and which start from the same level of understanding problems (Opdyke A. et al., 2016). **Trust** is needed for effective knowledge exchange and is a fundamental variable in the **co-operation** between groups or individuals (Goh S., 2002). For instance, the Project Manager of Caritas insisted, as a somewhat non-obvious consideration, to use *Tagalog* (the local language) during training or workshops. Therefore, Gaillard and Mercer state that, “strategies which are applicable to DRR may not be identified as such by community members, as they are embedded within community life and therefore not tangible to outside stakeholders” (Gaillard and Mercer, 2012, p.100). Another reason as to why communities do not always look for documentation could be attributed to the independence they have achieved because of the lack of assistance

from NGOs and governmental organisations. However, it is debatable whether this independence constitutes increased community resilience or not.

This perception in the community of self-reliance, and where guidance and information is redundant, is also reflected in the self-consideration of untrained carpenters in typhoon resistant housing (graph 21,22) this stands in contrast to what was previously observed in the case of reconstructed houses (see results section 4.2.1). A **false consideration of hazard risk and safety awareness** increases the gap between their attitude and actions, and between Translation Transfer and Adoption, according to the Spiekermann's model (Figure 1). In fact, the availability of knowledge does not imply that it is acquired, accepted or translated into actions (Spiekermann et al. 2015). This leads to the necessity of supporting educational programs towards more awareness-specific programs: Build Change started in collaboration with TESDA and Cordaid, but remains absent in the area of Coron. Although the lack of financial means hinders the reconstruction process, the **different community priorities** also have a role in influencing the effectiveness of safer reconstructions. Especially with large families, food supplies or education costs are prioritized over the reconstruction of their house (focus group table).

One of the key elements that should help to improve the knowledge adoption is vertical **communication** between stakeholders; as has been confirmed by local NGOs and observation on the ground, build back safer guidelines are mostly ineffective because of the illiteracy, particularly pervasive among IP communities, and the complexity of the language compared to what certain communities are used to. The latter is confirmed by what was observed during carpenters' training: in the guidelines carpenters are advised to build a 30° roof pitch, but not one carpenter was able to calculate this angle. It is important to consider (as international and local NGOs interviewed insisted), that information has to be communicated on the ground through community meetings, workshops and seminars (Prag A. 2018). Knowledge can be unsatisfactorily transformed into practical application, if a communication method is not sensitively adopted to engage with the context of its local traditions, skills, knowledge and communication habits (Spiekermann et al. 2015; Weichselgartner & Obersteiner 2002).

Understanding how stakeholders are communicating knowledge, and their interpretation of this knowledge, holds potential to bring to light barriers limiting adoption of local knowledge into programming.

(Opdyke, A., Javernick Will, A., Koschmann, M., & Moench, H, 2016, p. 4)

Therefore, there are emerging limits in the knowledge network: engineers, even though they are the main actors who are aware of hazard resistant construction techniques and work for governmental institutions, are not always aware of limit hazard risk principles being applied in

communities (interviews in section 4.2.2) and no households which were surveyed asked for technical advice from them (see results 4.1.2). However, these engineers do not offer any training at present because of lack of government funding. Based on the interview with the NCIP engineer, IPs communities in particular are more inclined to trust their own experience rather than courses given by external experts: the hypothesis concerning the lack of trust given to outside professionals is therefore partially confirmed. Interviews also revealed that engineers share information informally (on construction sites, for example), but also that they are not motivated to organise trainings programs to spread this knowledge more systematically, often because of a lack of economic incentives.

Ineffective exchange of knowledge depends also on **the lack of investment from the national government**. From interviews with international humanitarian experts in the Philippines and training schools, the results show that the government is not sufficiently involved in the dissemination of hazard resistant information and education programs.

The interview with the Cordaid Country Director revealed the importance of working on an evidence-based level with the government to increase the coordination between stakeholders. Bottom-up programs do work, but “the institutionalization of good practices in terms of reducing risk at the community level and utilizing local and scientific knowledge is the only way to achieve largescale results” (Gaillard and Mercer, 2012, p. 106). In the Philippines, construction policies are not missing (Prag. A, 2018); however, they are being implemented to such a limited extent that the intervention of NGOs is required. Besides implementation, NGOs are also helping to structure more effective policies; for instance, Build Change is working with the government to integrate hazard resistant principles in the Filipino building code. Once integrated in housing monitoring, these principles will be essential in enhancing community safety awareness. Trainings have been proven to have a strong impact on influencing knowledge adoption, as has been observed with the training given to carpenters by NGOs in some of the *Barangays*. However, despite the fact that DRR measures have been proven to be less expensive than the ones for disaster response (Ki Moon B., 2011), funds for trainings are scarce. Another factor hindering the start of a new training course is the limited demand from the community, which stems from both the misguided perception of expertise and due to the low demand for specialised labour in construction companies (see results 4.2.2). Forms of top-down knowledge transmission such as the trainings courses, while not sufficient by themselves, can certainly be helpful in fostering self-reconstruction and enhancing community resilience in the aggregate.

6. Conclusion

This research aims to reveal factors that might help or hinder the knowledge adoption of hazard resistant construction principles in self-recovery processes and the reasons why the information is not passed on through the different knowledge network.

Several aspects can determine the success and the failure of seeing build back safer techniques being applied. The study reveals that, within the case study among households, risk perception is one of the first reasons why safe self-reconstruction is not seen. This perception is strictly related to a prioritisation problem, where a lack of interest in construction hazard resistant principles has been seen through the different villages. Nevertheless, the limitations of livelihood that carpenters and households have to face daily also means that resilience construction knowledge is hindered by cultural beliefs. A high complexity of technical guidelines, illiteracy in the community and limited training programs in the considered area, highlight that communication has a significant role in affecting the understanding and application of hazard resistant construction principles. Amplifying this condition, the usual short time stay of NGOs, which bring only new housing programs, is caused by inadequately educated donors that are investing in educational programs. Finally, by understanding the reasons why information is not passed on between the stakeholders, the study clarifies why knowledge does not arrive at a household level which is fundamental for a resilient self-recovery. The knowledge network considered in this study is not effective in helping communication, and none of the investment from government agencies is used for educational programs. NGOs implement more shelter programs within a limited time, instead of increasing community resilience. Engineers do not actively share, if they are not involved in government programs, while the few trained carpenters do not work in communities as private construction companies employ them directly from the school.

The findings of this study suggest that humanitarian organisations should include long term programs to foster resilient self-recovery processes. This might lead to a greater investment of time and, perhaps, more funding, however, it would also be possible if governmental agencies increase the national coordination between stakeholders in order to invest in their own people. On the other hand, further research is needed to find alternative communication frameworks that would have a positive influence on hazard resistance and to determine what makes guidelines accessible to a specific community. Future work would also be useful in monitoring a more longer term process to explore ways of improving the effectiveness of bottom-up partnerships and hazard resistant awareness to have an impact on community resilience.

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8. Annex

Annex 1. Households survey

During the household surveys, many topics were covered, such as recovery timeline, planning process, construction actors, construction knowledge, construction process, material used, material source, assessment of safety, household priorities, satisfaction and future possible adaption. Participants of the household surveys were adult members who had not received humanitarian assistance after typhoon Yolanda. However, among the types of assistance that people have been provided with (such as from each other, the church, a bank, the government or humanitarian organisations) only beneficiaries of humanitarian or governmental full shelter programs were excluded from this survey.

In most of the communities, there were members that had received 290 (partly damaged houses) or 580 (totally damaged houses) dollars of materials from the government. However, although many houses were damaged, only a few households received this type of governmental assistance (from MSWD). In some cases, households had loans from CARD, that offered microloans for small-scale livelihood activities to finance their reconstruction. Since both beneficiaries from CARD and MSWD were also constructing their own house they have been included as participants in this survey to understand what motivates them in the adoption of hazard-resistant construction principles.

Thus, the households selection was done in three levels, per (1) **barangay**, per (2) **assistance type** (divided in assisted and non-assisted self-recovery), and per (3) **'house type'** (new houses, partially damaged houses, minor damaged houses).

This survey attempts to ask closed questions in chronological order of the recovery process.

Aspect	Question	Translation	Possible answers
General data	Date of interview	<i>Petsa ng Pakikipagpanayam.</i>	
	Name of interviewer	<i>Pangalan ng tagapagpanayam.</i>	
	Coordinates of house		
Recovery time-line	Where did you sleep the first week after the typhoon?	<i>Saan kayo tumuloy sa unang linggo pagkatapos ng bagyo?</i>	<ul style="list-style-type: none"> · Evacuation center · kapitbahay · Tigbaboy · kamag-anak · Bahay ng isa sa mga meyembro ng komunidad · iba pa...
	Where you covered from rain and wind in that place?	<i>Hindi ba kayo nababasa ng ulan at kubli ba kayo sa hangin sa inyong tinuluyan?</i>	
	How long did you stay there?	<i>Gaano kayo katagal nanatili sa inyong tinuluyan?</i>	<ul style="list-style-type: none"> · tatlong araw · isang linggo hanggang dalawang linggo · tatlong linggo hanggang isang buwan · higit pa
	Who else was sleeping there?	<i>Simu-sino pa ang ibang kasama ninyo na tumuloy din doon?</i>	<ul style="list-style-type: none"> · kamag-anak · kapitbahay · kasamahan sa komunidad · dayuhan · iba pa...

	Why were they staying there?	<i>Bakit sila nakituloy din doon?</i>	<ul style="list-style-type: none"> · nasira ang bahay · walang ibang malipatan · hindi pa ligtas ang bumalik sa dating tirahan · iba pa...
	How long did they stay there?	<i>Gaano katagal rin silang namalagi doon?</i>	<ul style="list-style-type: none"> · tatlong araw · isang linggo hanggang dalawang linggo · tatlong linggo hanggang isang buwan · higit pa
	Where did you go afterwards?	<i>Saan kayo pumunta pagkatapos?</i>	<ul style="list-style-type: none"> · bumalik sa dating tirahan · Nakituloy sa kamag-anak · lumipat ng bagong matutuluyan · iba pa...
	How long did you stay there?	<i>Gaano katagal kayong namalagi doon?</i>	<ul style="list-style-type: none"> · tatlong araw · isang linggo hanggang dalawang linggo · tatlong linggo hanggang isang buwan · higit pa
	When did you start with the construction of this house?	<i>Kailian kayo nagsimulang buoin o gawin ang bahay na ito?</i>	
	What limited you to start earlier?	<i>Bakit hindi kayo nakapaggawa agad?</i>	<ul style="list-style-type: none"> · walang pera · walang materyales · walang gagawa o karpentero · iba pa...
	When did you start to live in this house?	<i>Kalian kayo nagsimulang manirahan o tumuloy sa bahay na ito?</i>	
	What improvements on the house came while you were already living there?	<i>Ano ang mga nagawang pagbabago sa bahay habang nakatira kayo dito?</i>	
Planning process	Why do you think your house was destroyed?	<i>Bakit sa tingin mo nasira ang inyong bahay o tirahan?</i>	<ul style="list-style-type: none"> · dahil marupok ang mga materyales na ginamit · nakatayo sa delikadong lugar · hindi ganun katibay ang paggawa? · iba pa...
	Why did other houses stand?	<i>Bakit ang ibang bahay ay nanatiling nakatayo?</i>	<ul style="list-style-type: none"> · mas matibay ang paggawa · matitibay ang materyales · nakatayo sa ligtas na lugar · iba pa...
	Did you have other options for the location of your house?	<i>Mayroon ka bang ibang pagpipilian para sa lokasyon ng pagpapatayo ng inyong bahay?</i>	
	If yes, why did you select this location?	<i>Kung oo, bakit ito ang lokasyon na iyong napili?</i>	<ul style="list-style-type: none"> · malapit sa kabuhayan · ligtas ang lugar · pagmamay-ari ang lupa · doon lamang pwedeng magtayo · iba pa...
	What is special about your house?	<i>Ano ang natatangi o espesyal sa inyong bahay?</i>	<ul style="list-style-type: none"> · ligtas ang lugar na pinagtatayuan · hindi nasira ng nagdaang bagyo · matibay ang materyales at pagkakagawa · iba pa...
	Why did you make it special?	<i>Bakit mo ito ginawang katangi-tangi o espesyal?</i>	
	What motivated you to make your house different?	<i>Ano ang nag-udyok sa iyo upang gawing naiiba ang inyong bahay?</i>	<ul style="list-style-type: none"> · para maipamana pa · para maging matibay · para tiyak na ligtas sa panganib · iba pa...
	What does your house have in common with the other houses?	<i>Anong pagkakapareho meron ang bahay ninyo sa ibang bahay?</i>	<ul style="list-style-type: none"> · materyales · laki · desenyong · iba pa...
	What aspects did you copy from other houses for your house?	<i>Anong bahagi/paraan ng pagkakagawa ang kinopya ninyo sa ibang bahay para sa inyong bahay?</i>	
	What questions did you want answer to make a plan for your house?	<i>Anong mga katanungan ang nais mong masagot sa pagplano ng inyong bahay?</i>	

	Where else did you search for information to make a plan for your house?	<i>Saan pa kayo nangalap o naghanap ng impormasyon sa paggawa ng plano ng inyong bahay?</i>	· nagtanong sa may alam · sa nabasang babasahin · nagtanong sa ibang nagpagawa ng bahay · iba pa...
	Did you ask for advise to someone about the plan of your house?	<i>Humingi ba kayo ng payo sa iba para sa pagplano ng inyong bahay?</i>	- OO - Hindi
	If yes, who did you ask?	<i>Kung oo, sino ang inyong pinagtanungan?</i>	· karpentero,..... · engineer,..... · arkitekto,..... · iba pa...
	If yes, what did you ask for?	<i>Kung oo, ano ang inyong tinanong?</i>	
	Who else would you ask if they could not provide you with answers?	<i>Sino pa ang iba n'yong pinagtanungan kung hindi nya/nila nasagot ang iyong mga katanungan?</i>	
	Did you find all the answers?	<i>Nalaman mo ba lahat ng kasagutan sa tanong mo?</i>	- OO - Hindi
	If not, what did you not find?	<i>Kung hindi, ano iyon?</i>	
	Did you search for written documentation for the planning of your house?	<i>Naghanap ka ba ng mga babasahin para sa pagpapalano ng inyong bahay?</i>	- OO - Hindi
	If yes, what documentation that you found was useful to you?	<i>Kung oo, nakatulong ba ito sa iyo?</i>	
	If yes, what did you use from it?	<i>Kung oo, saan mo ginamit ang mga ito?</i>	· sa paggawa ng bahay · pagpili ng lokasyon · pagpili ng materyales na gagamitin · iba pa...
	If not, why did you not search for documentation?	<i>Kung hindi, bakit hindi?</i>	· hindi kailangan · hindi epektibo · hindi naayon sa nakasanayan o kultura · wala sa mapanganib na lugar · masyadong mahal · iba pa...
	Was there information that you found that you did not understand completely?	<i>Meron bang mga impormasyon na nakita o nabasa mon a hindi mo naintindinhan ng maayos?</i>	
Construct ion actors	Who managed the construction of your house?	<i>Sino ang namahala sa paggawa ng inyong bahay?</i>	· kamag-anak · kapitbahay · kayo mismo · mason o karpentero · eksperto sa paggawa · iba pa...
	Why was this person managing the construction?	<i>Bakit sya ang namahala sa paggawa ng inyong bahay?</i>	· nakapag-sanay · siya lang ang may alam tungkol sa paggawa sa kanilang lugar · walang pambayad sa mamahala ng paggawa · iba pa...
	Who provided money for the construction?	<i>Kanino nanggaling ang perang ginamit sa pagpapagawa ng inyong bahay?</i>	· Meyembro ng pamilya · kamag-anak · komunidad · simbahan · NGO · iba pa...
	Who provided labour for the construction of the house?	<i>Sino ang nagbigay ng manggawa para sa paggawa ng bahay?</i>	· kamag-anak · kakilala · gobyerno · NGO · iba pa...
	How did you select the people that provided labour?	<i>Paano mo pinili ang mga taong gagawa?</i>	· merong alam · mapagkakatiwalaan · murang maningil · kilalang magaling · iba pa...
	Did your family help others in the construction of their house?	<i>Tumulong ba ang pamilya mo sa iba sa paggawa ng kanilang bahay?</i>	-OO - Hindi
	Did you have complains about the construction process?	<i>Mayroon ka bang reklamo tungkol sa proseso ng paggawa?</i>	-OO pangalanan - Hindi
	Who supervised the quality of the construction of the house?	<i>Sino ang namahala para matiyak ang kalidad ng paggawa ng inyong bahay?</i>	· kamag-anak · kapitbahay

			<ul style="list-style-type: none"> · kayo mismo · mason o karpentero · eksperto sa paggawa - Walang sinuman · iba pa...
	If nobody, why not?	Kung wala, bakit?	<ul style="list-style-type: none"> · walang pambayad · kayang gawin ng sarili · walang makuhang marunong mamahala · iba pa...
Construct ion knowled ge	What knowledge or skill did this person have to supervise the construction?	Anong kaalaman o abilidad mayroon ang taong ito sa pamamahala ng paggawa?	<ul style="list-style-type: none"> · magaling pumili ng materyales · eksperto sa paggawa · may pagsasanay · may kaalaman sa ligtas na disenyo ng bahay · iba pa...
	Did this person ask for advise to someone about the construction of your house?	Ang taong ito ba ay humingi ng payo sa iba tungkol sa paggawa ng inyong bahay?	<ul style="list-style-type: none"> - OO - Hindi
	If yes, who did this person ask?	Kung oo, sino ang kanyang pinagtanungan?	<ul style="list-style-type: none"> · eksperto sa paggawa · mga babasahin · kakilala -lubos na may alam kesa sa kanya · iba pa...
	If yes, what did this person ask for?	Kung oo, ano ang hiningi ng taong ito?	
	If yes, who else would this person ask if they did not know the answer?	Kung oo, sino pa kaya ang maaaring pagtanungan ng taong ito kung sakali mang hindi nasagot ang kanyang mga katanungan?	<ul style="list-style-type: none"> · lubos na may alam kesa sa kanya · eksperto · foreman · iba pa...
	Where else did this person search for information?	Saan pa kaya naghanap ng iba pang impormasyon ang taong ito?	<ul style="list-style-type: none"> · babasahin · internet · telebisyon · karanasan · iba pa...
	What questions did this person want answer to?	Anong mga katanungan ang nais ng taong ito na masagot?	
	Did this person find all the answers?	Nasagot ba ang kanyang mga katanungan?	<ul style="list-style-type: none"> - OO - Hindi
	If not, what did this person not find?	Kung hindi, ano iyon?	
	Did your household receive any training or instruction?	Ang inyong pamilya ba ay nakatanggap ng kasanayan o pagtuturo?	<ul style="list-style-type: none"> - OO - Hindi
	If yes, who gave the training or instruction?	Kung oo, sino ang nagbigay ng kasanayan?	<ul style="list-style-type: none"> · NGO · Lokal na pamahalaan · meyembro ng komunidad na may kaalaman · iba pa...
	If yes, were construction rules explained to build back safer or typhoon resistant?	Kung oo, naipaliwanag ba ang pamantayan sa paggawa kung paano gumawa ng matibay at ligtas sa paggawa?	<ul style="list-style-type: none"> - Oo - hindi
	If yes, which rules?	Kung oo, anong pamantayan ito?	<ul style="list-style-type: none"> · tungkol sa paggawa ng ligtas na bahay · pagpili ng matibay na materyales · pagpili ng ligtas na lugar · desenyong mas matibay · iba pa...
	If not, did you find such rules somewhere else?	Kung hindi, nakahanap ka ba ng pamantayan sa iba?	<ul style="list-style-type: none"> -oo hindi
	If yes, where?	Kung oo, saan?	
Did you apply rules to construct hazard resistant?	Ginawa mo ba ang mga pamantayang ito sa paggawa ng bahay na mamakaligtas sa panganib ng bagyo?	<ul style="list-style-type: none"> - OO - Hindi 	
If yes, which ones? Can you show us? (make photo)	Kung oo, ano iyon? Maaari mo bang ipakita?		
If not, why did you not apply rules to construct safer?	Kung hindi, bakit?	<ul style="list-style-type: none"> · hindi kailangan · hindi epektibo · hindi naayon sa 	

			<i>nakasanayan o kultura</i> · wala sa mapanganib na lugar · masyadong mahal · iba pa...
	Did these rules change a lot to the way you were used to construct?	<i>Nakapagpabago ba ang mga pamantayang ito sa paraan mo sa paggawa?</i>	OO Hindi
	If yes, can you give an example of what is different?	<i>Kung oo, maari ka bang magbigay ng halimbawa kung ano ang pagbabagong iyon?</i>	
	Would you apply these rules in a future construction project?	<i>Gagamitin mo ba ang mga pamantayang ito sa paggawa sa hinaharap?</i>	
	If not, why would you not apply it?	<i>Kung hindi, bakit?</i>	· hindi kailangan · hindi epektibo · hindi naayon sa nakasanayan o kultura · wala sa mapanganib na lugar · masyadong mahal · iba pa...
	If yes, what motivates you to apply these rules in your house?	<i>Kung oo, ano ang nag-udyok sa iyo para gamitin ang mga pamantayang ito sa paggawa ng iyong bahay?</i>	· para mas ligtas · may panatag sa kalooban · makakamura · mas maging matibay ang bahay · iba pa...
	Did you search for written documentation for the construction of your house?	<i>Naghanap ba kayo ng iba pang babasahin tungkol sa paggawa ng inyong bahay?</i>	OO Hindi
	If yes, was the documentation you found useful to you?	<i>Kung oo, itong nakalap mo ba ay nakatulong sa iyo?</i>	- OO Hindi
	If yes, what did you use from it?	<i>Kung oo, ano ang ginamit mo sa mga ito?</i>	· paraan ng paggawa · pagpili ng mga materyales · makamura · iba pa...
	If not, why was the documentation not useful?	<i>Kung hindi, bakit?</i>	· hindi kailangan · hindi epektibo · hindi naayon sa nakasanayan o kultura · wala sa mapanganib na lugar · masyadong mahal · iba pa...
	Was there information you did not understand completely?	<i>Mayroon bang impormasyon na iyong nakita o nabasa na hindi mo naintindihan ng maayos?</i>	- OO, - Hindi
	Did you have new questions concerning the construction of your house after the typhoon?	<i>Mayroon ba kayong bagong katanungan patungkol sa paggawa ng bahay pagkatapos ng bagyo?</i>	- OO, - Hindi
	If yes, what new questions did you have?	<i>Kung oo, anong mga katanungan iyon?</i>	
Construct ion process	Did problems occur that affected your construction schedule?	<i>Mayroon bang nangyaring problema para maapektohan ang oras o panahon ng paggawa?</i>	
	If yes, what problem(s)?	<i>Kung oo, anong mga problema ito?</i>	
	Did problems occur that affected your budget	<i>Mayroon bang nangyaring problema na nakaapekto sa inyong pananalapi?</i>	OO hindi
	If yes, what problem(s)?	<i>Kung oo, anong mga problema iyon?</i>	
	Did problems occur that affected the quality of your construction?	<i>Mayroon bang nangyaring problema na nakaapekto sa kalidad ng paggawa?</i>	OO hindi
	If yes, what problem(s)?	<i>Kung oo, anong mga problema ito?</i>	
	What problems occurred during the construction that influenced your timeline, your budget or the quality of the construction?	<i>Anong mga problema ang nangyari habang gumagawa kayo na nakaapekto sa oras ng paggawa?</i>	
	Were you able to solve the problems?	<i>Kung meron, ano ito?</i>	Oo hindi
	If not, what not?	<i>Kung hindi, ano ito?</i>	
	If not, why not?	<i>Kung hindi, bakit?</i>	
If yes, how did you solve the problems?	<i>Kung oo, paano ninyo naresultahan ang mga problemang ito?</i>		

Material use	What materials did you use for the foundation?	<i>Anong mga materyales ang ginamit mo para sa pundasyon?</i>	<ul style="list-style-type: none"> · kahoy · semento · iba pa...
	What materials were used for the columns?	<i>Anong mga materyales ang inyong ginamit para sa halige?</i>	<i>Mahoney /Mangium/ Mahogany/ Gemelina / Paper tree / Cocolumber/ narra /ipil/ iba pa..</i>
	What materials were used for the beams?	<i>Anong mga materyales ang ginamit para sa barakilan?</i>	<ul style="list-style-type: none"> · kawayan · bilog na kahoy · tabla · iba pa...
	What materials were used for the walls?	<i>Anong mga materyales ang ginamit para sa pader o dingding?</i>	<ul style="list-style-type: none"> · sawali · semento · slab · iba pa...
	What materials were used for the roof?	<i>Anong mga materyales ang ginamit para sa sahig?</i>	<ul style="list-style-type: none"> · kawayan · semento · kahoy <li style="padding-left: 20px;">- Nipa <li style="padding-left: 20px;">- kogon · iba pa...
	If timber, what did you look at to check the quality of the timber?	<i>Kung troso, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If cocolumber, what did you look at to check the quality of the cocolumber?	<i>Kung coco lumber, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If Mahoney, what did you look at to check the quality of the Mahoney?	<i>Kung mahogany, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If Mahogoney, what did you look at to check the quality of the Mahogoney?	<i>Kung mahogany, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If Gemelina, what did you look at to check the quality of the Gemelina?	<i>Kung gemelina, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If Paper tree, what did you look at to check the quality of the Paper tree?	<i>Kung paper tree, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If nails, what did you look at to check the quality of the nails?	<i>Kung pako, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If cement, what did you look at to check the quality of the cement?	<i>Kung semento, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If concrete, did you use rebar/ steel bars in your concrete?	<i>Kung sementado, gumamit ba kayo ng bakal o steel bars?</i>	
	If concrete, what did you look at to check the quality of the concrete?	<i>Kung sementado, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If concrete, did you use gravel?	<i>Kung sementado, gumamit ba kayo ng graba?</i>	OO Hindi
	If yes, what did you look at to check the quality of the gravel?	<i>Kung oo, ano ang tinitingnan o para masiguro ang kalidad ng graba?</i>	
	If sand, what did you look at to check the quality of the sand?	<i>Kung buhangin, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>	
	If sand, did you use sand from the beach for concrete?	<i>Kung buhangin, gumamit ba kayo ng buhangin mula sa aplaya?</i>	
	If yes, why?	<i>Kung oo, bakit?</i>	
If other material, what did you look at to check the quality?	<i>Kung ibang materyales, ano ang tinitingnan mo para masiguro ang kalidad nito?</i>		
Material source	Where did you get materials for your house?	<i>Saan nanggaling ang mga materyales ninyo para sa paggawa ng inyong bahay?</i>	<ul style="list-style-type: none"> ● Binili sa tindahan ● May nagbigay ● Kayo mismo ang nanguha
	How did you transport the materials?	<i>Paano niyo nadala o ibinyahe ang mga materyales?</i>	<ul style="list-style-type: none"> ● Dyip ● Bangka ● binuhat
	Did you get material from a supplier?	<i>Kumuha ba kayo ng mga materyales sa isang taga suplay?</i>	
	How did you find his supplier?	<i>Paano ninyo nakilala ang taga suplay na ito?</i>	<ul style="list-style-type: none"> ● May nagrekomenda ● Dati nang suki ● Ito lang ang taga suplay sa lugar ● Iba pa...
	Why were you motivated to choose for	<i>Bakit ninyo napili ang taga suplay na</i>	<ul style="list-style-type: none"> ● Mura ang

	this supplier?	ito?	<ul style="list-style-type: none"> materyales De-kalidad ang materyales Malapit lang Iba pa...
	Was the quality of the materials consistent?	Yung kalidad ba ng materyales ay maganda/maayos at hindi nag-iiba-iba?	
	If not, did you complain?	Kung hindi, nagreklamo ba kayo?	
	If yes, what happened?	Kung oo, anong nangyari?	-pinalitan ang materyales -naghanap ng ibang supplier -binabaan ang presyo ng materyales
	If not, why did you not complain?	Kung hindi, bakit hindi kayo nagreklamo?	
	Were you willing to pay extra to get the good quality material?	Handa ba kayong magbayad ng mas mahal o sobra para makakuha ng mas magandang kalidad ng materyales?	
	If yes, did you receive this quality?	Kung oo, nakuha ba ninyo ang gusto o inaasahan ninyong kalidad?	
	If not, why not?	Kung hindi, bakit hindi?	
	If not, where did you spend your money on instead?	Kung hindi, saan mo na lang ginastos ang perang meron ka?	
Assessm ent of safety	How do you know this house is strong?	Paano mo nalaman na ang bahay na ito ay matibay?	-gawa sa matibay na materyales -inaplay ang mga prinsipyo para sa ligtas na paggawa -nasa ligtas na lugar -eksperto ang gumawa -iba pa...
	Do you feel your house is safe in case of a storm?	Nararamdaman mo bang ligtas ka sa bahay na ito kung meron mang sama ng panahong darating?	
	If yes, what makes you feel safe?	Kung oo, ano ang dahilan at ramdam mong ligtas ka?	-Matibay ang pagkagawa -nasa ligtas na lugar -matibay ang mga materyales -hindi nagiba ng nakaraang malakas na bagyo -iba pa...
	If not, why not?		
	Do you feel your house is safe in case of a typhoon?	Ramdam mo bang ligtas ka sa bahay na ito sakaling bumagyo ng malakas?	
	If not, where will you go?	Kung hindi, saan kayo pupunta?	<ul style="list-style-type: none"> Evacuation center Kamag-anak Kapitbahay Bahay ng ibang tao
	Will your house stand in case of a new typhoon such as Yolanda?	Kaya bang manatiling nakatayo ng bahay ninyo sakaling may dumating na malakas na bagyo gaya ng Yolanda?	
	What makes your house safe in case of a typhoon?	Ano ang dahilan at ligtas ang bahay ninyo sakaling mang malakas na bagyo?	-nasa ligtas na lugar -matibay ang pagkagawa -matibay ang ga materyales na ginamit -ang desenyong ay ginawa ayon sa prinsipyo ng ligtas na paggawa
What makes your house unsafe in case of a typhoon?	Ano ang dahilan upang hindi maging ligtas ang inyong bahay laban sa malakas na bagyo?	-Nakatayo sa mapanganib na lugar -mahina ang mga materyales -luma na -hindi maganda ang desenyong -iba pa	
Priorities	Could you make your house safer?	Magagawa ninyo bang mas ligtas ang inyong bahay?	
	If yes, why didn't you do that yet?	Kung oo, bakit hindi pa ninyo iyon ginagawa?	Hindi kinakailangan/ hindi epektibo / hindi naaayon sa kinasayanan o kultura / wala g panganiib sa kinatatayuan ng aming bahay/walang masyadong bagyo sa lugar / masyadong magastos/ hindi alam kung paano gagawin
	How do you know when a new typhoon is coming?	Paano niyo nalalaman kung may paparating na malakas na bagyo?	-balita sa radio o TV -babala ng barangay

			-balita ng kapitbahay -iba pa
	What do you do when a typhoon is coming?	Ano ang ginagawa niyo kapag may paparating na bagyo?	-lumilikas -gumagawa ng pagpapatibay sa bahay -nag-iipon ng pagkain -pumpunta sa ibang lugar -iba pa...
	Can you limit the damage to your house if a typhoon is coming?	Kaya ba ninyong gawan ng paraan para malimitahan ang pinsala sa inyong bahay kung may paparating na bagyo?	
	Will you limit the damage to your house if a typhoon is coming?	Gagawin ninyo ba ang mga paraan na ito upang malimitahan ang pinsala?	
	What will you do to limit the damage?	Ano ang mga gagawin ninyo para malimitahan ang pinsala?	-gagamit ng mas matibay na materyales -hindi na magtatayo sa delikadong lugar -gagamit ng mga paraan para sa mas matibay na paggawa -iba pa...
Satisfaction	If you compare this house with your from before the typhoon which one do you prefer?	Kung ikukumpara ang bahay ninyo na ito sa bahay ninyo noon bago ang malakas na bagyo, alin ang mas pipiliin ninyo?	
	Why do you prefer that one?	Bakit ito ang napili ninyo?	-mas matibay -mas maayos ang pagkagawa -mas ligtas ang lugar na pinagtayuan -mas malapit sa hanap-buhay -iba pa...
	Do you have plans to change your house?	May plano ba kayo na baguhin ang inyong bahay?	
	If yes, what do you want to change?	Kung oo, ano ang gusto ninyong baguhin?	-lugar na pagtatayuan -desenyo ng bahay -materyales na ginamit -iba pa...
	What do you like about this house? (enumerate)	Ano ang nagustuhan ninyo sa bahay na ito?(sabihin isa-isahin)	
	What don't you like about this house? (enumerate)	Ano ang hindi ninyo nagugustuhan sa bahay na ito?(isa-isahin)	
	Future	If you would have to build a house again what would you do different?	Kung magtatayo kayo ng bahay sa darating na panahon, ano ang gagawin ninyong naiiba?
Why would you do that different?		Bakit ninyo gagawin ang kaibahang iyon?	-para hindi masira agad -para maging ligtas -para hindi na kailangang lumikas kung may bagyo -para mas malapit sabhanapbuhay -iba pa...
What would you keep the same?		Anu-ano ang mga hindi ninyo babaguhin?	
Would you use the same materials?		Gagamit ba kayo ng mga parehong materyales?	
Would you use the same techniques?		Gagamit ba kayo ng parehong pamamaraan o diskarte?	
Who would you want to build your next house?		Sino ang gusto ninyong gumawa ng susunod ninyong bahay?	
Why to you prefer this/these person(s)?		Bakit ninyo pinili ang (mga) taong ito?	
Do you think it is likely that you will receive aid in the future from the church, the local government or an local or international aid organization?		Tingin ninyo may pagkakataon ba kayong makatanggap ng tulong mula sa simbahan, local na gobyerno, o di kaya ay sa lokal o taga-ibang bansang mga organisasyon?	
If yes, from which organization would you expect aid?		Kung oo, sa anong organisasyon kayo umaasang makakakuha ng tulong?	
If yes, why do you think you will receive aid?		Kung oo, bakit ninyo naiisip na bibigyan kayo ng tulong?	
If yes, how will you find them?		Kung oo, paano ninyo sila makikita?	
If yes, would they be able to find you?		Kung oo, makikita ninyo ba sila?	
How would you like to have information		Paano ninyo nais na mabigyan ng	

	presented to you?	<i>impormasyon?</i>	
Livelihood	What is your gender?		
	What is your age?	<i>Ilang taon na kayo?</i>	
	What is the total number of household members you have?	<i>Ilan ang miyembro ninyo sa bahay?</i>	
	What is your profession / present occupation?	<i>Ano ang inyong propesyon/kasalukuyang trabaho?</i>	
	What is the primary occupation or income source(s) of your household?	<i>Ano ang pangunahing trabaho o pinagkakakitaan ng pamilya?</i>	
	What is your average weekly income of your household?	<i>Ano ang katamtamang kita ng inyong pamilya sa loob ng isang lingo?</i>	
	Remittances, if any (in PhP)	<i>Padala galing sa ibang bansa, kung meron (sa halaga ng piso natin)</i>	
	Do you feel you are receiving enough food and income from your current livelihood?	<i>Tingin ba ninyo ay nakakatanggap kayo ng sapat na pagkain at kita sa kasalukuyanninyonghanap-buhay?</i>	
	If not, what do you do to augment the income?	<i>Kung hindi, ano ang ginagawa ninyo para punuan ang kakulangan ng inyong kita?</i>	
	How many savings do you have?	<i>Magkano ang inyong ipon?</i>	
	If you would have money what would you use if for?	<i>Kung may pera kayo, saan ninyo ito gagamitin?</i>	
	If you invest in your house, what will you built?	<i>Kung maglalaan kayo para sa inyong bahay, ano ang ipapatayo ninyo?</i>	
	Were could you get money if you need it?	<i>Saan kayo kumukuha ng pera pag kailangan ninyo?</i>	
	What livelihood would you like to have?	<i>Anong hanapbuhay ang gusto ninyong magkaroon?</i>	
	Where do you see yourself two years from now?	<i>Saan/paano mo nakikita ang iyong sarili dalawang taon mula ngayon?</i>	
	Where do you see yourself five years from now?	<i>Saan/paano mo nakikita ang iyong sarili limang taon mula ngayon?</i>	
What programs, policies or aid would help you to achieve your aspirations?	<i>Anong mga programa, polisiya o ayuda na makakatulong upang marating mo ang iyong pangarap o hangarin?</i>	<i>-pangkabuhayang proyekto -polisiya sa pangangalaga ng kalikasan</i>	

Annex 2. Carpenters survey

Carpenters have an essential role in the community of knowledge and the ability to positively and negatively influence adoption of hazard resistant construction knowledge. In each community two carpenters were selected based on their influence on the households opinion. In this case, many topics were explored such as, acquisition, collaboration, expertise, knowledge source, knowledge exchange, material quality, material supplier, assessment of safety and future.

The procedure for this survey is equal to that of the household survey.

Aspect	Question	Translation	Possible answers
General data	Date of interview	<i>Araw ng pakikipag panayam</i>	•
	Name of interviewer	<i>Pangalan ng tagapag panayam</i>	•
Acquisition	How many houses did you support with labour?	<i>Ilang bahay na ang nagawa mo na may sweldo?</i>	•
	What was the average price per house that you were offered?	<i>Ano ang katamtamang presyo ng pag gawa ng bahay ang ibinibigay mo?</i>	•
	Where you paid on a daily basis or on a contract basis?	<i>Ikaw ba ay binabayaran ng arawan o kontrata?</i>	•
	How did you find this job?	<i>Paano mo nahanap ang trabaho na ito?</i>	<ul style="list-style-type: none"> • Nag apply lang • Nerikomenda ng kamaga anak • Eksperto sa pag gawa sa lugar • Iba pa.....
	How were people selected that provided labour with you?	<i>Paano pinili ang mga mangagawa na ibinigay sayo?</i>	<ul style="list-style-type: none"> • Nirekomenda ng may ari o kamag anak • Ako mismo ang pumili • Nagpaskil ng pangangailangan • Iba pa.....
Collaboration	Did you have complains about the construction process?	<i>Meron ka bang natanggap na reklamo sa paraan ng paggawa?</i>	<ul style="list-style-type: none"> • Meron • Wala
	If yes, what were the complains?	<i>Kung meron, ano ang mga reklamo?</i>	<ul style="list-style-type: none"> • Hindi marunong humawak ng tao • Maliit magpasweldo • Kulang sa mga materyales • Iba pa....
	If yes, how did you handle the complains?	<i>Kung meron, paano mo ito hinarap o sinolusyonan?</i>	<ul style="list-style-type: none"> • Personal na kinausap para maayos • Hinarap sa barangay para mas maging mas maayos • Humingi ng payo sa mga eksperto • Iba pa...
	Who supervised the quality of your work?	<i>Sino ang namahala sa kalidad ng trabaho?</i>	<ul style="list-style-type: none"> • Foreman • Mason • Karpentero • May ari • Iba pa....
	Where did this person get knowledge to supervise the work?	<i>Saan kumuha ng kaalaman ang taong ito sa pamamahala ng pag gawa?</i>	<ul style="list-style-type: none"> • Napag aralan sa iskwelahan • Itinuro ng mga may alam • Karanasan lang sa pag gawa • Iba pa....
Expertise	How many houses have you built before the typhoon?	<i>Ilang bahay ang nagawa mo bago dumating ang bagyo?</i>	•
	How many of these houses still stand?	<i>Ilan pa dito ang nakatayo hanggang ngayon?</i>	• 1
	Do you consider yourself and expert on typhoon resistant constructions?	<i>Sa iyong palagay eksperto ka na ba o may kasanayan ka na sa pag gawa ng matibay na bahay na matatag sa bagyo?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...

How did you learn to build typhoon resistant?	<i>Paano ka nag karoon ng kaalaman na bumuo ng bahay na matibay sa bagyo?</i>	<ul style="list-style-type: none"> ● Itinuro ng mga may kaalaman ● Napag aralan sa eskwelahan ● Eksperyensa lang ● Iba pa....
Did you receive any training or instruction?	<i>Nakatanggap ka ba ng mga pagsasanay o pagtuturo?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If yes, who gave you the training or instruction?	<i>Kung meron, Sino ang nagbigay ng pagsasanay o pagtuturo?</i>	<ul style="list-style-type: none"> ● Mga Humanitarian Unit ● Munisipyo o Gobyerno ● Kamag anak o Mga may kasanayan sa sariling lugar ● Iba pa...
If yes, were some rules explained to construct safer?	<i>Kung meron, May mga panununtunan o pamamaraan ba sa pag gawa ng ligtas?</i>	<ul style="list-style-type: none"> ● Meron ● Wala ● Iba pa...
If not, did you find some rules somewhere else?	<i>Kung hindi, Natutunan niyo lang ba ang mga pamamaraan na ito sa kung saan?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If yes, where?	<i>Kung OO, Saan?</i>	<ul style="list-style-type: none"> ● Napag aralan sa iskwelahan ● Sa Munisipyo o gobyernong local ● Kamag anak o mga may kasanayan sa sariling lugar ● Iba pa...
Did you apply rules to construct safer?	<i>Ginagamit mo ba ang mga pamamaraan para sa pag gawa ng ligtas na bahay?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If yes, which ones?	<i>Kung OO, Ano- ano ang mga iyon?</i>	●
If not, why not?	<i>Kung hindi, bakit hindi?</i>	●
Did these rules change a lot to the way you were used to construct?	<i>Ang mga panununtunan ba na ito ay malaki ang nabago sa paraan ng iyong pag gawa?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If yes, can you give an example of what is different?	<i>Kung OO, magbigay kayo ng halimbawa ng kaibahan?</i>	●
Would you apply typhoon resistant construction principles in a future construction project?	<i>Gagamitin mo ba ang prinsipyo ng matatag sa bagyo na pag gawa sa mga paparating na proyekto?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If not, why not?	<i>Kung hindi, Bakit hindi?</i>	●
If yes, what motivates you to apply typhoon resistant construction principles in the houses?	<i>Kung OO, ano ang naguudyok sayo na gamitin ang prinsipyo ng matatag sa bagyo na pag gawa ng bahay?</i>	<ul style="list-style-type: none"> ● Takot sa nakaraang bagyo ● Gustong matiyak na ligtas ang bahay ● Para hindi pauli ulit ang pag gawa ● Iba pa...
Did you search for written documentation for the construction of the houses?	<i>Naghahanap ka ba ng mga babasahin sa pag gawa ng kabahayan?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
If yes, what the documentation that you found useful to you?	<i>Kung OO, Ano ang babasahin na ito na malaki ang naging pakinabang sayo?</i>	●
If yes, what did you use from it?	<i>Kung OO, Ano ang nagamit mo mula dito?</i>	●
If not, why not?	<i>Kung hindi, bakit hindi?</i>	<ul style="list-style-type: none"> ● Not needed / not effective / does not correspond to habits or culture / my house is not in a risky area/ we don't have a lot of typhoons / to expensive / I don't know how
Was there information you did not understand completely?	<i>May impormasyon ba na hindi mo lubos na naunawaan?</i>	<ul style="list-style-type: none"> ● OO ● Hindi
Did you have new questions concerning the construction of the houses after the typhoon?	<i>May mga bago ka bang katanungan patungkol sa paggawa ng kabahayan pagkatapos ng bagyo?</i>	●
If yes, what new questions did you have?	<i>Kung OO, Ano ang gusto mong itanong?</i>	●
What problems occurred during the construction?	<i>Anong problema ang kinaharap habang gumagawa?</i>	<ul style="list-style-type: none"> ● Kulang sa materyales ● Mahal ang mga materyales

			<ul style="list-style-type: none"> • Walang pera pambili ng materyales • Iba pa...
	Were you able to solve the problems?	<i>Nasolusyonan mo ba ang problema?</i>	<ul style="list-style-type: none"> • OO • Hindi
	If not, why not?	<i>Kung hindi, bakit hindi?</i>	<ul style="list-style-type: none"> •
	If yes, how did you solve the problems?	<i>Kung OO, Paano mo na solusyonan ang problema?</i>	<ul style="list-style-type: none"> •
Knowledge source	Do you have questions during the construction process?	<i>May mga tanong ka ba sa panahong ginagawa?</i>	<ul style="list-style-type: none"> •
	If yes, where do you go if you have questions about construction?	<i>Kung OO, Saan ka pumunta para magtanong tungkol sa pag gawa?</i>	<ul style="list-style-type: none"> •
	If yes, what questions did you ask?	<i>Kung OO, Ano ang inyong itinanong?</i>	<ul style="list-style-type: none"> •
	If yes, were you satisfied with the answers you found?	<i>Kung OO, Kumbinsido ka ba sa sagot na natanggap mo?</i>	<ul style="list-style-type: none"> •
	Who else would you ask if they did not know the answer?	<i>Sino ang tatanogin mo kung hindi nila alam ang sagot?</i>	<ul style="list-style-type: none"> •
	Where else did you search for information?	<i>Saan ka pa naghanap ng impormasyon?</i>	<ul style="list-style-type: none"> • Kamag anak na may kaalaman o kakilalang may kaalaman • Sa mga babasahing libro • Gobyernong local o munisipyo • Iba pa...
	What questions did you want answer to?	<i>Anong mga katanungan pa ang gusto mong masagot?</i>	<ul style="list-style-type: none"> •
	Did you find all the answers?	<i>Nahanap mo ba ang lahat ng kasagutan?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
	If not, what did you not find?	<i>Kung hindi, Ano ang hindi mo nahanap?</i>	<ul style="list-style-type: none"> •
	Did you search for written documentation for the planning of your house?	<i>Naghahanap ka ba ng babasahin para sa pagpapalano ng iyong bahay?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
	What the documentation you found useful to you?	<i>Anong babasahin ang nahanap mo na kapaki-pakinabang sayo?</i>	<ul style="list-style-type: none"> •
	If yes, what did you use from it?	<i>Kung OO, Ano ang nagamit mo mula dito?</i>	<ul style="list-style-type: none"> •
	If not, why not?	<i>Kung hindi, bakit hindi?</i>	<ul style="list-style-type: none"> •
	Was there information you did not understand completely?	<i>May mga impormasyon ba na hindi mo naunawan ng lubos?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
Knowledge exchange	Did you assist households in the selection of a location to build a house?	<i>Inalalayan mo ba ang bawat pamilya sa pagpili ng lokasyon para pagtayan ng bahay?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
	What is special about the houses you construct?	<i>Ano ang katangi- tangi sa bahay na iyong nagawa?</i>	<ul style="list-style-type: none"> • Lahat ng materyales ay matibay • Konkreto at pili ang materyales • Iba pa...
	Why do you make it special?	<i>Bakit mo ito ginawang katangi tangi?</i>	<ul style="list-style-type: none"> • Para matibay sa mga malalakas na bagyo • Para maging ligtas sa buong pamilya • Iba pa...
	What motivated you to make houses different?	<i>Ano ang nagudyok sayo para gumawa ng bahay na naiiba?</i>	<ul style="list-style-type: none"> • Natakot sa nakaraang dumaang bagyo • Upang mas maging ligtas • Iba pa...
	What do your house have in common with the other houses?	<i>Ano ang pagkakapareho ng bahay mo sa ibang bahay?</i>	<ul style="list-style-type: none"> • Desinyo • Kalidad ng pag gawa • Materyales • Iba pa...
	What did you copy from other houses?	<i>Ano ang kinopya niyo mula sa ibang kabahayan?</i>	<ul style="list-style-type: none"> • Desinyo • Kalidad ng pag gawa • Materyales • Iba pa....
Material quality	What materials did you use for the foundation?	<i>Anong mga materyales ang ginamit mo para sa pundasyon?</i>	<ul style="list-style-type: none"> •
	What materials were used for the columns?	<i>Anong materyales ang ginamit niyo para sa haligi?</i>	<ul style="list-style-type: none"> • Mahoney /Mahogoney/ Gemelina / Paper tree / Cocolumber
	What materials were used for the beams?	<i>Anong materyales ang ginamit niyo</i>	<ul style="list-style-type: none"> •

		<i>para sa barakilan?</i>	
	What materials were used for the walls?	<i>Anong materyales ang ginamit niyo para sa pader?</i>	●
	What materials were used for the roof?	<i>Anong materyales ang ginamit niyo para sa bubongan</i>	●
	If timber, what did you look at to check the quality of the timber?	<i>Kung Tabla, Ano ang tinitignan niyo para malaman ang kalidad ng kahoy?</i>	●
	If cocolumber, what did you look at to check the quality of the cocolumber?	<i>Kung coco lumber, Ano ang tinitignan niyo para malaman ang kalidad ng coco lumber?</i>	●
	If Mangium, what did you look at to check the quality of the Mangium?	<i>Kung Manguim, Ano ang tinitignan niyo para malaman ang kalidad ng Mangium?</i>	●
	If Mahogoney, what did you look at to check the quality of the Mahogoney?	<i>Kung Mahoganey, Ano ang tinitignan niyo para malaman ang kalidad ng Mahoganey?</i>	●
	If Gemelina, what did you look at to check the quality of the Gemelina?	<i>Kung Gemelina, Ano ang tinitignan niyo para malaman ang kalidad ng Gemelina?</i>	●
	If Paper tree, what did you look at to check the quality of the Paper tree?	<i>Kung Paper tree, Ano ang kalidad na tinitignan niyo para malaman ang kalidad ng Paper tree?</i>	●
	If nails, what did you look at to check the quality of the nails?	<i>Kung Pako, Ano ang tinitignan niyo para malaman ang kalidad ng Pako?</i>	●
	If cement, what did you look at to check the quality of the cement?	<i>Kung Semento, Ano ang tinitignan niyo para malaman ang kalidad ng Semento?</i>	●
	If concrete, did you use rebar/ steel bars in your concrete?	<i>Kung Sementado, Gumagamit ba kayo ng bakal sa pag sesemento?</i>	●
	If concrete, what did you look at to check the quality of the concrete?	<i>Kung Sementado, Ano ang tinitignan niyo para malaman ang kalidad ng pagsesemento?</i>	●
	If concrete, did you use gravel?	<i>Kung Sementado, Gumagamit ba kayo ng graba?</i>	●
	If yes, what did you look at to check the quality of the gravel?	<i>Kung OO, Ano ang tinitignan niyo para malaman ang kalidad ng Graba?</i>	●
	If sand, what did you look at to check the quality of the sand?	<i>Kung Buhangin, Ano ang tinitignan niyo para malaman ang kalidad ng Buhangin?</i>	●
	If sand, did you use sand from the beach for concrete?	<i>Kung Buhangin, Gumagamit ba kayo ng buhangin galing sa apaya para sa pagsesemento?</i>	●
	If yes, why?	<i>Kung OO, Bakit?</i>	●
	If other material, what did you look at to check the quality?	<i>Kung may ibang materyales, Ano ang tinitignan niyo para malaman ang kalidad?</i>	●
Material supplier	Where did you get materials for your houses?	<i>Saan kayo kumukuha ng materyales para sa kabahayan niyo?</i>	<ul style="list-style-type: none"> ● Taga suplay ● Tulong galing sa Humanitarian ● Galing sa local na gobyerno ● Iba pa...
	How did you transport the materials?	<i>Paano niyo dinadala o binabyahe ang mga materyales?</i>	<ul style="list-style-type: none"> ● Tricycle ● Jeep ● Binibitbit ● Iba pa....
	Did you get material from a supplier?	<i>Kumukuha ba kayo ng materyales sa mga taga suplay?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	How did you find his supplier?	<i>Paano niyo nahanap ang taga suplay?</i>	<ul style="list-style-type: none"> ● Sa radyo ● Rekomendasyon ng kakilala o kaibigan ● Sa mga pahayagan ● Iba pa....
	Why were you motivated to choose for this supplier?	<i>Paano kayo naudyok na piliin ang taga suplay na to?</i>	<ul style="list-style-type: none"> ● Mura ang materyales ● Mabilis ang pagdala sa lugar ● Maganda ang kasunduan ● Iba pa...
	Was the quality of the materials consistent?	<i>Ang kalidad ba ng materyales ay hindi nagbabago?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...

	If not, did you complain?	<i>Kung hindi, Nagreklamo ka ba?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	If not, did your customers complain?	<i>Kung hindi, Nagreklamo ba ang nagpagawa?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	If yes, what happened?	<i>Kung OO, Anong nangyari?</i>	●
	If not, why did you not complain?	<i>Kung hindi, Bakit hindi ka nagreklamo?</i>	●
	Were you willing to pay extra to get the good quality material?	<i>Ayos lang ba sayo magbayad ng sobra para sa magandang kalidad ng materyales?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	If yes, did you receive this quality?	<i>Kung OO, Natanggap mo ba ang kalidad na ito?</i>	●
	If not, why not?	<i>Kung hindi, Bakit hindi?</i>	●
Assessment of safety	Why do you think houses were destroyed?	<i>Sa tingin mo bakit nasira ang bahay?</i>	<ul style="list-style-type: none"> ● Dahil mahina ang mga materyales ● Malakas masyado ang mga kalamidad o bagyo ● Iba pa...
	Why did other houses stand?	<i>Bakit yung ibang bahay nakatayo parin?</i>	<ul style="list-style-type: none"> ● Dahil mas matibay ang pag kagawa ● Matibay ang mga materyales ● Nasa ligtas na lugar ● Iba pa...
	How do you know your house(s) are strong?	<i>Paano mo nalaman na matibay ang kabahayan niyo?</i>	<ul style="list-style-type: none"> ● Matibay ang mga materyales na ginamit ● Kongkreto ● Nasa ligtas na lugar ● Eksperto ang gumawa ● Iba pa...
	Do you feel your house(s) are safe in case of a storm?	<i>Nararamdaman mo ba na ligtas ang bahay niyo kapag may sama ng panahon?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	If yes, what makes you feel safe?	<i>Kung OO, Ano ang dahilan at ligtas ang pakiramdam mo sa bahay niyo?</i>	<ul style="list-style-type: none"> ● Matibay ● Nasa ligtas na lugar ● Ang desinyo ay ginawa ayon sa prinsipyong ligtas
	If not, why not?	<i>Kung hindi, Bakit hindi?</i>	●
	Do you feel your house(s) are safe in case of a typhoon?	<i>Nararamdaman mo ba na ligtas ang bahay mo kapag may malakas na bagyo?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	Will your house(s) stand in case of a new typhoon such as Yolanda?	<i>Ang bahay mo ba ay mananatiling nakatayo kung sakaling may isa pang yolandang dumating?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	What makes your house(s) safe in case of a typhoon?	<i>Anong dahilan para masabi mong ligtas ang bahay niyo kapag may malakas na bagyo?</i>	<ul style="list-style-type: none"> ● Matibay ang materyales ● Eksperto ang gumawa ● Nasa ligtas na lugar ● Matibay ang desinyo ng pag kagagawa ● Iba pa.
	What makes your house(s) unsafe in case of a typhoon?	<i>Anong dahilan para masabi mong hindi ligtas ang bahay niyo kapag may malakas na bagyo?</i>	<ul style="list-style-type: none"> ● Hindi ligtas ang lugar ● Mahina ang mga materyales na ginamit ● Hindi Eksperto ang mga gumawa ● Hindi nasunod ang matibay na desinyo
	Could you make your house(s) safer?	<i>Kaya mong gawing mas matibay ang bahay mo?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	If yes, why didn't you do that (yet)?	<i>Kung OO, Bakit hindi mo agad ginawang matibay?</i>	<ul style="list-style-type: none"> ● Not needed / not effective / does not correspond to habits or culture / my house is not in a risky area / we don't have a lot of typhoons / to expensive / I don't know how
	Can you limit the damage to your house(s) if a typhoon is coming?	<i>Kaya mo bang Malimitahan ang pinsala sa inyong bahay kapag dumating ang malakas na bagyo?</i>	<ul style="list-style-type: none"> ● OO ● Hindi ● Iba pa...
	Will you limit the damage to your house(s) if a typhoon is coming?	<i>Gagawin mo ba ang mga paraan para hindi mapinsala ng inyong bahay</i>	<ul style="list-style-type: none"> ● OO ● Hindi

		<i>kapag dumating ang malakas na bagyo?</i>	<ul style="list-style-type: none"> • Iba pa...
	What will you do to limit the damage?	<i>Anong gagawin mo para malimitahan ang mga pinsala?</i>	<ul style="list-style-type: none"> • Ipapagawa sa eksperto • Gagamit ng matibay na materyales • Itatayo sa ligtas na lugar • Iba pa...
Future	Where would you search for information for the construction of a house in the future?	<i>Saan kau kukuha ng impormasyon kung magpagawa ng bahay sa hinaharap?</i>	<ul style="list-style-type: none"> • Magtatanong sa eksperto • Maghahanap sa internet • Iba pa...
	How would you like to have information presented to you?	<i>Paano mo gustong maipakita o maituro sayo ang mga impormasyon na ito?</i>	<ul style="list-style-type: none"> •
	Do you train future carpenters or masons?	<i>Magsasanay ka ba ng mga karpentero o mason para sa hinaharap?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
	Do you advise others in their construction project?	<i>Magpapayo ka ba sa ibang may mga gagawing proyekto?</i>	<ul style="list-style-type: none"> • OO • Hindi • Iba pa...
Personal data	What is your gender?	<i>Ano ang iyong kasarian?</i>	<ul style="list-style-type: none"> • Babae • Lalaki • Iba pa...
	What is your age?	<i>Ano na ang edad?</i>	<ul style="list-style-type: none"> •

Annex 3. Focus groups

In each community one focus group meeting was organised at the beginning or at the end of the visit. While an interview usually occurs with an individual, the focus group method allows members of the group to interact and influence each other during the discussion and consideration of ideas and perspectives.

Questions on the recovery time-line

We use manila paper, markers and post-its to make a time-line of the recovery. We make a photo of the result, make notes and make photo and video.

- *Where did you search for shelter for the typhoon Yolanda?*
- *Where did you sleep in the first week? Who else slept there?*
- *When did you receive aid? What aid did you receive?*
- *When did you start with the construction of your current house?*
- *What problems were there in the selection of a site?*
- *What problems were there in finding materials for your house?*
- *What else was lacking or troubling you?*

Questions on hazard resistance

We use individual papers for all participants to draw on. We make photos of the results, make notes and video.

- *Can you draw your dream house?*
- *What materials is your dream house made of? And why?*
- *How is your house built?*
- *By who is it built? And why?*
- *Where is it built? And why?*
- *What is your current house lacking what you wanted?*

Questions on priorities / resilience

We start a discussion on community resilience and what it means for the community in one big brainstorm. We make a photo of the result, make notes and make photo and video.

- *What do you think of when you think of resilience?*
- *What else?*

Annex 4. Pre-assessment of sitio by BEANS

To be filled in manually

Pre-assessment of sitio	Answer
Name of sitio	
Name of Barangay	
Geographical coordinates	
Geographical location	inland / next to seashore / next to river / on island / close to city/...
Transport means to access community	by car/ by scooter / by bike / by boat/....
Access routes to community	Over landroad / over paved road / over sea / over river /...
Type(s) of recovery assistance provided to sitio	
Shelter assistance provided (amount and type)	
Criteria for beneficiary selection for shelter assistance program	
Amount of new houses built in sitio after Yolanda	
Amount of partially damaged in sitio after Yolanda	
Amount of minorly damaged in sitio after Yolanda	
Institution or organisation which provided recovery assistance	
Largest distance to primary education for households	
Largest distance to secondary school for households	
Distance to health centre	
Largest distance to water and sanitation for households	
Number of inhabitants of sitio	
Average income level of sitio	
Main occupation(s) of sitio inhabitants	
Percentage of inhabitants working within 30 minutes traveling from sitio	
Percentage of inhabitants working within 1 hour traveling from sitio	

Annex 5. Build Back Safer guidelines

8 BUILD BACK SAFER KEY MESSAGES V1.1

1 BUILD ON STRONG FOUNDATIONS

Yolanda showed us that the way we build houses needs to be stronger. These are 8 key messages on how to repair your house and build back safer.

HOW DOES A TYPHOON AFFECT YOUR HOUSE?

8 BE PREPARED

- EVACUATION
- COMMUNICATION
- GRAB BAG

2 TIE-DOWN FROM BOTTOM UP

3 BRACE AGAINST THE STORM

4 USE STRONG JOINTS

5 A GOOD HOUSE NEEDS A GOOD ROOF

6 SITE YOUR HOUSE SAFELY

7 A SIMPLE SHAPE WILL KEEP YOU SAFE

Shelter Cluster Philippines
ShelterCluster.org
Coordinating Humanitarian Shelter
DSWD
Department of Social Welfare and Development

BUILD BACK SAFER KEY MESSAGE 1 of 8 V1.1

Build on strong foundations

Foundations are very important as they anchor your house to the ground. Ensuring foundations are suitable to your building's location and ground conditions protect your house from strong winds, earthquakes and flooding.

A Stops the building flooding

B Protects the building from pests - like termites

C Keeps the timber away from water so it does not rot

D Stops the building from being pushed over

E Weights the building down so it can't be sucked up

F Stops the building sinking into the ground

WHAT CAN I USE AS A FOUNDATION FOR MY HOUSE?

<p>Above ground timber post</p> <p>Too Weak ❌</p>	<p>Below ground timber post</p> <p>Strong ✅</p>	<p>Anchors increase foundation strength</p> <p>Stronger ✅</p>	<p>Treated hardwood post below ground protects from rotting</p> <p>Strongest ✅✅</p>
---	---	---	---

Shelter Cluster Philippines
ShelterCluster.org
Coordinating Humanitarian Shelter
DSWD
Department of Social Welfare and Development

Figure 1. Build Back Safer guidelines. Source: Shelter Cluster, <https://www.sheltercluster.org/pacific/documents/8-build-back-safer-key-messages-english>

Tie-down from bottom up

In a typhoon your house can be sucked apart or blown away by the wind. Tie every part of your building right through to the ground. Start thinking about this from the bottom up.

A Tie the posts down to the foundation

B Tie the floor joists down to the frame

C Tie the roof beams down to the posts

D Tie the roof frame down to the posts

E Tie the roof battens down to the roof frame

WHAT CAN I USE TO TIE-DOWN MY HOUSE?

Rope or nylon fishing wire

Thick galvanized wire (multiple layers)

Strong ✓

Timber cleats

Galvanized metal strap

Strongest ✓✓

STRONG WINDS COMING?

Tie-down when strong winds come



Brace against the storm

Strong bracing stops your house being pushed over or pulled apart by the wind. Bracing needs to be strong against being crushed along its length or pulled apart. Brace between the strong points of your house.

A Brace each wall

B Brace below the roof

C Brace between roof trusses or rafters

D When on stilts, brace between the posts

E Full bracing both ways from strong point to strong point!

F Brace at 45°. No less than 30° and more than 60°

G Brace around doors and windows - strong point to strong point!

WHAT CAN I USE TO BRACE MY HOUSE?

Tie thick galvanized steel wire

Strong ✓

Tie old rebar

Nail timber

Nail galvanized steel straps

Stronger ✓

Nail timber and galvanized steel straps

Strongest ✓✓



Figure 2. Build Back Safer guidelines. Source: Shelter Cluster, <https://www.sheltercluster.org/pacific/documents/8-build-back-safer-key-messages-englis>

A Extend timber past joints to stop nails splitting the timber

Use strong joints ✓

Your house is only as strong as the weakest joint. Build every joint so it can't be pushed or pulled apart. Horizontal nails are better as they can't be pulled apart by the wind sucking your house up or pulling it down.

F Use gusset plates to strengthen joints

B Don't cut away too much of the main posts or beams

C Offset nails to prevent timber splitting

D Nailing at an angle will make the joint harder to pull apart

E Fishplate/strap vertical and horizontal joints to increase strength

WHAT CAN I USE TO STRENGTHEN JOINTS?

Single nail	Nails	Screw	Interlock joint and nail	Fishplate or cleats	Bolt
Too Weak ✗	Strong ✓		Stronger ✓		Strongest ✓✓



A Keep eaves short to stop the roof being sucked away and long enough to protect the walls from rain

A good house needs a good roof ✓

The way you design and build your roof is critical to protect you against strong winds and rain. Build your roof the right shape and pitch, and well nail down to protect against a storm.

E Overlap roof sheets to strengthen joints

B The best roof pitch is 30°

C Use more nails at all the roof edges

CGI thickness 0.4mm

D Use rubber washer or silicone on roofing nails

WHAT CAN I USE TO SECURE MY ROOF?

Regular nail	Umbrella head nail and washer	German wire (good for bamboo)	Twisted umbrella head nail and washer	Roofing screw and washer
Too Weak ✗	Strong ✓		Strongest ✓✓	

WHAT ROOF SHAPE SHOULD I USE?

Single slope roof	Two sided gable roof	Multiple roof slopes reduce the risks of your roof being pulled apart
Too Weak ✗	Strong ✓	Strongest ✓✓



Figure 3. Build Back Safer guidelines. Source: Shelter Cluster, <https://www.sheltercluster.org/pacific/documents/8-build-back-safer-key-messages-englis>

Site you house safely ✓

Identify the hazards in your location and build as well as you can to resist them.

A Raise your house above the floods

B Don't build too close to edges or where rocks might fall

C Reduce risks and build away from hazards where possible

D Build away from large trees or remove trees near the house to reduce risk of damage

E Use wind breaks to protect your house from strong winds



A simple shape will keep you safe ✓

The shape of your house is important to reduce damage in strong winds. Always keep the design simple and strong.

A Overhangs weaken the strength of your house

B Simple, compact shapes are the safest

C Don't extend too long

D Lean to roofs separate to main roof

Length no more than three times the width

HOW SHOULD WE PLAN A GROUP OF BUILDINGS?

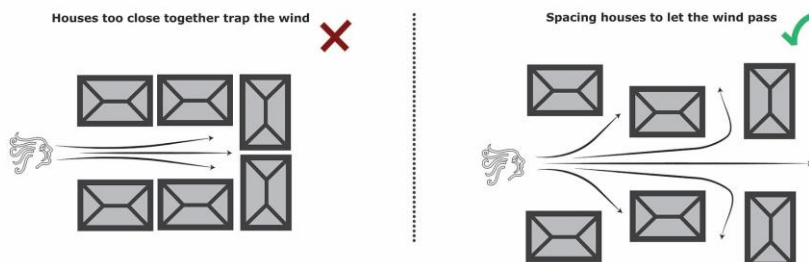


Figure 4. Build Back Safer guidelines. Source: Shelter Cluster, <https://www.sheltercluster.org/pacific/documents/8-build-back-safer-key-messages-english>

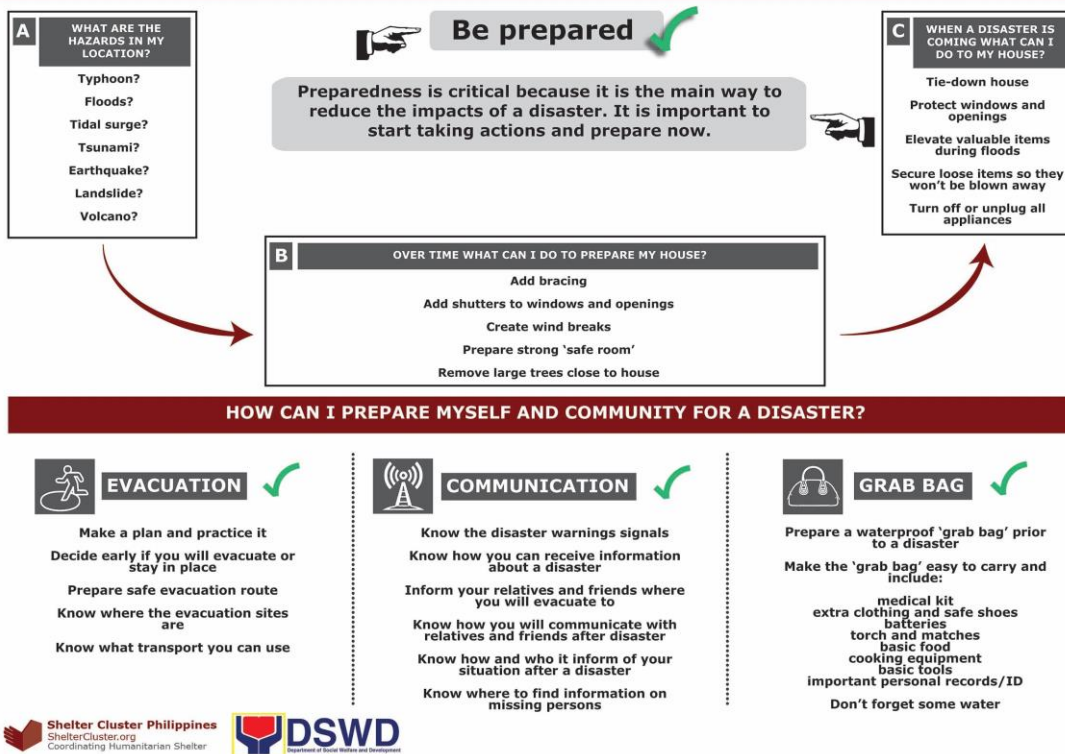


Figure 5. Build Back Safer guidelines. Source: Shelter Cluster, <https://www.sheltercluster.org/pacific/documents/8-build-back-safer-key-messages-englis>

Annex 6. Observatory check-list

List of construction principles from Shelter Cluster guidelines to observe in the field if safe construction techniques were applied by household and carpenters. Elaborated by the author.

Observatory based on Shelter Cluster checklist on self-built houses										YES/NO					Observations / Why did you build in this way?			
Key message	Principle that should be applied in the constructions	1	2	3	4	5	6	7	8	9	10	11	12	13		14	15	
1. Build on Strong foundations	1a. Material used for foundations	1. 1/4 height under ground																
		2. timber away from water																
		3. concrete foundation																
		4. wood into concrete foundation																
		5. Anchors																
2. Tie down from bottom-up	2a. Material used to tie down	1. The posts down to the foundation																
		2. Tie the floor joints down to the frame																
		3. tie the roof beams to the posts																
		4. Tie the roof frame to the posts																
		5. Tie the roof battens down to the frame																
		6. Rope or nylon fishing wire																
		7. Galvanized wire																
		8. Timber cleats																
		9. Galvanized metal strap																
3. Brace against the storm	3a. Material used for Bracing	1. Brace in walls																
		2. Brace below the roof																
		3. Brace between the roof																
		4. Brace between the posts																
		5. Bracing both ways																
		6. Brace at 45°																
		7. Brace around doors and windows																
		8. The old bar																
		9. Nail timber																
4. Use strong joints		1. Extend timber past joints																
		2. Don't cut away too much of the main post or beams																
		3. Offset nails of 1/3 to prevent timber splitting																
		4. Nailing at an angle																
		5. Fishplate strap vertical joints to increase strenght																
		6. Gussel plates to strengthen joints																
5. Good roof		1. Keep eaves short and long enough to protect from rain (45 cm max)																
		2. Roof pitch 30°																
		3. Two sided gable roof or better multiple roof slopes (cuatro aguas)																
		4. Overlapped roof sheets																
		5. More nails at all roof edges																
6. Good site - location		1. Raise the house above the floods																
		2. Don't build too close to edges or where rocks might fall																
		3. Build away from hazards where is possible																
		4. Away from large trees or remove large trees																
		5. Use windbreaks																
7. Simple shape		1. No overhangs																
		2. Compact shape																
		3. Don't extend too much																
		4. Lean to roofs separate to main roof																
		5. Spacing houses to make the wind pass																

Annex 7. Interview Protocol Engineers

Introduction:

“My name is Erika Palmieri and I am from Universitat Internacional de Catalunya, in Spain. I am a master student and I am in Coron for my thesis research; I am currently working with Eefje Hendriks that started last year her research in the same area. I would like to take about an **45 minutes** of time for the research we are doing. We study the needs of people that did not receive shelter assistance after typhoon Yolanda.

I would like to know how you were involved in the recovery process after the typhoon Yolanda and especially **what role you had in Disaster Risk Reduction** of the housing. We are interested in **effectiveness of the application of hazard resistant construction techniques** and how enhance the sharing of typhoon resistant construction principles.

After Yolanda, approximately only 10% of the affected population worldwide receives shelter assistance. There is very little known about people that self-recover in comparison with people that receive shelter assistance. I believe that for humanitarian organisations and a larger audience it is important to know more to find essential ways of giving technical assistance. This way we hope to give advice to the government and humanitarian organisations on how to help communities in self-recovery, after a natural disaster in the future.

I will ask you questions and you are free to give any answer. I do not want to influence your answers in any way. I would like to use this interview to give an insight on how **experts like yourself are currently involved in the recovery and which is the influence on the knowledge chain**. This way we can give a better advice for the area of Coron You can stop the interview at any time since it is completely voluntary. The interview will take about 45 min. Do you understand the procedure? Do you have any questions about the procedure?

Would you be willing to participate? Do you mind if I record your answers to write everything down after our conversation?”

Local engineers selected:

- Engineer (NHA National Housing Authority)
- Engineer Dana Dunnol (NCIP National Indigenous People)
- Eng. Fernando Lopez (manager MDRRMO Coron)
- Edwin Atanosa (trainer TESDA)

Priority legenda

- △△ essential
- △ important
- △ skip

Note

Interview topics are a guideline for the interview. It is possible to deviate from the order of topics and questions. Only the Introduction and closing parts are fixed. Topics are prioritized by ‘essential’, ‘important’ or ‘skip’. In case of a lack of time the topics marked ‘skip’ could be left out, but the topics marked ‘essential’ or ‘important’ should be included in the interview.

ID	Topic	Questions	Priority
Part 1: Introduction (5 min)			
1.1	Introduce myself and my research	<ul style="list-style-type: none"> ● Briefly introduce myself and the University I come from ● Working with Eefje Hendriks ● Aim is to deepen the research and my thesis ● We study the role of stakeholders in knowledge adoption . 	△
1.2	Duration of interview	<ul style="list-style-type: none"> ● Interview will take approximately 45 min 	△
1.3	Expectations from the interview	<ul style="list-style-type: none"> ● Understanding influence of the expert on the application of hazard resistant guidelines 	△△
1.4	Consent	<ul style="list-style-type: none"> ● Ask for permission to record / write everything down after the conversation, then start recording 	△△

Part 2: Biographical info of the interview (5 min)*Information about the interviewee, their organizations and their project(s). Includes their duties and reconstruction's role*

2.2	Reconstruction role	<ul style="list-style-type: none"> • How were or are you involved in the reconstruction process after Typhoon Yolanda? 	△
-----	---------------------	---	---

Part 3: Limit to share (10 min)*Focus on technical assistance given by engineers and people trust on their advice. Motivation to share the knowledge and what hinder them to spread it.*

3.1	Trust	<ul style="list-style-type: none"> • Do you think carpenters consider you as 'experienced' on the topics you are advising on? • And why? 	△
3.3	Willingness to share	<ul style="list-style-type: none"> • What motivates you to share knowledge? • If you don't share, what would motivate you to share your knowledge on typhoon resistant construction? • How would you like to benefit from your role as knowledge source? (What do you want to receive in return for sharing your knowledge with others?) 	△△

Part 4: Role in knowledge exchange chain (10 min)*Considerations on awareness of people on a safer reconstruction and other influential actors on the knowledge chain.*

4.1	Awareness	<ul style="list-style-type: none"> • Are all carpenters aware of typhoon resistant construction techniques? • What are the reasons for people not to apply technical guidelines in the reconstruction of their house? 	△
-----	-----------	---	---

Part 5: Knowledge sharing (10 min)*How knowledge is passed on and received from other actors.*

5.1	Knowledge exchange with carpenters and households	<ul style="list-style-type: none"> • How do you exchange your knowledge with carpenters? • Have you ever shared knowledge with households? • Do you believe sharing knowledge is important? 	△△
5.2	Information found	<ul style="list-style-type: none"> • Which kind of information have you received since the Typhoon hit the area? • Where do you look for information? 	△△
5.4	Suggestion	<ul style="list-style-type: none"> • How could engineers help to share knowledge? 	△
5.5	Possible training	<ul style="list-style-type: none"> • Do you train households and carpenters? • If yes, which problems do you encounter? How would you organise more effectively carpenters' training? • If no, does your organization have plans to provide any carpenter training? 	△

Part 6: Closing (5 min)*Closing of the interview by summarizing some key findings,*

6.1	Next steps	<ul style="list-style-type: none"> • Is there anyone else I should to talk to? • Repeat the purpose of the interview and the research project. Explain how the information is going to be used. • Any questions? 	△
6.2	Sign off	<ul style="list-style-type: none"> • Thanking for their input • Repeat issues of confidentiality • Agreeing on (potential) follow up / contact • Leave contact information (tel + email) 	△△

Annex 8. Interview Protocol International Humanitarian Experts

Introduction

“My name is Erika Palmieri and I am from Universitat Internacional de Catalunya, in Spain. I am a master student and I am in Coron for my thesis research; I am currently working with Eefje Hendriks that started last year her research in the same area. I would like to take about **45 minutes** of time for the research we are doing. We study the needs of people that did not receive shelter assistance after typhoon Yolanda.

I would like to know how you were involved in the recovery process after the typhoon Yolanda and especially **what role you had in Disaster Risk Reduction** of the housing. We are interested in **effectiveness of the application of hazard resistant construction techniques** and how enhance the sharing of typhoon resistant construction principles.

After Yolanda, approximately only 10% of the affected population worldwide receives shelter assistance. There is very little known about people that self-recover in comparison with people that receive shelter assistance. I believe that for humanitarian organisations and a larger audience it is important to know more to find essential ways of giving technical assistance. This way we hope to give advice to the government and humanitarian organisations on how to help communities in self-recovery, after a natural disaster in the future.

I will ask you questions and you are free to give any answer. I do not want to influence your answers in any way. I would like to use this interview to give an insight on how **international experts like yourself are currently involved in the recovery and which is the influence on the knowledge chain**. This way we can give a better advice for the area of Coron You can stop the interview at any time since it is completely voluntary. The interview will take about 45 min. Do you understand the procedure? Do you have any questions about the procedure?

Would you be willing to participate? Do you mind if I record your answers to write everything down after our conversation?”

International Humanitarian experts selected:

- Wan Sophonpanich (Shelter cluster)
- Anat Prag (Country coordinator Cordaid)
- Kate Landry (Country Director Build Change)

Priority legenda

- △△ essential
- △ important
- △ skip

Note

Interview topics are a guideline for the interview. It is possible to deviate from the order of topics and questions. Only the Introduction and closing parts are fixed. Topics are prioritized by ‘essential’, ‘important’ or ‘skip’. In case of a lack of time the topics marked ‘skip’ could be left out, but the topics marked ‘essential’ or ‘important’ should be included in the interview.

ID	Topic	Questions	Priority
Part 1: Introduction (5 min)			
1.1	Introduce myself and my research	<ul style="list-style-type: none"> ● Briefly introduce myself and University I come from ● Working with Eefje Hendriks ● The aim is to deepen the research and my thesis ● We study the role of stakeholders in the knowledge application. 	△
1.2	Duration of interview	<ul style="list-style-type: none"> ● Interview will take approximately 45 min 	△
1.3	Expectations from the interview	<ul style="list-style-type: none"> ● Understanding influence of the expert’s organisation on the application of hazard resistant guidelines 	△△
1.4	Consent	<ul style="list-style-type: none"> ● Ask for permission to record / write everything down after the conversation, then start recording 	△△

Part 2: Biographical info of the interview (5 min)

Information about the interviewee, their organizations and their project(s). Includes their history, objectives and organizational structures.

2.1	Interviewee profile	<ul style="list-style-type: none"> • What was your role and responsibility in the organization when you were working after Typhoon Yolanda? 	△
2.2	Reconstruction task	<ul style="list-style-type: none"> • What tasks were part of your job during the Typhoon Yolanda recovery process? <p>-----</p> <ul style="list-style-type: none"> • (Anat Prag) What was and is your role in contributing to typhoon resistant construction? • What were your level and duration of involvement? 	△△

Part 3: Tools to support self-recovery (10 min)

An insight on effectiveness Build Back Safer Guidelines: process making, spreading and limits.

3.1	Communication effectiveness	<ul style="list-style-type: none"> • What communication methods did you find to be most effective in the communities? • In which way do you get insight into the comprehension of guidelines by the community members? 	△
3.2	Guidelines limits	<ul style="list-style-type: none"> • Which are limitations of the guidelines to Build Back Typhoon resistant? • What conditions supported the information diffusion into your program at the different levels? • What conditions hindered the information diffusion into your program at the different levels? 	△
3.3	Collaboration BB, Cordaid and tesda	<ul style="list-style-type: none"> • How did you decided to start a collaboration between Build Change, Cordaid and Tesda? • What has this lead to? • Did you see an increased application of technical guidelines by the carpenters involved in the training program? 	△△
3.4	Typhoon consequences on knowledge adoption	<ul style="list-style-type: none"> • Since it is now 4,5 year after the typhoon do you feel the adoption of knowledge has changed? In what way? • How did the typhoon in Coron have an impact on the structures of newly built and existing houses? • How did the typhoon influence the exchange of knowledge around hazard resistant construction in Coron? 	△△

Part 4: Information sharing process (10 min)

Way of sharing to different actors, application limits and

4.1	Information sharing	<ul style="list-style-type: none"> • How did you share information about hazard resistant housing with municipalities? • How did you share technical information with households to support resilient self-recovery? • Which are the main actors with whom you share your knowledge? 	△△
4.2	Influence in knowledge adoption	<ul style="list-style-type: none"> • Why is the the application of hazard resistant guidelines still limited after your assistance? • How can international organizations help the application of hazard resistant principles? 	△

Part 5: Implementation of knowledge exchange (10 min)

5.1	Guidelines adopted	<ul style="list-style-type: none"> • How many guidelines are spread in the Philippines that are efficient and easy to understand? • How would you improve the technical guidelines? • Which alternatives do you see for technical guidelines like the one produced by Shelter Cluster? 	△
5.2	Self-recovery	<ul style="list-style-type: none"> • How to enhance resilient self recovery approaches in humanitarian 	△

	approaches	<i>practice?</i>	
Part 6: Closing (10 min) <i>Closing of the interview by summarizing some key findings,</i>			
6.1	Next steps	<ul style="list-style-type: none"> ● <i>Is there anyone else I should to talk to?</i> ● <i>Repeat the purpose of the interview and the research project. Explain how the information is going to be used.</i> ● <i>Any questions?</i> 	△
6.2	Sign off	<ul style="list-style-type: none"> ● <i>Thanking for their input</i> ● <i>Repeat issues of confidentiality</i> ● <i>Agreeing on (potential) follow up / contact</i> ● <i>Leave contact information (tel + email)</i> 	△△

Annex 9. Interview protocol Local Organisations

Introduction

*My name is Erika Palmieri and I am from Universitat Internacional de Catalunya in Spain. I'm a master student and I'm here for my thesis research; I'm working with Eefje Hendriks that started last year the research in Coron. I would like to take about an **45 minutes** of time for the research we are doing. We study the needs of people that did not receive shelter assistance after typhoon Yolanda.*

We would like to know how your NGO was involved in the recovery process after the typhoon Yolanda and especially what role you had in Disaster Risk Reduction of the housing. We are interested in effectiveness of the application of hazard resistant guidelines and how enhance the knowledge exchange. We have to be smart about the way we help to be able to help more people in their real needs. Currently approximately only 10% of the affected population in the Philippines but also worldwide receives shelter assistance. There is very little known about people that self-recovery in comparison with people that receive shelter assistance.

For humanitarian organisations it is important to understand these self-recovery process better and find out what are the needs in this process. This way we hope to give advise the government and humanitarian organisations on how to help communities in self-recovery, after a natural disaster in the future. However, this does not mean that this research will directly influence the situation in this region. We can not promise that. Do you understand my storey so far?

We will ask you questions and you are free to give your answer. We do not want to influence your answers in any way. I would like to use this interview to give an insight on how experts like yourself are currently involved in the recovery. This way we can give a better advice for the region. You can stop the interview at any time since it is completely voluntary. The interview will take about 45 min. Do you understand the procedure? Do you have any questions about the procedure?

Would you be willing to participate? Do you mind if I record your answers to write everything down after our conversation?

Local Humanitarian experts selected:

- Eric Lopez (Cordaid)
- Project Manager Caritas

Priority legenda

- △△ essential
- △ important
- △ skip

Note

Interview topics are a guideline for the interview. It is possible to deviate from the order of topics and questions. Only the Introduction and closing parts are fixed. Topics are prioritized by 'essential', 'important' or 'skip'. In case of a lack of time the topics marked 'skip' could be left out, but the topics marked 'essential' or 'important' should be included in the interview.

ID	Topic	Questions	Priority
Part 1: Introduction (5 min)			
1.1	Introduce myself and my research	<ul style="list-style-type: none"> ● Briefly introduce myself and the University I come from ● Working with Eefje Hendriks ● Aim is to deepen the research and my thesis ● We study the role of stakeholders in the knowledge adoption . 	△
1.2	Duration of interview	<ul style="list-style-type: none"> ● Interview will take approximately 45 min 	△
1.3	Expectations from the interview	<ul style="list-style-type: none"> ● Understanding influence of the local organisation on the application of hazard resistant guidelines 	△△
1.4	Consent	<ul style="list-style-type: none"> ● Ask for permission to record / write everything down after the conversation, then start recording 	△△

Part 2: Biographical info of the interview (5 min)

Information about the interviewee, their organizations and their project(s). Includes their history, motivation, objectives and organizational structures.

2.1	Interviewee profile	<ul style="list-style-type: none"> • What was your role and responsibility in the organization when you were working after the Typhoon Yolanda? 	△
2.2	Reconstruction task	<ul style="list-style-type: none"> • What tasks were part of your job during the Typhoon Yolanda recovery process? • What was the level and duration of your involvement? 	△△

Part 3: Technical assistance and trust (10 min)

Focus on technical assistance given by engineers and people's trust in their advice. Motivation to share knowledge and what hinders them to spread it.

3.1	Technical assistance	<ul style="list-style-type: none"> • How did you assist households during the recovery? • How many households did you provide with technical assistance in this community? Number? 	△△
3.2	Trust	<ul style="list-style-type: none"> • Do people apply your technical advices? Number? And why? • Do people ignore your technical advices? Number? And why? • Do you think people assisted in the community consider you as 'experienced' on the topics your advising on? And why? 	△
3.3	Motivation and Willingness to share	<ul style="list-style-type: none"> • What do you need to reach more people with your advice? • What motivates you to share the knowledge? • If you don't share, what would motivate you to share it? 	△△
3.4	Households: other priorities	<ul style="list-style-type: none"> • How did you manage the different priorities perspective with households? 	△△

Part 4: Role in knowledge exchange chain (10 min)

Considerations on awareness of people on a safer reconstruction and other influential actors on the knowledge chain.

4.1	Awareness	<ul style="list-style-type: none"> • Are all households aware of typhoon resistant construction techniques? • Why don't people apply technical advice in the reconstruction of their house? 	△
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Part 5: Knowledge sharing (10 min)

How knowledge is passed on and received from other actors.

5.1	Knowledge exchange with households	<ul style="list-style-type: none"> • How did you share your knowledge with households to support resilient self-recovery? • With how many households do you actively share your knowledge? 	△△
5.2	Shelter Cluster role in exchange knowledge	<ul style="list-style-type: none"> • Which information have you received from Shelter Cluster since the Typhoon hit the area? 	△△
5.3	Resources shared	<ul style="list-style-type: none"> • What type of resources did you share? Materials, information, financial, human, other? • Did you receive resources from outside the community? If yes, which? 	△
5.4	Influence in knowledge application	<ul style="list-style-type: none"> • Why is application of hazard resistant guidelines still limited after your assistance? • How can local organization help to guarantee the application of those informations? 	△

Part 6: Closing (5 min)

Closing of the interview by summarizing some key findings,

6.1	Next steps	<ul style="list-style-type: none"> • Is there anyone else I should to talk to? • Repeat the purpose of the interview and the research project. Explain how the information is going to be used. • Any questions? 	△
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6.2	Sign off	<ul style="list-style-type: none">• <i>Thanking for their input</i>• <i>Repeat issues of confidentiality</i>• <i>Agreeing on (potential) follow up / contact</i>• <i>Leave contact information (tel + email)</i>	△△
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