International course on water and water management in the Philippines: 6 January - 1 February 2019

Weerd, M. van; Gatan-Balbas, M.; Luning, S.; Taggueg, J.

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Hoogheemraadschap van Rijnland

Universities of Leiden and Oxford
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Cover: participants of the water course 2019

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International course on water and water management in the Philippines 2019

Editors

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Isabela State University, Mabuwaya Foundation and Leiden University

Cabagan, the Philippines and Leiden, the Netherlands

2019

Hoogheemraadschap van Rijnland

Message

Water / Winter Course 2019

In January 2019, 15 students of |Leiden University student went to the Philippines to meet their fifteen counterpart students of Isabela State University, with whom they would participate in the Winter Course of 2019. Although the name Winter Course might confuse one in the Philippine context, something serious is going on with climate change.

The goals of the Water Course might be described as: Getting to know your counterpart student from a different country and a different discipline; Getting to understand what 'integrated water management' and 'river basin management' looks like in practice.

The Rijnland District Water Control Board feels an obligation in sharing knowledge on the subject of integrated water management. With the millennium goals in mind, we understand that sharing knowledge does not limit itself to the boundaries of your country. Our cooperation with Leiden University led us to the Philippines and in this case specifically to the Isabela State University and the Cagayan Valley Programme on Environment and Development (CVPED) and the Mabuwaya Foundation.

In this booklet you find the experiences of the group of students participating in the Water Course 2019. We are proud of the results and the fact that we could contribute to this activity.

We can now speak of a well-established tradition, and I am confident that this ninth Water Course in a row will not be the last one.

I sincerely hope that many more Water Courses may follow!

Timo van Tilburg
Head of the Policy Department
The Rijnland District Water Control Board

Leiden, the Netherlands

ACKNOWLEDGEMENTS

The present booklet is the outcome of the work done by 15 students of Leiden University and 15 students of Isabela State University during the ninth international water course that took place in the Philippines from 6 January – 1 February 2019.

The 2019 Course would not have been possible without the funding support by Hoogheemraadschap Rijnland, the Louwes Fund for research on Water and Food, Leiden University, Isabela State University and the Mabuwaya Foundation.

The course was organized by the Institute of Environmental Sciences (Kiki Boomgaard, Ellen Cieraad, Paula van den Berg, Joyce Glerum), Faculty of Social Sciences of Leiden University (Louise van Gent, Jan Jansen, Ilse Prins, Sabine Luning, Merlijn van Weerd), Isabela State University (Cecille Mangabat, Jouel Taggueg) and the Mabuwaya Foundation (Marites Balbas, Dorina Ferrer, Merlijn van Weerd).

Participants from Isabela State University (ISU) were screened from the different colleges and ISU professors provided lectures and guidance to the students. We wholeheartedely thank all deans, professors and staff of Isabela State University for their support. The Cagayan Valley Program on Environment and Development (CVPED) of Isabela State University (ISU), headed by Cecille Mangabat and Myrna Kaye Ramos, with staff members Eso Tarun and Onia Gunayon provided support while the students stayed in Cabagan. We thank the Campus Executive Officer Dr Hans Ambrosius Aggabao of ISU Cabagan and ISU President Dr Ricmar Aquino for all their support during the coordination, preparation and the implementation of the course.

Essential support during the preparation and implementation of the course was also provided by the Mabuwaya Foundation team: Arnold Macadangdang, Bernard Tarun, Leonalyn Tumaliuan, Mario Pedrablanca, Jovilyn Cureg, Dorina Soler Ferrer, Amante Yogyog and Nanette Cataggatan.

A large number of representatives of government, non-government and international organizations warmly welcomed the students in their offices or field sites and provided a unique insight in their work. The water course 2019 students and staff visited the National Disaster Risk Reduction Management Council (NDRRMC) in Camp Aquinaldo and the Philippine Red Cross Headquarters in Manila. Sam and colleagues of the Kalahan Educational Foundation (KEF) welcomed and toured the students in the Ikalahan Ancestral Domain in Imugan.

Mayor Edgar Go of San Mariano allowed the students to visit Dunoy Lake and to conduct a field work trial in his beautiful municipality in the foothills of the northern Sierra Madre Mountains.

Mayor Leonardo C. Pattung of the municipality of Baggao, local government officials and barangay officials allowed the students to conduct research in their municipality and provided support and information.

Last but not least the students experienced the famous Filipino hospitality while staying with host families in *Barangays* Remus, Pallagao and Sta Margarita in Baggao.

The editors

First encounters in Manila (photo by Merlijn van Weerd).

Visiting the situation room at the National Disaster Risk Reduction Management Council in Manila (photo by Merlijn van Weerd).

Introduction

Water is one of the most critical resources currently under threat world-wide. Developing countries in particular face complex challenges as the demand for clean drinking water, irrigation water and water for the generation of hydroelectricity grows rapidly. Water becomes increasingly scarce while its quality declines. Climate change leads to greater risks associated with floods and droughts.

Water supports a great variety of resources, functions and services, and in order to safeguard these for the future, sustainable management is essential yet not adequately practiced. The formulation of policies for sustainable water resource management is a complex process. Water resource management is typically associated with multiple stakeholders and a wide range of social, environmental and economic needs. Moreover, effective management of water resources is achieved through the linkage of sustainable land and water uses across the whole of a river basin, crossing boundaries of different administrative units. Global institutions highly promote the participation of local communities, claiming that water resource management and development are central to sustainable growth and poverty reduction. Nevertheless, communities face numerous barriers in their efforts to establish sustainable water and land resources management systems, water sources and watersheds and adapt to weather-related disasters

The Faculty of Social Sciences (FSW) and the Institute of Environmental Sciences (CML) of Leiden University, in cooperation with Isabela State University and the Mabuwaya Foundation in the Philippines organized an international, interdisciplinary course on water issues and water management in the Cagayan River basin in Northeast Luzon in the Philippines from 6 January – 1 February 2019. Thirty students participated in this course, 15 through Leiden University and 15 through Isabela State University. The students were enrolled in different studies:

Agribusiness, Agricultural Engineering, Agricultural Technology, Applied Mathematics, Archeology, Biology, Civil Engineering, Cultural Anthropology and Development Sociology, Development Communication, Education, Environmental Science, Forestry, Hotel and Restaurant Management, Information Technology, International Relations, International Studies, Life Science and Technology, Mechanical Engineering, Political Science and Psychology.

The theme of the 2019 course was “Natural Disasters” and specifically the preparation for, impact of and response to Typhoon Ompong (international name Mangkhut) that struck Northeast Luzon on 15 September 2018. In January 2018, the focus of the course was on water management, sustainable development and natural resource utilization in the municipality of Baggao in Cagayan Province. Baggao was the muncipality that was hardest hit by Typhoon Ompong and the course returned here in January 2019 to study the impact of the typhoon.

The objective of the course was to gain experience with working in an international, interdisciplinary team on a problem-oriented research assignment. Apart from gaining knowledge on water management and sustainable development in a developing country, students learned practical fieldwork skills, the application of research methods and techniques and the complexities and opportunities of working in multi-disciplinary multi-cultural teams.

At the start of the course, to get to know each other and learn something about the Philippines, the students visited the old city of Intramuros in Manila, the National Museum of the Filipino People and the Natural History Museum. The group visited the National Disaster Risk Reduction Management Council (NDRRMC) in Camp Aquinaldo for presentations on the governments' program to prepare for and deal with natural disasters. At the Philippine Red Cross Headquarters, the students were shown what an NGO does to prepare for and respond to natural disasters.

On the way to northern Luzon, the Kalahan Educational Foundation (KEF) and the Ikalahan Ancestral Domain in Nueva Vizcaya were visited. Here the students learned about the role of Indigenous Peoples in watershed protection. Magat Dam was visited to see one of the largest dams in the Philippines and its use for flood control, hydropower generation and rice irrigation.

In Cabagan at Isabela State University, a series of lectures was given by external and academic presenters on subjects related to natural disasters, indigenous peoples, biodiversity, sustainable development and about proposal wiritng, field research techniques, presenting and report writing.

During a two day field trial in Dunoy in San Mariano, students were introduced to field conditions and to research methods. The field trial was preceded by a visit to the Municipal Philippine crocodile rearing station in San Mariano where students learned about the critically endangered Philippine crocodile and the efforts to conserve this species in the wild.

The students worked in couples (interdisciplinary, multi-cultural) on the development of a small field study proposal on a topic relevant to natural disasters in the municipality of Baggao in Cagayan Province.

After field work, four days were available to analyze data, write a final report and present the research outcomes.

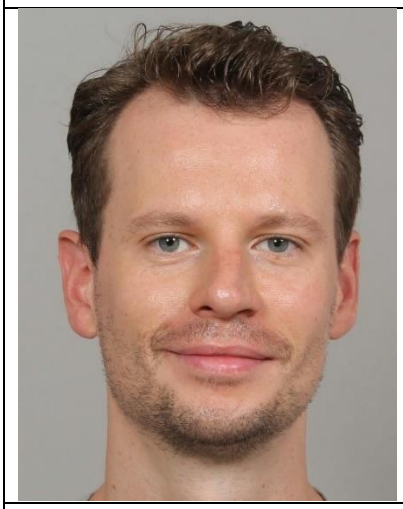
The hard work done, the students visited the rice terraces of Banaue, a world wonder of indigenous engineering and water management. In Batad, a UNESCO World Heritage Site, the students toured the rice terraces and helped restore part of a degraded rice terrace.

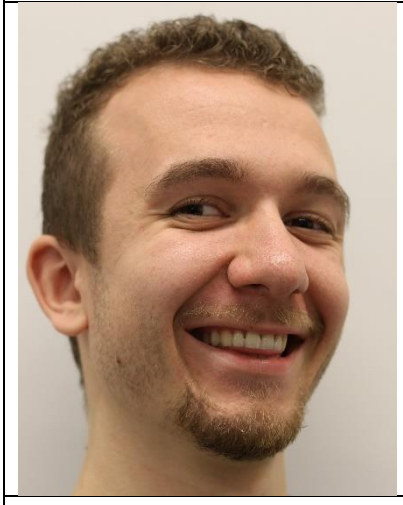
This booklet contains an introduction of the participating students, the course program and student reports of the field studies. The booklet concludes with the facebook blog that was kept by the students.

The Editors

Participating Students

Leiden University

		
Eva Berkman Political Science	**Iris Pieters** Cultural Anthropology and Development Sociology	**Joke Janson** Cultural Anthropology and Development Sociology
		
Simon Stam Cultural Anthropology and Development Sociology	**Vera de Regt** Cultural Anthropology and Development Sociology	**Alissa Kerklingh** Psychology

		
Lotte Bryan Applied Mathematics	**Rosaida Brahim** Archeology	**Layla Schmitter** Life Science and Technology
		
Aniek Hiemstra Mechanical Engineering	**Thomas Bussink** International Studies	**Mattia van der Laan** International Relations
		
Ernst Beijk Biology	**Celine Huisman** Biology	**Philippe Dols** Biology

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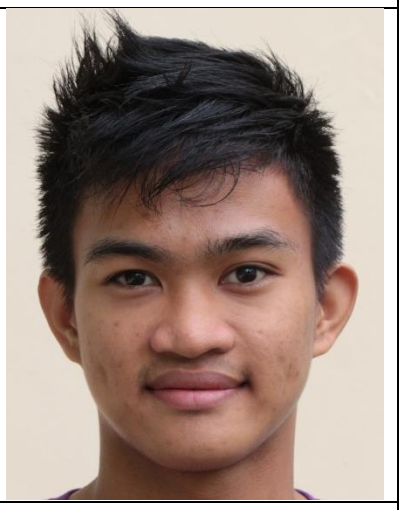
Rina Mae V. Tagayun Agricultural Technology ISU-San Mariano	**Justin C. Maguliano** Biology ISU-Cabagan	**John Paul B. Maggay** Elementary Education ISU-Cabagan
		
Nichelle P. Esmane Elementary Education ISU-Cabagan	**Neil Kim G. Lanquita** Agribusiness ISU-Cabagan	**Dane Christian P. Tuliao** Environmental Management ISU-Cabagan

		
Mary Claire Bauit Development Communication ISU-Cabagan	**Leymar T. Calavan** Development Communication ISU-Cabagan	**Jaycee J. Baldamuerte** Environmental Science ISU-Cabagan
		
Valerie S. Ranchez Environmental Science ISU-Cabagan	**Kimberly Ann P. Malabug** Hotel and Restaurant Management ISU-Cabagan	**Jerico A. Alingod** Forestry ISU-Cabagan

Staff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Bondee Peñaflor Isabela State University	**Sabine Luning** Leiden University	**Bernard Tarun** Mabuwaya Foundation
		
Arnold Macadangdang Mabuwaya Foundation	**Mario Pedrablanca** Mabuwaya Foundation	**Amante Yogyog** Mabuwaya Foundation

		
Dorina Soler Ferrer Mabuwaya Foundation	**Nanette Cataggatan** Mabuwaya Foundation	**Jovilyn Mamauag** Mabuwaya Foundation
		
Leonalyn Tumaliuan Mabuwaya Foundation	**Eso Tarun** Isabela State University	**Onia Gunayon** Isabela State University

Program Water Course 2019: 6 January – 1 February 2019

Day	Date	Locality	Activity	Accommodation
Sun	6	Manila	Welcome, Intramuros, National Museum, welcome dinner	Natividad
Mon	7	Manila	Visit NDRRMC and Red Cross Manila	Natividad
Tue	8	Travel: Manila - Imugan	Travel to Imugan	Imugan
Wed	9	Imugan	Visit Kalahan Educational Foundation	Imugan
Thu	10	Travel: Imugan - Cabagan	Travel to Cabagan via Magat	Environmental Information Center (EIC) Cabagan
Fri	11	Cabagan	Opening program / lectures	EIC
Sat	12	Cabagan	Lectures and workshops / preparation proposal	EIC
Sun	13	Cabagan	Preparation proposal / free	EIC
Mon	14	Fieldwork trial	Travel to San Mariano / rearing station/ Dunoy	Dunoy: tents and hostel
Tue	15	Fieldwork trial	Dunoy	Dunoy: tents and hostel
Wed	16	Fieldwork trial	Back to Cabagan, rest / prep proposal	EIC
Thu	17	Cabagan	Preparation and presentation proposal	EIC
Fri	18	Field	Area study / travel to Baggao	Field: Baggao
Sat	19	Field	Area study	Field: Baggao
Sun	20	Field	Area study	Field: Baggao
Mon	21	Field	Area study	Field: Baggao
Tue	22	Field	Area study	Field: Baggao
Wed	23	Field	Area study	Field: Baggao
Thu	24	Field / Cabagan	Area study / Return to Cabagan	EIC
Fri	25	Cabagan	reporting	EIC
Sat	26	Cabagan	reporting / Fiesta	EIC
Sun	27	Cabagan	reporting	EIC
Mon	28	Cabagan	Presentation results. Farewell party	EIC
Tue	29	Travel: Cabagan - Banaue	Am: travel to Banaue. Pm: Banaue	Banaue
Wed	30	Banaue	Banaue / Batad	Batad
Thu	31	Batad	Batad	Batad
Fri	1 Feb	Travel: Banaue - Cabagan/Manila	Am: travel to Banaue. Pm: travel to Manila/Cabagan	Natividad

Traveling from Manila to Cabagan (Photo by Merlijn van Weerd)

Visiting Magat Dam (Photo by Merlijn van Weerd)

Planting trees and Banana in San Mariano **(**Photo by Merlijn van Weerd)

Simon and Jerico conducting an interview with an Agta Elder in Sitio Malisi (photo by Merlijn van Weerd)

MANSARONG

THE UNDERSTANDING AND ATTITUDE OF PEOPLE IN MANSARONG ABOUT THE WARNING SIGNALS

Iris Pieters and Leymar Calavan

INTRODUCTION

The Philippines is a country that is used to natural disasters like typhoons. It is because of its geographical location along the Pacific region near the Equator, which is prone to tropical cyclones and storms. Especially Luzon and the Visayan Islands are affected by these natural hazards. The storms can cause great amounts of damage to buildings, roads and communication lines and disrupt agriculture severely (Warren 2015). Since the Philippines experiences so many typhoons every year, the government is working on the resilience and sustainable development of the country. Being able to prepare properly and having good communication can reduce disruption and damage done to these areas (Binag and Tas 2017).

Before the '90s, the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) used a much simpler storm warning system with only 3 signals and a fixed leading time of 16 to 18 hours. In 1991, the system was expanded to a 4-signal warning system and was first used when Typhoon Trining hit Luzon (gmanetwork 2016). It was not until November 2013 when Typhoon Yolanda (internationally named Haiyan) hit the Philippines, particularly in the Visayas region, that the government instated Republic Act 10121 making sure a signal 5 was added to the system. This signal refers to typhoons with sustained wind speeds exceeding 220 km/h. Signal 5 means that it was a very strong typhoon. On 15 September 2018, typhoon Ompong (internationally named Mangkhut) made landfall in northern Luzon as a Category-5 typhoon (Philippines Humanitarian Country Team 2018).
The warning system does not reflect the current weather in an area, but warns the people of future wind conditions. The leading time is a very important aspect. This means that a typhoon can be a signal number 1 at first, but can turn into a 4. A higher number means stronger winds and a shorter leading time to prepare for the typhoon. The earlier a warning is given, the more time there is to start preparations. More information on the typhoon, however, becomes more accurate as time passes. The strength of the typhoon can be better predicted when it is closer to land (Comes et al. 2015). This makes it difficult to give a correct forecast of the coming typhoon, resulting in difficulties for the people to prepare.

Since there are a lot of aspects included in the warning signal system, like the wind speed, leading time and possible impacts, we wanted to know if people who do not have access to many sources of information understand the complete warning signal system, specifically the leading time. When for example a signal 1 or 2 is given, because it is still far away, a strong typhoon can easily be underestimated. Especially in areas where the typhoon strikes the hardest, it is important that the people know what the signals mean. Mansarong is one of many places that experience the consequences of typhoons greatly. This is why we have conducted our research here. Mansarong is a sitio of Barangay Santa Margarita in the municipality of Baggao, Cagayan in northern Luzon. Mansarong used to be only inhabited by Agta people, indigenous people in the Philippines. Now, the sitio is home to various cultural groups (Dela Cruz and Cox 2018). For our research we were interested in how the community members and government officials of this sitio look at the warning signals and whether they understand them or not. We also wanted to know how they prepare according to the signals and how the government informs people about typhoons.

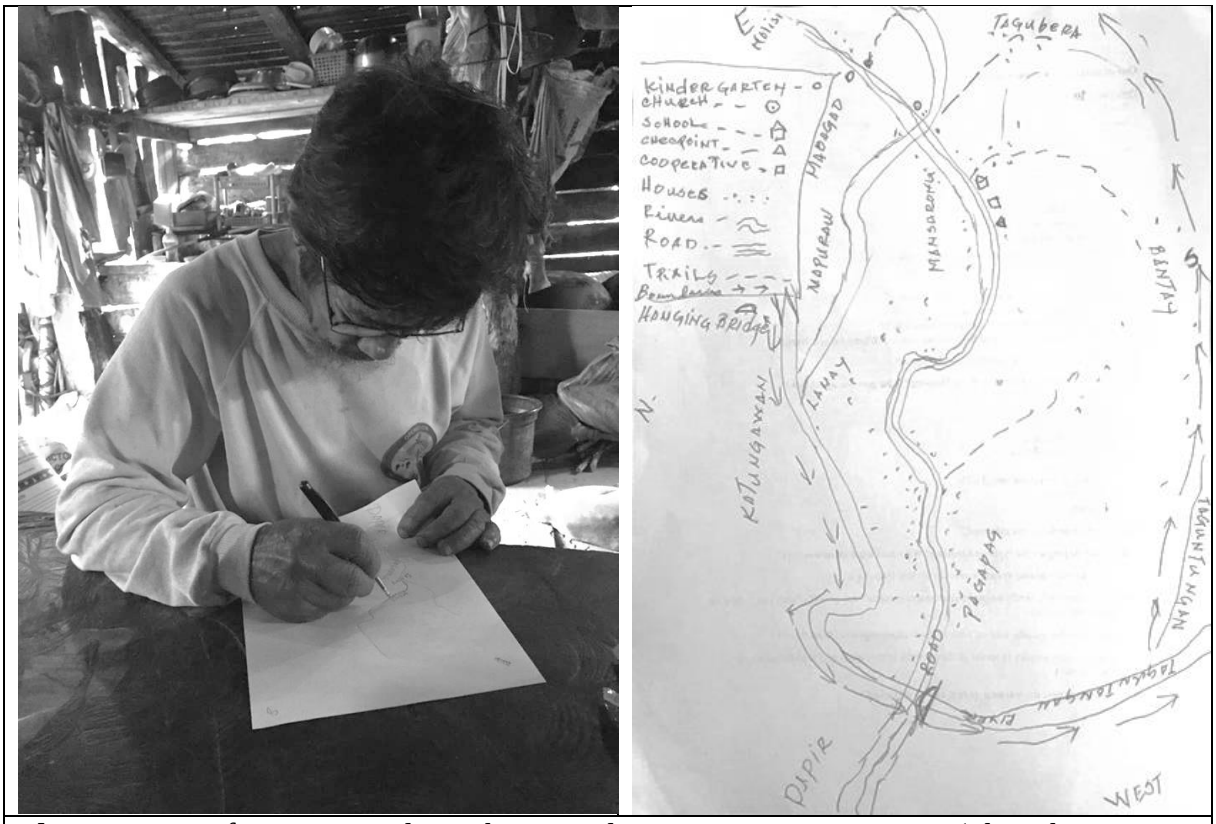

Photo 1: Map of Mansarong drawn by Marcelino Laoyan in Mansarong (Photo by I Pieters 2019)

RESEARCH QUESTION

Research question: How do people in Mansarong understand the typhoon warning signals?
Sub-questions:

- What is the attitude of people in Mansarong towards the warning signals?
- How do the people in Mansarong prepare for typhoons using the signals?
- What is the source of information of people in Mansarong concerning the warning signals and how do they want to be informed?
- How does the government inform the people in Mansarong about the warning signals?

METHODS

For our research, we conducted 30 semi-structured interviews in Mansarong. Out of 30 respondents, 16 are men and 14 are women. We interviewed different kinds of respondents coming from different backgrounds, such as the Agta, farmers, housekeepers, teachers, students/teenagers, LGU-staff and barangay officials (Table 1). We used housekeepers as a separate category, because this is how the wives of the farmers identified themselves. They do however help their husbands with farming most of the time. With regard to the barangay officials and LGU-staff, we wanted to gain insights and perspectives from the government on the warning signals; how they inform the people and whether they are satisfied with the way they inform. As for the community members, we wanted to gain insights on how they experience the warning signals, whether they understand them and how they prepare according to the given warning signals.

Table 1: Number of interviewed respondents from different backgrounds

Type of respondent	**Number**
Farmers	7
Housekeepers	7
Teachers	4
Agta	4
Barangay officials	3
Teenagers/students	2
LGU-staff	2
Miner	1
Total	**30**

We used interviews only as a method to answer our research question because we wanted to know how people experience the current warning signal. In an interview, we can have a deeper conversation and thus collect more valuable information. This way, we invite our respondents to tell their stories about the preparation stage and how they feel about the way they are being prepared by the government.

For our interviews, we mostly used random and availability sampling for the households and farmers. By visiting houses and communicating with people on the street or near the church, we managed to interview a lot of people. Other than that, we used key informants of the barangay officials and LGU.

Table 2: Time schedule and activities

Date	**Activities**
18-01-19	Travel day from Cabagan to Mansarong. Arriving in host family.
19-01-19	Meeting with community members in Mansarong; We interviewed 9 community members. Mostly women, housewives of farmers.
20-01-19	Walking around in Mansarong looking for respondents. We interviewed 7 people; 4 Agta, 2 farmers (1 being a former barangay official) and 1 current barangay official.
21-01-19	We interviewed 9 people. First, we went to the Elementary School of Mansarong and interviewed 4 teachers. Afterwards, we interviewed 4 farmers and 1 LGU staff.
22-01-19	We interviewed 2 people; 1 miner and 1 farmer.
23-01-19	We left Mansarong and said goodbye to our host family. We travelled to Santa Margarita and interviewed the barangay captain there. After this we went to visit Blue Waters.
24-01-19	We left Blue Waters and went to the municipality of Baggao and interviewed an LGU official, the MENRO-designate. Afterwards, we travelled back to Cabagan.

RESULTS

What is the attitude of people in Mansarong towards the warning signals?

With this sub-question, we wanted to know what the people in Mansarong think of the current warning signal system. First, we asked them if they know about them and if they can explain them to us. Even though all of our respondents had heard of the warning signals, not all of them were capable of explaining them to us. All the Agta we interviewed only knew them until signal number 4 and one of them even thought there were only three. Also, not one understood the signals correctly. One Agta thought signal 3 was not strong and 1 was really strong. This

understanding of the signals could have very problematic consequences for them. Most farmers, housekeepers, teachers and students knew at least 4 signals. Of 30 respondents, 18 knew all five signals while 12 knew four or less signals. Excluding the Agta, that means that 8 of the other kinds of respondents were unaware of signal number 5.

When we asked all our respondents what they thought of the warning system, they all agreed that it was really important and that everyone takes them seriously. Most of them said it was very important, because it enabled them to be well prepared and so they would know what to do. It is therefore important for their safety and the security of their houses and possessions. One of our elder respondents (age: 69) explained that there have been a lot of improvements of PAGASA already. In the 1990s, there was hardly any explanation of the weather. Nowadays, they provide information on the path of the typhoon, the time it will come and on the signals. This has made it much easier for people to prepare well.

However, when we asked all our respondents about the lead time - how many hours before a typhoon comes - in the signals, very few seemed to be aware of this. All the teachers admitted that this was actually the first time that they had heard of the lead time. After we explained this to our respondents and asked whether they thought it is important to know this, they all admitted that they would have liked to know about it. One of the teachers we interviewed told us that not only the lead time should be announced by the newscaster, but also the type of rain. Actually, all the teachers said that it would be good if the warning signals, with the lead time, are explained properly in school. Other respondents like farmers explained that the lead time is the basis for preparing. With typhoon Lawin, they were not well prepared because they completely underestimated it; they did not know it was going to be so strong and when they had only very little time left to prepare, the typhoon was already affecting the land. With typhoon Ompong, the people of Mansarong were warned well in advance. Because of the devastating typhoon Lawin, they were prepared much better. Still we found that respondents expressed their wish to get informed better on the meaning of the signals, specifically the lead time.

How do the people in Mansarong prepare for typhoons using the signals?
The purpose of the warning signals is to give the people an indication on the strength of the coming typhoon, the possible impact and the time before it will make landfall. These factors determine how the people can prepare for the typhoon. To find out whether the community members understand the warning signals, we asked them to explain for every signal how they would prepare.

Table 3: How people in Mansarong prepare differently according to the signals

Signal	**Preparations**		
	Agta	**People in weak houses**	**People in stronger houses**
1	Stay home, look for food and secure stuff	Secure stuff in plastic bags	No preparations
2	Prepare to stay home	Some evacuate, some prepare to stay home	Secure materials
3	Evacuate	Go to neighbours with stronger houses	Double security of things, secure roof
4	Evacuate	Evacuate	Provide needs for needy families
5	Do not know the signal	Evacuate	Prepare for more families to evacuate here

Most people living in similar kinds of houses gave similar answers. Of course, there were also differences but to summarize the answers, we have made a table (Table 3) to give an overview of the most common preparations that were being done one when different signals were given. Most people claimed they prepare differently when different signals are given. For signal number 1 there is no to very few preparations. The higher the signal, the stronger the typhoon and therefore the more preparations are needed. For most Agta it is actually really important to be well prepared, because they mostly have very weak houses. What we have seen though, is that they are actually least informed on the warning signals and their meanings. They either receive the information too late, or they understand the warning signals incorrectly. This does not mean however that they are not well prepared. They have also their own way of knowing that a typhoon is coming or are informed by neighbours. For Lawin however, one Agta said they did not know at all that it was coming. For this typhoon it was too late to prepare properly. For most of our respondents, their meaning of the signals concerned the strength of the typhoon and not the lead time. Only one teacher knew that signal 2 meant that the typhoon was 24 hours away.

What is the source of information of people in Mansarong concerning the warning signals and how do they prefer to get informed?

A large majority of respondents (20) claimed that they were well informed about typhoon Ompong through radio. That is why people in Mansarong were able to prepare ahead of time. 18 of our respondents stated that they were also alarmed through their neighbors. A total of 11 respondents also said that through barangay officials, typhoon Ompong was brought to their attention. Most of them were brought to the evacuation center, especially those with light/weak houses that could be easily blown by the typhoon. Also, 11 respondents said that they received information on the typhoon through nature; such as darkening of the sky, the meeting of birds together, dragon flies flying low and meeting together and also bats meeting together. A respondent explained that these natural signs of a typhoon can be observed around 3 hours before a typhoon. Therefore, most people in Mansarong use other sources to get informed on a typhoon, so they will have enough time to prepare.

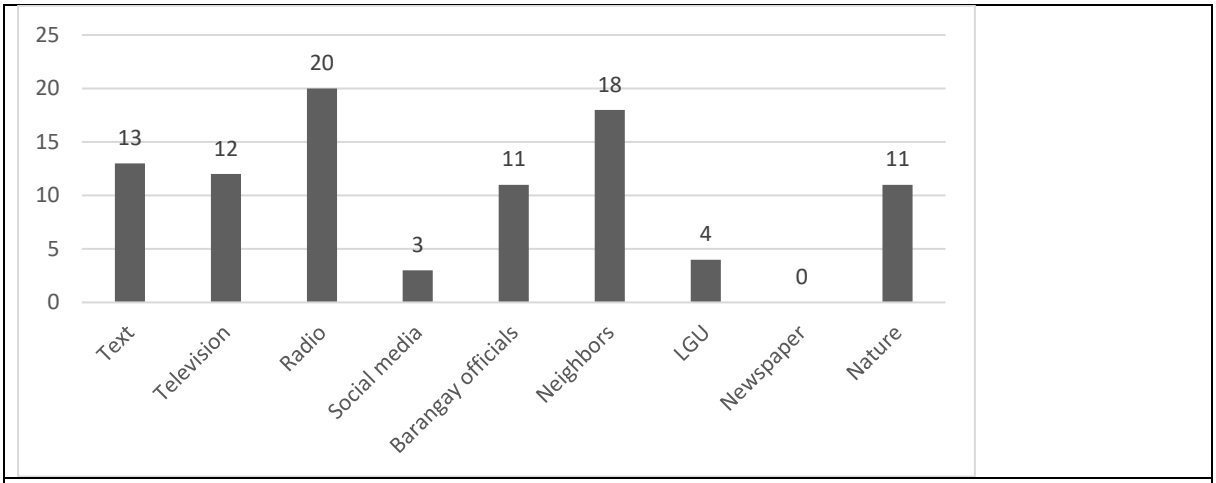

Figure 1: How people in Mansarong were informed about typhoon Ompong

Furthermore, 4 respondents claimed that the Local Government Unit (LGU) went to their house to inform them and only 3 said that they also use social media as a source of information. These answers imply that typhoon Ompong was brought to the attention of the people of Mansarong in various ways, which made it possible for them to prepare sufficiently.

For a follow-up question, the respondents were also asked how they prefer to be informed about the warning signals. About 13 (32%) respondents said that they still prefer the radio as their source of information, because most of the respondents have a radio in their house. Others also mentioned that a radio is a portable object that you can bring wherever you want. Furthermore, 12 (29%) of the respondents preferred to get informed by barangay officials, because most of the barangay officials have all the means for getting the right and complete information. They can then distribute this information to the people and explain to them what is the best thing to do; evacuation for example. It will be easy for them to understand the situation when barangay officials visit their house and explain the warning signals. Especially the Agta people experienced difficulties in understanding the information from the radio because the language used on the radio is Tagalog and most Agta only understand Ilocano. They therefore also expressed their wish to get informed by barangay officials about the warning signals and needed preparations or evacuations.

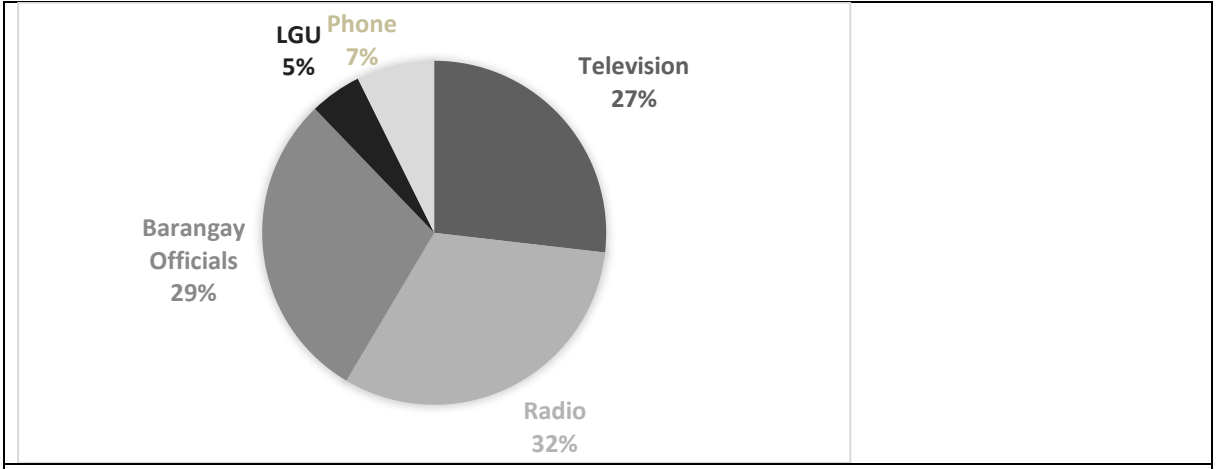

Figure 2: How the people in Mansarong prefer to be informed about the warning signals

The teachers also preferred that the information will come from the barangay officials so that they will not be blamed for not coming to school. In the past, they had received complaints about this. Also, 11 (27%) of the respondents preferred to be informed through television, because it will provide them with an accurate update of the warning signals. Through television, the newscaster explains clearly when the typhoon is coming and what the possible impacts are so that the people can prepare well. The problem is that many people do not own a television or the signal stops working when the typhoon starts to come close.

How does the government inform the people in Mansarong about the warning signals?

In total we interviewed 5 key informants, 3 of whom are barangay officials and 2 are LGU officials. We used different questionnaires for the community members and the key informants. For the key informants the questions were more about their way of informing people about the warning signals, while the questions for the community members were more about their attitudes towards the warning signals and their preparation when different signals are given.

When the key informants were asked about their way of informing the people about typhoon Ompong, all of them said that they went house to house to inform the people about the typhoon and if necessary use forced evacuation. They also have meetings in advance to discuss how to act and then send out some early alarms like text messages and use megaphones to announce the details about the typhoon. In addition, the MENRO-designate told us that they are issuing a letter to the radio stations to request the possibility of delivering the information in Ilocano dialects because most of the respondents do not really understand Tagalog, especially Indigenous People (IPs).

One of our respondents (age: 62) was the barangay official of Mansarong in 1996. He told us that the use of warning signals is really important. They used to sit together in a group and then go around the houses to inform the people about the coming typhoon. He says that now there is actually a lot more help from the government in informing than before. Many people prefer to get informed about the warning signals by barangay officials, as was explained in the previous sub-question. The current barangay official told us that they try to inform as many people as possible, but that it is hard to reach everyone, since they also have to stay home and prepare for themselves. Therefore, they are encouraging people to also listen to the radio and television when possible, so they are not solely dependent on the barangay officials.

The key informants were also asked if they think there is a need to improve their ways of informing people. They explained that the megaphone is really effective in informing people but it is inappropriate to use, especially for elders. The MENRO-designate suggested that there must be more strike teams involved that will come from all barangays because there is currently a lack of human resources.

When we asked the barangay officials about their knowledge of the lead time, not one knew the exact lead time per signal. After explaining, they told us that it would be important to include the lead time in informing people, because it is crucial for the preparation. One LGU staff said that it would be important to tell so people are alarmed, but for him it is just important to tell the community members what time they need to be in the evacuation center. He then added that praying is the best weapon against a typhoon. The MENRO-designate knew about the lead time from PAGASA and he told us that the LGU explained it to the people but that many people don't understand.

CONCLUSION

After conducting our research, we were able to answer our main research question, which is 'How do people in Mansarong understand the typhoon warning signals?'. With the results shown in the previous pages we can conclude that most local people in Mansarong were aware of the current warning signals. Some, especially Agta people, did not know all 5 signals or even the meaning of the signals. This implies that there are still individuals that do not really know the exact meaning of each signal. We also found that people in Mansarong think that the current warning system is really important. Mostly because it enables them to easily know what to do, what to prepare for and if there is a need to evacuate. With regard to their attitude about the warning signals all of the respondents were able to see its importance, especially after typhoon Lawin hit their area. When typhoon Ompong was coming, people were alarmed much earlier and prepared a lot better.
When we asked people whether they prepare differently when different signals are given, we found out that people interpret the meaning of the signals as being only about the strength of the typhoon. When we asked them about the lead time, we found out that almost no-one knew that this was included in the warning signals. However, when we explained it to them, they all thought it was really important to know and actually the basis for preparing. They all would have liked to be informed about this and teachers said it should also be taught in school.

Apparently, respondents still prefer radio as their source of information because it has a portable function and can be used without electricity, like with batteries. Also many people preferred to be informed by barangay officials, since they trust their information and can afterwards be advised on how to prepare or whether they should evacuate. We actually found though that the barangay officials also do not know about the lead time and think that it should be informed to

the people of Mansarong. The barangay officials also mentioned that they want to go house to house to as many people as possible, but that they also want to encourage them to listen to the radio and television and receive information and advice in that way, if possible.

To give a final conclusion to our research question, we could say that people think that they understand the warning signals completely, but are actually missing an important aspect of the warning signals: the lead time. The understanding of people in Mansarong about the warning signals can therefore be improved by paying more attention to this aspect of lead time and educating people on the importance of it.

RECOMMENDATIONS

Since people expressed to us their gratitude for not just getting data from them but also informing them on the lead time, we feel that people find this information really important. We therefore suggest to look for ways to increase the awareness of people in Mansarong about the warning signals and their meanings. Perhaps this could be done by the LGU, barangay officials and teachers for instance by organizing activities or programs regarding the information and preparedness of the local people about typhoons. There are already plans in that direction, for instance the plan of the LGU, specifically the MENRO, in organizing more active and professional strike teams in doing the information dissemination. Moreover, we want to encourage teachers to include the explanation of the warning signals, including the lead time, in their curriculum. When spreading the information on the warning signals, there needs to be an awareness that this information should also be available in Ilocano, so everyone can understand it.

For further research, it would be interesting to assess the level of awareness of the people in Mansarong on the lead time and if the people think this is a logical system. Maybe a comparative study on typhoon warning signals in other countries can be done to find out the effectiveness of the systems and to see if any improvements can be done.

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APPENDICES

Questionnaire community members

Personal information:

- Number
- Name
- Age
- Sex
- Occupation/livelihood
- Ethnicity
- Religion
- Type of household
- Number of people in the household
- Educational attainment
- Media use (radio, television, phone, newspaper etc.)

Questions:

1. Have you heard about the warning signals system?
    - If so, can you name the signals?
    - Can you tell me what they mean? (from 1 to 5)
    - How did you know about the warning signals? Where did you learn?
2. What do you think of the current warning system?
3. How were you warned about typhoon Ompong? Who gets the signal first?

a. text b. television c. radio d. social media e. barangay officials f. neighbors g. LGU h. newspaper i. nature

4. How do you prefer to get informed?
5. How did you prepare for typhoon Ompong? Who does what (men/women)?
6. Do you take the warning system seriously/ do you listen to it?
7. Do you prepare differently when different warning signals are given? (From 1 to 5, how do you prepare differently)
8. Do you know the specific leading time of the warning signals? (from 1 to 5)
9. Do you use other sources to establish the strength of the typhoon? (Traditional ways, nature, beliefs etc.)
10. How do you think the warning system can be improved?

Questionnaire key informants/government officials

Personal information:

- Number
- Name
- Age
- Sex
- Occupation/livelihood
- Ethnicity
- Religion
- Type of household
- Number of people in the household
- Educational attainment
- Media use (radio, television, phone, newspaper etc.)

1. What do the warning systems mean? (from 1 to 5)
2. What do you think of the current warning signal system?
3. How did you warn the people about typhoon Ompong?

a. text b. television c. radio d. social media e. barangay officials f. neighbours g. LGU h. newspaper i. nature

4. Did you inform them differently than before? Did it change since Lawin for example?
5. How do you prefer to inform the people?
6. Are you satisfied with how you can inform the population?
7. How do you think the warning system can be improved?

TYPHOON-RESILIENT INTEGRATED FARMING SYSTEMS IN MANSARONG, BAGGAO

Nichelle Esmane and Mattia van der Laan

INTRODUCTION

Agriculture is a global prerequisite to feed the ever growing world population. In the Philippines alone, the agricultural sector, in combination with forestry and fishing, made up for 30.289 billion USD in 2017. This translates to a 9.7 percent share of the national GDP (World Bank 2017). Not only does agriculture contribute to the national economy; it also creates job opportunities for Filipinos in central as well as in more remote areas, on larger and smaller scales. A substantial challenge that small-scale Filipino farmers face is coping with typhoons. Of the about twenty tropical cyclones or typhoons which enter the Philippine Area of Responsibility yearly, on average 8-9 make landfall in the Philippines. Seventy percent of these typhoons occur in the months of July through October, and as such this period is referred to as 'typhoon season' (PAGASA 2018). A particularly destructive typhoon was Ompong, with winds of 205 kilometers per hour and gusts reaching 270 kilometers per hour (PHILSTAR GLOBAL 2018). The typhoon affected 10 million people in the Philippines, mainly in Northern part of Luzon (Van Weerd 2019). Typhoons are detrimental to agricultural practices, as they cause direct severe damage to crops, property and material of farmers. Moreover, typhoons can bring about other disasters, such as landslides and flooding (Romero 2019).

In order to limit negative typhoon impact, small-scale Filipino farmers could adapt their agricultural practices. In other words, their practices might be becoming more typhoon-resilient. The concept of resilience is defined by the UN as "the ability of a system [...] to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard [...] through the preservation and restoration of is essential basic structures and functions" (UNISDR 2017). In other words, farmers would have to be able to continue their practices to some extent despite typhoon damage.

Multiple farming practices fit the goal of resiliency. A tested practice is the use of an Integrated Farming System (IFS). An IFS is a holistic approach to agriculture in which waste is reused and multiple crops are combined in one field. Examples of this can be the combination of rice and vegetable crops, such as eggplant, pepper, okra and beans. Ideally, farmers use crops that are less vulnerable to typhoon damage, such as peanuts and root crops (Van Weerd 2019, pers. comm.). IFS is beneficial to efficient nutrient, soil, crop, water, and pest management. Furthermore, it can improve crop yields, ensure food availability, and financial stability and in the long-term help to reduce poverty (Walia and Kaur 2013). A practice supportive to IFS is the use of a small farm reservoir to ensure water supply throughout the year. Whether and how small-scale farmers adapt their practices to be more typhoon-resilient depends on a multiplicity of factors and is not a matter of course. In contrast, after typhoon Imbudo, almost 80% of the questioned farm households did not adapt their practices (Huigen and Jens 2006). This static attitude is explained by "the cultural and societal structure of farm households and their traders" (Huigen and Jens 2006). The power relationship between the corn traders and the farm households keeps the latter trapped in a cycle of paying off outstanding debts and also borrowing more to commence a new cultivation cycle; a debt-trap. As the loans also double as a buffer, farming households might be less urged to adapt. Other reasons why farmers do not adjust are lack of resources, lack of knowledge on risk reduction strategies and limited marketing channels (Huigen and Jens 2006).

In order to gain a deeper understanding of these practices in practice, it is of great value to research whether and how Integrated Farming Systems are implemented in small-scale rural communities, and whether the limitations are in accordance with the ones found by Huigen and Jens. The small *sitio* or village Mansarong, which is part of the barangay Santa Margarita, is selected as a case study.

The barangay is only involved in the farming practices of the farmers to a very limited extent. The yearly informational report that the barangay issues does not contain any information on the resilience of agricultural practices. Furthermore, the subsidies that the barangay provides to the farmers are not designed in such a way that they stimulate typhoon-resilient agricultural practices (Molinas 2019, pers. comm.) If the farmers do make use of resilient agricultural practices, the reasons for this can be found by the farmers themselves.

RESEARCH QUESTIONS

In order to assess the usage of a typhoon-resilient Integrated Farming System in Mansarong, we structured the research based on the following question:

"How are typhoon-resilient Integrated Farming Systems used in Mansarong?"

To answer the main research question, we structured the research in accordance with the following sub-questions:
1. "To what extent are typhoon-resilient Integrated Farming Systems currently used in Mansarong?"
2. "How did the use of Integrated Farming Systems change as a reaction to typhoons?"
3. "What is the attitude of farmers towards typhoon-resilient Integrated Farming Systems?"
4. "What are the limitations to implementing typhoon-resilient Integrated Farming Systems?"

METHODS

Research tools

This research consists of a combination of quantitative and qualitative research practices. We collected our data through a questionnaire (appendix I). The questionnaire is structured according to the resilient farming practices described in Table 1. All of the practices are indicated as discussion points. Whereas the questions make sure that the information necessary for quantitative data analysis is obtained, respondents are invited to elaborate on the topics. In addition to the questionnaire, we used observation of the field. In this way, a more visual understanding of the farmers' situation is obtained.

Respondents

We selected the respondent sample through availability sampling. We expected a large part of the Mansarong population to have the occupation of farmer. In order to keep an overview of the total population, we followed the map of Mansarong indicating the residence of the inhabitants of Mansarong (Photo 1). In order to maintain a level of anonymity, we address the respondents exclusively by first name. 20 respondents participated in answering the questionnaire. The respondents are all small-scale farmers, with a land size varying between 0.125 hectares and 5 hectares and an average of 2.1 hectares. Out of our respondents, 8 are female and 12 are male. We conducted our research according to the time schedule (Table 2).

Table 1: Time schedule

15-01-19	Field work trial in Dunoy, San Mariano, Isabela.
18-01-19	Arrival in Mansarong, Baggao, Cagayan.
19-01-19	Attending meeting with the Brgy. Officials and residence. After the meeting we interviewed 3 respondents; Susana, Angelita and Samuel.
20-01-19	Interview 4 respondents: Jesus, Ligaya, Marivic, and Zaldy.
21-01-19	Interview: 7 respondents; Mario, Leonora, Irene, Raymond, Rodel, June, and Antonio.
22-01-19	Interviewed 6 respondents; Loyda, Francisca, Prospero, Jimmy, Marcelino, and Renato.
23-01-19	Departure from Mansarong, Baggao, Cagayan.

RESULTS

Kind of crops

The respondents are cultivating a variety of crops (Table 2). The table includes crops that are used for business purposes as well as crops that are used for own consumption. Please note that the cultivation of multiple crops does not necessarily identify the use of an Integrated Farming System, as the multiple crops can be cultivated on different fields. Out of the 20 respondents, 19 cultivate corn. The respondents all declare that it is not possible to pre-harvest corn; the harvest time is dependent on the maturity of the crops. The single farmer who cultivates upland rice, Raymond, also is an opponent of pre-harvesting.

Out of 20 respondents, only 1 used the small farm reservoir because most of them cultivate corn that is not really necessary to irrigate. Only June plants lowland rice, as it requires irrigation. He is using creek as a source of water.

Table 2: Number of farmers cultivating specific crops and crop combinations in Mansarong

Crop(s)	**Number of farmers**
Yellow corn	11
Yellow corn and upland rice	3
Yellow corn and mongo beans	1
Yellow corn and banana	1
Yellow corn, banana, coconut, and vegetables	1
Yellow corn, upland rice, and banana	1
Upland rice, banana, and pineapple	1
Yellow corn, rambutan, lanzones, longgan, and durian	1

1. Inventory of typhoon-resilient Integrated Farming Systems currently used in Mansarong

Out of our 20 respondents, 6 make use of an Integrated Farming System. Our first respondent, Angelita, cultivates upland rice, corn, and bananas in one field. The 50-year-old farmer possesses her own 3.5 hectares at Mapuraw. The reason she can cultivate this land with a limited labor force is her usage of fertilizer. Personally, Angelita is not a strong proponent of cultivating corn. However, she explains that she feels the social pressure to continue cultivating this crop, as 'everyone else plants corn.'

The second respondent who makes use of IFS is the 33-year-old Irene. The respondent is a tenant; the 1.5 hectares that she cultivates are not her property. Irene plants yellow corn bordered by banana trees. The land she leases automatically comes with the banana trees, with which Irene is very content. In fact, she would prefer to plant additional banana trees because she knows that these trees are low in maintenance and typhoon-resilient. When she removes the leafs before a typhoon hits, the trees will not be toppled and the leafs will regrow quickly. However, she does not have the financial means.

Raymond, the third user of an Integrated Farming System, is 60 years old. On his own 5-hectare land, he cultivates upland rice as the main crop, bordered by banana trees and pineapple. Because of the relatively high banana demand, he decided to cultivate the bananas in addition to his upland rice. The cultivation of pineapple is added because Raymond knows that pineapples are resilient crops. Because of their small shape, the pineapples are not easily damaged by wind. He does not have to be wary of floods, as his land is uphill.

Photo 1: Field combining corn (front) and vegetables (back) (Photo by N Esmane 2019)

Our fourth respondent, Francisca, is 79 years old. She hires her relatives to cultivate her 1 hectare of land with yellow corn, bordered with banana trees and coconut trees. Moreover, she makes use of the height difference of her field. In the higher part, she cultivates corn. In the lower part, she cultivates the vegetables. Francisca explains that this diversification offers her financial stability in case a typhoon damages her corn. In principle, the vegetables are meant for her own consumption, but she likes to keep the possibility of selling them open.

Marcelino of 68 years is the fifth respondent using an Integrated Farming System. He cultivates most of his fields with either yellow corn or upland rice, but on one fourth of a hectare he planted an interesting mix of pineapple, beans, and *kalabasa* or squash. In case this field has a large harvest, he sells these crops. Marcelino explains that his mixed field is mostly meant as an experiment to see how different crops do in changing weather circumstances.

Respondent number six is the 50-year-old Renato. He inherited 6 hectares with title, on which he cultivates yellow corn, rubber tree, eucalyptus, rambutan, lanzones, longgan, and durian. He decided on this cultivation because of the demand of corn. He is especially very content with the rubber tree, as this counters soil erosion and protects the forest and the livelihood. Renato is also content with the eucalyptus, as this functions as a wind breaker and insect repellant to protect his corn fields.

2. The implementation of Integrated Farming Systems change as a reaction to typhoons

Out of the 20 respondents, not a single one made use of an Integrated Farming System in the past and stopped this practice in response to a typhoon. Out of the six respondents who currently use and Integrated Farming System, only Francisca implemented this practice in reaction to the typhoon Lawin that crossed Baggao in 2016. She experienced massive damage to her harvest, as all the corn was destroyed. Because of this failed harvest, she experienced grave financial problems in the year that followed. This is the reason why she decided to increase her financial stability by applying an Integrated Farming System.

3. The attitude of farmers towards typhoon-resilient Integrated Farming Systems

All of the interviewed respondents were aware of the practice of Integrated Farming Systems in the sense of 'the practice of planting multiple crops in one field.' However, as expected, they were not acquainted with the terminology. The farmers are familiar to the concept of resiliency; they understand that some crops are better able to withstand typhoons than others and they can indicate for which crops this is the case.

Out of the 14 respondents who do not make use of IFS, 7 respondents indicated that they would like to make use of an Integrated Farming System if given the opportunity. The other 7 respondents are not necessarily in favor of using an Integrated Farming System. In this section, the arguments against and in favor of IFS that are used by the farmers will be discussed.

Table 3: Arguments against and in favor of the use of IFS

Arguments against IFS	**Times used**	**Arguments in favor of IFS**	**Times used**
It takes effort to learn a new practice	2	More profitable	2
It is laborious	2	Harvest stability	4
Not necessary	2	Income stability	1
Added crops attract harmful insects	1		

An obvious argument against the use of IFS is that it takes more effort to manage. As Jesus explains, corn is a low-maintenance crop. The use of the herbicide P-Max contributes to this; he does not have to spud the weeds. If he were to cultivate multiple crops in his field, he would no longer be able to apply P-Max. Thus, he considers an Integrated Farming System as inefficient and laborious.

Ligaya and Prospero both make use of an alternative typhoon-resilient practice; they adjust their cropping calendar in such a way that during typhoon season, they cultivate the more resilient rice (Ligaya) or mongo (Prospero) instead of corn. They do not see the added value of complementing this practice with an Integrated Farming System.

Leonora holds an alternative argument against Integrated Farming Systems; she is afraid that additional crops will attract insects that can be harmful to the yellow corn she is cultivating. Not all respondents in favor of IFS see profit as being the most important argument. In fact, 4 of the respondents see IFS as a backup plan, a guarantee of still being able to harvest even if a typhoon damages the corn.

4. The limitations to implementing typhoon-resilient Integrated Farming Systems

The respondents indicated what they considered to be their main limitation(s) to implementing an Integrated Farming System. In order to gain a broader understanding, we also asked the respondents who indicated that they were not interested in implementing IFS what their limitation(s) would be, if they were to implement it. Please take note that multiple answers by one respondent are possible.

Table 4: number of farmers encountering limitations to using IFS

Limitations	**Number of farmers**
Financial limitations	4
Decision made by other party	3
Use of herbicide	3
Limited land area	2
No demand in market	2
No access to seeds	2
Decision made in accordance with other party	1
Use of fertilizer	1
No means of transportation	1

First of all, not all respondents have the possibility to decide what kinds of crops they cultivate. They are tenants, and lease the land from the owner. However, this is not always a formal relationship. In the case of Susana, her uncle is tenant. He makes the final decision on the kind of crops that are cultivated, but takes her opinion into consideration. Samuel, who moved to Mansarong in 1991 from Laguna, leases his field and farm to a tenant. He also feels that he has a strong say in what crops are cultivated, and he regularly discusses this with his tenant.

A common limitation to adding additional crops to the corn field is limited financial means. Farmers would like to add for example peanuts, but they lack the capital to invest in the seeds. The availability of seed is also mentioned as a main limitation of the farmers. Mario and Jimmy explains that they really want to cultivate other crops like (Mario) peanut and (Jimmy) ginger but no one sells the seed to for cultivation.

Soil and grass growth can also form a limitation to adding a second variety of crops. Angelita explains that in addition to corn, she would like to cultivate beans. However, the soil is too firm to pulverize. Marivic would prefer to plant other crops in addition to corn, but she is forced to use herbicide because of the grass growing on her land. This makes it impossible to cultivate other crops.

DISCUSSION

Our research on agricultural practices and typhoon adaptation in Mansarong pictures a different image than the research by Huigen and Jens. Rather than being stuck in a debt-trap, our respondents seem to have a fair amount of say in their agricultural practices, including their crop choice. The lack of resources does indeed form a limitation to implementing IFS. However, our respondents also explained that cultivating a single crop was the most efficient and profitable practice for them. We assume that the farmers maintain close contact among themselves and are thus to a certain extent aware of the strategies of their IFS-using neighbors. Our findings regarding limited marketing strategies, for both demand and supply, are in accordance with those of Huigen and Jens. It stands out that the farmers seem to have made a rational consideration in choosing whether to use or not use IFS.

These findings are important to take into account in the perspective of assistance to small-scale farmers. Many kind initiatives by Non-Governmental Organizations (NGOs) have been carried out to assist these farmers, in which knowledge and financial means are provided to adapt complex agricultural strategies and practices. From our results, it follows that farmers can be very content with their agricultural practices, even if these are not the most resilient option. We can thus assume that the farmers might be hesitant and perhaps even in opposition to these adaptations. It is thus of crucial importance to inquire to the attitude of small-scale farmers before implementing well-meant adaptations.

Very few farmers changed their practices as a response to a typhoon. Interestingly, the farmers that do make use of IFS are all relatively old. Perhaps, the fact that they experienced more typhoons has increased their urge to implement typhoon-resilient practices. It should be kept in mind climate change might cause more and stronger typhoons and a longer typhoon season in the future. As a result of this, the damage to the harvest might increase, which could be a reason for more farmers to change their agricultural policies.

CONCLUSION

Out of 20 respondents, 6 in Mansarong make use of IFS. The implementation was in one case in response to a typhoon. The farmers are well aware of the possibility of the practice of IFS. We find that the farmers are able to explain their thought-through reason to implement IFS. The limitations to implementing IFS are diverse. The farmers are not all in a debt-trap, but rather have chosen an agricultural practice that fits their personal preferences and work ethic.

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APPENDICES

Appendix I - Questionnaire English

Personal information

a. Name
b. Age
c. Land size

Integrated Farming System (IFS)

What kind of crops are you cultivating?
Do you cultivate these crops in separate fields or in a mixed field?
Has the kind of crops you are cultivating changed after typhoon Ompong? How?
How satisfied are you with the kind of crop you are cultivating? Why?
If given the opportunity, would you want to cultivate additional crops in the same field? Why?
What do you consider your main limitation to changing the kind of crop you are cultivating? Why?

Resilient crops

To what extent are your crops able to withstand typhoon damage? Why?
How satisfied are you with the ability of your crops to withstand typhoon damage? Why?

Small Farm Reservoir (SFR)

If and, yes how do you irrigate your land?

Living circumstances

How satisfied are you with living in Mansarong? Why?
If given the opportunity, how would you change the place you live? Why?
What do you consider your main limitation to leaving Mansarong?
How satisfied are you with your employment as a farmer? Why?
Would you consider switching form of employment? And, if so, what kind of employment?
What do you consider your main limitation to changing your job?
Do you have any additional sources of income?

IMPACT OF TYPHOON OMPONG ON THE AGROFORESTRY MARKET IN MANSARONG

Ernst Beijk and Neil Kim Lanquita

INTRODUCTION

Agroforestry worldwide

Around the globe, people consume or use a lot of the products obtained from agroforestry. In short, agroforestry is the planting of woody perennials and crops in farming systems (ICRAF 2016). In general, agroforestry generates good livelihoods, income and food security. This is due to the diversity of their crops and the improving soil conditions it creates. As a result of this, government agencies and non-government organizations (NGOs) introduce farmers to different kinds of agroforestry (Agustin & Vogelzang 2018), such as fruit and timber. These products are inconceivable from our daily lives: fruits contain much vitamins and anti-oxidants which are essential in keeping us healthy in combating several diseases like scurvy and cancer (Food Editorial 2019), while timber is still a main dominator in the furniture market (International Timber 2017) and is also mostly used as building material of establishments worldwide.

Production within the Philippines

The Philippines is an archipelago composed of 7,107 islands with a favorable climate and soil fertility, making it an ideal place for the production of tropical fruit. Within the Philippines, 20 species of fruits are commercially cultivated, and the major fruit species grown in the country are the pineapple, mango, papaya, calamander and, most importantly, banana (Rodeo 2016). For the timber, the wood industry is quite vibrant in Mindanao, especially in the CARAGA region, dubbed as the 'Timber Corridor' of the Philippines, being the leading producer of timber within the country (Zaragoza 2018). Timber derived from ITPs (Industrial tree plantations) are among the important export earners of the country (Wood Information Network 2018).

Markets within the municipality of Baggao

Philippines. Within the island of Luzon lies the municipality of Baggao, part of the province Cagayan (City Population 2015). Again, a lot of the inhabitants are farmers, especially in the remote barangays. The barangay of Sta. Margarita has agroforestry areas by four different (community based) organizations (DENR 2018). CBFM Three Diamonds has the biggest area of 208 hectares with commodities of both fruit trees and timber. CBFM New Land Resources Developers Association has 100 hectares and commodities of fruit trees, but no timber. Same for CADT and CADT SITE 2, no timber as one of the commodities. Both organizations have 50 hectares (DENR 2018).

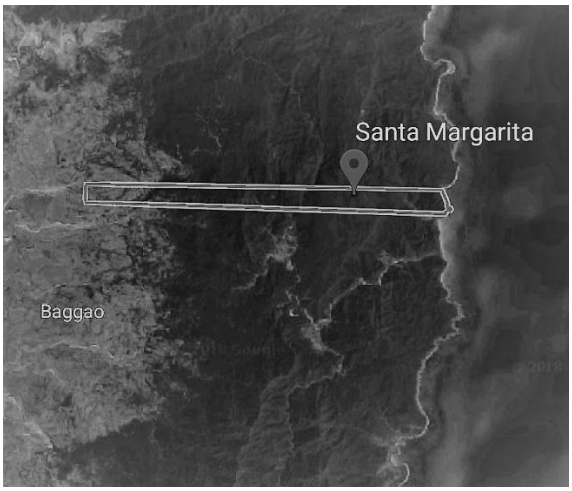
Typhoon Ompong

Due to the Philippines' location, it is prone to typhoons. Typhoons are tropical cyclone systems with high-intensity wind speeds. In 2018, a category 5 (Safer-Simpson) typhoon named Ompong (international name: Mangkhut) made landfall in Cagayan on the 15th of September (ABS-CBN 2018), reaching peak winds of 205 km per hour (10 minutes). The Typhoon Ompong caused widespread flooding and landslides, and is considered by some people as the most alarming typhoon they ever experienced (Lanquita 2019). Before the exact day of the typhoon landfall, PAGASA already warned the people in the specific area to prepare them for the upcoming typhoon. That is why a week before the landfall, everybody was busy harvesting their food or evacuating their livestock to a safe location. In a press briefing at the NDRRMC

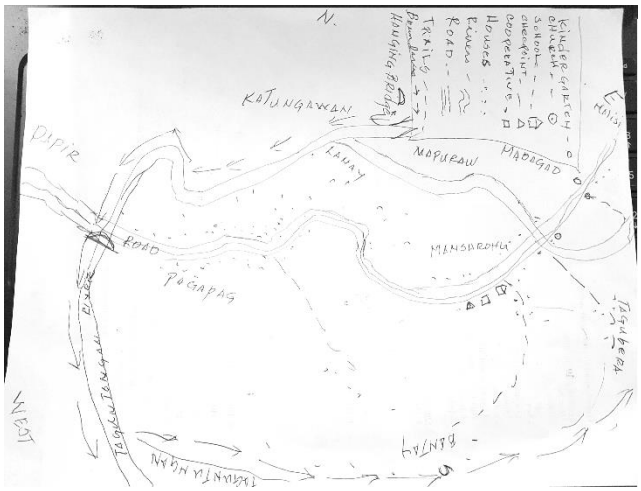
headquarters last September 15, 2018, Department of National Defense (DND) Secretary Delfin Lorenzana said, "Apparently, Baggao received the biggest damage...because they were directly in the path of the storm." What is the damage done? Citing reports from the military at around 3pm on Saturday, Lorenzana said the storm ruined 3 power towers, and an estimated 1,000 houses "along the road" and at the Baggao old town area. Also most of the root crops were destroyed. All and all a very big loss for the people of Baggao (Talabong 2018).

Our research proposal

As mentioned, the typhoon caused much physical damage to the Municipality of Baggao (Photo 1). Our focus on this study will be the damage done to the agroforestry, more specifically the damage done to the fruit and timber trees. We want to research the effects the typhoon had on the agroforestry market. We expect to see some changes in prices between the several fruit and timber products, because we think not all trees will have the same amount of production in comparison to the production before the typhoon. This will have consequences in prices of the products. For this we also need to find information on how the local market works in Baggao. We take the sitio of Mansarong as location of research, as agriculture and agroforestry is the main livelihood of the people there (Photo 2).



Map 1: Google earth image of municipality of Baggao and Barangay Sta. Margarita within Luzon, Philippines (Screenshot by E. Beijk, January 27, 2019)



Map 2: Map of sitio Mansarong and surrounding area (Drawing made by Marcelino Laoyan, January 22, 2019)

QUESTIONS

Research Question

What is the impact of typhoon Ompong on the agroforest market in Mansarong, Sta. Margarita, Baggao, Cagayan, Philippines?

Sub Questions

- How do the people of Mansarong trade their products?
- What impact did typhoon Ompong have on the local agroforestry in Mansarong?
- What effect did typhoon Ompong have on the values of the products?

METHODOLOGY

We gathered our data through primary and secondary sources of information. Our target respondents consisted of farmers, traders and buyers (all people we interviewed were considered buyers) of fruits and timber in Mansarong. To be able to determine the impact of typhoon on the operation and management of fruit and timber in Mansarong, we planned out the following activities:

- Survey/interview the farmers, traders and buyers of crop plants in Mansarong to gather information about the current market dynamics of the products (See Appendices)
- Score the trees by the amount of damage and the amount of production. For this, a field form was used to score the physical damage seen according to the standard (See Appendices).
- Describe the factors affecting the operation and management of the fruit and timber and evaluate the impact of typhoon Ompong on the agroforestry in Mansarong.

Table 1: The time schedule of the project

Date	Activity	Location	Key Informants
18-01-2019	• Arrival to Sta. Margarita • Meeting with mayor • Traveling to Mansarong Meeting with host family	Cabagan Tallang Sta. Margarita Mansarong	Leonardo Pattung Ramil Soriano Alejandro Logro
19-01-2019	• Meeting at Mansarong Elementary School with town officials and inhabitants of area. • Interviews within Mansarong with farmers • Interviews within Pagapag with farmers	Mansarong Pagapag	James Laruan Marcelino Laoyan
20-01-2019	• Start of observations across farms • Interviews within Mansarong with farmers • Travel to Mapuraw farmlands for observations • Travel to agroforestry land within Mansarong	Mansarong Mapuraw	Richard Vargas (LGU) Nestor Ganase Alfredo Ganase James Laruan
21-01-2019	• Trip to Tallang Market • Interviews within Tallang with traders • Short briefing with Merlijn, Tess and Sabine	Tallang Mansarong	Levimae Lacaden Jinky Addur
22-01-2019	• Travel to Km.9 farmlands for observations • Return from Km.9 to Mansarong • Interviews within Mansarong with farmers (rubber tree)	Mansarong Km.9	James Laruan Marcelino Laoyan Renato Ganase
23-01-2019	• Farewell to Mansarong • Arrival at Barangay office of Sta. Magarita • Travel to Blue Waters	Mansarong Sta. Magarita Blue Waters	n.a.
24-01-2019	• Farewell to Blue Waters • Arrival at Municipality Office of Baggao • Return back to Cabagan, Isabela (ISU)	Blue Waters Baggao Cabagan	n.a.

RESULTS AND DISCUSSION

Tallang Market

After carrying out the five days of field work, a number of observations have come to light about the local market of agroforestry products in Mansarong. To begin with, there is a strong cooperation within the community of Mansarong when it comes to delivery, as well with the surrounding sitio of Pagapag, Km.9 and Ligadig. Every Monday, a truck goes to Tallang from

central Mansarong (Photo 3). In Tallang, every Monday a large market is held on the square in front of the municipality office of Baggao. Visit has shown hundreds of people coming to this market every week from Tallang and surrounding area (Photo 4). Despite the hour's long journey, it is for the people of Mansarong the only way to get the products unavailable in the small shops within Mansarong itself. The rate for this delivery truck is Php 60.00 to Php 80.00 (retour). In addition to the groceries for the population, this weekly trip is mainly meant for the delivery of harvest and the purchase of fertilizers and building materials.

The interviews with the farmers at Mansarong showed that 83% of the farmers surveyed who carry out agroforestry are negotiating products with the Tallang market. This concerns all the fruit, cocoa and coffee beans, as well as tiger grass brooms. These products are traded both to the traders of the weekly market and to the shop owners. These shops are located within a radius of one kilometer, so that the exchange of the products from Mansarong from a central point is not excluded. The market to the timber of Mansarong is not to be found: all farmers in Mansarong grow only timber trees for personal or mutual use as repair of houses or as firewood.

Photo 1: People of Mansarong traveling with their goods to Tallang market for trading. (Photo by E Beijk 2019)

Photo 2: Market day in Tallang, Baggao. (Photo by E Beijk 2019)

Sharing businesses

The interviews show 67 percent of the farmers within Mansarong pay nothing for their seedlings. This is made possible because of the underlying stock of seedlings that the farmers collect from a number of their trees, also called the 'mother trees'. After a harvest-debilitating disaster farmers can use these seedlings. There is mutual use as well with local farmers, especially with friends and family in Mansarong. All farmers outside Mansarong (also Palagag and Km.9 in this case) can also obtain these seedlings but at a price. Thus, a kind of 'friend' market has emerged among themselves in the trade of seedlings.

Observations were also made on the usage of the destroyed trees that typhoon Ompong created. As seen with the timber trees, people use the trees for personal or mutual use. An exception to this is the banana tree, which is left for rotting. These rotting trees serve as natural fertilizers for the next harvest. Seventeen percent of farmers also refuse to clean up the fallen trees, because of the impact of Typhoon Ompong. 'Typhoon Ompong is a cruel thing,' has become a well-known statement.

Harvest loss

According to the interviews, all farmers lost 100 percent of their annual harvest due to typhoon Ompong. This includes all the fruit, cocoa and coffee beans that the farmers have planted from early 2018. Harvest period is from October and November. Because the typhoon made landfall in September, the farmers have not been able to pre-harvest these products. The result is total destruction of all crops. The damage of all trees differs between almost unaffected to totally destroyed, main reason being the wind forces of the typhoon. Although there was no specific look at the plantations of fruit products, it was striking the damage was significantly greater on the farmlands than in the forest of Mansarong (Photos 5 and 6). The trees on a plantation catch all the wind, while the trees within Mansarong catch the wind force for each other through the dense vegetation. The trees in Mansarong are therefore less affected by the wind than the trees outside Mansarong on the plantations. However, the same applies to the harvest that 100 percent has been lost.

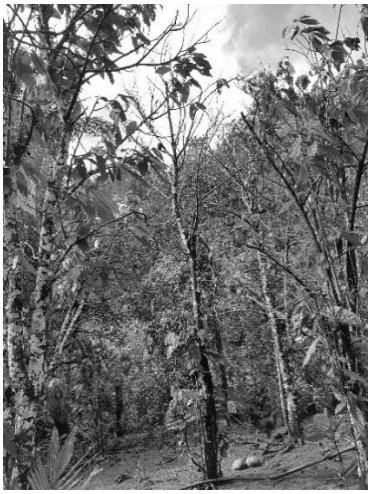


Photo 3: Agroforestry setting of rambutan trees within Mansarong (Photo by E Beijk 2019)

Photo 4: Newly planted banana farm in Mapuraw farmlands outside of Mansarong (Photo by E Beijk 2019)

Damage scoring

During the interviews, we asked the farmers which agroforestry products they mostly grow. However, not all of these fruits were observed during our field work on January 20 and January 22. A damage assessment was made of the species that were visited. We looked at the branches, the leaves, the bark and the roots. We also examined whether potential fruit growth could be observed. In this way, 45 crop plants were scored, coming from six different types of crop plants and two types of timber trees. For this, a healthy tree was first looked up as comparison material. However, the plants are not evenly distributed, because certain trees occurred less frequently than other trees.

In Figure 1, the average damage was taken on the six types of trees. Of all the crops, the avocado is most damaged on the branches, bark and the roots. The latter can be regarded as a fragile tree, which is not resilient to emerging disasters, certainly because the roots are unable to supply the tree with more nutrients after a typhoon. The rambutan tree follows, as most affected to the branches and also strikingly much on the leaves. With weaker branches and leaves, the tree has more trouble with photosynthesis, so that the build-up and growth of the rambutan after a typhoon can only get going again very slowly.

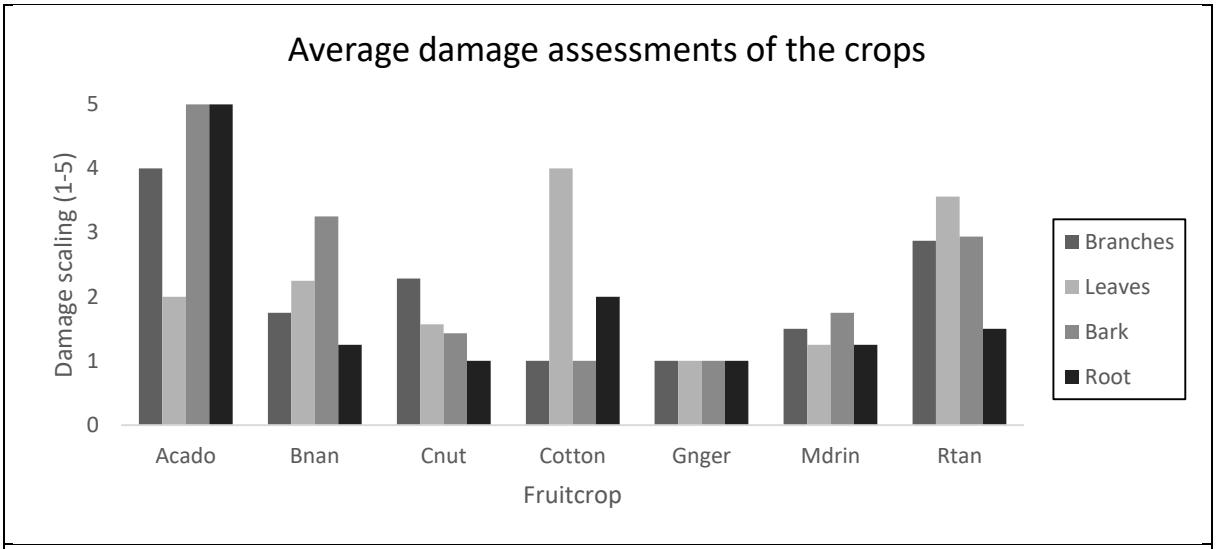


Figure 1: Average damage assessments of the fruit crops according to a damage scoring from 1 to 5 by observations. (1=untouched, 2=slightly damaged, 3=mildly damaged, 4=badly damaged, 5=destroyed) Scored by the damage done to the branches, leaves, bark and the root per fruit crop. (Acado=Avocado, Bnan=Banana, Cnut=Coconut, Cotton=Cotton fruit, Gnger=Ginger, Mdrin=Mandarin, Rtan=Rambutan)

The cotton fruit plant also clings to this. This is also the case for the banana tree, although the main weakness is the bark. An impeded flow of plant hormones but also the protection of phloem and xylem also cause a difficult recovery for the banana tree. As a result, farmers rather plant new seedlings instead of letting damaged banana trees restore. Although the coconut tree is much affected by the branches, the tree seems to be resilient. In three of the eight coconut trees, fruit has already been observed, although it is uncertain whether this fruit has started to grow. The mandarin tree and the ginger plant seem to be affected the least by the typhoon, although the mandarin tree is probably only planted after the typhoon due to the little damage according to the farmers. Furthermore, the ginger plant grows low and the product grows ginger as the root of the plant, therefore having little contact with the typhoon.

Rubber trees

Comparing to last year's research of Agustin and Vogelzang (2018), the damage that has been done to the rubber trees that have recently been planted has also been scored. None of the trees had been affected by the typhoon, which is astonishing because the bark of the plant is very thin. However, these trees will not produce harvest for at least 15 years and it is also uncertain what kind of impact the trees will have on the rubber market.

Preparations for next typhoon

The farmers were asked what kind of preparations they are planning for a potentially emerging disaster such as a new super typhoon (Figure 2). It emerged that 59% of the farmers surveyed who do agroforestry do not intend to plan preparations. They do not want to think of a new big disappointment if that is not necessary. 33% of farmers do plan to remove branches and leaves so that the wind will pull less from the tree in its power. There has been only one farmer who wants to switch from rambutan to tiger grass. This would be because the tiger grass would be more resilient to the typhoon. The grass could also be harvested outside the typhoon period. However, data on the tiger grass was not obtained from the damage assessment.

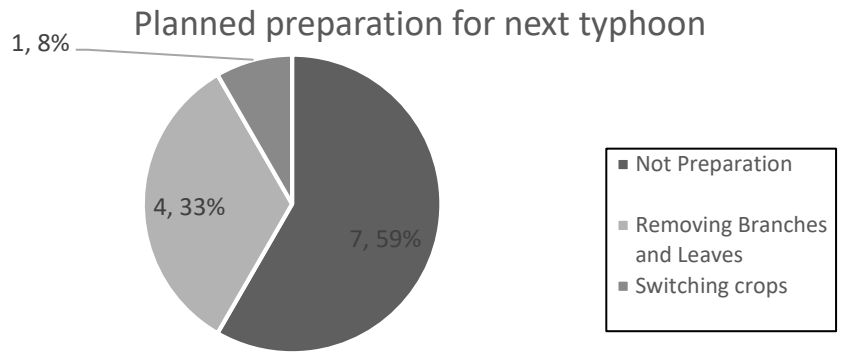


Figure 2: Survey on the planned preparation for a potential upcoming typhoon. Number of farmers with agroforestry asked was 12. Out of the 12 farmers, 7 farmers weren't planning any preparations; 4 farmers were planning to remove the branches and leaves in the time of warnings; 1 farmer was planning to switch crops.

Trade evaluation

An assessment was made with the interviews of the traders and the farmers. This assessment includes the prices for which traders have purchased their products and then sold them again. This has been requested for both before and after the typhoon in order to get a clear picture of the change in the values of the products. However, not all the products from the farmers have been included in the assessment, because the farmers were not fully familiar with the exact prices of which they sold their products. Additionally, traders were not always willing to share all their purchasing and selling prices or did not want this data to be included in the results. Respect must be shown for the choices.

Table 2: Survey results of the purchase and sale prices by the traders within Tallang.

		Before Ompong		**After Ompong**	
Trader	**Product**	**Buy**	**Sell**	**Buy**	**Sell**
A	Rambutan	50	60	80	100
	Mandarin	20	40	30	40
	Banana	20	30	60	80
	Coconut	5	10	10	15
B	Rambutan	50	80	80	105
	Mandarin	25	40	30	50
	Lansones	120	140	160	180
C	Rambutan	60	80	120	160
	Mandarin	50	70	N.a.	N.a.
D	Rambutan	50	60	80	100
	Mandarin	20	40	30	50
	Banana	20	35	N.a.	N.a.
E	Rambutan	50	80	85	105
	Mandarin	20	40	30	50
	Coconut	5	10	10	15
F	Rambutan	50	60	80	90
	Mandarin	25	40	30	40
	Coconut	5	10	10	15
	Lansones	120	150	170	200
	Banana	20	30	N.a.	N.a.

All prices went up after the typhoon (Table 2). This was not only the case for the purchase price, but also the sales price went up. Buyers were asked if these price changes had an impact on what they all wanted to buy on the market. However, it did not interest any respondents much that the prices of their usual products on the market had increased. This was reflected in the observation that no respondents had undergone a change in diet or purchase habits.

Change in dynamic

Contrary to the previous statement, farmers brought less of their supply to the market. Instead, they used their own converted product instead of making a profit on the market by definition. This was partially offset by the higher purchase prices that farmers offered to the markets. As a result, the markets had less product to sell which did have a higher price to keep the profit the same. However, the traders do not only deal with Mansarong but also with the other sitio such as the aforementioned Pagapag, Km.9 and Ligadig on the road to Tallang. Other parts of Baggao also trade with the traders in Tallang. Thus, a proportion of all rambutan is also obtained from Viscaya and Baguio, while bananas are also obtained from Davao. Finally, there is also a lot of trade between Tallang and Tuguegarao, although this research did not go much further between these agreements.

Position of Mansarong in the market

Regardless of competition with other sitio, the products from Mansarong are surprisingly attractive among all the traders surveyed. The reason is that the products from Mansarong are cheap and also of high quality. From observations, farmers from Mansarong do not use chemicals and apply two turns of fertilizer only instead of the usual three turns in other sitio. For agroforestry itself (not the plantations where a proportion of the products come from), no fertilizers are used at all.

Mansarong also maintains a strong position on the Tallang market after the typhoon. All the traders surveyed said they would rather not sell a particular product which was no longer available from Mansarong than they had to get it from another site where the price is higher and the quality is lower. Surveyed traders state they would rather not sell a certain unavailable supply from Mansarong than to purchase it from other sitio. This is one reason why not all markets sell bananas in Tallang because there was no more supply from Mansarong. The value dynamics was most visible shortly after the typhoon. In the meantime, most traders have been able to normalize their products again like for the typhoon because there is again a good flow of supply, partly made possible by stockings. Because there is little harvest from Mansarong, however, her position has become less strong but still well appreciated among the traders.

CONCLUSION

The impact of typhoon Ompong on the agroforestry market in Mansarong has been moderate with one year no harvest but still a strong position in the market.

RECOMMENDATIONS

As we found out in the field, we didn't have much time to really expand our list of interviews and to visit all the farmlands and agroforestry places. This was also due to the weather and muddy roads that really reduced our mobility in the field which prohibited us from further observations. We also noticed during the reporting that we might have missed some questions in our questionnaire which could have given us more insight on the market dynamics and food harvest within the area of Mansarong. Last, we also might have missed some farmers with agroforestry, as they might not have been at home or at their farm during our research or they

were visiting people (like family) outside of Mansarong. This is something we could change if we wanted to repeat the research. We also didn't gain much more information on the timber market in Mansarong. That is why we didn't include much information in the results about it. For recommendations on further research on this topic, more interviews across different sitio within Sta. Margarita could be planned. For instance, for farmer interviews there could be potential new insights in the community of Malisi or Km.9, as for the trader interviews more information could be gained from the competition from Mansarong with other sources like Davao and Viscaya. Furthermore, the topic agroforestry could be combined with agriculture to give a complete view on the dynamics of food and product market.

ACKNOWLEDGEMENTS

We sincerely want to thank all the 18 respondents of farmers and traders within Mansarong area and Tallang market for their contribution to the accomplishment of this research and giving us their time in answering our questions. Furthermore, we would like to thanks Ramil Soriano for our housing and being a good host and Alejandro Logro as owner of the house. Special thanks to Barangay councilor James Laruan and farmer Marcellino Laoyan for introducing us to their farmlands and contributing much background of the area and the use of agroforestry within the sitio, as well for Richard Vargas for traveling with us along the farmlands. Lastly, to Barangay Captain Norman Molina and Mayor of Baggao Leonardo Pattung our deepest gratitude for allowing us our research in the designated areas.

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APPENDIX: Questionnaire

Name:
Age:
Gender:
Occupation:
Ethnicity:
Do you have any planted trees? (No → cancel questionnaire)
For farmer:
What fruit or timber trees do you have?
How do you use the fruit/timber trees? Selling ( ) Personal needs ( )
How big is your field?
How many kilos/cubic feet did you harvest per cropping?
How many cropping did you do in one year?
What was the price of your product per kilo/cubic feet?
How much did you invest in?
How do you trade your products or with who?
How much of your field did you lost after typhoon Ompong?
How many kilos could you still sell?
How much money did you get from this?
How did you lose your field? (Landslide/wind/flood…..)
How many trees were totally destroyed?
What did you do with the destroyed/fallen over trees?
How the typhoon did affect the coming cropping?
What does it mean to you that you lost your harvest?
How will you prepare for the next typhoon?
For trader:
What products do you sell?
How much do you get supplied?
What were the prices before typhoon Ompong?
What were the prices after typhoon Ompong?
Where did you get your goods from before and after Ompong?
Has anything changed about the quantity and the quality of the goods?
Where do you prefer to get your goods from and why?
How did you feel about Ompong?
How has Ompong affected your market?
What preparations will you make for a potential upcoming typhoon?
Field Form
After interview with farmer, ask to go to his (potentially damaged) farm. With permission set samples to measure the tree damage and production. Follow the field form for every tree.
What fruit/timber tree/plant?
Quantify damage out of scale of 1-5 for damage to braches, leaves, bark and roots.

INFLUENCE OF SOCIO-ECONOMIC BACKGROUND AND ACCESSIBILITY ON RELIEF GOODS RECEIVED AFTER TYPHOON OMPONG IN SANTA MARGARITA, BAGGAO

Charlotte Anna Bryan and Fevie Dianne M. Peralta

INTRODUCTION

Income Inequality

The Philippine GDP per capita has been growing steadily since 1985, with a 6.1 percent growth in 2018 (Trading Economics 2019). Unfortunately, income inequality is also growing (The Manila Times 2018). In 2015, the median income per capita for the Philippines was Php 180,000.00. For the bottom 10 percent this was Php 83,000.00, while for the top 10 percent the median annual income per capita was Php 652,000.00, a difference of factor 7.85.
Our research will be based in Sitio Mansarong. This Sitio is situated in barangay Santa Margarita, municipality of Baggao. This municipality lies in Cagayan, a province in the Cagayan Valley region. In this region, the median income per capita is Php168,000.00, just a little under the national average. However, the poorest 10 percent of the Cagayan Valley region earn above Philippines median, at Php 98,000.00 per year. The richest 10 percent are poorer than the Philippine median, earning Php 557,000.00 per year. This is a difference of factor 5.58, one of the lowest factors for all regions in the Philippines (The System is Broken 2017).

Natural Disasters

Not only does the Philippines have to deal with income inequality. The country is also extremely prone to natural disasters. This is caused by a couple of main reasons. West of the Philippines is the Pacific Ocean. The waters here have the warmest ocean temperatures in the world and often reaches the temperatures needed to form a typhoon (above 28°C). This causes many typhoons to form in these waters, and as there is no landmass protecting the Philippines on the East coast, the storm doesn't lose much force before it hits the Philippines. Moreover, the Philippines is situated on the Ring of Fire, a belt around the Pacific that generated many earthquakes and volcanic eruptions, caused by the Pacific Ocean's crust applying pressure on the continents surrounding it. Only 18 percent of the original forest covers of the Philippines remains, and this causes massive landslides following heavy rainfall. With more than 60% of the Philippine population living along the coast, storm surges also cause major damage and loss of life. Finally, many people along the coast live in poorly constructed houses, offering no protection against the storm (National Geographic 2019).

In 2018, 21 typhoons entered the Philippine Area of Responsibility (PAR). One of these typhoons was typhoon Ompong. On the early morning of 15 September 2018, this category 5 super typhoon made landfall in Baggao (Philippines Humanitarian Country Team 2018). Eight casualties were reported by the National Disaster Risk Reduction and Management Council (NDRRMC), excluding at least 50 people that died in a landslide that was caused by the typhoon. Moreover, the typhoon had caused at least 9.3 billion pesos worth of agricultural damage in northern Luzon alone (Philstar Global 2018). In Baggao, fisher folks had trouble finding income and farmers had to prematurely harvest their crops, leading to loss of income because of the poor quality. The presence of many muddy roads due to continuous rains after Ompong made access to the different barangays and sitios troublesome. Fortunately, relief aid arrived from multiple sources, such as the Philippine Red Cross (PRC), the NDDRMC, and the government of Australia and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

In Baggao, most relief aid is coordinated by the barangay. Per zone, there is a leader who takes charge. They have a team that goes around different houses to take pictures and assess damage. Based on this assessment, relief goods are distributed. If inhabitants are not at home during this assessment, they can come by the barangay hall to report the damage. Everyone has 24 hours to report his damage. After this period of time, the barangay officials issue a report to the Local Government Unit (LGU). Another report is issued after 48 hours, to allow people living further away from the barangay hall the time to travel there. If the inhabitants of the barangay are too late, they don't receive any relief goods from the barangay. This is communicated to them during the general assembly of the barangay (Molina 2019, pers. comm.).
From the LGU, monetary aid is usually provided. This is coordinated by the Department of Social Welfare Development (DSWD). People with totally damaged houses receive 30,000 pesos from funds of the national government. People with partially damaged houses receive 500 pesos from the LGU. Unfortunately, the LGU funds are often insufficient to provide monetary aid to everyone who needs it. They base their distribution of the money on the assessment of the barangay (Salvador 2019, pers. comm.).
Other organizations that provide relief goods are the PRC, Ching Yen Foundation and the Religious Group.

This research aims to investigate whether there is a significant difference in the relief aid distribution across different income levels in Mansarong and Santa Margarita. We will focus on the total amount of relief aid that the inhabitants received, on the amount of relief aid they received from the barangay, and the time the inhabitants had to wait to receive their relief goods, also called the relief time. However, we suspect that socio-economic background will not be as influential on the relief aid received as the accessibility of the location. The road leading to Santa Margarita is paved, whereas Mansarong can only be reached by a dirt road that gets very muddy after rainfall.

RESEARCH QUESTIONS

The main question of this research is:
Was there a significant difference in support received by inhabitants of Sitio Mansarong and Santa Margarita after typhoon Ompong based on their income and their accessibility?
To answer these questions, the following sub questions will be investigated.

1) *What type of relief aid did the people of Mansarong and Santa Margarita receive?*
2) *Who gave the relief aid received by the people of Mansarong and Santa Margarita?*
3) *How long did the people of Mansarong and Santa Margarita have to wait to receive relief aid?*
4) *Was there a perceived unfairness in the distribution of the relief goods in Sta. Margarita and Sitio Mansarong?*

METHODS

Interviews

We conducted our research in Sitio Mansarong and Santa Margarita. For this research, we used interviews as the main method. In total, we conducted 46 structured interviews with locals to answer the sub questions (Appendix A). We also had 9 conversations with other locals in addition to the structured interviews to get some additional answers to the fourth sub question. Finally, we interviewed two officials for additional information: the barangay captain of Santa Margarita and the social welfare officer from DSWD at the LGU.

Of the 46 respondents of the structured interviews, most were Igorot (18), followed by Ilocano (14), Agta (3), Visaya (1) while 10 had an unknown ethnicity. Fourteen respondents were aged between 21 and 30, 8 between 31 and 40, 9 between 41 and 50, 10 between 51 and 60, 2 between 61 and 70 and 3 between 71 and 80. Household sizes ranged between 1 (2 respondents) and 10(1 respondent). Three respondents had a household size of 2, 7 respondents had a household size of 3, 10 of 4, 7 of 5, 9 of 6, 4 of 7 and 2 of 8. Majority of the respondents (37) were female.

Table 1: Overview of research activities conducted during our research

Date	**Activities**
January 18, 2019	• Meeting with Mayor of Baggao • Travel to Mansarong
January 19, 2019	• Attend meeting with locals of Mansarong to introduce our research • Interviews in Sitio Mansarong
January 20, 2019	• Continuation of interviews in Sitio Mansarong
January 21, 2019	• Travel to Santa Margarita Proper • Interview people at the market of Tallang • Interview people in Santa Margarita
January 22, 2019	• Interview DSWD official at LGU • Continuation of interviews in Santa Margarita
January 23, 2019	• Continuation of interviews in Santa Margarita
January 24, 2019	• Meeting and interview with the Barangay Captain of Sta. Margarita • Travel to Cabagan

To determine the income levels of our respondents, we followed a technique established in a project called Dollar Street (Gapminder 2019). This project has photographed families from all over the world and assessed their living situations. They also include the income of these families. We chose photos from Philippine families from different income levels, showing their house, shoes, cooling system, cooking appliances and CR (Photo 1). We asked our respondents which pictures most represented their living situation and used their answers to categorize them in different income levels, from 1 to 4. According to this categorization, 26 respondents had an income level of 2, 19 respondents had an income level of 3, and only one had an income level of 4.

Photo 1: Different pictures of Philippine CRs used to determine the income levels of our respondents (Source: Dollar Street)

The accessibility of our respondents was determined on a scale from 1 to 5, with 1 indicating their house is difficult to reach, and 5 easy. Seven of our respondents lived in very remote places (level 1) such as Sitio Malisi and KM 10. Sixteen respondents were a bit easier to access (level 2), living in Mapurow and Sentro Mansarong. Seven respondents lived in Pagapag, putting them at accessibility level 3. All the 16 respondents of Santa Margarita Proper were categorized in level 4.

We also travelled to Tallang market to have conversations with people from other barangays in Baggao to ask them about any unfairness they perceived. We spoke with 9 people from different barangays such as Tallang, San José, San Isidro and Remos.

Statistical Analysis

We are interested to know whether income and accessibility make a significant difference in the relief goods received by our respondents and their relief time. For this we will look at three different factors: the relief goods received from the barangay, the total amount of relief goods received and the relief time. For each factor we will test if accessibility and income have a significant influence. As most respondents received relief goods from different sources, we will use the relief time of the organization that was quickest. From now on, we will refer to this as the absolute relief time.

As we are looking at distributions within different categories (Accessibility: Category 1,2,3,4,5; Income: Category 1,2,3,4) and are wondering whether the distributions differ significantly per category, the chi-squared test is a fitting test to use. The null-hypothesis of this test assumes that there is no significant difference across the different categories. The test gives us a *p*-value between 0 and 1 that represents that odds that there is indeed no difference across the different categories. Our significance level is 0.05. This means that if the odds of the categories belonging to the same distribution are smaller than 0.05, we reject the null-hypothesis, and thus assume the alternative hypothesis: there is a significant difference across the different categories, and so income or accessibility have a significant influence on the relief aid (from the barangay) or the absolute relief time.

For income we can look at Santa Margarita and Mansarong both, as there is no significant difference in income levels across different accessibility categories (*p*-value: 0,246).

To translate the total amount of relief goods received to a number, we took the following approach: we added all units of relief units, taking 5 kg of rice as 1 unit and 1000 pesos as 1 unit. The total number is then rounded up to then next round number. For example:

- 20 kg rice
- 3 noodles
- 2000 pesos

The example would give us 4+3+2=9, which rounded up gives us 10 units.

RESULTS

In this section, we will first give the results of the first three sub questions. Next, a statistical approach will be used to answer the main research question. Finally, the fourth sub question will be answered as a qualitative addition to the main research question.

Sub Question 1: What type of relief aid did the people of Mansarong and Santa Margarita receive?

The majority of people we interviewed had received relief aid in the form of food (41 respondents). This was usually rice, sardines, *manapak* and noodles. Sometimes people also received goods such as coffee, soy sauce or cooking oil.

21 respondents received non-edible products, usually from the PRC. These were products such as plastic sheets, sleeping mats, blankets, towels, soap and clothes. The PRC usually only gave these relief goods to people whose houses were completely destroyed by Typhoon Ompong.
5 respondents had received money from DSWD, the Religious Group, the Ching Yen Foundation or WFP. These people usually had houses that were totally destroyed by Typhoon Ompong, although some people with partially destroyed houses also received money for the reparations. Only 3 of our respondents had received nothing at all.

Sub Question 2: Who gave the relief aid received by the people of Mansarong and Santa Margarita?
Most of the respondents we interviewed had received relief aid from the barangay (Figure 1). This was usually in the form of food. A minority had also received relief aid from the Religious Group, DSWD, the Ching Yen Foundation and the PRC. The organizations that fall under 'Other' were the Aski Loan company (only 1 respondent had received relief goods from this organization), WFP (1 respondent), Department of Agriculture (1 respondent) and Provincial relief aid (2 respondents).

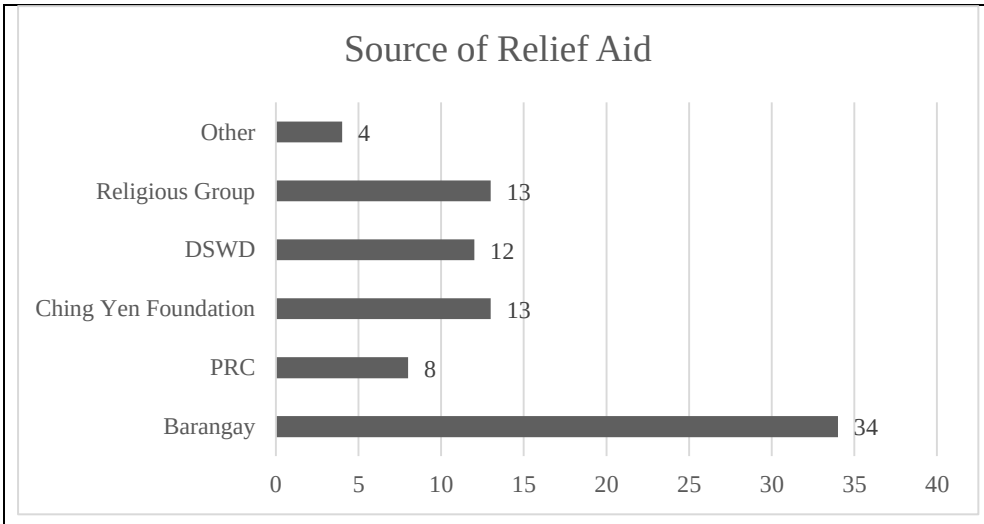

Figure 1: Sources of relief aid received by people in Santa Margarita and Mansarong.

Sub Question 3: How long did the people of Mansarong and Santa Margarita have to wait to receive relief aid?
The relief time differs per relief aid organization. One respondent received relief aid a day before Typhoon Ompong, while others still received relief goods 4 months after. For our statistical analysis we focus on the absolute relief time. This differs between 1 day before Typhoon Ompong to 2 months after (Figure 2).

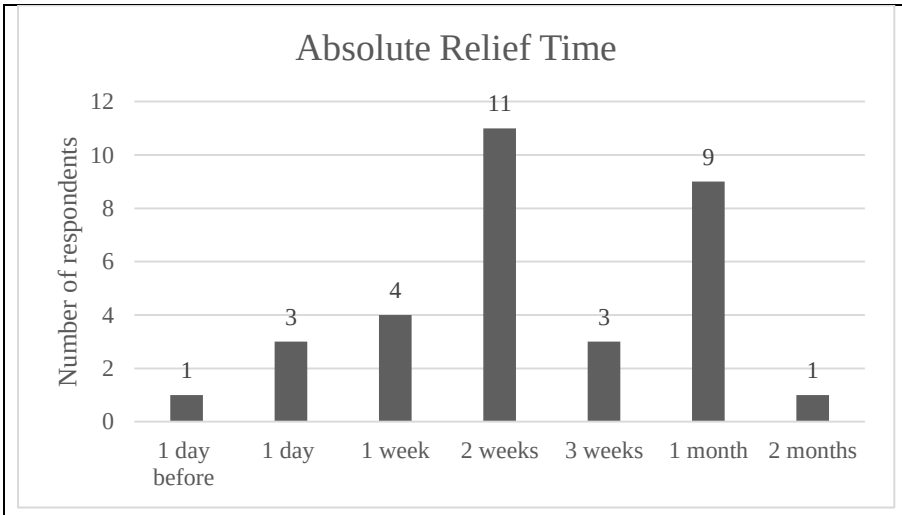

Figure 2: The absolute relief time (relief time of organisation that was quickest to provide relief aid) of respondents in Santa Margarita and Mansarong.

Statistical Analysis

Table 2: Results of the chi-square test for all explanatory and response variables.

Explanatory Variable	**Response Variable**	**p-value**
Income	Total Relief Goods	0.245
Income	Barangay Relief Goods	0.999
Income	Absolute Relief Time	0.984
Accessibility	Total Relief Goods	0.749
Accessibility	Barangay Relief Goods	0.208
Accessibility	Absolute Relief Time	0.115

For none of the tests we can reject the null-hypothesis, so we can't assume that neither income nor accessibility have a significant influence on the relief goods received (total and from barangay) or the relief time (Table 2). For the barangay relief goods and relief time there is some more uncertainty whether its dependent on accessibility, while for the total amount of relief goods the greater uncertainty lies with income. However, this uncertainty is not great enough to assume the alternative hypothesis. There are some interesting trends that can be seen. For example, there is a negative correlation between income and the total amount of relief goods received. Also, accessibility and total amount of relief goods seem to be positively related (**Figure 3**). However, as mentioned before, these trends aren't strong enough to disprove the null-hypothesis.

Sub Question 4: Was there a perceived unfairness in the distribution of relief goods in Santa Margarita and Sitio Mansarong?

From the statistical analysis we have concluded that there is no demonstrable difference in distribution of relief goods based on income or accessibility. However, of the 32 respondents we asked if they thought there was any unfairness in the distribution of relief goods, only 5 responded they didn't think there was any unfairness. 3 said they didn't want to talk about this subject or didn't know. The big majority, 24 of the respondents, said they thought there was quite some unfairness in the distribution of relief goods. For this they had different (sometimes contradictory) explanations, which will be described in the following paragraphs. The interviews were anonymous, so none of the names are included in the report.

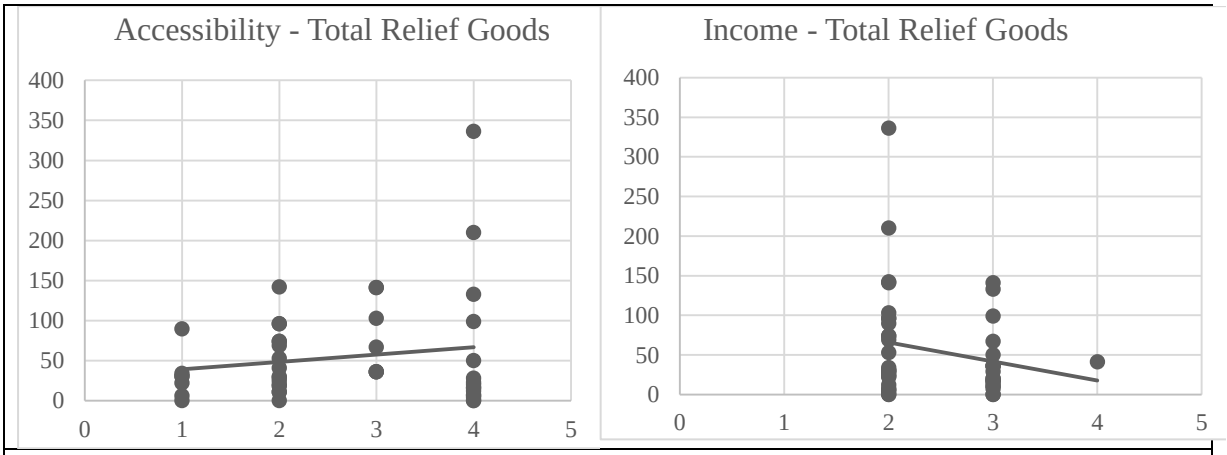

Figure 3: We can see a positive correlation between accessibility and the total amount of relief goods received by the inhabitants of Mansarong and Santa Margarita, while the income and total amount of relief goods are negatively correlated.

The List

Many respondents mentioned that to get relief goods from the barangay, your name must be on a list. This gives many people a reason to believe that there is unfairness in the distribution of relief aid. Some respondents said their name was not on the list. They had no idea why. Some people didn't know how to get on the list, while others said they had put their name on the list and had been removed for unknown reasons.

There were some contradicting answers as to how the list was constructed. Some respondents indicated they had to go to the barangay hall to put their name on the list, while other respondents said there was an official that came to their houses to make a damage assessment. One respondent wasn't home when the officials came by to assess the damage. Even though her house was partially damaged, she didn't get anything. Some respondents from Malisi said that an official had made the list for Malisi based on the people he knew lived there. As these respondents didn't know him personally, their name wasn't on the list.

A respondent from Mansarong Centro indicated that some people who were not on the list got in line anyway and got relief goods. For this reason, there were less relief goods for the people on the list.

Some respondents had other reasons they weren't on time to put their name on the list. Someone had a baby to take care of, so she didn't want to leave her house amidst strong winds after the typhoon. Someone else still had to clean her house because she lived next to an overflowing river. She neither received anything from the barangay because they were too late.

Access

Many respondents indicated that access played an important role in receiving relief goods. A respondent from Mapurow had a house that was blown away during typhoon Ompong. However, she didn't receive anything from PRC because she was too hard to access.

It was also reported that people living close to the barangay hall sometimes came more than once to collect relief goods. For people living far away it wasn't possible to go more than once because of the amount of time it costs to travel there and back. Sometimes they would return emptyhanded from the barangay hall, because they came too late. Also, people standing at the beginning of the line allegedly got more than the people that arrived later.

Communication
A respondent from KM 10 hadn't received anything from PRC because the barangay official hadn't told them there were any relief goods from PRC. Respondents from Mansarong sometimes indicated that by the time they were told that there were relief goods available at the barangay hall, they were already too late. Pagapag apparently had a very active councilor, who was on time to communicate they presence of relief goods.
Many people also claimed that people that are close to barangay officials receive much more. This is countered by someone we interviewed that is close family to a barangay official. She said she didn't receive anything and didn't want to abuse her power to get more.

Income
During our conversations with people on Tallang market, many people indicated that you often receive more relief goods if you wear fancy, expensive clothes. Barangay officials wouldn't take the time to speak to you if you weren't wearing high heels and make-up. As they said: "They only know you around election time. When the time comes to distribute relief goods, they only know the people wearing nice clothes."

Ethnicity
Some respondents claimed ethnicity plays a role in receiving relief goods. They said Agta receive more, but this wasn't a problem to most respondents, as Agta have less money. According to some Igorot respondents, being Igorot is a disadvantage. They say the barangay told them the Igorot are hardworking, self-providing people and thus need less relief goods. Someone else said the barangay captain believes that many Igorot voted against him, even though the elections are anonymous. The respondent claims that for this reason, Igorot also receive less.As can be read in the previous paragraphs, many respondents stated that there was quite some unfairness in the distribution of relief goods.

CONCLUSIONS/DISCUSSIONS

There was no significant difference discovered in the relief goods that people received and the relief time based on their income and accessibility. However, most of the respondents felt there was quite some unfairness in the distribution of relief goods.
It is of course possible that there is measurable unfairness but that our methods couldn't detect it. It would be interesting to repeat this research with different methods. A different statistical test could be used, or a different way to measure income and accessibility. If the time allows it, a greater group of respondents would also make the tests more accurate.

ACKNOWLEDGEMENTS

We want to thank Mayor Leonardo Pattung of Baggao Cagayan and Sir Pong for welcoming us to their municipality. Our gratitude also goes out to Social Welfare Officer 2 Elvie Salvador of the DSWD for taking the time to answer our questions. To Barangay Captain Norman Molina and the Barangay Councilors of Sta. Margarita who patiently answered all our questions about relief goods distribution in the barangay. To our warm and hospitable host family who welcomed us into their house, Councilor James Laruan and his wife Ate Esperanza Laruan, who helped us by organizing a meeting with the inhabitants of Mansarong. Also, to our second host family in Santa Margarita, Aunt Evelyn L. Abuan and her family. We would like also to thank our 46 respondents for sharing their experiences to making this research possible. To all the aforementioned: a warm thank you! We hope to meet you again in the future.

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APPENDIX A: Survey

Questionnaire for Locals

Personal Information

Name, age, number of people in household, role in the household, occupation, main source ofincome, ethnicity.

Income

- What does your house look like?
- What do your everyday shoes look like?
- What does your CR look like?
- How do you cook?
- How do you cool your house?

Accessibility

- On a scale from 1 to 5, how accessible is your house?

Typhoon Ompong

- Did you live in Mansarong/Santa Margarita when typhoon Ompong struck?
- What type of relief aid did you receive? (Based on the interview with the Barangay official)
- What was the source of the relief aid you received?
- How long after typhoon Ompong did you receive relief aid?
- Do you think there is unfairness in receiving the relief aid in your Barangay? If yes, how do you say so?

MALISI

THE IMPACT OF TYPHOON OMPONG ON HOUSES IN SITIO MALISI AND SITIO MANSARONG, BAGGAO

Jeffrey P. Tuquiero and Aniek Hiemstra

INTRODUCTION

Global building materials

Comparing different areas in the world, houses are built out of a lot of different materials. The type of material depends largely on the climate and the availability of the materials. One of the most commonly used building materials in housing is concrete. Other popular building materials include: wood, cement, metals, bricks, clay and aggregates (The Constructor 2018).

Building materials used in the Philippines

The Philippines has a very diverse environment. It has a lot of different species of trees ranging from evergreen trees to hardwood trees. Most of them are endemic to the country. A lot of the building materials used in the country are found in the forest like wood, which is used in flooring, walls, and roofing in traditional Filipino houses. Likewise, other houses in rural areas, especially houses of Indigenous Peoples (IP) like Bahay Kubo, are made up of light materials such as bamboo or anahaw leaves for walls and floors, and Nipa leaves or grasses for the roofing. Houses made of light materials are vulnerable to typhoons. The most popular material for building houses in the Philippines is concrete. Concrete is usually used for the foundation of the house because of its strength and durability. Concrete and steel houses are hefty and can withstand heavy rains and powerful winds (Homify 2018).

Typhoon Ompong

Due to its geographical location, the Philippines is exposed to high incidents of hazards such as typhoons. An average of 20 typhoons make landfall in the Philippines every year, and the typhoons making landfall over the last decade have become stronger and more devastating (Philstar 2018). Typhoon Mangkhut, known in the Philippines as Typhoon Ompong, was an extremely powerful tropical cyclone that brought widespread damages to the Philippines in mid-September (The Washington post 2018). It brought winds of over 200 km per hour and 4.2 million people have been impacted by the typhoon. Tens of thousands of people have had to be evacuated, although not everyone followed these orders. Some people stayed to guard their house (ABS-CBN News 2018). A lot of houses have been damaged by typhoon Ompong especially the houses made of lighter materials.

Our research

Typhoon Ompong made a big impact in Baggao, Cagayan, Philippines. Baggao has a land area of 920.60 square kilometers which constitutes 9.90 percent of Cagayan's total area (Philatlas 2015).

The typhoon especially had a big impact on rural areas where houses are made of lighter materials such as wood or anahaw. A lot of houses have been either partially or completely damaged. In this research we assess what the impact of typhoon Ompong is on the different building materials used for houses in different areas. We will look at two different sitios, Sitio Malisi and Sitio Mansarong. Sitio Malisi is also known as km 12 since it is 12 km away from the main road. This is interesting for our research because we want to know more about whether the availability and lack of transport play a big role in the materials being used. Mansarong is a bigger village and is accessible for transport so they might use other materials for building

their houses compared to Malisi. Additionally, Malisi is an Agta community with a status as Indigenous People. Their culture might vary from the people living in Mansarong regarding building houses. We think that the availability and culture are the main things to influence the building materials that will be different in the two sitios.

Photo 1: Aerial View of Sitio Malisi *(left)* and Sitio Mansarong *(right) (*Photo by M van Weerd 2019)

RESEARCH QUESTIONS

Main research question:

What is the impact of Typhoon Ompong on building materials used in housing comparing the sitio Malisi and the sitio Mansarong?

Sub research questions:
What building materials are being used to build houses?
What was the impact of Typhoon Ompong on the different materials used in housing?
What materials are available in the community after the typhoon?
What measures did they take in response to the destruction of their house?

METHODS

With this research, we want to learn more about the effect of typhoon Ompong on building materials used for houses. We used different methods to gather this information. We gathered data from the Local Government Unit (LGU) office about the number of damaged houses in Sta. Margarita. Also, we interviewed the villagers in the two sitios we visited, Malisi and Mansarong. We conducted the interviews randomly based on availability due to lack of time. We formulated a questionnaire which gave us the right information for our research (Appendix 1). The interview started off with some basic questions, then we asked if their house got damaged and what materials were being used for the parts that got damaged. Then we asked about the availability of materials after the typhoon. Lastly, we asked if they rebuilt their house and which materials they used for the rebuilding. We used a combination of open-ended questions and multiple choice questions. Additionally, we interviewed Barangay Officials to learn more about the total assessment of the damage to houses and the aid they might have received. A second method we used was making observations about the houses. While we were doing the interviews, and walking through the sitios, we could see what materials the houses are made of now. We observed whether some houses were damaged or completely destroyed.

Respondents

We started the Field Study early in the morning of January 20. We were introduced to the community by Mr. Mario Pedrablanca, a staff of Mabuwaya Foundation and we explained our research to them. We interviewed a lot of our respondents after this introduction in the school. We interviewed 13 respondents, mainly Agta (11) and 2 non-agta respondents. We also interviewed 2 heads of the community namely: Jaime Rosalem, Mayor of Agta Tribe in Baggao and Marlon Rosalem, Vice Governor Agta Tribe in Baggao. We learned that Sitio Malisi has 28 households, 3 of them are non-Agta households. In Mansarong, we went door-to-door to conduct our interviews, where we interviewed 10 respondents (Table 1). In San Jose, we interviewed the MDRRM Officer at the LGU office (Table 2).

Table 1: Number of people interviewed per location

People interviewed	**Malisi**	**Mansarong**	**San Jose**
Villagers interviewed	13	10	0
Officials interviewed	2	0	1

Table 2: Field Study Time Schedule

Date	**Activity**	**Location**
18-01-19	Travel from ISU Cabagan to Baggao. AM: Welcomed by the Mayor to Baggao in San Jose. PM: Travel to Mansarong.	Mansarong
19-01-19	Travel from Mansarong to Malisi.	Malisi
20-01-19	AM: Introduced to the local community in the elementary school, Malisi. Conduct 10 interviews with villagers. Conduct interview with the Mayor of Agta. PM: Conduct interview with the vice governor of Agta.	Malisi
21-01-19	AM: Conduct interviews with 3 villagers. PM: Travel from Malisi to Mansarong.	Malisi/Mansarong
22-01-19	Conduct interviews with 10 villagers.	Mansarong
23-01-19	Travel from Mansarong to Blue Waters.	Mansarong/Blue Waters
24-01-19	A.M.: Conduct interview with MDRRMO officer at LGU office, San Jose. P.M.: Travel from Baggao to ISU Cabagan.	Blue Waters/ San Jose

RESULTS

Sub-question 1. What building materials are being used to build houses?

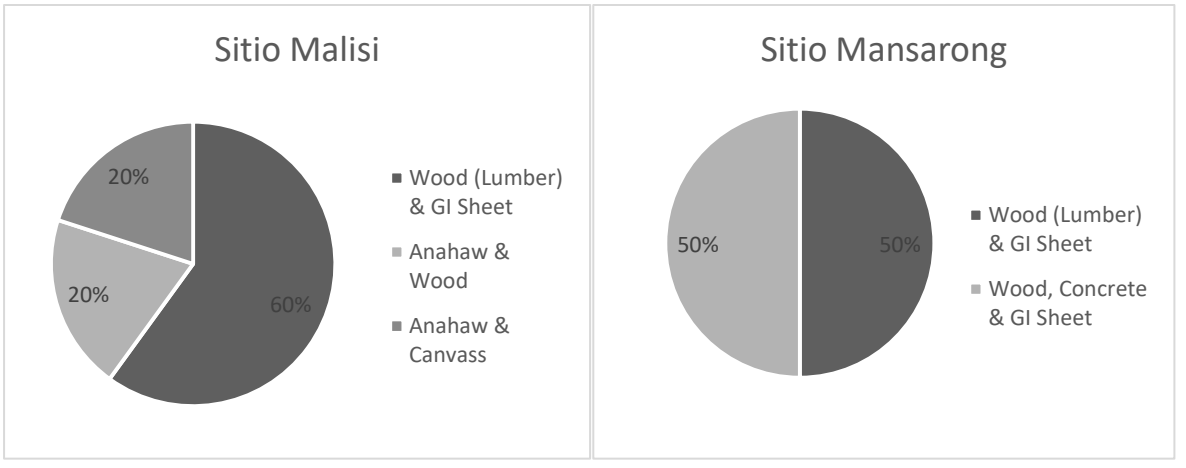


Figure 1: Materials Used in Housing before Typhoon Ompong

Building materials before the typhoon in Malisi

The materials used in houses on both sites are affected by the culture and the environment around them. Sixty percent of the houses in Sitio Malisi are made up of wood and GI Sheets (Figure 1), this is because the building materials were given to them after previous typhoons by the Non-Government Organization (NGO) called MEDAIR Emergency Response Services. The aid given were GI Sheet and other building materials. But before typhoon Ompong hit Sitio Malisi, most of the houses were built with Anahaw and wood coming from the forest because these materials are widely available in the forest. Forty percent of the houses are made of Anahaw leaves (Figure 1). Moreover, other commercial building materials like concrete are not being used in the area because the road is inaccessible to vehicles and they don't have the budget.

Building materials before the typhoon in Mansarong

The houses in Sitio Mansarong are different. The houses in the area are composed of 50% wood and GI Sheets and 50% combination of wood, concrete and GI Sheet (Figure 1). Most of the wood used in this area are either bought from the market or cut down from their own land (*posisyon*) mainly because it is illegal to cut trees from the forest.

Building traditions

One of the traditions of Agta tribe in building houses is to bury fireflies to the hole before laying the foundation of the house. They believe that by burying fireflies, it will attract more visitors and it will make the house stronger (Rosalem 2019, pers. comm.). The Ilocano and Igorot households in Sitio Mansarong have a similar tradition. They have the tradition that before building their house, they will slaughter either a pig or a chicken then they will pour the blood in the area where they will build their house. They believe that this will make their houses stronger and it will invite good luck (Ganasi 2019, pers. comm.). They also have the tradition that before laying a concrete foundation, they will put coins in the cement. They believe that this will attract good luck and riches and that this will make the house stronger (Bucal 2019, pers. comm.).

Sub-question 2. What was the impact of Typhoon Ompong on the different materials used in housing?

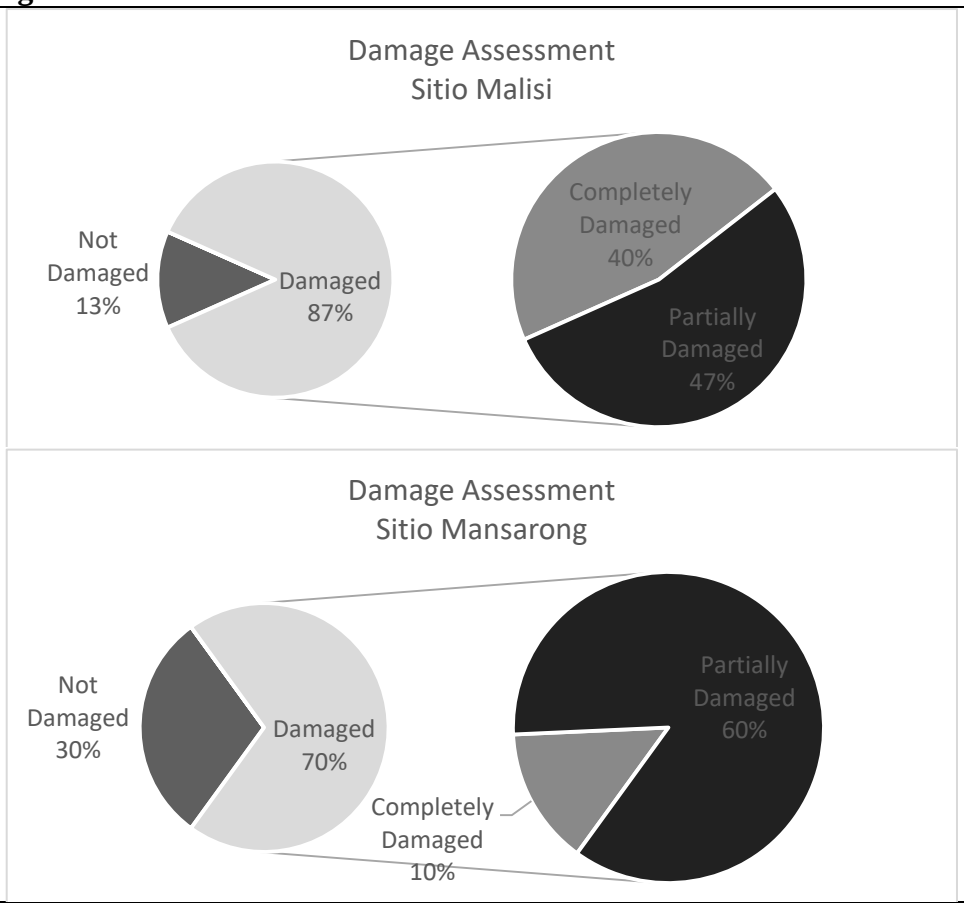


Figure 2: Damage on Houses

Damaged houses in Malisi and Mansarong

With more than 200 kph speed of winds of Typhoon Ompong, damages in houses are severe. 87 percent of the total respondents of Sitio Malisi and 70 percent of Sitio Mansarong have either partially or completely damaged houses (Figure 2). But comparing the data of the two sitios, it is noticeable that most of the completely damaged houses are from Sitio Malisi (40 percent) compared with 10 percent of Sitio Mansarong. This is because most of the houses are made up of light materials (Table 3).

Table 3: Building materials which are damaged

Materials	Malisi houses made of	Malisi houses damaged	Mansarong houses made of	Mansarong Houses damaged
Anahaw	7	7	0	0
Wood	7	5	10	2
Cogon Grass	2	2	1	1
Canvass	3	2	0	0
Rattan	2	2	0	0
GI Sheet	7	1	10	6
Concrete	0	0	5	0

What type of houses were damaged by the typhoon

Most of the houses in Sitio Malisi are made up of light materials such as anahaw leaves for their roofs and walls. Out of 13 respondents, 11 of them have a destroyed roof and 9 have destroyed walls. On the other hand, in Mansarong, 7 of 10 respondents complained of destroyed roofs. All the houses made of light materials were damaged such as anahaw and cogon grass. All the houses made of stronger materials such as concrete were not damaged (Table 3). The choice in building materials affects the strength of the house. Furthermore, it also affects its resiliency in hazards like typhoon.

Photo 2: House destroyed by typhoon (*top)* and rebuilt (*Bottom)* in Malisi (*left*) and Mansarong (*right*) (Photos by A Hiemstra (*left*) and J Tuquiero (*right*) 2019)

Preparedness for typhoons

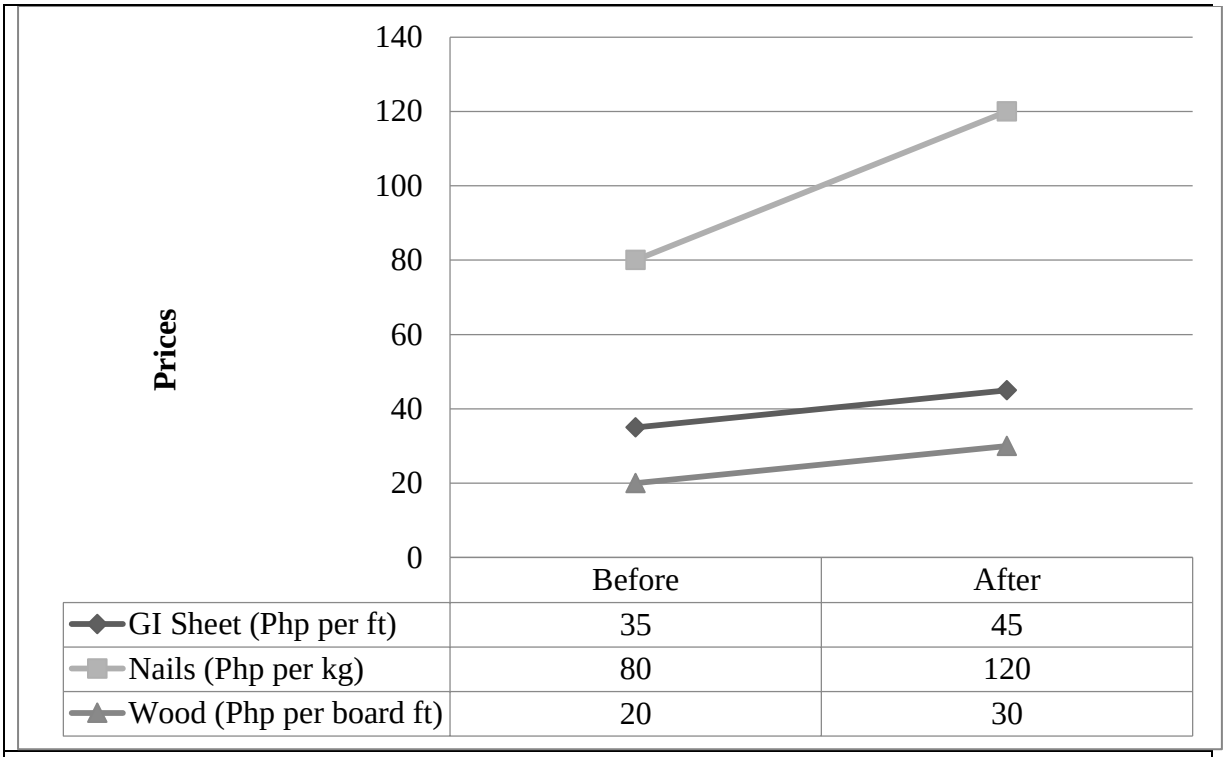
The preparedness for incoming typhoons affects the extent of damage in the area. Sitio Mansarong has better coverage on media such as television, radio, cellphone, etc., which makes them more prepared for the incoming typhoon. Because of the location, the barangay officials cannot warn them in time. Compared to the community in Sitio Malisi where they just rely on radio and traditional beliefs such as the presence of a bird named (*baltay)*, which signals an incoming disaster, such as typhoon (Rosalem 2019, pers. comm.), which may not be reliable sometimes.

Sub-question 3. What materials are available in the community after the typhoon?

Availability of materials after the typhoon

After the typhoon, materials were needed to rebuild the houses. In both Malisi and Mansarong, natural materials such as wood, anahaw leaves and rattan were easily available. In Malisi, they got their wood from the forest and in Mansarong they mostly got their wood from their own land. Although some said that when they couldn't get enough from their own land, they got the rest of what they needed from the forest. As of aid, some people in Malisi received aid in the

form of GI Sheets which they could use. Some of the habitants also received nails and gasoline to use for the chainsaw. In Mansarong, those whose houses were destroyed received money - Php 34,000 for completely damaged houses and Php 5,000 for partially damaged houses (Corpuz, pers. comm.). The government has its own procedure in selecting the recipients of the aid. Some of the recipients in Sitio Mansarong received the aid after more than 3 months or in January 2019 (Ganasi, pers. comm.).



	Before	After
GI Sheet (Php per ft)	35	45
Nails (Php per kg)	80	120
Wood (Php per board ft)	20	30

Figure 3. Prices of Building Materials before and after Typhoon Ompong

Prices of materials after the typhoon

Most of the materials used in housing were bought from the market. We asked the respondents about the price of each material is (Appendix 1). Most of the prices of the materials went up after the typhoon such as the GI Sheet which rose to as high as Php 10.00 while nails increased from Php 10 to Php 15. Some of the merchandizers took advantage of the situation. They increased the prices because they knew that the demand for the materials increases after typhoons.

Aid after the typhoon

According to Mr. Narciso Corpuz, Municipal Disaster Risk Reduction Management Council Officer (MDRRMO) of Municipality of Baggao, the total damage is estimated at Php 113.58 million on the infrastructure in Baggao alone. There were 15,532 damaged houses (both partially and totally damaged) in the entire municipality, 4 percent of which (630 households) came from Barangay Sta. Margarita where Sitio Malisi and Sitio Mansarong are located. As mentioned earlier, the government gave cash assistance to those who have damaged houses, Php 34,000.00 to completely damaged houses and Php 5,000.00 to partially damaged houses (Corpuz, pers. comm.).

Sub-question 4. What measures did they take in response to the destruction of their house?

Table 5: Rebuilding houses

SITIO MALISI	
Did they rebuild?	**Quantity**
No	5
Yes	10
1. Helping each other *(Bayanihan)*	3
2. Family	3
3. Hired Labor	3
4. Alone	1
Number of Damaged houses	15
SITIO MANSARONG	
Did they rebuild?	***Quantity***
No	3
Yes	4
1. Helping each other *(Bayanihan)*	1
2. Family	0
3. Hired Labor	3
4. Alone	1
Number of Damaged houses	7

Rebuilding houses after the typhoon

There are two classifications of damaged houses which are: partially damaged and completely damaged houses. We asked the respondents how they were able to rebuild their damaged houses (Appendix 1). Out of the 13 damaged houses in Sitio Malisi, 62% of them claimed to have rebuilt their houses (Table 5). 33% of these houses have been rebuilt with the help of the neighbors (*Bayanihan*), and 37% have hired help. In the case of Sitio Mansarong, 4 out of 7 damaged houses were rebuilt. 75% of these houses were rebuilt using hired labor (Table 5).

Materials used for rebuilding houses

The people who rebuilt their houses in Malisi mostly used GI sheet for the roof and wood for the walls and the foundation. Some people didn't receive any GI sheets so they used canvas or anahaw to rebuild their house. These people did say that they eventually wanted to rebuild their house using wood and GI sheet. People preferred not to rebuild their house with anahaw because it gets easily destroyed by typhoons. The road to Malisi was not a big problem to get materials to the community. It might have made it harder for them but not impossible. The biggest issue was whether to use certain materials because of financial constraint. In Mansarong, people rebuilt their houses using GI sheet and wood. If given the choice, everyone would have preferred to build their house with concrete but they don't have the means to do this.

DISCUSSION

Conclusion

To summarize, we learned a lot about the building materials used for houses after typhoon Ompong. In Malisi, the Agta tribe's culture is to use anahaw and rattan from the forest to build their houses but because this isn't very strong, most of their houses are now made of wood from the forest and GI sheet. Some received GI sheets as aid after the typhoon. In Mansarong, 50 percent of the houses are built with concrete and GI sheet and the other 50 percent are built

using wood and GI sheet. Some of the houses made of wood were damaged which were rebuilt with wooden houses again. Those whose houses were damaged received aid in cash. Everyone preferred to build their house using concrete but not a lot can afford this. We also learned more about how culture affects the building of houses. Both the people in Mansarong and Malisi have traditions which they believe can make their house stronger.

Recommendation dissemination of information

Baggao suffered a severe damage when a Category 5 Supertyphoon struck the area. A problem in the area of Sitio Malisi is the dissemination of information. Leaders of the area said that it is hard to disseminate information to the area because it is far. It would be better if they could disseminate the information ahead of time so that they can prepare their houses and minimize the effect of typhoon to the houses. The results show that stronger materials used (e.g. concrete and GI Sheet) in houses decrease the possibility of being blown away by typhoon. So we suggest that it is better to use stronger materials in building houses. It may cost more but in the long run it will be better than the light materials.

Recommendation further research

For the future, we recommend that a research could be done on how to strengthen certain existing cheaper building materials so that the consumers can afford these materials. Or a research could be done to find a new material which is strong and affordable.

ACKNOWLEDGEMENTS

We would like to express our warmest gratitude to Mayor Leonardo C. Pattung of Baggao and MDRRMO Narciso "Pong" Corpuz; Mr. Marlon and Mr. Jaime Rosalem; to those who shared their insights and knowledge, the respondents from Sitio Malisi and Mansarong, our colleagues, others that have been part of our research and especially our host family.

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Ganasi, R., pers. comm. Purok Leader, Chairman of Community-based Forest Management. Sitio Mansarong, Sta. Margarita, Baggao, Cagayan, January 22, 2019

Rosalem, M., pers.comm. Vice Governor of Agta tribe in Baggao. Sitio Malisi, Sta. Margarita, Baggao, Cagayan, January 20, 2019

APPENDICES

Appendix 1.

QUESTIONNAIRE (For Villagers)

1) What is your name?
2) What is your age?
3) What is your gender?
4) What is your occupation?
5) What is your Ethnicity?
6) Do you own this house?
7) How many people live in your house?
8) Was there damage to your house because of the typhoon? (If yes, proceed to question 9, if no, proceed to question 11)
9) Was your house completely damaged or just partly?
10) Which parts of your house was destroyed by the Typhoon?
    a. Roof
    a. Walls
    b. Windows
    c. Door
11) What was the material used for these parts of your house?

a. Wood
b. Concrete
c. Coconut leaves
d. Grass (Roof)
e. GI Sheets
f. Anahaw
g. Ratan
h. Others. Please Specify.

12) With what materials and how do people usually build their house in your sitio?
13) Does culture influence how and with which materials you build your house?
14) Does the place where you live influence which materials are being used?
15) Can you tell us more about the history of building houses and rebuilding after typhoons?
16) What materials were available after Typhoon Ompong to rebuild your house?
    a. Wood (from the forest)
    b. Wood
    c. Concrete
    d. Coconut leaves
    e. Grass (Roof)
    f. GI Sheets
    g. Anahaw
    h. Ratan
    i. Nails
    j. Others. Please Specify.
17) Did you receive aid from the government or other institutions? (If yes, proceed to question 18, if no, proceed to question 19)
18) What kind of aid did you receive? Which materials?
19) What building materials did you prefer to rebuild your house with? and why?
20) Was it possible to use this building materials to build your house? why? If no, why not?
21) Did you rebuild your house? (if no, why not? if yes, proceed to question 20)
22) What parts did you rebuild? (And why these parts?)
23) And which materials did you use for which parts?
24) Who helped rebuild your house?
    a. Did you do it alone?
    b. Did you do it with your wife?
    c. Do neighbors help each other/ or does the whole neighborhood help each other?
    d. Or did you hire someone to help you rebuild your house?
25) What are the prices of the different building materials?
26) Did the prices of these materials go up after the typhoon?

THE DISTRIBUTION AND COORDINATION OF RELIEF GOODS AFER TYPHOON OMPONG IN SITIO CAMUNAYAN AND MALISI, BAGGAO

Layla Schmiter

INTRODUCTION

Every year South East Asia is hit by a wave of tropical storms, especially the Philippines. Due to its geographical location the country is extremely vulnerable to natural hazards. In 2018 the Philippines ranked third on the World Risk Index (WRI), released by The United Nations University's Institute for Environmental and Human Security, for the most vulnerable country for natural disasters (Esquire Philippines World Risk Report 2018). The WRI indicates the risk or the exposure of a country to natural hazards like typhoon, earthquakes and flooding. In addition, it also measures the human activities in these events. The three elements the UN takes into account are: coping, adaptation and susceptibility of a country. This entails that the level of preparedness, the ability to respond, adjust effectively with long term strategies and the socio-economic conditions of the citizens. All these components together indicate the vulnerability of a nation to natural disasters (Esquire Philippines World Risk Report 2018).

A disaster is an event after which a community cannot cope with the consequences. The magnitude of the impact on the environment, social lives and economy is disrupted in such extremes that the community needs a lot of time to recover. A hazard turns into a disaster when people cannot deal with the impact. Human activities can also prevent a disaster by preparing themselves for the coming hazards. Furthermore, disaster can also be mitigated by reacting appropriately after the event. (NDRRMC presentation 7 January 2019)

The Philippines is a resilient country that has learned to live with the hazards but the government has development a national disaster management strategy starting in 1954 (D de Weerd 2018). In 1972, the Philippine Atmospheric Geophysical and Astronomical Services (PAGASA) was established, responsible for monitoring and- forecasting tropical depressions and floods in the area of responsibility of the Philippines. The management strategy of the government responded to criticism over the years and with various innovations which resulted in the current Republic Act 10121. The National Disaster Risk Reduction Management Council (NDRRMC) is responsible for the coordination of this act. The RA focuses on the preparedness and the response through all governance levels, thus from national, provincial, municipality all the way down to barangay level. The RA 10121 strategy established in 2010 has a multi-sector, inter-agency and community based approach for a maximum risk reduction (D de Weerd 2018).

Typhoon Yolanda, 2013, and typhoon Lawin, 2016, were two super typhoons which tested the capacity of the NDRRMC. After Yolanda, the major national logistical operation providing relief goods led to a lot of media attention and criticism. The extent of the operation resulted in a very slow distribution of the relief goods and the media triggered a massive influx of international aid leading to corruption. After Lawin the criticism entailed the difference in the amount and the timing of relief goods received. This shows that the RA10121 still needs some improvement and management development in the short term response department.

This research proposal focuses on the coordination and distribution of short term responses after typhoon Ompong made landfall in Baggao, in the Northern Luzon on 15 September 2018. The typhoon caused flooding, landslides and major destruction (World Health Organization 2018). Directly after the typhoon the province of Cagayan and the municipality of Baggao are

coordinating the response with the help of the Department of Social Welfare and Development (DSWD) and the Philippine Red Cross (OCHA 2018). On 4 October 2018 the recovery response shifted to rebuilding the most vulnerable communities, like villages in remote areas. The DSWD implemented a shelter rebuilding program for those families, including a cash assistance of PhP30,000 (OCHA 2018). Also, the Humanitarian Response Consortium, which consists of a group of local organizations, gave assistance to vulnerable communities during crisis situations in the Philippines. Through interviews the short term response in the Santa Margarita barangay in the municipality of Baggao has been studied, especially in sitio Malisi and Camunayan. Santa Margarita is one of the biggest barangays in South East Asia but contains mostly the forest and the mountains of the Northern Sierra Madre. Also, there is one way from The Pier that crosses rivers and follows a muddy trail up to the coast area through the forest. This road leads to Malisi, three hours walk from Mansarong, and to Camunayan which is an additional half day walk from Malisi.

RESEARCH QUESTION

How was the short term response coordinated and distributed after typhoon Ompong in the sitio of Malisi and Camunayan, Baggao?

Sub-questions

Which organizations gave the short term response in zone 7 after the typhoon?
What kind of short term response (goods, materials, cash, food, help) was given?
Did the relief correspond to the needs of families?
Was the aid enough for all the households in Malisi and Camunayan?
What did the families buy from the cash assistance?
What did they do in between the relief help?
How is the short term relief response structured within Santa Margarita?
How is the distribution of relief coordinated between villages and households in the zone 7, Santa Margarita?

METHODS

We conducted the study over a period of five days in several places. The two main locations were at Depir in Mansarong and in Malisi. We used semi structured interview to form a qualitative overview of the distribution system in zone 6. The 10 main questions can be found in the appendix. Firstly, an inventory was made of the short term response given in Malisi and Camunayan. Thus the source and timing of the relief goods were studied. A semi random sampling method was used. As all the 21 households of the Agta community of Camunayan were present at Depir, all the interviews were conducted there. Also, 6 of the Agta households from Camunayan participated in a group discussion. The women would consult with each other to combine their knowledge to give a more concrete answer. In Malisi the interviews took place in the Elementary School and the houses of the citizens. In Table 1, the general information of the responded are presented. An additional set of questions were asked to the key informants about the structure of the short term response system in their area of responsibility. In Table 2 an overview of the activity schedule is presented.

Table 1: General information of the respondents

	Camunayan	**Malisi**
Agta households	10	6
Ilocano/Ibanac households	2	1
Respondents total	18	10
Women	10	5
Men	8	5
Occupation	Housewife/ Farmer	Housewife/ Farmer
Key informants	**Location**	**Position**
Freddy and Susanna Pablo	Camunayan (interviewed at the Pier)	Purok leader of Camunayan
Joel Flor	Camunayan (interviewed at the Pier)	Agta leader in Camunayan
Jaime Rosalem	Malisi	Major of Malisi
Marlon Rosalem	Malisi	Vice-Governor of Malisi
Norman Molina	Barangay Hall Santa Margarita	Punong Barangay (Captain)
Narcisso Pong	LGU in San Jose	Head of MDRRMO

Table 2: Time schedule of the field work in the municipality of Baggao

Date	**Morning**	**Mid-day**	**Afternoon**	**Key informant**
Fri 18-01-2019	Travel to Baggao	Lunch in Tallang	Travel to Depir, conduct interviews	Freddy and Suzanna Pablo, *Purok* (village) leader of Camunayan
Sat 19-01-2019	Conduct interview	‘’	Travel to Malisi	Joel Flor, Agta leader in Camunayan
Sun 20-01-2019	Conducted interviews	‘’	‘’	Mayor of Malisi J. Rosalem
Mon 21-01-2019	No interviews	‘’	Conducted interviews	
Tue 22-01-2019	No interviews	‘’	Conducted interview	Vice-governor Marlon Rosalem
Wed 23-01-2019	Travel to Mansarong	Conducted interview	Travel to Blue waters	*Punong* (captain) Barangay of Santa Margarita Norman Molina
Thu 24-01-2019	Travel San Jose	Conducted interview	Travel in Cabagan	Head of the MDRRMO Sir Narcisso Pong

RESULTS

Firstly, an inventory of the short term relief response was made on each site based on the first two sub-questions. The overview of the inventory was only completed in detail after all the 28 interviews were conducted (Table 3). Further findings and the main structure of the relief distribution in barangay Santa Margarita are discussed below the table. Also specific cases from Camunayan and Malisi are presented separately. After also a specific case of a private organization providing relief help is studied.

Table 3: Overview of the received relief goods directly after Ompong per organization per sitio. (*Tolda* is a tent/shelter)

Organization	***Relief goods***	***Building materials***	***Others***	***Cash assistance (Pesos)***	***Received in Camunayan (households)***	***Received in Malisi (households)***
Catholic priest from San Jose (Private Initiative)	Canned goods, 5 kg of rice	-	Kitchenware	-	10	5
DSWD	-	-	-	33.400	10	2
Municipality Baggao/ Barangay Santa Margarita	Canned goods, 3 kg of rice	-	-	-	2	5
Phillipines Red Cross (NGO)	-	-	Blankets, mosquito nets	-	-	-
Medair (International NGO)	Rice	-	*Tolda*	-	12	7
HRC	-	-	-	2500	10	7
Mabuwaya Foundation (NGO)	-	-	-	700	12	8

Almost all the responds were not specific on the amount of the relief goods and they did not clearly remember from which organization the goods came. The relief goods consist mostly of rice, sugar, coffee, sardines and noodles. The 10 households from Camunayan did not remember from whom they received the Php 2,500.00 pesos and nobody mentioned the Philippine Red Cross or the relief goods from the DSWD. But both key informants N. Molina, Barangay Captain of Santa Margarita and N. Pong, head of the Municipal Disaster Risk Reduction Management Office (MDRRMO) confirmed that both provided relief goods packages for each household just a few days after the typhoon Ompong. Only the families with their house completely destroyed could receive Php 33,400.00 from the DSWD. The concerned houses were made from bamboo structures and *Anahow* leaves forming a traditional Agta cabin. The cash assistance is used to rebuild the Agta houses more resilient and stronger than before the typhoon. The Medair NGO was always referred to as the white people from the helicopter but the cash assistance from the Mabuwaya Foundation distributed to the households after two weeks by Mario Pedrablanca and *Kagawad* James of zone 5 (Mansarong and Pagapag), was well remembered by everybody. In addition, gasoline was requested by both sitios to clean the roads and was provided by the LGU for free.

As all the households we interviewed were farmers and all their crops were gone after the typhoon the primary needs were food and shelter. While waiting in between the relief goods packages there is a social system adapted by the people of Malisi and Camunayan. *Bayanihan* means that neighbors help each other. All the respondents worked to earn money or borrowed money from stores of neighbors. They would pay it back later by labor. With the money the villagers received from HRC and Mabuwaya Foundation, they bought food, building materials, new clothes, medicine, basics for the kitchen or even to send children to school.

Structure of the short term response in barangay Santa Margarita
Before typhoon Ompong, all the barangay officials had a meeting at the LGU office where the disaster management strategy was discussed. Also, the MDRRMO deployed 5 strike teams two days in advance to give the immediate response. But as Baggao has 14 barangays and Santa Margarita is a remote one, no strike team was deployed there. However, the citizens were warned and advised to evacuate to safer places, which most of them did. A day after the typhoon, all the *Purok* leaders would have to assess the damage and report to the zone officials. Then they would report back to the barangay and the captain forwards the information to the municipality. The DSWD and the MDRRMO inform the NGO who are present. The NGOs will then decide which area they will give the relief goods to (Molina and Pong, pers. comm.). After the damage is assessed, the *Kagawad* of each zone will inform the sitios, by text or by person, in their area of responsibility that relief goods are available at the barangay hall. In the sitios the village leader will hold a gathering where all the villagers are informed. Then the men go down to get the goods or the cash assistance. The municipal office keeps record of who has received what kind of relief help.

Camunayan
As we arrived at Depir to cross the river to go to Mansarong, we encountered the *Purok* leaders of Camunayan, Freddy and Suzanna Pablo, together with 15 Agta families who were staying there. So we decided to stay one day at Depir and start our research then and there.

Before the typhoon, the whole Agta community from Camunayan took refuge in the medical center, the *Purok* leader house or in the sitio main hall. After three days, they went back to their houses by crossing the river, which was dangerous considering the strong current. All houses were completely destroyed. By mid-January, all the 21 Agta households went down to Tallang to claim the 33,400 pesos cash assistance from the DSWD together with Freddy and Suzanna Pablo, the *Purok* leader family, and Joel Flor, the Agta leader in Camunayan. Together they discussed a plan to rebuild resilient houses for the next generation. Arrangements were already made; galvanized Iron (GI) sheets, wood, nails and a chainsaw were also ordered. When the materials would arrive in Mansarong, the men will carry them up to Camunayan, which is a nine-hour walk.

The majority of the families we spoke to told us they were not familiar with the canned goods they received. Most of the families preferred to go fishing and sell the catch. From the money they bought rice and traditional food. Some of the information could have been lost in the translation as the questions were translated from English to Ilocano and then to the Agta dialect, by Susannah Pablo. Sometimes the questions were perceived to complex, so those were not asked again. Also the number of days between the typhoon and the first relief response was not remembered clearly, so this information was also left out.

Malisi
Malisi, situated 12 km from Mansarong, holds approximately 28 households, with just one Ilocano family. In contrast with the Agta community in Camunayan, the families interviewed in Malisi had a more variety of stories after typhoon Ompong. Also, all households we spoke to were better prepared; they saved a bit of money from farming or could stock pile a small amount of food. The organizations who provided short term help were the same who also helped the people from Camunayan. But we spoke to three families who missed out on a kind of relief help. All missed crucial information at the central gathering in the village. Two families have a second house in Nuebe, kilometer 9 from Mansarong, where many farm lands are located. So after the typhoon they were in the fields to assess the damage. One of the families missed the

Php 2,500.00 from the HRC and the other missed the relief goods from the Catholic priest. Another reason is that one family went to relatives in Camunayan and missed the news and the relief goods from the barangay hall.

Most of the households went to the church or the Elementary school for shelter during the typhoon and went back home after three days. Most houses were only partially destroyed. Just one family we spoke to told is their house had not been affected by the typhoon. This family got the same relief help as the rest of the village. The *tolda* is used for drying rice and the other relief goods lasted for over a month because they were well prepared and they could stock pile the goods. In addition, Mayor J. Rosalem informed us that seven households received eight GI sheets from the LGU and three received Php33,400.00 from the DSWD to rebuild their houses. The major also told us the LGU provided seeds to replant.

Catholic Priest from San Jose gives short term relief

Next to the municipal short term relief response and the help from various NGOs there was also a private help giver. A catholic priest from San Jose gathered relief goods, like rice and canned goods, and kitchenware from NGOs and helped five sitios. On the map important sites for this research are indicated (Figure 1). The Catholic priest lives in site 1, where also Mr. Pong was interviewed. The Agta households and the Pablo family were interviewed in site tree: Depir; here Sir N. Malino gave us a lot of information at the barangay hall. Depir is part of Mansarong, site 4 and Malisi is located in site 5. Camunayan can be found in area 6. The connection between Malisi and Camunayan and the Parish Priest is Mayor Rosalem. Mayor Rosalem has a son who lives with the Parish Priest in San Jose, who financially supports him in his studies. The priest gave notice to the vice-governor in Malisi by text to come and bring back the relief goods. As a lot of relatives also live in Camunayan, the news spread rapidly. Many tricycles and the pickup truck from counselor James (*Kagawad* of Mansarong and Pagapag) were used to bring the packages back to Depir. Each family would then carry it all back to Malisi and Camunayan.

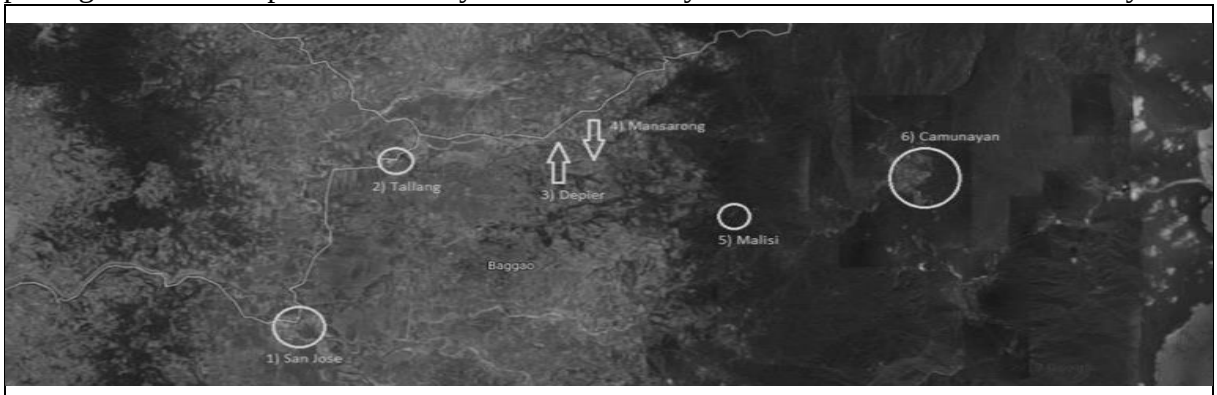

Figure 1: Map of municipality of Baggao with 1)San Jose 2)Tallang 3)Depir 4)Mansarong 5)Malisi 6)Camunayan (by Layla Schmitter on 26 January 2019)

CONCLUSION

The research assessed the distribution and coordination of the short term response in Malisi and Camunayan. All the sub questions have been answered in the result section. Overall, all families we talked to had a hard time after typhoon Ompong as the majority of the houses were completely or partially destroyed. We have seen that the municipality of Baggao has an efficient disaster management strategy to give response immediately. However, the barangay Santa Margarita and especially sitio Malisi and Camunayan are so remote that immediate help is not possible. The accessibility of an area is crucial for the short term relief in the first week after

the natural hazard. But as presented in the results, the citizens of these remote areas were still able to cope with the damage. They were more or less prepared; people would go to stronger buildings and save a bit of food and money. Directly after the event cleaning and rebuilding operation are started. Also, the local *Bayanihan* system helps to mitigate the damage as everybody helps each other out. With the help of the DSWD and the HRC the houses of the Agta community are currently rebuilding houses from wood and GI sheets. So, the next generations will be more resilient for future natural hazards. Next, the preferred relief good would be food and cash assistance. The families can then buy their primary needs.

The MDRRMO management strategy works and the information is even distributed to remote places by foot when communication systems are down. But it takes time. So to mitigate the damage, while waiting for information, the remote sitios should still be well prepared. All the families are well aware of their living situation and that is difficult to reach them but if goods do, they are truly thankful.

ACKNOWLEDGEMENTS

I would like to thank Jessa D. Macapallag for sharing this amazing experience with me while helping me translate the many questions. Also, I would like to extend my thanks to ATE Jovilyn Mamauag and KUYA Maria Pedrablanca for helping me out with the interviews while Jessa was also conducting her own research. Further, I express my gratitude to Freddy and Susannah Pablo for welcoming us at The Pier and coordinating the interviews with all the Agta families who were present. Also, thanks to the Mayor and the Vice-Governor of Malisi Jaime and Marlon Rosalem for hosting us in the community. Lastly, thank you Po to Julie Calixto for hosting us in the guest house and answering our many questions.

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Flash update No. 3 16-09-2019 United Nations Office for the Coordination of Humanitarian Affairs

OCHA October 2018 Humanitarian Bulletin Philippines Issue 9

APPENDICE: Questionairre
General information: Name, Age, Number of children, Occupation, Ethnicity
What was the situation directly after the typhoon Ompong?
What kind of help did you receive?
Do you know from which organization?
Was is what you needed and was it enough to support the family?
What did you do with the cash assistance?
What did you do in between directly after the typhoon and in between the relief goods?
Where there differences between households in the village?
How is responsible for the distribution of the information to remote areas?
How are the relief goods distributed to the households?

THE GOVERNANCE STRUCTURE OF THE AGTA PEOPLE AND ITS INFLUENCE ON THE RESILIENCE TO TYPHOONS

Eva Berkman and Kim Malabug

INTRODUCTION

Indigenous People

Indigenous People (IP) form a significant and important portion of societies in the world. Their indigenous knowledge and insights are very valuable. In every region of the world, there are many different cultural groups who live together and interact, but not all of these groups are considered indigenous or inherent to a particular geographic area (Welker 2018).

It is estimated that there are more than 370 million indigenous people spread across 70 countries worldwide. Practicing unique traditions, they retain social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live (Welker 2018). One of the IP are the Agta people in the Philippines, who are mostly located at the Northern part of Luzon. The Agta are an indigenous group that descend from the Philippines' first colonizers, a Negrito population that arrived in the archipelago between 35,000 and 60,000 years ago (Minter 2010). Most historians point to the 'Bering Land Bridge Theory' to explain how they have reached the Philippines. This theory suggests that the Agta reached the Philippines because of the land bridges or narrow strait that connected landmasses in the world. Their skin color, height, and hair type characterize the Agta people. They mostly have dark to dark-brown skin, curly hair, and are usually below five-feet tall (Culture Trip 2018). There are many Agta tribes, scattered over Regions 1 to 5 in the island of Luzon, particularly in Northeastern Luzon, Cagayan and Isabela in Cagayan Valley (Levinson 1998).

Governance Structure

The Agta people have no formal acknowledged leaders, although elderly people may serve as advisors or mediators in conflicts (Minter et al. 2012). The Philippine government does not officially recognize the leaders of indigenous groups. A study on indigenous peoples in the Philippines shows that they do always have an informal leader. Most of the times, these are the elderly people of the community (Domingo 2004). The resilience of the Agta community is highly dependent on the quality of its leaders. The Agta people are a vulnerable group that needs protection. The Philippine government has implemented mandates and acts such as the Indigenous People's Rights Act (IPRA) of 1997 but it's not enough to protect them and help them in hard conditions like when a typhoon hits the village.

Our Research

Last September 15 in 2018, Typhoon Ompong greatly damaged a big part of Northern Luzon specifically Baggao, Cagayan. The *Sitio* Malisi in Baggao, Cagayan province was also affected by the typhoon. Most of the houses were destroyed and some of their crops were damaged. After the typhoon, one of their leaders walked for six hours to reach the municipal hall and asked help for his community (Dullana 2018). Our research is focused on Malisi, Baggao, Cagayan. This is a vulnerable site because of the Agta tribes residing here. Malisi is a little remote village sited in *barangay* Santa Margarita in Baggao, Cagayan. This little village consists of 23 households, has a primary school, and the houses are made of wood. We were informed that Malisi is well developed in comparison with other Agta tribes. They have their own governance structure with leaders (Weerd 2019, pers comm.). The village of Malisi is well developed considering the other Agta people. This may be caused by the way their governance

structure works. Good leadership can help the community recover after big disasters like Typhoon Ompong. The resilience of the village to typhoons partly depends on their organizational structure. We will conduct a case study about the village of Malisi and determine how they cope with natural disasters by looking at the way their governance works and how different actors regard this structure.

RESEARCH QUESTIONS

How does the governance structure of the Agta people influence their resilience to typhoons?

Sub-questions

- What is the governance structure of the Agta people? (who are the leaders? How do they get chosen?)
- What do the villagers think about the governance structure in their village?
- What is the relationship between the Agta people and their leaders?
- How do the leaders act to strengthen their resilience during typhoons?
- Do the leaders communicate with the local government (focused on typhoons)? Do they have an indigenous person in the council?
- How does the LGU regard the Agta people regarding typhoons? How do they work together? Did they help them? In what way?

METHODS

For our case study about the governance structure of the Agta people in Malisi, we will interview inhabitants of the village, as well as their leaders, a Baranguay Captain, and other LGU officials. This descriptive research will use semi-structured interviews, non-structured interviews and focus group conversations.

We have conducted semi-structured interviews with the inhabitants of Malisi (Photo 3). We made a questionnaire beforehand, and used this to interview 10 villagers. This number allowed us to have deep interviews and say something about the village as a whole. There was a gathering at the school, where the villagers and the Mayor and Vice Governor gave their consent to interview them for our research. After we had introduced ourselves, and our research, we interviewed the people who were present at this meeting. The 10 interviewees have been chosen according to the availability sampling method. Although, we tried to randomize as much as possible by interviewing men and women, old and young people, and people who did and did not speak *Ilocano;* to come out with an unbiased sampling group. As for the language barrier, the people of the Mabuwaya Foundation helped us in translating during the interview.

We have designed separate questions for the leaders, our key informants, of the village. We have used these questions the first time we interviewed them. Separate from each other we have asked them the same questions about how they think about their governance structure and how they have acted during Typhoon “Ompong”. After these interviews we had some time to think about the answers they had given us. But, we still had lots of questions. We decided to revisit the Vice Governor. Here, Merlijn van Weerd and Tess Gatan Balbas accompanied us. Together we asked for more clarification about the governance structure and the voting environment. We drafted a map with Vice Governor, Marlon Rosales, about the different leadership-positions that exist in the 8 *sitios* in Baggao. We also had a second interview with the Mayor, who happened to be with his son, the Vice Governor, to authorize the information that we received from his son.

For the LGU officials we made a questionnaire to assess the relationship between the LGU and the Agta people in Malisi. The interviews were semi-structured and because of this we were able to ask about the things we had discovered in Malisi. We have interviewed key informant Eliza Jose, the Vocal Person of IP of Municipal Social Welfare Development (MSWD). Other important informants were the MENRO head and the Secretary of SB.

Lastly, we used the same semi-structured interview in a focus group discussion with the *baranguay* Captain of Santa Margarita. The advantage of having a group discussion with the other students offered new angles to look at our research.

Table 1. Time Schedule

Date	**Location**	**Activities**
01/19	Malisi	Arrival at Malisi. We had a tour around the village. We also got to meet the Mayor and the Vice Governor.
01/20	Malisi	In the morning we had a gathering at the school with the villagers. We conducted 10 interviews with the people. Concluding, we interviewed the Mayor. After we went to the house of the Vice Governor and interviewed him and his wife. After lunch we visited the vice governor again, since we had more questions.
01/21	Malisi and Mansarong	In the morning we visited the Mayor once more and had a conversation with him and his son, the Vice Governor to verify our findings. In the afternoon we left to Mansarong.
01/22	Santa Margarita and San Jose	Went to the LGU in San jose and interviewed the Vocal Person of Indigenous People.
01/23	Santa Margarita	Visited the Baranguay and had a focus group conversation with the Barangay Captain.
01/24	San Jose	Visit the LGU office again and interviewed the MENRO Head and the Secretary of SB.

RESULTS

Governance structure

Leadership plays an important role in the development of any community or organization. The Agta people in Baggao have 6 leaders (Figure 1). Most people feel like the leaders rule and motivate them in their daily lives and keep them safe. There are eight Agta communities in Baggao. The hierarchy is important, but tasks are not strictly separated between the six different leaders (Figure 2). The Governor is the highest position for the Agta people. He leads all the Agta communities in the municipality. The Governor exercises the highest authority to the Agta. In daily leadership, he is not very active in Malisi because he lives some place else. The Agta people still respect him. The next position is the Vice Governor. He is the most active of them all. People in Malisi see him as their daily leader. He communicates to the LGU officials for the needs of the Agta people. Third is the Mayor, who happens to be the father of the Vice Governor. He is the one who cooperates and communicates to his co-leaders for solving problems in their community. He visits every *sitio* or *barangay* in the municipality. This happens less now because he is too weak for the long travels. Next to him, the Vice Mayor helps the Mayor in leading their community.

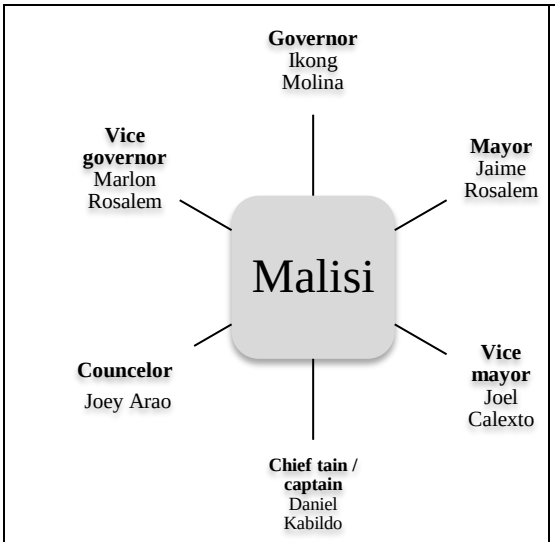

Figure 1: Leaders of Malisi

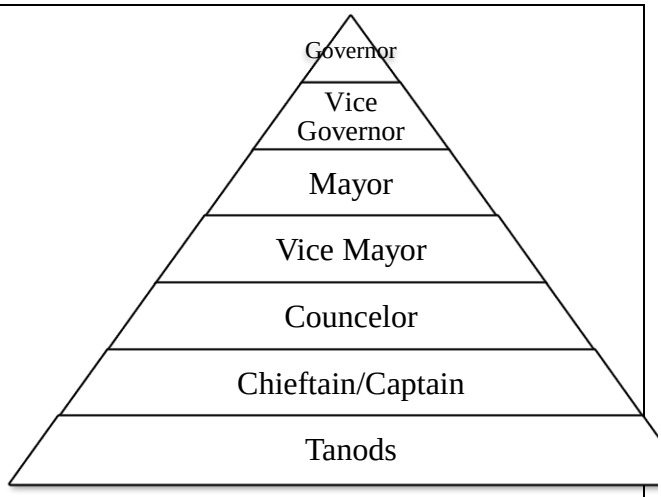

Figure 2: Hierarchy leaders of Malisi

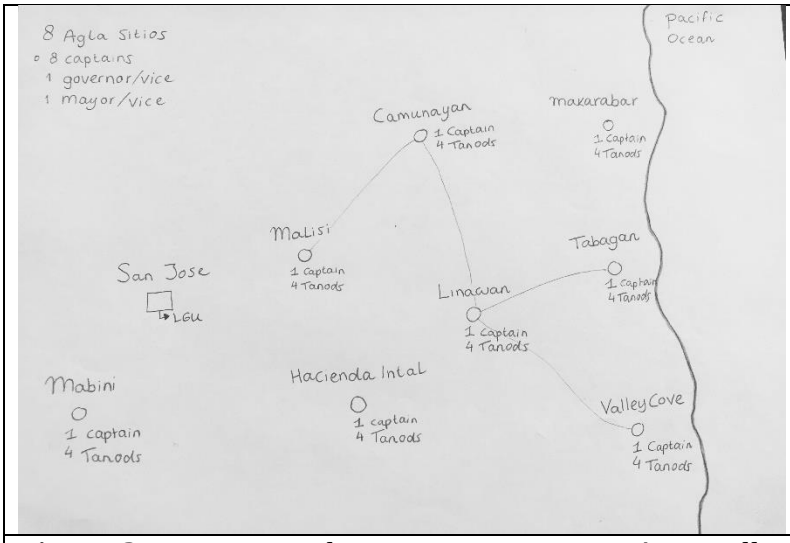

Figure 3: Location and governance structure Agta Villages in Baggao (Source: Marlon Rosalem. January 20, 2019 in cooperation with Merlijn van Weerd)

The councilor helps his co-leaders in decision-making. There is only one councilor for the whole area of Baggao. So, all the issues are settled in Malisi, where he lives. The captain (*chieftain)* works with his 4 *Tanods* for the safety of their community. There is only one Governor, one Vice Governor, one Mayor, one Vice Mayor, and one Councilor per municipality. Together, they lead the same area (Figure 3) with quite similar functions. The separate communities have a *chieftain*/captain and four "policeman' (*Tanods*). These captains meet each other often. The governor and mayor meet twice a month. Before this structure was put in place, the highest leader was called *Affu*. In the old structure, there also used to be two leaders.

Elections

The leaders get separately chosen during a meeting. In Malisi, this election takes place in the school building. People get nominated because of their presence and activeness. During this election, all the villagers should be present to cast their vote. The votes between men and women are equal, and the system allows women to be leaders too. Mostly, you are allowed to vote when you are 18 and older. Sometimes people can vote at an earlier age, but only on less

important subjects. Or they have to be older when something really important has to be decided. The villagers have to vote many times, but this does not tire them because they agree it is for their own good. The way they vote is a counting system with stones. The nominees for a leader position for example present themselves to the other people. The people vote with stones. They all have one stone and can lay that stone at the place of the nominee. The nominees vote too. They vote for themselves and they are the last ones to vote. One person is in charge of counting the votes, and this happens in public. Cheating in voting is hard because of the set amount of stones that can be voted with. The voting is not anonymous.

Decision-making and change in leaders

The leaders do not get chosen for a precisely defined time but often for somewhat a year. They get elected at different moments. The alteration of new and old leaders depends on their acts during their rule. If they make a mistake in their tasks as a leader or make a scene, then there will be a new election for that position. Also, if leaders are not present during planning making, they will be replaced. The elders will decide this. Except for the mayor, he will stay. They can only change him if they can find someone better and this will be decided with the whole tribe. The current Mayor has this function since the 1990s. Besides their leadership role, the leaders often work as farmers and laborers. The leaders do not earn money with their functions. But people do contribute to their expenses.

Judicial system

If someone makes a mistake, they first try to solve it within the community. The elders ask the spirits for guidance in their decisions. Elders come together and have their own language together. This helps for the decision-making. You get to be an elder when you are 30 and up. Everyone in the community is treated equally and you will receive the same punishments for the same deeds. If they cannot resolve the problem within their own *sitio*, they will ask help of the other Agta tribes. With bigger issues, they will go to the higher authorities and ask the *barangay* and LGU for help.

Leadership as coping mechanism

Most villagers express that they are grateful for their leaders. They think that having leaders is an important reason why they are well organized. Especially when it comes to natural disasters, the true meaning of leadership gets out. They make sure that their co-villagers are in good condition to cope with disasters. During the Typhoon “Ompong”, the leaders have helped their co-villagers the best they can (Figure 4). They visited all the houses to make sure that all of them were warned regarding to the typhoon. After typhoon “Ompong”, one of their leaders did not hesitate to walk for six hours to reach the LGU and ask for assistance. He could not stand the look of the hungry and cold children and went there. Because of this action, the villagers recovered more easily after the typhoon. 80% of the respondents found out about the typhoon coming, thanks to their leaders (Figure 5). Because of this early warning they had time to prepare their houses and fields. The villagers think that because of their leaders, they can cope with natural disasters much more easily. They cooperate with the police to make the place saver. The leaders communicate with the Philippine government. The leaders keep developing their village, with rules and laws. If there would be no leaders, there will be no change.

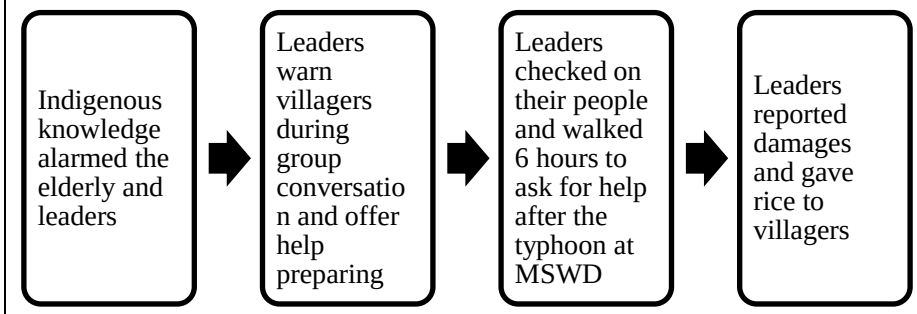

Figure 4: Importance of Leaders during Typhoon "Ompong"

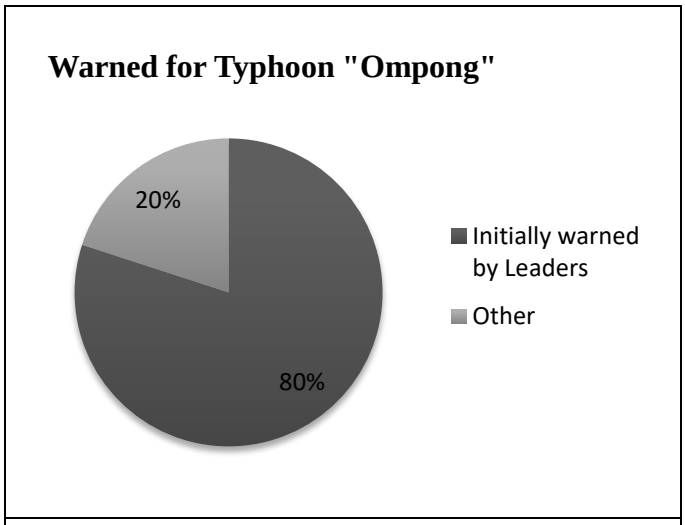

Figure 5: Villagers who got warned for Typhoon "Ompong" by their leaders

Cooperation with local government

The leaders of Agta people are informal leaders, they are not officially recognized by the Philippine government. According to the interviews, they do have a good relationship with the LGU. The Vocal Person of IP in MSWD, Mrs Eliza Jose, knows some of the leaders personally. She has worked together with the Vice Governor a lot. The MSWD has different programs for the Agta. They have an IP celebration every year. Because of the Agta having leaders, communication between the Agta and the LGU became easier. Some of the duties of MSWD is to identify the basic needs of the needy and to provide relief and assistance for the victims of natural disaster. When Typhoon "Ompong" hit the Baggao town, and affected the area of Malisi, they had a problem in assisting the people there because of the remoteness of the village. Because of the Agta leaders it became easier for them to reach and fill the needs of the Agta people. Marlon, the Vice Governor is very active, according to the Vocal Person of IP, the MENRO head, and the Captain of the *barangay*. Marlon Rosalem was the one who went personally to the municipal office to ask for assistance. Despite of the leaders' activeness they still have no Agta people in their organization. They cannot represent the needs of their people in the LGU. Mr. Jose, the secretary of SB thinks that it would be hard for them considering their nature and educational background. Mr. Pong, the MENRO head, thinks in the contrary that it is a very nice proposal and he will try to talk to the Mayor about it. The Vocal Person of the IP would also really want the Agta to represent themselves.

DISCUSSION

The governance-structure of the Agta people is somewhat different from the Philippine government. They try to fit their traditional way of organizing to the formal Philippine structure of governance. In the context of the Agta this formal system needs to be adapted to the particular characteristics of Agta communities. Like how they vote with stones during elections and ask the spirits for guidance. In the past the people also had two leaders with similar functions (the

highest was the *Affu*). This double function in their leaders still exists with the Governor and the Mayor. They are double, because they had to fit the old structure. This combination of structures, we think, is most interesting. Furthermore, it is important to notice that similar governance structures to the Philippine government are in place but this is still not evident that the Agta will represent themselves in the LGU. Our research question is about the influence of the governance structure on the resilience to typhoons. The people of Malisi and the LGU have told us that the leaders played a significant role in all the phases of the Typhoon "Ompong". Before, during, and after the typhoon they tried to help their people (Figure 4). For the LGU, the governance structure of the Agta makes is really helpful. So they know who to approach and who can for example help assess the damage after the typhoon.

CONCLUSION

The descriptive case study of the Agta people in Malisi about their governance structure, and how they use this to cope with natural disasters like Typhoon "Ompong" shows interesting findings in governance dynamics. Most of the villagers are very involved with the leaders and appreciate them a lot. Without their leaders they would not be where they are now. The government officials are well aware about the governance structure of the people in Malisi and even know some of the leaders personally. All the involved parties in our research think that the governance-structure was beneficial for the community during Typhoon "Ompong".

RECOMMENDATIONS

We think it would be interesting for future research to elaborate on the interest for a representative of the Agta people in an official Philippine governmental organization. So that their needs are clear and in case of natural disasters there is an opportunity to act quickly. Research in whether the Agta people would be interested, and to what standards they must comply to participate is important for the inclusion of this numerous Indigenous Peoples group is recommended.

ACKNOWLEDGEMENTS

We would like to extend our deepest gratitude to the LGU officials of Baggao for welcoming us in their town. We also want to thank the people of Mansarong for letting us stay in their chapel. A special thanks to the leaders and people of Malisi for helping us in carrying our bags on our way to Malisi. Most especially to the Vice Governor Marlon Rosalem and his father Mayor Jaime Rosalem for welcoming us in their tribe and for giving us the information that we need. Special thanks to *Manang* Julie Alecto for letting some of our companions to stay in their house. We would also like to acknowledge Mrs. Eliza Jose, the Vocal Person of IP in MSWD, for giving us the information that we need, and for guiding us also to the people that are of great value to our research regarding IP. We would also like to express our appreciation to Mr. Narciso Corpuz for entertaining us and welcoming us to his office. Many thanks also to Mr. Jose the secretary of SB for allowing us to have an interview with him. Lastly, we would like to thank the Almighty God for keeping us safe all the time.

Photo 1: Conducting an interview with the villager Johny Asuncion ((Photo by M van Weerd 2019)

Photo 2: The Vice Governor and his family (Photo by J Toquero 2019)

Photo 3: Children in Malisi playing in front of the school (Photo by E Berkman 2019)

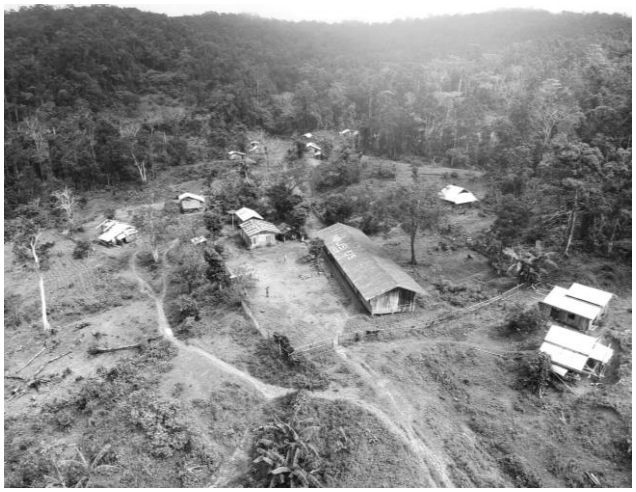

Photo 4: The village of Malisi drone view (Photo by M van Weerd 2019)

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APPENDICES

Appendix A: Questionnaire villagers

- Name
- Age
- Sex
- Occupation / livelihood
- Ethnicity

1) Do you know the leaders of the village?
2) Do you know how they became your leaders?
3) Did you know Typhoon Ompong was coming? If yes, was it told by your leaders? And what did you do?
4) What did your leader do after Typhoon Ompong?
5) Do you think the leaders have helped you to cope with the typhoon? If yes, in what way?
6) Are you afraid for a next typhoon?

Appendix B: Questionnaire Leaders Malisi

- Name
- Age
- Sex
- Occupation / livelihood
- Ethnicity

1) What are your roles being a leader?
2) Whom are you working with?
3) Do you have any contact with the local government unit?
4) Did you see Typhoon Ompong coming? And if yes; what did you do to warn your co-villagers?
5) What did you do in preparing for the typhoon?
6) Have you asked the LGU for help after the typhoon?
7) Did they provide all of your needs before and after the typhoon?
8) Did the local government came to visit you after the typhoon?

Appendix C Questionnaire LGU officials

- Name
- Age
- Sex
- Occupation / livelihood

1) What is your role?
2) Do you have any contact with the people in Malisi?
3) Are you aware of them having a leader? (If no go to 5)
4) What do you think about their governance structure?
5) Have you ever worked together with them?
6) Are you familiar with their situation during typhoon Ompong?
7) Have you tried to warn them and/of help them recover?

ATTITUDES OF AGTA AND MANSARONG PEOPLE REGARDING THE MEDIA ATTENTION AND AID THE AGTA PEOPLE IN MALISI RECEIVED AFTER TYPHOON OMPONG

Mary Claire Bauit and Vera de Regt

INTRODUCTION

The Agta, Ayta and Dumagat are among the hundreds of indigenous people found in the Philippines. Agta, Ayta or Dumagat can be found in Luzon, specifically in Northern Luzon in the mountainous and along the coast. The Agta are different from neighboring populations, mainly in their history and mode of production. The Agta tend not to stock their produce, but rather consume or trade it immediately. According to Minter (2010: 3), Agta are by no means an isolated population in northern Luzon. On the contrary, they are surrounded by a host of other ethnic groups wherein they still maintain their social and economic relationship' (Minter 2010).

Agta people feel that they are different from their neighbors. They have a forest-based livelihood and 'follow a highly diversified and flexible livelihood strategy, which combines foraging activities as hunting and gathering with barter, paid labor and cultivation'. Other 'non-Agta' populations are often referred to as 'lowlanders, farmers and Filipinos', but the neighboring populations often refer to themselves by their specific ethnic label as Ilocano, Ifugao or Tingguian (Minter 2010).

The Philippines was the first country that recognized indigenous peoples with the Indigenous Peoples Right Act in 1997 (IPRA). The term 'indigenous people' in the Philippines refers to a group of people or homogeneous society identified by self-ascription and ascription by others. An indigenous group has continuously lived as an organized community on a specific territory which has been utilized 'under claims of ownership since time immemorial'. They are culturally different from other groups in terms of language, customs, traditions and other cultural traits. And share also a history which is different from the majority of Filipinos through resistance (Van Weerd 2019, pers. comm.).

The IPRA gives indigenous peoples certain rights and privileges which are not being enjoyed by non-indigenous people. This includes their right to own ancestral domain and therefore live in public land. It respects their rights to traditionally manage their land. It also gives them the right to self-governance and empowerment, to social justice and human rights and to cultural integrity (van Weerd 2019, pers. comm.). One of the rights Agta people have for example is that they are allowed to hunt if it is for food, which is illegal for non-Agta communities. Their livelihood depends on hunting, which is included in their cultural integrity.

For our research we are going to look at the media attention and aid the Agta community in Malisi received after typhoon Ompong hit Baggao last September 2018. The vice-governor of the Agta community in Malisi, Marlon Rosalem, was interviewed after he went out to ask for help and relief goods. The online news website, Rappler, posted two articles about his story and it went 'viral', as Rappler reported. Our research is about both the attitudes of the Agta people in Malisi and the attitudes of the people in Mansarong on this media attention and aid for the Agta community after Typhoon Ompong. In which, a big difference between these two communities explains the fact that the Agta are labeled as 'indigenous' and the people in Mansarong are not.

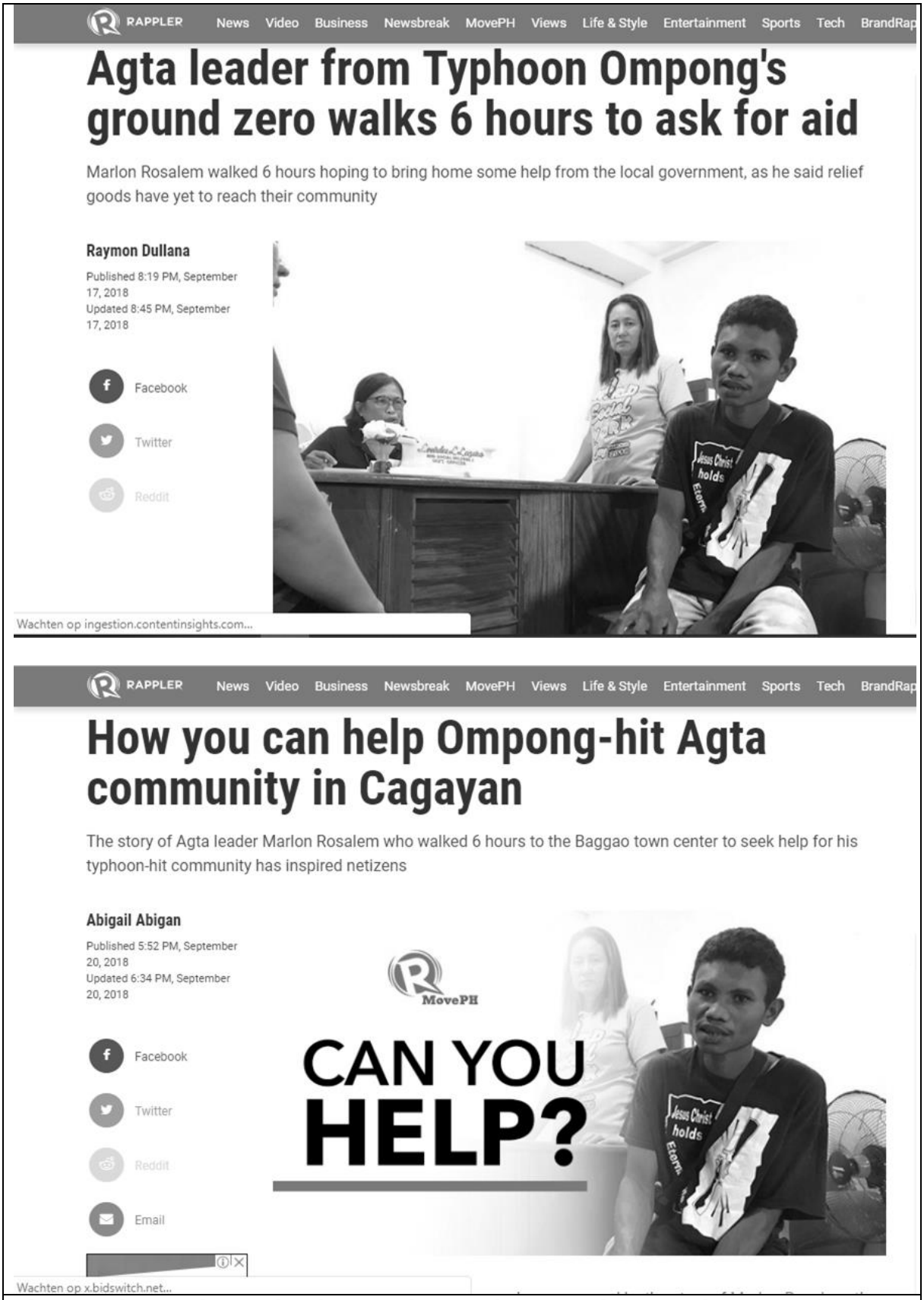

Photo 1: The Rappler articles about Marlon Rosalem, posted on 17 and 20 September 2018.

RESEARCH QUESTIONS

What kind of different attitudes are there among Agta and Mansarong people regarding the media attention and aid the Agta people in Malisi received after typhoon Ompong?
- What kind of aid did Agta and Mansarong people receive after Ompong?
- How do people perceive the media attention regarding the Agta community?
- How do people perceive the content and amount of aid the Agta people received?

Table 1. TIME SCHEDULE

Date	**Activity**	**Location**
Fri 18-01	Traveled to the municipality of Baggao, and stopped at LGU of Baggao to have a short lecture regarding the typhoon Ompong and traveled again going to another area and stayed for a night in *sitio* Mansarong.	LGU Baggao to mansarong
Sat 19-01	Hiking for three hours going to *sitio* Malisi.	Malisi
Sun 20-01	We had a short meeting with the Agta people, introducing ourselves and our purpose in their village. After that we interviewed 7 respondents including Marlon Rosalem.	Malisi
Mon 21-01	In the morning, we interviewed 5 people. In the afternoon, we went back to Mansarong.	Malisi to Mansarong
Tue 22-01	We conducted 7 interviews and stayed for lunch with one of our respondents.	Mansarong
Wed 23-01	We left Mansarong and conducted an interview with the *Barangay* Captain in Sta. Margarita. We had lunch at the *Barangay* hall. After lunch we went to Blue Waters.	From Mansarong to Sta. margarita to Blue Wares
Thu 24-01	Traveled to San Jose and lunch to the LGU and travelled back to Cabagan	From Blue Waters to LGU to Cabagan

METHODS

We used semi-structured interview as our primary research method because the answer to our research questions required qualitative data. Our target respondents were a variety of people with different sexes, ages and professions. But it turned out most of our respondents are farmers, because most of the people in Malisi and Mansarong are farmers. Of the 20 respondents interviewed, 12 were from Malisi, 7 from Mansarong and 1 from Sta. Margarita.

We also interviewed a respondent with a small shop, 2 government employees and the *barangay* captain of Sta. Margarita. Our sampling method was mostly availability sampling.

We spent five days in the field for data gathering. We first went to Malisi for three days, followed by two days of fieldwork in Mansarong. We planned this because of logistical reasons. We chose to do research in both Malisi and Mansarong, because it is valuable to compare the attitudes of two different groups on the same subject, to see if there is a difference.
In our interviews in Malisi, we asked the question: ‘do people in other *sitios* talk negatively about the Agta in Malisi?’ and ‘also if there is no typhoon, do you hear non-Agta people talking

about Agta people in Malisi?'. We asked this to find out if Agta people are aware of their image among non-Agta people. As we started in Malisi, we did not yet hear the opinions of the people in Mansarong, so we ourselves also did not know if, and which image and opinions existed of the Agta in Malisi. When we conducted interviews in Mansarong, we could test if the assumptions of the Agta people were right.

Photo 2: Mary Claire Bauit conducting an interview in Malisi, Cagayan (Photo by V de Regt 2019)

RESULTS

Attitudes in *Sitio* Malisi

First we went to Malisi, one of the Agta villages in North-Eastern Luzon. The *sitio* is located right on the edge of the Sierra Madre forest, and can be reached from Mansarong by a hike of five kilometers. In Malisi, there are 24 households which live in wooden sheds, often very open with no doors. Most people we spoke to are farmers and have their own fields with crops. But they also hunt and fish, which they do not do only for food, but also to sell in other *sitios* as Mansarong and Dapir. Malisi has a school with teachers from other *sitios*, and a chapel and a church with a priest and a pastor who are only staying in Malisi for the mass or Sunday worship. In the middle of the village is a hose with water which people use for drinking, cooking and showering.

Malisi was hit by Typhoon Ompong on September 15, 2018, and two days later vice-governor Marlon Rosalem went to the Local Government Unit (LGU) of Baggao in San Jose to ask for relief goods for his community. Marlon told us he thought the people, especially the children,

really needed help because they were hungry and cold. He said he was the person to go ask for help because he is well-known at the LGU. When he arrived, there was a journalist who asked his permission to interview him, and Marlon agreed with this because he did not only want help for Malisi, but he also wanted to share the story of the Agta, and see the reaction of the government. His interview was published in an article on Rappler and went 'viral'.

Marlon and other villagers of Malisi shared that they started receiving relief goods three days after the typhoon. They received Php 700.00, rice, sardines, noodles, blankets, kitchen supplies, *tolda* and other materials for the house per household. Marlon mentioned several organizations which provided aid: Roman Catholic Parish of San Jose, Church of Christ, Mabuwaya, MedAir and the Provincial Government. Most people we interviewed did not know who provided the aid, but they said the relief goods were sufficient for them, and that they received more after typhoon Ompong than after typhoon Lawin. One woman we interviewed, Gina (22 years old) told us she thought they received too many relief goods, 'because Ompong was not that strong'. Some of the people we interviewed heard about Marlon's interview on the radio, but the majority of the people we interviewed in Malisi did not know about the interview and the articles about Marlon. But all of them knew Marlon went to the LGU for help. Rody (70) said he saw the video of Marlon on someone's cellphone at the Pier. 'Are you not shy for asking help?' he had asked Marlon. The vice-governor himself did not think that people from other sitios talk about his media attention and the aid they received, 'they may talk about it, but not to my face', he told us. Rody mentioned he was happy that Marlon asked for help, because the village received many relief goods which they needed. But he also expressed his concern about people in other villages who might think that Marlon did it for attention and to receive many relief goods. He heard people in Mansarong and Dapir talk badly about the aid the Agta in Malisi received. They say it is not good the Agta people received so much, even though the people in Mansarong and Dapir also received relief goods themselves, he says. But it is not only about the relief goods the Agta in Malisi received, Rody told us that other people say that Agta people are always asking for help. He quoted something he heard around as 'the livelihood of Agta is just asking for help now and then'. People might be jealous of the attention the Agta people get, he says. 'When Agta need something, they go to the local government and ask for it and get it', is what people around Malisi say about the Agta. Rody feels like his village is recognized by the local government, but not by the people living in surrounding *sitios*, a feeling more of our respondents expressed.

What Rody told us about how other non-Agta people look at Agta people in this case was also mentioned by most of our respondents. Although not everyone was aware of the opinions of people in other *sitios*, these respondents were all women. Gina is an example of this, she did not know if others were talking about the media attention and relief goods, but she mentioned she felt like non-Agta people do not like Agta people. Agta are seen as 'very low', and it hurts her feelings to hear that. She said it was 'okay' Marlon went to the LGU, but she thinks people might talk negatively about it so she does not like the attention that much, like Rody also mentioned. Junior (45 years old) told us he hears people in Mansarong and Dapir gossiping about the relief the Agta received, they appear to be envious about the amount of goods. The Mayor of Malisi, Haime Rosalem, also the father of Marlon, also confirmed this. 'People say it is 'good to stay at the Agta because their life is easy'', the mayor tells us. 'People think life in Malisi is easy because they receive a lot of help'. But the mayor tells us life is hard for them, because they need to work hard for their food. He is very proud Marlon went to the LGU and went 'viral' on the internet, but the bad thing is that people say Marlon is lying about the time he spent walking to the LGU and the damage in Malisi. Besides that, the mayor is still happy about the event, because now the world can get to know more about the Agta. People in Malisi

also say Marlon should have gone to the *Barangay* hall first instead of going to the LGU, because it seems to be 'too much' to immediately go there. They feel like he 'abused' (*nagabuso*) his power as an indigenous people to ask for help again.
We expected the media attention to be a big happening in Malisi, and that the people would have a strong opinion about this, but it turns out a lot of people in Malisi are not even aware of the fact that Marlon went 'viral'. All of our respondents do know he went out to ask for help, but are more worried about what other non-Agta people think of it and think of them, as there appears to already exist a clear, not so positive, image of the Agta community. They would be depending on help too much, which they always receive because 'it is easy for them to get'. The vice-governor of the Agta going out to ask for help from the local government after Ompong, appears to be a more sensitive action than we thought before.

Attitudes in *sitio* Mansarong
After three days in Malisi we went to Mansarong. People with different ethnicities live in this village, Igorot, Ilocano and Itawis are the ethnicities we encountered among our respondents. The households are very spread. Compared to Malisi, the houses in Mansarong are quite big, and mostly made of concrete, but some houses are also made of wood. Most houses have different rooms for the kitchen and bedrooms, and a comfort room located outside.
All of our respondents in Mansarong mentioned they received rice, noodles and sardines as relief goods. Prospero (54 years old) said he also received corn seeds, t-shirts, pants and blankets. No one in Mansarong mentioned receiving any cash money after Ompong. Almost all of our respondents thought the relief goods they received were not enough for their needs. Other said they were happy to even receive something at all. Lani (50 years old) mentions she only received relief goods one week after the typhoon. All the relief goods which entered Mansarong were distributed to Malisi first, she says. And the amount of relief goods that Malisi received was more than what Mansarong received. We also expected the people in Mansarong to have a strong opinion about the media attention for Marlon and the Agta, but also in this sitio it turned out that most people do not know about it, as none of our respondents in Mansarong knew about it. But when we asked about their thoughts on the amount of aid the Agta got, all of our respondents had a strong opinion which in most cases overlapped with what the Agta told us in Malisi. Most of them felt envy towards the situation, as they themselves received less and had to wait longer for the relief goods. But a few of our respondents mentioned they were just happy for the Agta, because they needed it. Anyway, this question always triggered people to tell about their general visions, and most of the time frustrations, on the livelihood of Agta and how they are treated by the local government.

"Let's go and curl our hair to also receive help" people have been saying, according to Renato (50 years old). This quote illustrates the general feeling among our respondents in Mansarong. For the Agta it is very easy to ask for help, because they always get it, Lani told us. Precy (35 years old) told us the government is always looking after the Agta people, they really take care of them and focus on them as a community. The LGU said that the Agta people are the first people in the Philippines, that is why we need to preserve them, Precy said. And also because they protect the forest. Actually, the majority of the farmers in Mansarong we interviewed did not exactly know why the Agta are getting 'so much help'. Some of them say that the Agta don't know how to work and that they are lazy. Two of our respondents mentioned clearly that not all Agta people are lazy, but just the Rosalem family. David (49 years old) was a former *Barangay* official for five years. He thinks the Agta community should work for themselves, because they ask for help too much. The Agta don't have a lot of fields, so if it is possible, the local government gives them food. He says before *Barangay* captain prioritized the Agta, but now he realized they asked for too much. Now the help is more neutral. But the LGU still

prioritizes the Agta community. David thinks that is the reason why Marlon went straight to the LGU instead of the *Barangay* hall. David himself always tried to act neutral when he was a *barangay* official, the most important thing for him was providing help when really needed. For him it felt like Marlon hurt the feelings of the *Barangay* officials by directly going to the local government. Prospero thinks there is a real difference between the Agta community and Mansarong community in that the Agta are more powerful in asking for help. Examples of assistance given to the latter are the school, which was built by the *barangay* on request of the Agta and the roofs and kitchen materials that were given by the priest after the typhoon. And also food, as David mentioned. We sensed a lot of incomprehension among our respondents towards all the 'help' and focus on the Agta. They are not familiar with the term 'indigenous peoples'. Lani expressed her incomprehension with 'we are all the same people, why focus on the Agta people?', something Precy and Prospero also mentioned. This indicates people do not know about the special status of 'indigenous peoples' and what this means in practice. 'We cannot do anything about the Agta always getting first, it just happens', Lani said.

We also interviewed two government employees from Department of Environment and Natural Resources (DENR), Michael (39 years old) and Renato (50 years old). They are both working for the Community Based Forest Management (CBFM), a project of DENR, and are often in Malisi to work together with the Agta community. Renato says they really need to communicate with the Agta, and that they have the same aim: protecting the forest. Both men are happy the Agta received so many relief goods and attention, because they really need the help. Micheal feels pity on them because their life is hard, you can see that in their living situation, he says. He never gets jealous of them, because they are poorer then he is. But other people in Mansarong got jealous, because they saw a helicopter going to Malisi after the typhoon. They asked themselves: 'why them?'. Renato says he does not know why the Agta are prioritized, but he knows that the Agta are 'indigenous peoples' and that there is an organization for 'IPs' who help poor people. He is happy for the Agta, because 'we are all family'.

CONCLUSION

This tension between 'indigenous peoples' and non-indigenous peoples fits into the discussion on the 'tribal slot' (Li 2000), which is a slot that defines certain groups as 'indigenous' and 'culturally different'. In the case of Li's research in Indonesia, these are upland peoples. The slot excludes lowland peoples, because they don't have the same special 'indigenousness'. In our case the 'tribal slot' would be the special label of 'indigenous' and what rights (IPRA) and privileges this label gives. Non-indigenous peoples are often excluded from these rights and privileges. This label has its effects, as Li (2000) mentions 'some people would gain from official recognition of their "indigenous peoples" status, but the result might be heightened tensions as neighboring or intermingled populations find themselves differently affected'. This effect can be seen in the responses our respondents gave, in which the Agta in Malisi do fit into the 'tribal slot', and the people in Mansarong do not. All our respondents notice the difference in how the Agta people and Mansarong people are treated, but most of them do not really know why this is.

Most people in Malisi are happy with Marlon asking for help after typhoon Ompong, because they received a lot of relief goods which they needed. But at the same time our respondents also really mentioned their concern about non-Agta people talking negatively about it. People in Malisi told us non-Agta people often say Agta people are lazy and ask for help too much, and Marlon asking for help may just contribute to that image.

Our respondents in Mansarong mostly confirmed this image the Agta people told us about. They are indeed often seen as depending on help too much and being lazy. But non-Agta people often do not understand why the Agta are being prioritized and helped so much, for example when it comes to relief goods. Interesting to see is that the respondents who work for the government had a different view on the Agta. In their opinion the life of Agta people is hard and they indeed need the help. These men were also familiar with the term 'indigenous peoples'.

What was also interesting is that a lot of our respondents did not know Marlon was on the news, and if they knew they did not really have a strong opinion about it. The people in both Malisi and Mansarong had stronger thoughts and opinions about the fact that Marlon went out to ask for help and the amount of aid the Agta received. This is understandable because this 'asking for help and getting it' appears to be an existing pattern among the Agta according to the respondents in Mansarong. And it also fits into an already existing image about the Agta as 'lazy and help dependent', which the Agta people themselves are aware of, but disagree with. The different treatment of the Agta community by the authorities obviously causes some tensions between Malisi and Mansarong people.

RECOMMENDATION

As we interviewed people in *sitio* Mansarong, we noticed that most of them didn't know the term "Indigenous people" and what this implies, that's why we would recommend that maybe the LGU will conduct an educational campaign regarding the "Indigenous people" explaining who they are, and why they are treated differently by the government. So that non- Agta people would understand it well. One of our respondents is an indigenous also, the Igorot, but they do not actually know the term "indigenous people".

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APPENDICES

1. Questionnaire

General questions for the interviews with Agta locals

1. Personal information:
   - Name
   - Age
   - Sex
   - Occupation / livelihood
   - Ethnicity
2. What kind of relief goods did you get?
3. What other kinds of aid did you get? (for example money)
4. Did you feel the help after the typhoon was suitable and enough for your needs?
5. Do you remember what kind of relief goods and aid you got after typhoon Lawin?
6. Which aid do you think was better, the one after typhoon Lawin or typhoon Ompong?
7. Are you familiar with the articles on the news about vice-governor Rosalem asking for help after the typhoon?
8. What can you say about Marlon asking for help?
9. If yes, what do you think about this attention for the Agta community?
10. Do you think the media attention had impact on the amount of aid your community received?
11. How do you think the other sitios feel about the attention you received?
12. Do you know something about the relief goods and aid sitio Mansarong received?
13. If yes, how do you feel about the aid sitio Mansarong received, compared to what *sitio* Malisi received?
14. Do you think other *sitios* talking about the media attention for Agta in Malisi?
15. In general, do you think people in other *sitios* talking bad things to Agta people?
16. What can you say about those bad things your hearing from non-Agta people?

General questions for the interviews with Mansarong locals

1. Personal information
2. What kind of relief goods did you get?
3. What other kinds of aid did you get? (for example money)
4. Did you feel the help after the typhoon was suitable and enough for your needs?
5. Do you remember what kind of relief goods and aid you got after typhoon Lawin?
6. Which aid do you think was better, the one after typhoon Lawin or typhoon Ompong?
7. Are you familiar with the articles on the news about Agta vice-governor Rosalem from Malisi asking for help after the typhoon?
8. If yes, what do you think about this attention for the Agta community?
9. Did sitio Mansarong also get media attention?
10. Do you think the media attention had impact on the amount of aid the Agta community received?
11. Do you know something about the relief goods and aid the Agta people in Malisi received?
12. If yes, how do you feel about the aid the Agta people received, compared to what Mansarong people received?
13. Do you think they receive too much compared to you?
14. What can you say about the attention Agta receive from the local government?
15. How can you say it is unfair?
16. Do you know what "Indigeneous people"is?
17. Do you know the reason why the local government prioritized the Agta people?
18. Do you ever go to Malisi?
19. What can you say about the situation of people in Malisi?

General questions for the interview with vice-governor

1. Why did you go to the municipal government after typhoon Ompong?
2. What happened when you where at the municipal office?
3. When, and what kind of relief goods and aid did your sitio receive after you went to the municipal office? (How many? How much money?)
4. From whom did you get relief goods and aid? (Organizations? Government?)
5. Did you feel the help after the typhoon was suitable and enough for your community's needs?
6. How do you think the other *sitios* feel about the attention you received after typhoon Ompong?
7. Do you remember what kind of relief goods and aid you got after typhoon Lawin?
8. Which aid do you think was better for you, the one after typhoon Lawin or typhoon Ompon.
9. In general, do you think people in other sitios talking bad things to Agta people?

INDIGENOUS KNOWLEDGE IN WARNING AND PREPARING FOR TYPHOONS BY THE AGTA IN MALISI

Jerico Alingod and Simon Stam

INTRODUCTION

With an average of 20 typhoons every year, the people living in the Philippines experience a lot of hardship. In the past there was a lot of emphasis on the response after a typhoon, but since the '70s the approach has markedly shifted to a more pro-active approach to mitigate the effects before disaster strikes. A lot of effort has been taken to make the people aware of the need for preparation for disaster and to warn the people in areas to be affected, for incoming typhoons and its effects. These preparations are not only needed on the national level, but have to be implemented on the local level as well (Bunag 2019).

As a culturally and ethnically diverse country, implementing systems for warning and preparedness is not an easy task. The indigenous communities reside often in remote and mountainous areas and have distinct language and customs and are sometimes hard to reach. We use the term Indigenous in our research as "the permanent attachment of a group of people to a fixed area of land in a way that marks them as culturally distinct" (Li 2010).
One of those communities is the Agta, living in north eastern Luzon (Minter 2012), particularly in sitio Malisi (Figure 4), barangay Pallagao, municipality of Baggao, Cagayan. Malisi is a village of 24 households from which 19 are Agta households. In this research, we focused on the indigenous warning systems of the Agta.

The Agta have a presence in the region which goes back a long time (Minter 2012) and as such have experienced a lot of typhoons. It can be expected that they developed ways of predicting weather in general and hazards like incoming typhoons especially. Besides the expectation that indigenous ways of warning and preparing exist, little research about this subject, in relation to the Agta, is known.

This research was an explorative research, without knowing for sure that our topic was still relevant to the Agta of Malisi. After all, hasn't the introduction of technological means like radio and cell phones and the efforts from the Local Government Units (LGU) made warning and preparing the 'old way' redundant? So, our first task was to get clear if there was still any knowledge left and if so, would they still rely on it? We expected that there would be a divide between generations in relying on the indigenous ways of warning and preparing. The older people perhaps being more conservative and slower to adapt new technology then the young. And the continuous efforts from the government, how did that influence the ways of warning and preparing? With preparation as important aspect of government policy, it could be possible that the traditional ways had changed.

RESEARCH QUESTIONS

The before mentioned leads us to the following research questions with sub-questions.
'Do the indigenous people of Malisi use indigenous/traditional signs for warning and preparing in the wake of a typhoon and has that changed after efforts from the government to warn people?'

Sub-questions

- What were traditional ways for preparing and warning in for typhoons?
- How do different generations use traditional warning signs?
- Did the efforts from the government affected traditional ways of warning and preparing?

METHODS

Interviews

Our most important way to learn from the Agta in Malisi was by interviewing them. During our second day of fieldwork, we gathered our Agta respondents (for so far able and present in the village) in the elementary school. We took the moment to introduce ourselves and our topic to the people. Then we met with them and asked their permission for an interview. The 'mass' gathering in the school was a very efficient way to get informants, and we did a decent number of interviews. Later that day and the next day, we went to people's houses and approached them for an interview. The house to house visitation was more time consuming, but gave us a chance to have a closer look at their house, connect with their children and in general build up *rapport*. After the first few interviews, we learned about the importance of birds as a warning sign for incoming typhoons. Which birds our informants were talking about was not clear. A big problem was the language barrier. We often heard the names by which the Agta know them, but we didn't know the correspondent bird names in English. So, we acquired a bird guide to try, together with our informants, to identify some of the birds (Figure 2).

Sampling

The selection of our informants was at first accidental. We simply spoke with who was available. In the research proposal we discussed a sampling method partly based on age, and later we were able to target certain age groups as well as gender. In total we had 14 respondents, four female, 11 male (Figure1), with ages ranging from 22 to 65 (Appendix: Table 3). Some of the informants were not sure about their age and we had to estimate.

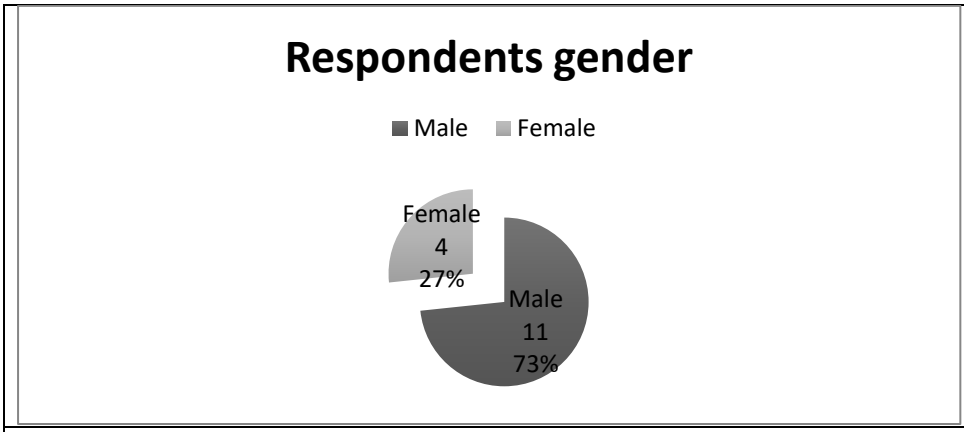

Figure 1. Gender distribution of respondents

Schedule

The time schedule we put in our research proposal had to be adjusted to field conditions and the result is included in this report (Table 1). It took a while before we reached Malisi and we arrived a day later than we expected. The rain also played a huge role during our fieldwork and it affected our plans by making it difficult to move around and drawing energy to keep our own household up and running. Finally, the people of Malisi had their own affairs which had to be taken care of like a funeral and a meeting in the nearby village of Mansarong.

Table 1. Daily Schedule

Day	Time	Activity
January 18th 2019- Friday	Morning	➢ We arrived at the municipal hall in San Jose and met the honorable Mayor of Baggao; they did a simple presentation about the History of their Municipality and also the typhoon "Ompong" damage to infrastructure and Agricultural crops
	Afternoon	➢ We arrived at Sto. Mansarong, Baggao and stayed at Chapel for one night.
January 19th 2019– Saturday	Morning	➢ We hiked to go to Sto. Malisi.
	Afternoon	➢ We arrived at Sto. Malisi and also took a rest.
January 20th 2019 – Sunday	Morning	➢ We introduced ourselves in a simple meeting in Malisi Elementary School and informed them about our purpose. We also conducted 6 interviews.
	Afternoon	➢ We conducted 3 interviews in their houses.
January 21th 2019 – Monday	Morning	➢ We conducted 2 interviews in their houses.
	Afternoon	➢ We conducted 2 interviews in their houses.
January 22th 2019 – Tuesday	Morning	➢ We showed a book of bird titled "A guide to the birds of the Philippines" By Kennedy et.al. to our two respondents.
	Afternoon	➢ Review day
January 23th 2019 – Wednesday	Morning	➢ We showed a book of bird entitled, "A guide to the birds of the Philippines" by Kennedy et.al. to two respondents and hiked to go back to the Community hall of Barangay Sta. Margarita. ➢ We arrived at the Community hall of Sta. Margarita.
	Afternoon	➢ We went to Sto. Blue Waters. ➢ We arrived at Sto. Blue Waters.
January 24th 2019- Thursday	Morning	➢ We went back to the Municipal hall of Baggao. ➢ We arrived at the Municipal hall of Baggao.
	Afternoon	➢ We arrived at ISU- Cabagan.

RESULTS

The Agta of Malisi provided us with a lot of information and shared their rich knowledge of the environment and what one can tell from it. We presented the results connected with our main themes.

What were traditional ways for preparing and warning in for typhoons?

A lot of informants mentioned a bird called *Baltay*. Baltay is the name the Agta gave it and we were not able to identify the common name. According to our informants, it is a bird that lives in the forest surrounding Malisi. It shows itself prior to a typhoon. How long before depends on who you ask. We heard informants talking about 'one day before' and 'two days before'. Apparently, it comes to Malisi and makes a pass, some informants talked about circling the village. It has a single calling; "Tik!". The Baltay's appearance is not clear. Most often the colour red was mentioned.

Apparently, birds in general play an important role. Many informants mentioned birds as one of the most important indicators of incoming typhoons and other danger. Some of the accounts were confusing or contradictory and we were not able to follow up on most of the interviews. Besides, the Baltay informants shared with us their knowledge on a variety of other birds and their behaviour. We made an overview of the different birds, the names Agta gave them, their appearances, behaviour and function of that behaviour (Table 3).

The trees and clouds were also an often-mentioned sign of incoming typhoons. During our fieldwork, we noticed the constant whisper of the wind through the forest and the weather was quite unpredictable. Clouds were often nearby in the top of the trees on the surrounding hills, slowly drifting by. This is in contrast to what would happen during the day before a typhoon. According to our informants not only the trees fall silent, but the clouds appear high in the sky and moving at great speed.

Figure 2: Vice Gov. Marlon Rosalem and Haime Rosalem referring to a book named "A guide to the birds of the Philippines" by Robert S. Kennedy. Captured by Jerico Alingod

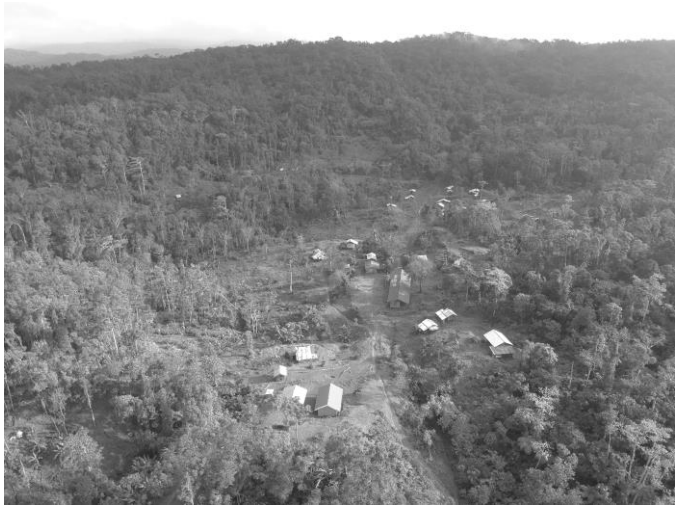

Figure 3: Overview of Sto. Malisi. Capatured by; Merlijn van Weerd

Table 2: Possible name and information of the birds given by the Respondent

Species		Description	Behaviour	Function
Local Name	Common Name			
"Baltay"	Unknown	I. Very small bird with red body, small red eye, and small crocheting bill. II. Green head with a black straight tail It could be also III. Big bird with big eyes, chest is grey and reddish medium tail	➢ The bird making noise and fly low early in morning around 3:00am - 4:00am. one day before the typhoon ➢ One day before the bird making noise early in morning. Sounds like "Tik". ➢ Fly from the north to south; sign that people coming from the south. ➢ When the bird pass and pass by	There's a typhoon approaching There are people approaching There's something to happen
Siroro	Possible Name: Philippine falconet	➢ The birds colour is black and white, small black bill and short feet, small tail. If it is a female there is a white line going to the tail.	➢ Flies low and makes sound in the morning	There is a typhoon coming
Salaksak	Possible Name: King fisher	➢ The bird is almost blue in colour with green and a big bill	➢ They pass by and make a loud sound	Some accident or hazard is about to happen
Kalaw/Taraw	Possible Name: Rufous Horbill	➢ A big bird that has a big reddish to yellow hornbill and also having a brown to dark wings with long white to dirty white tail.	➢ Passing by an make a loud sound	Something will happen
Tackit	Possible Name: Common Iora	➢ The bird is colour green and black, stripe of white in wings, with black bill and small tail	➢ If they make sound once there is a hazard approaching when they make two there is moderate visitors and when they make a lot of noise there is a disaster coming.	Typhoon is approaching and there also a visitor and hazards approaching.
Salapingaw	Possible Name: Whitehead's swiflet	➢ The birds colour is dark to dark brown from the top and dirty white from the bottom. ➢ The birds has very small and slightly crocheting bill and tail slightly forked.	➢ Not available	There's a typhoon coming
Paniki	Possible Name: Bat	➢ A kind of bird that active at night (Nocturnal) with a smooth wings that don't have feathers.	➢ Not available	There's a typhoon coming
Kiaw	Possible Name: Myna	➢ A black bird that has yellow feather at the head and yellow to orange bill and foot	➢ Not available	There's a typhoon coming
Palansisiw	Possible Name: Not available	➢ Small white bird, yellow bill, white feet, black tail, and their eyes is little bit reddish.	➢ Birds come to their house two days before the typhoon and playing around their ceiling and jumping all around.	There's typhoon coming.

How are traditional and technological warning systems combined?
How about the new technology that is increasingly available to the Agta in Malisi? In the morning we were sometimes welcomed by modern pop songs screaming from the radio owned by our neighbours. We saw solar panels on more than one occasion and cell phones are increasingly common. There is also some regular traffic between Malisi and neighbouring villages. So, Malisi is an integrated part of the world. Asking about radios and if someone owns one is a delicate affair. We probably stepped on a few toes by bluntly asking or assuming that the informant we spoke to has a radio. Not everyone has the financial means to afford it. Based on our finding we think that there are two households with a radio in Malisi.

Still, warnings about typhoons over the radio reach Malisi and are shared between villagers. Informants also mentioned warnings by LGU-officials. We asked the informants about a preference. Did they prefer to rely on the more traditional warning signs, based on the surrounding environment or the 'new' ones like the radio and government? It depends who you ask. Not everyone has knowledge about the traditional warning signs (more on that later) and those who have not, do prefer the warning messages of the radio or the officials from the LGU. In a way they have no choice.

The informants who knew how to interpret the signs of the birds, trees and clouds often preferred to rely on that traditional knowledge. Asked for a reason one informant said that the radio warnings sometimes came late. The typhoon already hit them when they received the message. This could be the result of warning systems which issue warnings for category four and five typhoons just 12 hours before impact (Bunag 2019).

The third option is to use both. It is useful to have confirmation of incoming danger before you start preparations to limit the damage. We presented four informants with the dilemma that the radio gave a warning message, but they did not see the environmental signs. Which would they trust most? Again, we got mixed answers. Two of them considered the radio more reliable. One of them recalled a typhoon and he didn't see any birds to warn him. The other two would disregard the radio message and base their actions on the things they saw in the flight of the birds, the clouds and waving of the trees. According to them it never failed in the past, so the reliability of their knowledge and their ability to interpret the birds, trees and clouds, is proven.

But our main finding is that there is not really a conflict between the old/traditional warning system and the new technological one. Almost all of the respondents had encountered multiple typhoons in Malisi and everyone recalled it as a terrifying experience. They are looking for a reliable and timely way to be warned.

It is interesting how this will change if the technological warning systems become better. Will there be a moment when the traditional warning signs are no longer deemed relevant? Will it become obsolete when every member of the village can just follow the path of an incoming typhoon with an app on their cell phone? Maybe the knowledge and skill of predicting by looking at the birds, trees and clouds has more merit than only the practical knowledge.

How do our informants prepare for a typhoon?
When the warning signs are considered convincing enough, people start with the preparations. The majority of informants chose to stay in their house. They tied things down, put heavy things on the roof and waited till it passes. The latter is still seen as common sense, but nowadays most of our informants go the school where they gather and sit out the typhoon. The school is considered stronger and better suited as shelter for the forces unleashed in such an event.

One informant with livestock told us that he tried to bring them into safety by locating them at the side of the mountain that didn't catch the wind. Another respondent mentioned the building of a very small shelter house, just big enough to fit him and his family. Such a compact construction should be better suited than his own house.

Not everyone stays in Malisi. At least one respondent went down to 'KM 9' to find shelter there and sit out the typhoon. He explained it was safer there.

Is there a generational divide in knowledge?
Not everyone has knowledge about the warning signals. In the introduction, we explained that we more or less expected this and that we came up with a theory that age would play a big role. The older generations having more experience, and in the past, had to rely almost completely on the traditional warning signs. Mixed with some conservatism we expected that they would cherish their knowledge and rely on it in spite of new technology. The younger generation, perhaps more used and eager to adopt new technologies, would know less about traditional warning signs and prefer to use new technology.

That theory is falsified. We have no reason to believe that there is generational divide. When we asked respondents with traditional knowledge, who taught them, the answer was often 'my parents'. The ones without knowledge (the minority of respondents) told us that their parents had limited knowledge or that they forgot the things that were taught to them.

CONCLUSION AND DISCUSSION

What were traditional ways for preparing and warning in for typhoons?
The traditional ways of warning focus on the knowledge of the behaviour of birds, trees and clouds. The stories about the trees and clouds were not that difficult to understand, but that was not the case with the birds. Different birds have different meanings and their behaviour has to be interpreted, because that too can mean different things. At some point in our research we found ourselves 'chasing' birds without having sufficient knowledge to do this. We identified a few, but the most important one, the Baltay, has yet to be identified. We have to consider the possibility that some accounts of the birds and their behaviour are fictional or became exaggerated over time. After all, living in the forest, and in a way relying on it to get warned and prepared for typhoons inevitably shapes relations and plays a role in conversation and imagination.

How do different generations use traditional warning signs?
The generation gap that we expected doesn't play a role in our findings. Correspondents from all ages were able to inform us about traditional ways of warning and preparing and the people who couldn't, belonged both to older and younger generations. The explanation offered by Agta informants was that personal interest and perhaps intelligence mattered.

Did the efforts from the government affect traditional ways of warning and preparing?
The efforts from the government affects the way traditional warning signs and preparations are used, but not in a fundamental way. The Agta of Malisi benefit from the government efforts by allowing them confirmation of incoming typhoons. For now they tend to put greater trust in the old, traditional ways, but that can change in the future if technology succeeds in giving more timely warning messages.

What could have been better in this research?
The difficult circumstances in Malisi hindered us in our efforts to influence the results. Often you want to regroup after the first round of interviews, evaluate, adjust and deepen understanding by conducting follow up interviews. Due to the circumstances, the follow-up interviews never took place.

What have we accomplished?
We have confirmed the existence and active use of indigenous knowledge used for warning and preparing in the days before a typhoon. We know more about how wide the knowledge is shared and can say that age is not defining in the distribution of knowledge and that knowledge is combined to a certain extent with modern communication like the radio.

Recommendations for further research
The Agta of Malisi had to rely on their traditional knowledge on birds, trees and clouds. Two of those three are threatened by deforestation. In one of the interviews this was also mentioned as potential threat to their warning systems. It may be interesting to see if the deforestation continues and how that influences their ability to timely predict typhoons.
A second recommendation is the more systematic survey and identification of the different birds mentioned by informants and especially the identification of the Baltay.

ACKNOWLEDGEMENT

We would like to thank the Local Government Unit of Baggao for the support and hospitality they have shown us specially to Honorable Mayor Leonardo C. Pattung, MDRRMO Narciso Corpuz and also the divers who accompanied us always to the different sitios. We also like to thank Barangay *Kagawad* James Laruan and his family and Alecto family for providing us shelter and for letting us use their things while conducting this research. We also acknowledge the vice governor of Agta Community of Baggao, Kuya Marlon Rosalem, and Mayor of Agta in Sto. Malisi for the warm welcome.

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APPENDICES

Questionnaire

Personal information

1. What is your name?
2. How old are you?
3. What is your civil status?
4. How many children do you have?
5. How long you've been living in Sto. Malisi?

Awareness and Preparedness

6. Do you experience typhoons here in Sto. Malisi?
7. How do you know that typhoon is coming?
   - What do you more preferred to use for knowing that typhoon is coming?

   A. New technology- Radio, cell phone/text massage
      - How many days before you hear or know that the typhoon is coming?
      - Is it really very helpful?

   B. Old technology- Environment; trees, birds, clouds weather
      - What did you observed or what is their behaviour?
      - What kind of birds did you see?

   C. LGU – Meeting, house approach, informing the leader of tribe.
      - How many days before they inform you that the typhoon is coming?
      - Do they really helpful?
8. How do you prepare when typhoon is coming?

Teaching

9. How do you know this old tradition?
   - Do you like to teach what do you know to others? and Why?
10. How does the other know the old tradition while other doesn't know it?

Table 3. Respondent's data

No	Name	Age	Gender
1	Haime Rosalem (Mayor of the tribe)	60	Male
2	Rodrigo Pablo	65	Male
3	Fermin Ragingan	60	Male
4	Elena Ragingan	59	Female
5	Carding Ragingan	31	Male
6	Lisa Pablo	50	Female
7	Eddie Corpuz	40	Male
8	Mario Corpuz	49	Male
9	Gina Andres	22	Female
10	Junior Rosalem	24	Male
11	Marlex Antonio	38	Male
12	Aurelia Ballad	47	Female
13	Marlon Rosalem (Vice Gov. of the whole tribe of Agta in baggao)	35	Male
14	Romel Caildo	36	Male
15	Guillermo Pattun	36	Male

BLUE WATERS

AN ANALYSIS OF THE SUFFICIENCY OF THE PROVIDED RELIEF GOODS AFTER TYPHOON OMPONG IN BLUE WATERS (BAGGAO)

Joke Janson and John Paul Maggay

INTRODUCTION

In the contemporary world, the impacts of natural disasters increase within the context of an ever growing world population and climate change. Especially developing countries are prone to the impacts of climate change and natural disasters. One reason for this is the high amount of people that are living in high risk areas (Zorn 2018). Another reason for this is the lack of resources in these developing countries to cope with natural disasters (Globalissues 2019).
Climate change is increasing the severity of several natural disasters and decreasing the predictability of them. Last year, natural disasters around the globe were devastating at an alarming rate (Gabbatiss 2018). The number of typhoons also increases caused by the rise in seawater temperature, for it requires a seawater temperature of 27 degrees for a typhoon to develop (Hannigan 2017). This affects several countries that are situated in high risk typhoon areas, such as the Philippines. On average, 20 typhoons make landfall every year in the Philippines (Ramos & Nees 2017).

Last year, typhoon Ompong (Mangkhut) made landfall in Baggao, in the province of Cagayan in the early hours of 16 September 2018. The typhoon was highly destructive with sustained wind speeds of 205 km/h and higher, accompanied by gusts of 255 km/h, making it one of the strongest typhoons that ever hit the region (Reliefweb 2018). Nearly 19,3000 people took shelter in 1,900 evacuation centers, and another 26,000 people were displaced and took shelter somewhere else (ibid).

When such a natural disaster strikes, short term relief goods play an essential role in the first hours or days after. These goods can save lives and support people in their social and economic rehabilitation afterwards. It is of great importance that these goods are fairly distributed among the victims. This report aims to provide an analysis on the provided relief goods in the Sitio of Blue Waters, Barangay Pallagao, Baggao, Cagayan.

Several actors played a role in the provisioning of the relief goods in Blue Waters after typhoon Ompong. The Department of Social Welfare and Development (DSWD) was one of these actors. It is a government owned agency which in times of disaster aims to provide the necessary basic services like food packages or money (Officialgazette 2019). However, the Local Government Unit (LGU) should be the first one to respond and take action after a natural disaster, and the DSWD supports the LGU whenever needed (Dswd.gvp 2019).

The Sierra Madre Outdoor Club (SMOC) was a non-government organization (NGO) that provided material relief goods to the victims in Blue Waters. SMOC is a non-profit organization that supports responsible ecotourism (SMOC Facebook page 2019). This NGO gave food, water and clothes to the inhabitants of Blue Waters.

Aside from the SMOC, the Mabuwaya Foundation also gave monetary assistance for the villagers of Blue Waters. The initiative and raised money came from the students who participated in last year's area study program. In the report, short term relief responses are divided into cash and material relief goods. In terms of cash relief goods, monetary assistance in Philippine Peso (PhP) is considered. In terms of material relief goods, clothes, food, water,

temporary shelter, first aid kits, or other things respondents received in the package are considered. The report could give insight in the short term relief response at the local level, which can lead to improvements in local governance of the distribution of short term relief goods. The output will provide information about possible flaws and strengths of the system.

The research question of this research followed:

Research Question:

What were the relief goods provided to the victims of typhoon Ompong/ Mangkhut in Blue Waters (Baggao)?

In order to answer our research question, three sub questions were answered. These sub questions are divided into different topics concerning the relief goods that were received by the villagers of Blue Waters.

Sub questions:

1. Where did the received relief goods come from?
2. Were the relief goods provided quantitatively enough?
3. What was the amount of time the victims had to wait for the relief goods?
4. Did the relief goods fit the needs of the victims?

METHODS

This section describes the used methods in order to collect data from the field. One of our main ways of collecting data was by semi-structured interviews. These interviews were structured by the survey questions but we also left room for additional information and questions, depending on the responses from our respondents. During the interview, one of us noted the answers that were given, both for the survey as interesting additional answers. By this way, we received answers on the questions of our survey during the interview and this saved us as well as our respondents time and effort to fill in the survey. Therefore, we preferred this method instead of asking our respondents to simply fill in our survey. By this way, we had the possibility to ask additional questions derived from the responses on our survey questions directly.

Field Schedule

During our first days in the field, we conducted the most interviews. These interviews were not scheduled. The first day, we conducted 7 interviews, the second day 6 and in the other two days we conducted 2 more (Table 1). In our spare time on the last day, we also asked questions to one of our key respondents, Precy Bakichan. She seemed to know the most about the NGOs and governmental institutions that gave relief goods. We refer to this as ‘additional conversations’.

We were depending upon the availability of our respondents or whoever was at home as household head at the time we visited the household (husband or wife). This means that we made use of an availability sample method. We were lucky to find out that the villagers gathered several times in front of our neighbor’s house; thus, we could participate in these meetings. We conducted 17 interviews in total and of those 17, there was one Barangay official, one Barangay police, housewives, farmers of which two of them worked also as tour guide, and two persons who lived outside Blue Waters.

Table 1: Field schedule

Date	Activities
Saturday (19-01)	7 semi-structured interviews (host family, farmers, one man outside of Blue Waters, and housewives)
Sunday (20-01)	6 semi-structured interviews (farmers, Barangay captain, housewives, tour guide)
Monday (21-01)	2 semi-structured interviews (farmer, Barangay Police)
Tuesday (22-01	2 semi-structured interviews (farmers)
Wednesday (23-01)	Additional conversations (key informant)
Thursday (24-01)	Day of leaving

RESULTS

Cash Relief Goods

This section gives an overview of the collected data and summarizes the results in several graphs and tables. First, an overview of the provided cash relief goods to our respondents is given (Table 2). It shows that the assessment of damage on the house was only differentiated into two categories; either partially or totally damaged (Photo1). These assessments were based upon photographs made by the Barangay officials after the typhoon struck Blue Waters. We found that every household received cash relief goods from the Mabuwaya Foundation. The host families of last year all received PhP 5,000.00, and the other households all received PhP 4,000.00.

Photo 1: A house categorized as totally damaged (Photo by J Janson 2019)

Other sources of cash relief goods were the DSWD and the LGUs (municipal and provincial). For the LGU, the amount of cash money for a partially damaged categorized house is PhP 500.00, and for a totally damaged house is PhP 1,000.00. For the DSWD, these numbers are PhP 1,000.00 and PhP 3,000.00. However, we found that some respondents with a house

categorized as partially damaged, still received PhP 3,000.00 from the DSWD. We could not find an explanation for this discrepancy. At last, only the two households that were categorized as completely damaged (Photo 1) received PhP 33,000.00 from the Provincial government. It was unclear for us why all the other houses were not assessed by the Provincial government. Furthermore, respondent 9 was the Barangay captain who did not receive relief goods and respondent 15 had no damage on his house. Respondent 14 was the Barangay Police, who also owned a house in the Barangay centre.

Table 2: Summary of the provided cash relief goods in Blue Waters after typhoon Ompong

Respondent	Mabuwaya	LGU	DSWD	Provincial	Assessment of damage	Duration	Spending
1	5000	500	None	None	Partially	28 days	Repair and groceries
2	4000	500	None	None	Partially	7 days	Repair and groceries
3	None	500	None	None	Partially	1 day	Groceries
4	5000	500	3000	None	Partially	5 days	Repair and groceries
5	4000	500	3000	None	Partially	7 days	Only repair
6	4000	500	None	None	Partially	28 days	Repair
7	5000	500	None	None	Partially	56 days	Groceries
8	5000	500	None	None	Partially	21 days	Repair and groceries
9	None	none	None	None	None	None	None
10	4000	1000	3000	33000	Totally	112 days	Repair, groceries and seeds
11	4000	500	None	None	Partially	28 days	Repair and groceries
12	4000	500	None	None	Partially	28 days	Repair and groceries
13	5000	500	1000	None	Partially	7 days	Repair, seeds and fertilizer
14	None	500	None	None	Partially	5 days	Groceries
15	None	none	None	None	None	None	None
16	5000	500	None	None	Partially	14 days	Repair and groceries
17	4000	1000	3000	33000	Totally	112 days	Repair and groceries

To summarize these results, 12 percent of the houses were categorized as totally damaged, 12 percent as not damaged at all and 76 percent as partially damaged (Figure 1). We found that one respondent (number 5) was not satisfied with the way her house was assessed; it should have been categorized as totally damaged. Because of that, she did not receive enough money to fully repair the damage on her house.

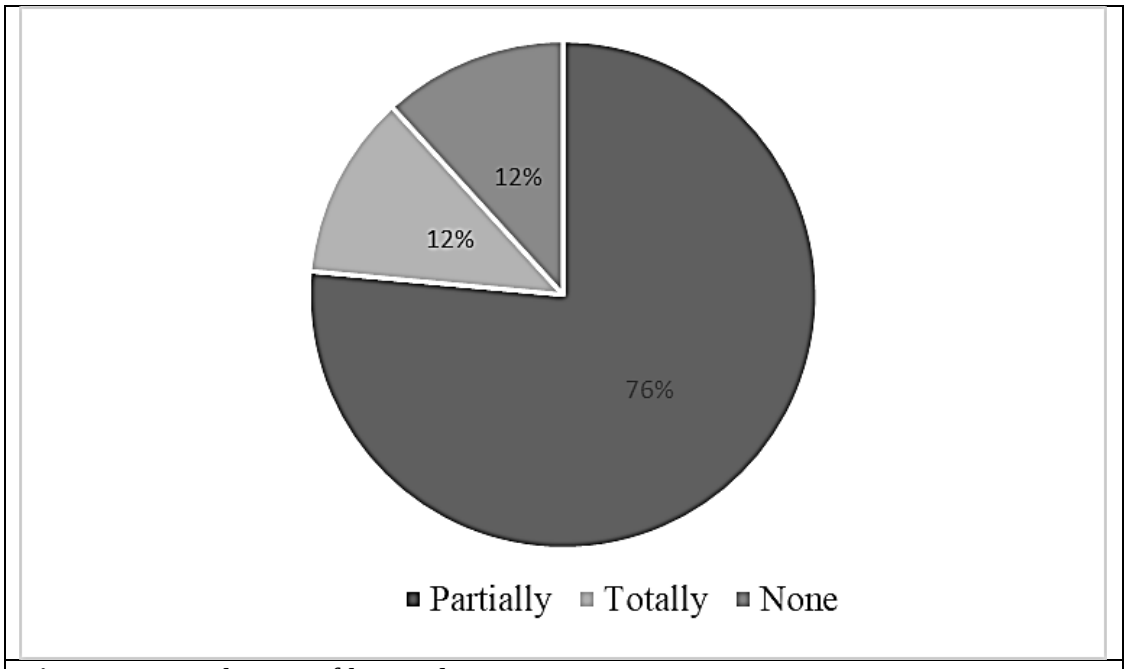

Figure 1: Distribution of house damage assessment categories

In relation to the received cash relief goods from the DSWD, 71 percent did not receive any cash relief goods from the DSWD, 23 percent received PhP 3,000.00 and 6 percent received PhP 1,000.00 (Figure 2). However, as said before, there is a discrepancy between the assessment of the damage on the houses and the amount of received cash relief goods. To summarize this, from the 76 percent of the households that were categorized as having a partially damaged house, only 3 of them received monetary support from the DSWD. From the Provincial government, only the households with totally damaged houses received monetary support.

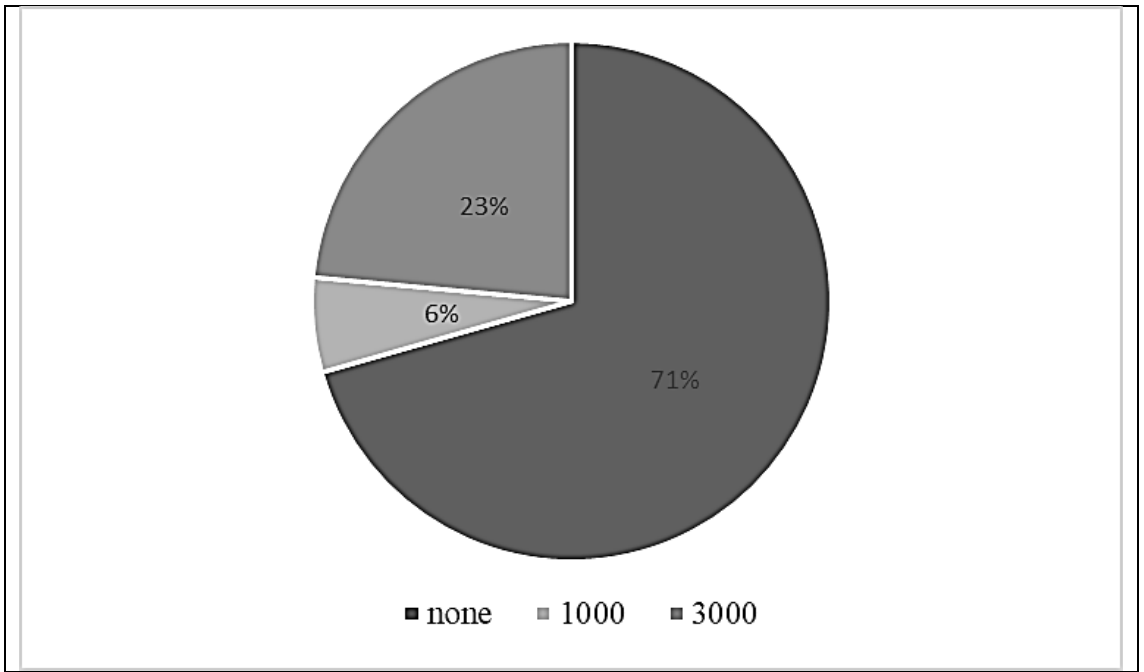

Figure 2: Amount of cash relief goods received by households provided by the DSWD

The number of days the cash lasted was dependent upon the amount of cash that was received and the extent of damage on the house. Most of our respondents estimated the duration of the received cash relief goods on 28 days (Figure 3). Only one respondent (number 3) spent all the cash (Php 500.00) in one day on groceries. We found that almost all the respondents used the cash relief goods for repairing their houses or for groceries (Table 2). Some bought seeds or other agricultural products with it. Everyone was thankful for the cash they received, especially the cash from the Mabuwaya Foundation. However, four respondents who received only the PhP 500.00 from the LGU were not satisfied; it was rapidly finished. Also, the cash from the Mabuwaya Foundation was brought to Blue Waters, one month after the typhoon, whereas the cash received from the LGU was picked up by the respondents themselves at the municipal office after two months.

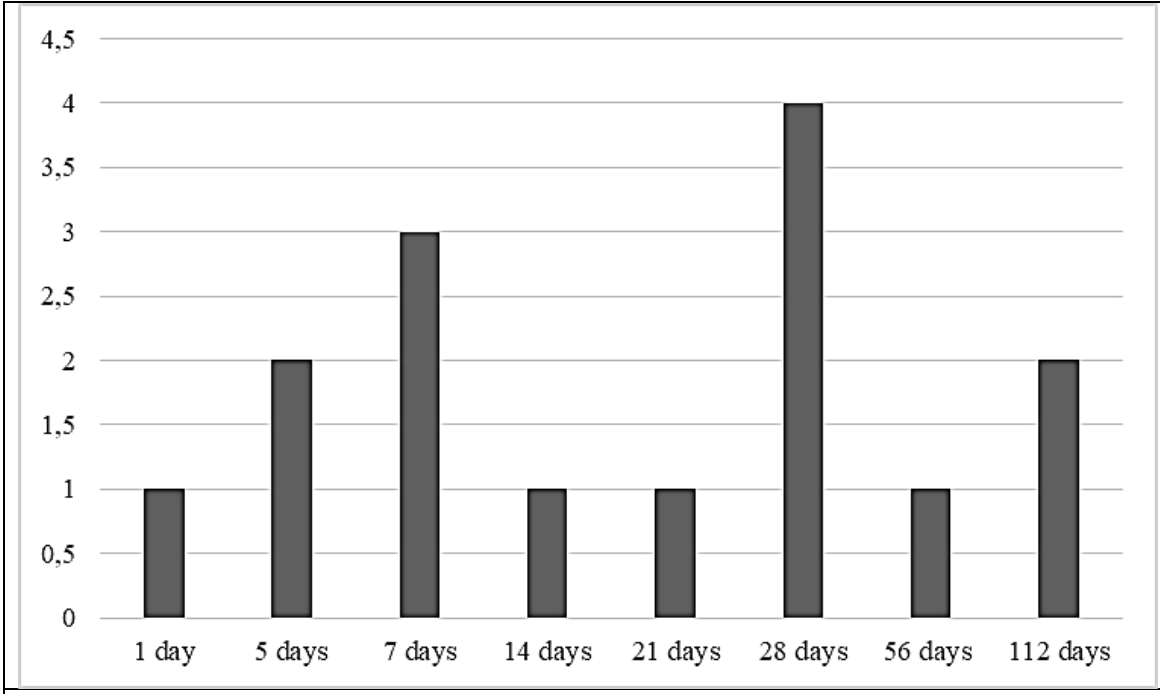

Figure 3: Number of days the cash relief goods lasted

Material Relief Goods

Two actors were involved in the provisioning of the material relief goods: the LGU and the Sierra Madre Outdoor Club (SMOC). We found that every respondent received the same material relief goods from these two actors; food, water and clothes. There was however a discrepancy between the amount of time it took per respondent to receive the material relief goods. The 6 respondents that were evacuated already received their material relief goods from the LGU at the evacuation center.

The other 11 respondents who stayed at their house during the typhoon received the material relief goods provided by the LGU a considerable amount of time later. However, the exact amount of time it took for them to receive them stayed unclear; the answers differed. From an interview with the Barangay official, we could conclude that it took around three weeks for them to receive these relief goods. The material relief goods provided by SMOC were brought to the Sitio of Blue Waters by trucks. The estimated amount of time it took for our respondents to receive the material relief goods from SMOC was not for every respondent the same (Table 3).

Table 3: Estimated number of days after which material relief goods from SMOC were received after typhoon Ompong

Estimated number of days	Number of respondents
7 or less days	3
14 days	6
21 days	3
28 days	2
84 days	1

Based on this information and the information provided by our key informant, Precy Backichan, we estimated the average amount of waiting time on 14 days. Overall, our respondents were more satisfied with the material relief goods that were provided by SMOC compared to the material relief goods provided by the LGU. There were two main reasons for this:
First, the material relief goods provided by SMOC were quantitatively more; they lasted for a longer period of time. The SMOC relief goods lasted on average for several weeks, compared to the LGU relief goods that lasted for a couple of days at the max.
Second, the material relief goods provided by SMOC were brought to the center of Blue Waters by trucks. This saved our respondents time and effort to go to the Barangay center to pick up these relief goods. However, this does not mean that our respondents were not thankful for the received material relief goods from the LGU. In contrast, every respondent seemed thankful for the material relief goods they received. The LGU did also a good job in informing all the respondents in person that relief goods were on their way, right after the typhoon.

CONCLUSION

In this section, a short conclusion for each research question will be provided, as well as some suggestions for improvements of the system.

What were the relief goods provided to the victims of typhoon Ompong/ Mangkhut in Blue Waters (Baggao)?
Every respondent received the same material relief goods; food, water and clothes. Along with these material relief goods came monetary assistance, which differed in amount per household.

Where did the received relief goods come from?
The LGUs (both municipal and provincial) and the DSWD were governmental actors. The Mabuwaya Foundation and SMOC were the participating NGOs.

Were the relief goods provided quantitatively enough?
All of our respondents received the same amount of material relief goods. On average, the material relief goods provided by SMOC lasted for several weeks whereas the ones provided by the LGU lasted for several days. The amount of cash relief goods was not equally distributed for it was depending upon the way the damage on the house was categorized (partially or totally damaged) and by which governmental institution (Table 4). However, as mentioned above, not every house was assessed by every governmental institution and there were also discrepancies between the categorization and the amount of money respondents received.

Table 4: Distribution of cash relief goods

	LGU (municipal)	DSWD	Provincial
Partially damaged	PhP 500.00	PhP 1,000.00	PhP 1,5000.00
Totally damaged	PhP 1,000.00	PhP 3,000.00	PhP 33,000.00

Every household in Blue Waters received either PhP 4,000.00 (non-host families) or PhP 5,000.00 (host families) from the Mabuwaya Foundation. On average, cash provided by the LGU lasted for several days and the cash provided by Mabuwaya approximately one month. The two households who received the PhP 33,000.00 are still living from this money.

What was the amount of time the victims had to wait for the relief goods?
The villagers who were evacuated received the material relief goods from the LGU in the evacuation center. Those who stayed in Blue Waters received them after three weeks. It took approximately two weeks for them to receive the he material relief goods provided by SMOC. It took two months for our respondents to receive the money from the governmental institutions and one month from the Mabuwaya Foundation.

Did the relief goods fit the needs of the victims?
All respondents were thankful for the provided material and cash relief goods. However, the relief goods (both material and cash) coming from the LGU were less and more quickly finished compared to the ones provided by the NGOs. Some respondents mentioned that they also could have used agricultural relief goods like new seeds or fertilizers. However, we think of this as being more a long-term relief good. Also, one respondent claimed to have right on the PhP 33,000.00 which she did not get because her house was wrongly categorized as only partially damaged. Furthermore, four respondents who received only PhP 500.00 said that it was too less. The two households that received monetary assistance from the Provincial government could build up a whole new house with the received cash, which was still not finished at the time of research.

Recommendations
In order to improve the equal distribution of the cash relief goods by the governmental institutions, we would suggest to add one more categorization of house damage: ‘not severely damaged’, which would receive 500 PhP from the LGU. Partially damaged houses should than receive 1000 PhP and totally damaged houses 3000 PhP. By adding this category, we would expect a more fair assessment of damage. We also suggest for an increase in assessments by the Provincial government and DSWD, for the amount of money received from these institutions can make a substantial difference.

ACKNOWLEDGEMENTS

First, we would like to thank our host Nanay Banji for her hospitality. Without our host family, it would have been hard for us to conduct our research. We have experienced the Philippine hospitality in our host family and hope that they will continue to be a host family for future students.
Second, we would like to thank our key informant, Precy Backichan. She provided us with a lot of additional information. Also, she opened her house for meetings among us students as well as villagers of Blue Waters. This gave us the unique opportunity to conduct several interviews in the meeting place in front of her house. Therefore, we would like to thank her husband as well for his hospitality.
Lastly, we want to thank all of our respondents for making time for us and for answering our questions as good as possible. Everybody was willing to participate in our investigation and we never experienced trouble during our interviews. Especially we want to thank the Barangay official and the police for their time.

APPENDICES

Survey

1. What is your name?
2. How old are you?
3. What is your occupation?
4. How far away do you live from the village centre?
5. How many children do you have?
6. With how many people did you live in your house during the typhoon?
7. What is your role in the household?
8. What are your roots?
9. Have you received any relief goods (material and/or cash)?
   - Yes
   - No
10. If you received any material relief goods, how long did it take for you to receive it?
11. A. For how long did these material relief goods lasted? (in days)
    - 1- 2 days
    - 2-4 days
    - 4-6 days
    - 6-8 days
    - 8-10 days
    - 10 + days

B. How were you informed that you would receive them?

12. If no, what do you think is the reason for that?
13. If yes, from which organization did you received them?
14. If you received any cash relief goods, how long did it take for you to receive it?
15. If you received material relief goods, which ones? (more options possible)
    - Food
    - Water
    - Clothes
    - First aid kit
    - Temporary shelter
16. A. If you received cash relief goods, how much?
    - 0-100 php
    - 100-500php
    - 500-1000 php
    - 1000-1500 php
    - 1500 + php

B. how long did it last?

C. For what was it used?

17. Were you satisfied with the material relief goods you received? (Scale of 1-5)
18. If you were not satisfied with the material relief goods received, why?
19. How many times did you receive material relief goods?
20. Were you satisfied with the cash relief goods you received? (Scale 1-5)
21. If you were not satisfied with the cash relief goods received, why?

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THE IMPACT OF TYPHOON OMPONG ON THE WAYS THAT FARMERS PREPARE FOR FUTURE TYPHOONS

Jaycee J. Baldamuerte and Thomas Bussink

INTRODUCTION

People and societies need incentives to change their ways of doing things. These incentives can come from governments, market forces or the societies themselves. Less steerable incentives for change come from natural disasters. The approach to societal change that is incentivized by natural disasters or disasters in general is called the "fatalist approach". A fatalist believes that a disaster which no individual has any influence on must happen to drive societies towards change. When one takes a look back in time, one can see that the most radical changes in societies worldwide were incentivized by disasters in the form of economic crises, famines, volcanic eruptions, floods and many more. Where other incentives for change are always held back by political opposition, short term economic solutions or simply unwillingness, natural disasters are real "game changers" (Tukker and Butter 2007).

The Philippines is a country where natural disasters play an important role in society. The country is located at the boundaries of tectonic plates and within the Pacific ring of fire. On average, 20 typhoons make landfall in the country per year, of which 4 to 5 cause major damage to houses, roads and agriculture (NDRRMC 2019). Next to typhoons, the country is also plagued by floods, landslides, earthquakes, volcanic eruptions and periods of drought (ACAPS 2014). The Philippine government's National Disaster Risk Reduction and Management Council (NDRRMC) has developed coping mechanisms for natural disasters (INFORM Country Risk Profiles 2019), yet there are still significant gaps in management capacity across different regions and there is very little data on local societies' preparedness and resilience to these natural disasters (Bolletino et al. 2015).

When zooming in to one of these disasters, a typhoon that took place in September 2018 catches the eye. Typhoon Mangkhut, also known as Ompong in the Philippines, made its landfall in Baggao, Cagayan, Northern Luzon in the early morning of Saturday, September 15, 2018, with maximum sustained winds of 205 km/h and gusts of up to 285 km/h. Ompong has caused severe landslides, damage to buildings and homes, and loss of power (NDRRMC 2019). The areas affected by Typhoon Ompong were largely agricultural. Disruptions in staple food, rice and corn have had a negative impact on the food supply for the following months. At least 288,150 farmers and fisherfolk were directly affected by Typhoon Mangkhut (Food and Agriculture, Organization of the United Nations 2018). The majority of the affected families in Baggao are dependent on farming as their major source of livelihood. The impact of typhoon Ompong led to missed harvest for the farmers, including among others corn, rice and white beans. This in turn led to loss of income and disruptions of the food supply.

Introduction of the Study

In order to assess if typhoon Ompong was a disaster that led to a fatalist incentivized societal change, this study will research the impact of typhoon Ompong on the way that farmers prepare for future typhoons in the municipality of Baggao, specifically in sitio Blue Waters. Most of the people in sitio Blue Waters depend on farming activities; therefore, this area is specifically interesting to look at. Blue Waters is a small village with around 16 households. Next to farming, there is also a focus on tourism. Blue Waters has waterfalls that count as one of the major attractions in Baggao. Many of the inhabitants of Blue Waters are not "just" farmers. Next to their agricultural work, they also work as tour guides, construction workers, shop owners and carpenters. This study will assess ways of information, physical preparations but also financial preparation in the form of agricultural insurances. Our research took this turn when we were in the field. Agricultural insurances are important because they safeguard a stable income and they prevent high debts (Myfarminfo 2017). This is especially of importance in a disaster-prone country like the Philippines.

Photo 1: Overview of Sitio Blue Waters (Google Earth).

Purpose of the Study

Since the farmers represent the local agricultural sector, our study will be focusing on how farmers prepared for typhoon Ompong and how they will be doing this for future typhoons. This research will thus draw a comparison. Little research has been done on natural disaster preparedness among farmers while the agricultural sector is the most important sector in the Philippines. Hence, the necessity of learning more about this.

RESEARCH QUESTION

How did typhoon Ompong (Mangkhut) affect the way farmers prepare for future typhoons in the sitio Blue Waters?

Sub-questions:

- What are the crops that are mostly grown in Blue Waters?
- In what way were farmers informed about typhoon Ompong?
- Will farmers change the way they prepare for future incoming typhoons?
- Will farmers change the way they protect their crops/cattle/machinery for future typhoons?
- Do farmers know about agricultural insurances that are provided by the government and are farmers getting those?

METHODOLOGY

When looking at the agricultural and accompanied financial damage that is caused by typhoons, not government institutions, but farmers are the primary victims. In order to answer the question ''Did typhoon Ompong (Mangkhut) affect the way farmers prepare for future typhoons in the sitio Blue Waters?'', we chose the farmers of Blue Waters as our research population.

In a research like this, one can make use of both qualitative and quantitative methods. The primary research method is interviewing and the results of the interviews are analyzed quantitatively. The interviews that are carried out are based on questionnaires that have been

created before the fieldwork period. This research made use of semi-structured interviews in order to make sure that similar questions are asked to all respondents (to make quantitative analysis possible), but that each interview could be personalized to each respondent so that we had the possibility to expand on particular topics.

With respect to creating a research group, we made use of sampling based on availability. Blue Waters is a small village that does not have many residents. Therefore, we wanted to interview as many people as possible, based on their availability during the day. We aimed to interview at least 10-15 farmers. We managed to interview 15 farmers and the *Barangay* officials of Blue Waters. The interview with the *Barangay* officials about Blue Waters and the map of Blue Waters can be found in the appendices under Appendix C.

Table 1. TIME SCHEDULE

Date	**Activity**
18 January 2019 / Day 1	Morning: Travel to Blue Waters Afternoon/early evening: Open discussion with some of the residents and local *Barangay* officials about population numbers, number of households and sharing experiences regarding to typhoon Ompong.
19 January 2019 / Day 2	We conducted 3 interviews in the morning and also 3 interviews in the afternoon
20 January 2019 / Day 3	We conducted 2 interviews in the morning and also 2 interviews in the afternoon.
21 January 2019 / Day 4	We conducted 2 interviews in the morning and we had an open discussion with the *Barangay* captain and one of the *Barangay kagawads* about the map and thankfully the *Barangay* captain together with his companion and some of the residents helped each other with drawing the map of sitio Blue Waters. In the afternoon we conducted only 1 interview.
22 January 2019 / Day 5	We conducted 2 interviews in the morning.
23 January 2019 / Day 6	We only conducted 1 interview in the morning.
24 January 2019 / Day 7	Travel back to Cabagan.

RESULTS AND DISCUSSION

In order to find out if farmers changed their preparedness for typhoons after the strong typhoon Ompong, we carried out interviews with the inhabitants of sitio Blue Waters. The farmers who live here have a variety of occupations. Next to being a farmer, some of them are tour guides for the close by waterfalls, some are construction workers and some are shop owners. We asked these farmers 19 questions that are related to our 5 sub questions. By answering these sub-questions, we could draw a conclusion about our main research question. The questions that can be found in Appendix B of this report have been used in a different way for every respondent. Some farmers could elaborate a lot on certain questions, while others could expand on different questions.

What is being farmed in Blue Waters?

What are the crops that are mostly grown in Blue Waters? By identifying what kind of crops are most commonly farmed in Blue Waters, we can get to know more about planting seasons, vulnerability of crops and supply chains of seeds/fertilizers. Most of this information came from the respondents themselves, but also our interview with the *Barangay* officials of Blue Waters were very helpful in this. Our key respondent Romeo Espe, a 55 years old farmer and tourist guide from Blue Waters (Photo 2) explained to us how the supply chain for -in his case- corn seeds and related agricultural products like fertilizers in this area works.

The supply of seeds and fertilizers

Photo 2: Farmer and tourist guide Romeo Espe (55 years old). Our key informant who explained to us how seed and fertilizer supply chains work in Blue Waters (Photo taken by J Baldamuerte 2019)

When a farmer in Blue Waters wants to start growing a certain kind of crop, he or she needs seeds to do so. The first question that is at stake is if the farmer has money to buy seeds or if he will need to loan the seeds from traders. In Blue Waters, it is mostly the case that the local traders offer loans to farmers in the form of seeds and fertilizers. When they loan these seeds, the farmer creates a debt at this trader. The loan is paid back when the farmer harvests its crops and sells these to the trader. The trader will pay the farmer in pesos while the value for the loaned seeds and interest is reduced from this amount of money. The revenue that farmers get from this is commonly used to take care of the family costs such as buying food etc. For new seeds the farmer takes again a loan (Figure 1).

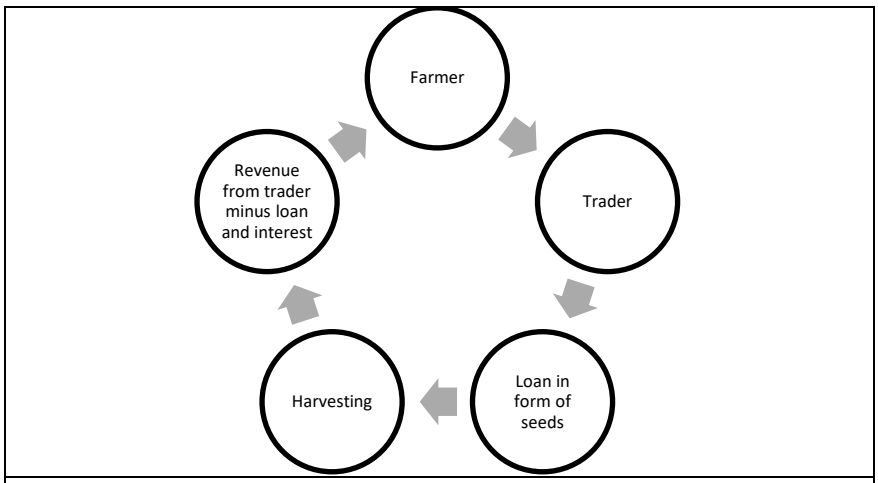

Figure 1: A schematic overview of seed trade and supply for Blue Waters as explained by Romeo Espe.

This system sounds quite steady at the first glance, because farmers who don't have any starting capital can start a farm. The problems of the farmers in Blue Waters are however the typhoons that destroy their crops. When a farmer loses his crops due to a typhoon, he is in the first place not getting income, because he cannot sell any crops (or a significant lower amount of crops). In the second place, the farmer is also not able to pay back his debt from the trader. So in short, when a typhoon hits, a farmer loses his income and he has to get a new loan (which includes interest) and he has to pay off the old debt he/she has with the trader plus interest. Because of this explanation by Romeo Espe we identified a disaster-induced poverty trap. Because of the many typhoons that hit the area, farmers constantly face both income loss and high debts.

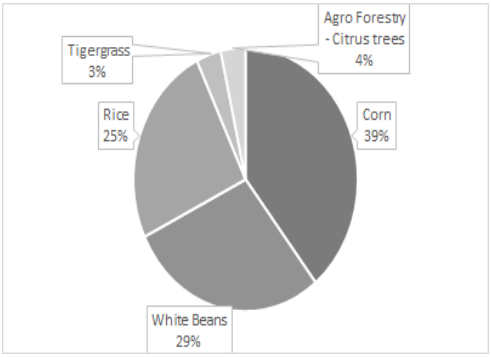

Figure 2: Proportion of farmers that grow certain crops.

Grown crops in Blue Waters

The crop that is most commonly farmed and is also most visible when you walk around in Blue Waters is corn. But also white beans and rice are popular crops (Figure 2). It is interesting that one of our respondents, namely Dominador de la Cruz, is experimenting with tiger grass. He told us that this crop is very resilient to typhoons because the grass can easily be pre-harvested because it doesn't need to get beyond flowering stage. Furthermore, the crop recovers by itself after a typhoon and doesn't need to be replanted.

In what way were farmers informed about typhoon Ompong?

We asked in what way our respondents were informed about typhoon Ompong and if they for future typhoons would like to be better informed. We asked our respondents if they were informed by text message, social media, *Barangay* officials, friends, radio, tv or not at all. Radio and the *Barangay* officials are the most important ways in which farmers were informed. Some were also informed by friends or via TV (Figure 3). Our respondents were all informed 2-3 days in prior. Interestingly, the farmers told us that for future typhoons they would like to be better informed. This goes primarily for the information they receive. The only information they received is that a very strong typhoon was coming and that houses should be secured. If they lived in flooding areas they had to evacuate. The farmers told us that there was no information about what kind of agricultural preparations they should make.

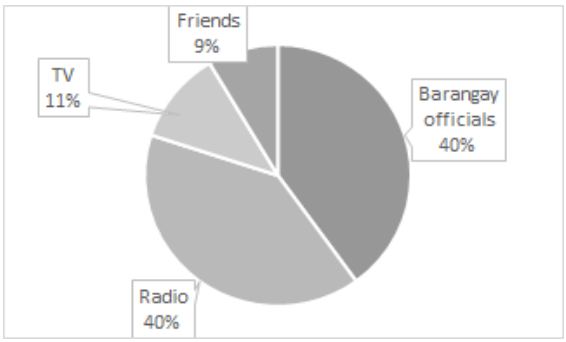

Figure 3: Proportions of the ways in which farmers in Blue Waters were informed about typhoon Ompong.

Will farmers change their ways of preparation for future typhoons and in which ways?

We asked our 15 farmers if typhoon Ompong made them change their physical preparations for future typhoons. Farmers in Blue Waters want to prepare their farm better after typhoon Ompong than they did before (Figure 4). This implies that Ompong had such an impact on the farmers that it changed their ways of preparing for typhoons. Majority of our respondents want to pre-harvest their crops when they expect an incoming typhoon. But Jose Espe, a 43-year-old farmer and tour guide, told us that pre-harvesting can only be done when the crops are (partially) ready for harvesting (if it has a small crop/fruit). Feed storage, seed storage and fertilizer storage are among the few things that farmers in Blue Waters want to do, but the loan system that many farmers rely on, does not allow them to do so. One farmer, namely Dominador de la Cruz, wants to change entirely to tiger grass, because it is more resilient to typhoons. 7 of our respondents want to plant their crops in another part of the year to avoid the typhoon season. This includes primarily corn farmers, because this crop allows differentiating of the planting calendar throughout the year. The category "other'' included mainly preparations at the house of the farmers. We do not count this as physical agricultural preparations. The number of farmers that do not prepare their farms for typhoons declined from 4 to 0 (Figure 4). All this shows that farmers are indeed planning to change their physical agricultural preparations for typhoons.

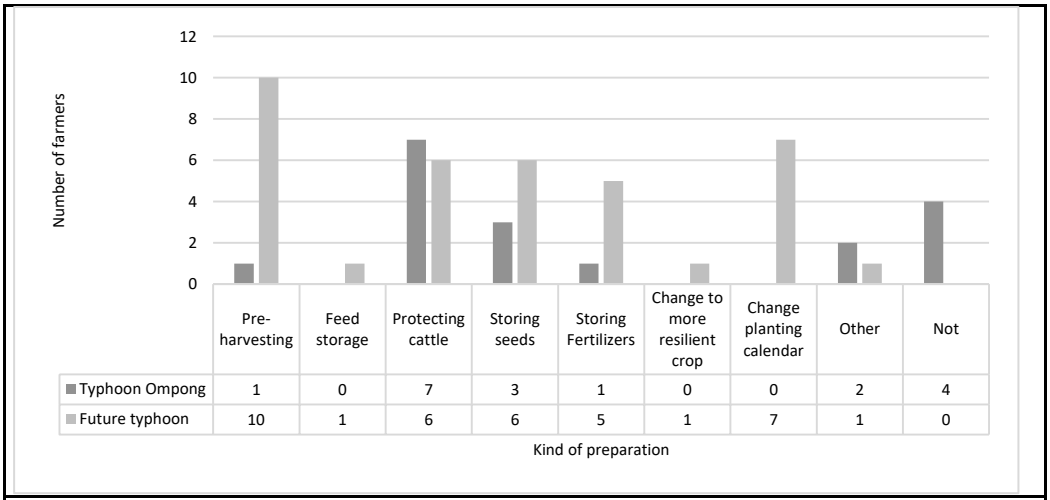

Figure 4: Physical agricultural preparations for typhoon Ompong and for future typhoons.

Do farmers know about agricultural insurances that are provided by the government and are farmers getting those?

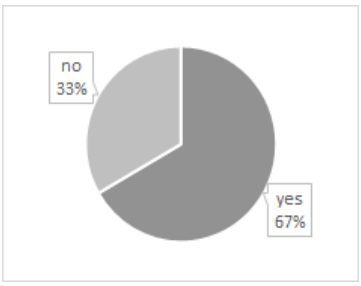

Figure 5: Share of farmers that (did not) know about the existence of agricultural insurances before typhoon Ompong.

Next to agricultural preparations, one can also make financial preparations. We asked farmers in Blue Waters if they knew about the availability of agricultural insurances before Ompong and we asked them if they want to be better informed about these insurances after typhoon Ompong. Sixty-seven percent of the farmers already knew of the existence of agricultural insurances before typhoon Ompong (Figure 5). We learned from the *Barangay* officials of Blue Waters that the prime agricultural insurance is the Philippine Crop Insurance (PCI). This insurance is issued to farmers by the government. A crop insurance would be a good financial tool for farmers to protect themselves against sudden high costs caused by typhoon damage. An agricultural insurance would also prevent farmers from making high debts with the seed- and fertilizer traders. Interesting for our research is that all of our respondents expressed their interest in getting an agricultural insurance after typhoon Ompong. There is however one recurring problem amongst the farmers of Blue Waters: they have no land titles of the agricultural land they use because it is classified as government owned forest land. Without land titles, farmers are not allowed to take an agricultural insurance. This means that no farmer in Blue Waters has an agricultural insurance. Although our study is small and we only heard 15 farmers, we think that enabling farmers to get an agricultural insurance is a big step forward in increasing the level of preparedness amongst farmers in disaster-prone areas.

CONCLUSION

After visiting Blue Waters and conducting interviews with the farmers, we learned a lot about the way in which farmers prepared themselves for typhoon Ompong and how they are going to prepare their farms for future typhoons. This study was aimed at finding out if typhoon Ompong did change the preparations for future typhoons and the way in which this is done. After looking at the crops that are grown and comparing the ways in which people are informed, the physical preparations and the financial preparations, we can conclude that typhoon Ompong has been a severe natural disaster that has created a perception-change towards typhoons among farmers

in sitio Blue Waters. Within their capabilities, the vast majority of our respondents stated that they are going to change/improve their preparations for future typhoons farmers. Their physical preparations for future typhoons include pre-harvesting (if possible), protecting cattle (take them away from flooding areas), storing seeds/fertilizers and change the planting calendar of crops that allow this. In the field we also found out that farmers really want to protect their income with an insurance. However, because farmers in Blue Waters don't have the land titles of their land, they are not allowed to take an agricultural insurance. This is a problem that is probably present all over the Philippines. Agricultural insurances would be a good financial preparation for farmers in a disaster-prone country like the Philippines because they safeguard income and prevent high debts.

ACKNOWLEDGEMENTS

Above all, we thank our Almighty God for giving us strength and knowledge and for keeping us safe in the field. We would also want to give our heartfelt gratitude to the Local Government Unit of Baggao headed by Mayor Leonardo C. Pattung for allowing us to conduct our interviews in their municipality. We also thank the *Barangay* officials of Pallagao for giving us some background info and for drawing the map of Sitio Blue Waters. We also want to thank all of our respondents for participating on the interview sessions, especially Tatay Romeo Espe as our key informant. Lastly, our deepest gratitude to our host family Tatay Willie, Kuya Wilmer, baby Makmak and Ate Precy for a warm welcome and for allowing us to stay in their house to do our research.

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APPENDICES

Appendix A: personal information

Name: ……..

Age: . . . . . Gender: M/F Civil Status: …….

Occupation/Livelihood: ……...

Family Situation: . . . . . .

Highest Educational Attainment:

□ Graduate Studies (Master, Doctoral Degree)
□ College Graduate
□ College Level
□ High School Graduate
□ High School Level
□ Elementary Graduate
□ Elementary Level
□ No Schooling

Appendix B: Questionnaire Preparedness before and after Ompong

1. What is the total land area of your farm?
2. How long have you been a farmer?
3. What do you farm?
4. When did you hear that a typhoon was coming?
   a. 2-3 days prior to landfall
   b. 1-2 days prior to landfall
   c. 24 hours prior to landfall
   d. Shorter than 24 hours prior to landfall
5. Were you informed the same way as with former typhoons
   a. Yes
   b. No
6. How did you hear about the Typhoon Ompong?
   a. Text Message
   b. Social Media
   c. Barangay Officials,
   d. Friends
   e. Radio
   f. TV
   g. Not
7. What kind of information was given? And did you understand?
8. Did you already know it would be a strong typhoon?
   a. Yes
   b. No
9. How did you prepare for Typhoon Ompong?
   a. Pre-harvesting
   b. Feed storage (for use after typhoon)
   c. Protecting cattle (putting kettle inside, cutting fences etc.)
   d. Storing seeds
   e. Storing fertilizers
   f. Others (please specify)
   g. Not

……
……
……

10. Did you experience significant damage to your farm from typhoon Ompong?
    a. Yes (go to question 11)
    b. No
11. What kind of damage to your farm did you experience from typhoon Ompong?
    a. Loss of cattle
    b. Loss of crops
    c. Loss of machinery
    d. Damage to infrastructure/houses/stables
    e. Loss of human life
12. What kind of government assistance did you expect before typhoon Ompong?
    a. Financial aid
    b. Material aid (seeds, fertilizers, machinery etc.)
    c. Other (please specify)
    d. Relief Goods
13. Did you receive any assistance after Typhoon Ompong?
    a. Yes (please specify)
    b. No
14. Were you aware of agricultural insurances provided by the government before typhoon Ompong and did this change your preparations?
    a. No
    b. Yes
15. For future typhoons, do you expect that typhoons will be stronger and/or could do more damage to your farm?
    a. Yes
    b. No
16. Would you want to be better informed about future typhoons?
    a. Yes
    b. No
17. For future typhoons, how would you prepare your crops/cattle?
    a. Pre-harvesting
    b. Feed storage (for use after typhoon)
    c. Protecting cattle (putting kettle inside, cutting fences etc.)
    d. Storing seeds
    e. Storing fertilizers
    f. Others (please specify)
    g. Change to a more resilient crop
    h. Not
    i. Change Planting Calendar

……
……
……

18. For future typhoons, would you want to avail agricultural insurances provided by the government, in order to replace the agricultural damage?
    a. Yes
    b. No
19. With the current preparations that you have in mind, do you expect to experience less damage to your farm from strong typhoons in the future?
    a. Yes
    b. No

Appendix C: Interview with the *Barangay* officials including the drawn maps

What do *Barangay* officials advice to farmers if typhoon is coming?

- It is the Initiative of farmers and it depends if the crops are ready to pre-harvest.
- We are only concerned with the safety of the people in the community

Are there any farmers here in Blue Waters practicing agroforestry?

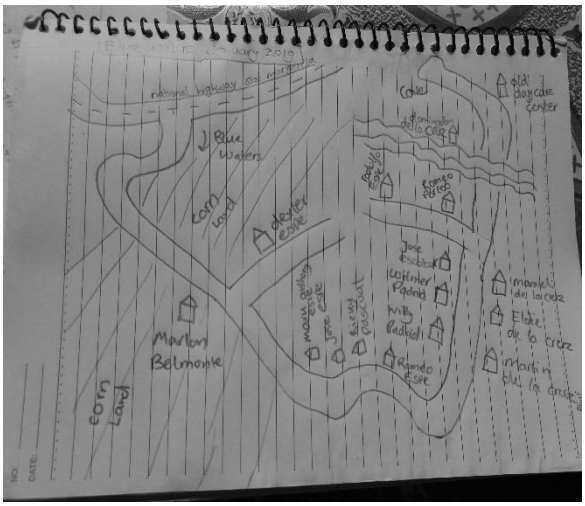
- Yes, some of the farmers are planting fruit trees like coconut, mango and citrus fruits.

What kind of crops are farmed in Blue Waters?

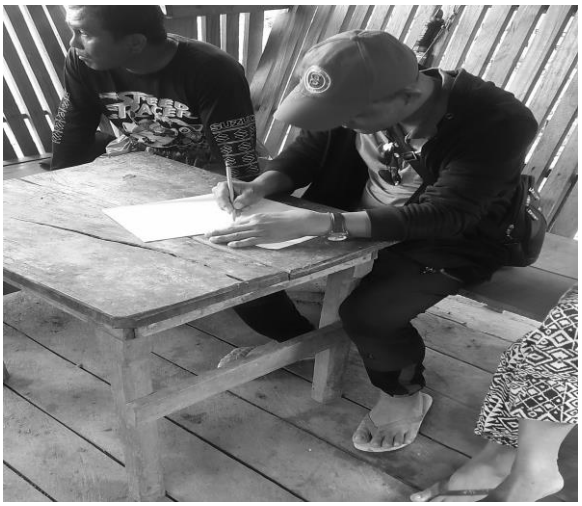
- Primarily corn, rice, white beans and tiger grass.

Could you provide us with the number of households and a map of Blue Waters?

- We have no available map, but we can draw you a map showing the location of the houses here in Blue Waters. The *Barangay* counts more than 800 people. There are 15 house-holds in sitio Blue Waters. They are all farmers. They have secondary jobs but their first job is farmer. They have a lot of time next to farming (for tour guiding, construction work and carpentry).



Picture 3: Map of Blue Waters drawn by the *Barangay* captain. Picture taken by Thomas Bussink on 21 January 2019.



Picture 4: *Barangay* Captain drawing the map of Blue Waters for us. Picture taken by Jaycee Baldamuerte on 21 January 2019.

ASSESSING THE TRAUMATIC IMPACT OF TYPHOON OMPONG IN BLUE WATERS

Alissa Kerklingh, Rosaida Brahim, Rina Mae Tagayun

INTRODUCTION

The Philippines, situated in the Pacific Ring of Fire, is hit by around twenty tropical cyclones each year (Van Weerd 2019). The Philippines has seen various devastating typhoons make landfall, causing economic, educational, and societal disruptions (Samphantharak 2014). On September 15, 2018, Typhoon Ompong, internationally named Mangkhut, raged with speeds of more than 205 km/h and gusts of 255 km/h over the Philippines, causing widespread damage (World Health Organization 2018). It made landfall in Baggao, municipality Cagayan, and caused the most damage in this region (Rappler 2018). One of the sitios in Baggao which is promoted as a tourist spot and that is important for the region, is Blue Waters (Gabinete and Deus 2018).

The humanitarian response to Typhoon Ompong has focused on giving people material aid (OCHA 2018a). This aid is given in the form of cash assistance to families whose houses were destroyed during the typhoon and by providing shelter for those in need of it (OCHA 2018a). However, little attention has been given to the psychological impact of the disaster. In the educational sector, one of the priority responses was to conduct psychosocial first aid for affected learners and education personnel, but no psychological help was organized on a large scale (OCHA 2018b). Consequently, little is known about the psychological impact the typhoon had on the inhabitants of the Baggao region. From previous studies, we know that resource loss is positively correlated to psychological distress (Freedy et al. 1992). Additionally, in a study six months after typhoon Haiyan, 16 percent of respondents in a study among the general public in the provinces of Leyte, Samar and Eastern Samar, Philippines, had problems with functioning and were likely to be in need of help (Leonardi et al. 2016). Moreover, certain groups, such as people aged over sixty-five, those who are unemployed, or those who rate themselves as having bad health were extra vulnerable for disability after a typhoon (Leonardi et al. 2016).

A high prevalence of Post-traumatic Stress Disorder (PTSD) among people living in areas heavily affected by a natural disaster was reported in previous studies (Finnsdottir and Elklit 2002; Najarian et al. 2001). Since Baggao was hit hard by Typhoon Ompong, we are interested to see whether Typhoon Ompong has been a traumatic experience for the inhabitants of Blue Waters. We define trauma as a deeply distressing experience which has a long-term negative impact.

We expect that if you have experienced more typhoons, you are more resilient to experiencing one. Therefore, we have come up with two hypotheses that we want to test. The first hypothesis states the following: people who have experienced previous typhoons are less likely to experience Typhoon Ompong as traumatic. The second states: people (i.e. children) less experienced with typhoons are more likely to experience typhoon Ompong as traumatic.

RESEARCH QUESTIONS

Main research question

Has typhoon Ompong been a traumatic experience for the inhabitants of Blue Waters?

Sub-questions

1. How did the inhabitants of Blue Waters experience Typhoon Ompong?
2. Do inhabitants of Blue Waters report having traumatic experiences related to Typhoon Ompong?
3. What were the coping mechanisms used by the inhabitants of Blue Waters in response to Typhoon Ompong?

METHODS

Over a period of five days we conducted 20 semi-structured interviews using availability sampling methods in sitio Blue Waters in Baggao, Cagayan province. Eleven of the respondents were male, 9 were female, and 6 were over the age of fifty. The reason for having a diverse sampling population is that it has been shown that age and sex impact how trauma is experienced (Green et al. 1991). Because children might not be able to understand our research and give informed consent, we did not interview anyone under the age of 16. To compensate for not being able to interview children, we asked parents to report how their children experienced the typhoon. We interviewed multiple people per household. Interviewing multiple people from one household provided us with additional information about the situation that one respondent might not have given.

The questionnaire we used (see Appendix) consists of a series of open-ended questions that provided a basic structure for the interviews, drawn up partly by using the Post Traumatic Stress Disorder (PTSD) checklist published in the DSM-V. This quantitative checklist is used by clinicians to assess whether a person can be diagnosed with PTSD. The questions on the questionnaire can be categorized as belonging to any one of the three sub-questions outlined above: for the first sub-question questions are all related to the experience of the subject during the typhoon itself; for the second sub-question questions are related to possible expressions of trauma within the inhabitants; for the third sub-question questions are related to how they cope with the losses they have encountered.

Table 1. Schedule of Fieldwork Activities

Date	**Activities**
18 January 2019, Friday	Arrival at Blue Waters in the late afternoon Meet our host family
19 January 2019, Saturday	Conduct 6 interviews
20 January 2019, Sunday	Conduct 7 interviews
21 January 2019, Monday	Conduct 1 interview
22 January 2019, Tuesday	Conduct 6 interviews
23 January 2019, Wednesday	Discuss the results

RESULTS

Experience of Typhoon Ompong

The majority of the respondents learned about Typhoon Ompong three days before it arrived, either through the radio or through a *barangay* official. In response, multiple people fortified their houses by adding braces to the walls and by hammering more nails to their roofs. Three households heeded the *barangay* official's warning and moved to evacuation centers. Those who did not go to the evacuation centers chose not to for the following reasons: they either wanted to look after their livestock or they felt as though their house was stable enough to endure the typhoon. In two households, the men sent their families to the evacuation centers and stayed behind themselves. Though there were no human casualties, all the households interviewed reported severe losses in livestock and in crop harvest, and several also reported damage to their houses. From these losses all respondents are still currently recovering, with significantly lowered standard of living than before the typhoon. It is notable that the respondents who sustained most damage to their houses also reported a more traumatic experience during Typhoon Ompong.

Based on the answers of the respondents, there are many parallels in how the typhoon was experienced. The majority of respondents reported that they were scared and turned to prayer. Depending on the strength of their house, people transferred to shelter in a family member's household; in one case, 11 people hid in a small makeshift bunker within the main house.

All other respondents reported that the typhoon was a traumatic experience for them. In several cases the house was shaking under the force of the winds. This effect was worsened by the fact that a few of the houses were not yet complete; in Christy Espe's case, discussed further below, they had to keep moving sides of the house depending on which way the wind was blowing. In another case, the house was shaking so much that the respondent decided it would be safer to hide in a nearby cave, where he only had a blanket to stay warm and some cooked rice to eat. Even in the main square of Blue Waters, where most of the people stayed in their homes, one house was shaking so much that one of the respondents refused to enter the elevated section of the home, deciding instead to stay underneath the elevated section with the dogs. When it comes to how children experienced the typhoon, there seem to be two reactions. Some respondents report their children sleeping through the event or watching television or listening to the radio, whereas others report the children cried during the typhoon.

Long term effects of Typhoon Ompong

We found that most people reported experiencing typhoon Ompong as traumatic. In several interviews we asked whether this trauma would be alleviated if their material losses would be restored. Everyone who was asked this question answered affirmatively. We further asked some respondents why this particular typhoon was so traumatic for them, and they replied that it was because this typhoon was so strong. Next to that, we noticed that material loss was related to the psychological impact the Typhoon Ompong had on the inhabitants of Blue Waters. For example, the typhoon seemed to have had a more lasting impact on the respondents who had lost almost all their harvest than on those who had retained some of their harvest. As Gerardo Ulep Delacruz Sr. eloquently put it: *"Typhoon Ompong felt like we lost in gambling"*.

All respondents, except one, answered negatively to having symptoms of PTSD, such as avoidance behavior, having nightmares or not remembering everything that happened with respect to the typhoon. However, five respondents added that they do feel nervous when a Low-Pressure Area (LPA) is reported, indicating that there is in fact a long-lasting impact of Typhoon Ompong. When asking parents with children younger than 16 if they think that their children

were traumatized by the typhoon, eight respondents answered that they do not think that their children were, and two respondents answered that their child or children were. Notably, one respondent replied that, rather than the children, it was the elderly that need more help after a typhoon. However, when interviewing respondents over 50, this was not confirmed.

Coping mechanisms

When the residents of Blue Waters were asked as to how they coped during and after Typhoon Ompong, their responses were almost uniform. All the respondents used prayer as an important coping mechanism. In one household, music was played and hymns were sung to distract themselves from the typhoon. In few select households the tv was turned on to distract the household, particularly the children, but in all these cases the tv was at some point turned off so that people could pray. This suggests that religion is therefore the most important, and most commonly used, coping mechanism.

In the aftermath of the typhoon, focus was foremost placed on rebuilding the community (Photo 1). When asked about the rebuilding efforts which, four months after the typhoon, are still underway, the respondents were very factual in talking about their losses. Funnily enough, several of the respondents state that, when talking about the typhoon, they are even able to use humor, another coping mechanism. In this light, the respondents prefer to be optimistic in regards to the future, rather than to dwell on the past. This attitude is best summed up by a saying by Rodolpho Espe, which translated into English reads as follows: *"You cannot go on with your life if you stay in the past".*

Photo 1: The new church (on the left) that is being built in Blue Waters after the previous church was completely destroyed by Typhoon Ompong (Photo by A Kerklingh 2019)

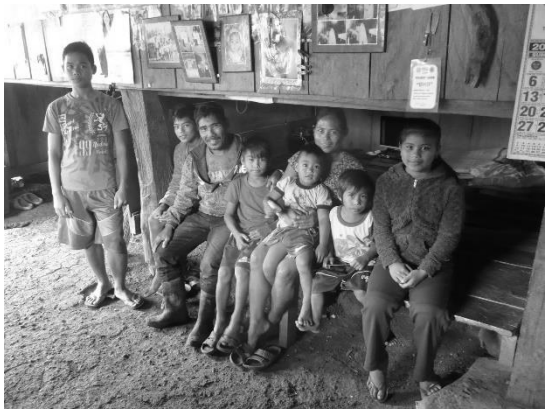


Photo 2: From left to right: Romel, Ronald, Romeo, Ryan, Segundina, Reyel, Aries and Roslin Espe in front of the hiding place Romeo built for Typhoon Ompong (Photo by A Kerklingh 2019)

Two contrasting stories

In our study, we interviewed two people whose experiences during Typhoon Ompong represent two very different narratives with very different consequences. We outline these two stories here, as we believe their narrative is important to the overall understanding of how people in Blue Waters experienced the typhoon.

Romeo Espe

Romeo Espe (56) is the vice-*barangay* leader. He is part of the local police force, and has 10 children who still live in Blue Waters. When Romeo heard that there would be a strong typhoon, he did not consider leaving because he believes that those who leave do not have a strong heart. He takes particular pride in the fact that he managed to prepare himself, his house, and his family for the typhoon. He did not hesitate to discuss the preparations he made for the typhoon: he put braces against the sides of his house for stabilization and hammered more nails in his roof so that it would not be blown away. Next to that, he also made a small hiding place inside his house (Photo 2) which he hammered shut with wood and that kept him, his wife and nine of his children safe. During the typhoon, everyone watched tv and two children even slept. He reported that all who were in the house did not even feel that there was a typhoon because the hiding place was so sturdy, and therefore no one in his house experienced Typhoon Ompong as traumatic. His wife, who joined us later in the interview, confirmed this. She added that if the hiding place would not have been there, the typhoon would have been a traumatic experience.

We were impressed by how little impact the typhoon seemed to have had on this family, and conclude that this was probably due to attitude Romeo Espe and consequently his family seemed to have towards the typhoon: you do not have to be scared of it, you just have to be well prepared. Romeo takes great pride and bravado in the fact that he stayed in his house and that he prepared so well for the typhoon. The fact that indeed there was a safe hiding place in his house and that there was little damage to it, caused the typhoon to not be a traumatic experience for this family.

Christy Espe

Christy Espe (30) lives with her husband and two daughters, Cristalin (3) and Princess (5) by the side of the trail that leads to Blue Waters (Photo 3). She heard about Typhoon Ompong three days before it made landfall, and her husband made prompt fortifications to the walls of the house. The house was not completely finished yet, and the unfinished state of their house meant that part of it laid bare to the winds of the typhoon. As a result they had to move to different areas of the room depending on how the wind blew. During the typhoon her children were crying, and she nearly cried, too. The only thing that lessened her nervousness during the typhoon was prayer. She told us that she has ‘a phobia for typhoons’ because of Typhoon Lawin, which we found an interesting self-assessment. She does not like to talk about the typhoon and would even prefer to totally forget about it. In our conversation, she seemed nervous and uneasy. It seemed as though her eyes were watery during a part of the interview, indicating how traumatic this experience still was for her.

During this interview, we were struck by the impact the typhoon seemed to have on Christy. She actually reported having quite some symptoms that are indicative for PTSD: avoidance of things that remind her of the experience, feeling very upset when something did remind her and being constantly on guard for the next typhoon. The big impact that the typhoon has had on Christy can be partially explained by the situation her family was in during the typhoon, but there also seemed to be personal factors in play, as other respondents also experienced scary situations but seemed less impacted. It might be that Christy is more prone to trauma than others, but to map what makes her different from the rest we would have to conduct more elaborate interviews.

Photo 3: Christy Espe with her children (from left to right): Cristalin, Princess, Jamaica and Xyric John (Photo by A Kerklingh 2019)

DISCUSSION

Although most of the inhabitants of Blue Waters are unsatisfied with the pace of reparations, they still manage to cope with the effects of Typhoon Ompong. Our finding that material losses are correlated to psychological impact is not new; various studies have come to the same conclusion (Freedy et al. 1992; Leonardi et al. 2016; Hamama-Raz et al. 2017)**.** Consequently, we found that our respondents were mostly focused on restoring their material possessions.
Most people we interviewed reported that they are not focused on talking as a coping mechanism (*"Talking does not really help me, it's more like a habit" - Saturnino Espe*). People would rather receive material compensation than any psychological help, because as one respondent said: *'If we fixed everything we lost, we would be happy'*. That being said, religion seemed to be one of the strongest coping mechanisms people used, because it might give people some solace in the thought that someone is watching over them and it can be an activity in which they can engage together.

The hypotheses we formulated before conducting the research were not confirmed: we did not find that people who experienced more typhoons were impacted less by them. Most of the elderly must have experienced a lot of typhoons, but the majority stated that only the last three typhoons (Lawin, Ompong and Rosita) were notable enough to remember. This suggests that once material losses are restored, the event itself is easily forgotten. We found that most children were too young to understand what happened during Typhoon Ompong and are thus not traumatized. However, we should be critical towards the assessment parents make regarding their children being traumatized. There seems to be some relation between the experience of the parent and the assessment parents make.

There were some limitations to this research. We believe that there was a difference in what the word ‘trauma’ means for our respondents and for us as researchers. With two of the researchers coming from a Western country, and one studying psychology, we had a certain expectation of how people would react to a disaster such as Typhoon Ompong. And as discussed in the introduction, our definition of trauma is having had a deeply distressing experience which has a long-term negative impact. During the interviews, however, when people used the word ‘trauma’ to describe the impact of the typhoon, they always seemed to refer to the experience of the typhoon itself and not a long-lasting psychological aftermath. We thus have to interpret their answer accordingly.

Rina’s expectations before we started our research were different from Rosaida’s and Alissa’s. As a Filipino student, she knows that people here are not really prone to any psychological problems caused by typhoons. Nevertheless, she feels like the research was valuable because it shows that people in this village are able to cope with the typhoons they encounter so much, but also that the challenges of rebuilding after each typhoon are very hard nevertheless.

CONCLUSION

In general, we found that Typhoon Ompong has not been a traumatic experience for the inhabitants of Blue Waters. Though we conducted the research with certain expectations and encountered some communication problems regarding the definition of the word ‘trauma’, we were still able to conduct high quality interviews. All our respondents seemed to feel at ease when interviewed, which made way for open discussions and interesting answers. This was due to the ability of Rina to simultaneously have a conversation and translate from Ilokano to English. We learned that inhabitants of Blue Waters are quite resilient when it comes to experiencing strong typhoons, such as Typhoon Ompong.

ACKNOWLEDGEMENTS

We would like to thank our host family, Rowena and Rodolfo Espe, and their children, Aries and Iries Ann. They showed us incredible kindness by letting us sleep in their home, and eat at their table. The bed was comfortable and the food was delicious, thank you. We would like to thank the inhabitants of Blue Waters for being so accommodating and for being so open to being interviewed. This research would have been impossible otherwise. We would like to thank the mayor of Baggao, the honourable Leonardo C. Pattung, for welcoming us so freely to do research in his beautiful municipality.

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APPENDIX

Questionnaire

Name:

Age:

Sex:

Description of household (/family size):

1: How did the inhabitants of Blue Waters experience Typhoon Ompong?

A. How many typhoons have you experienced before? How does it compare to others you have survived?
B. When did you hear there would be a typhoon, and how did you receive the warning?
C. Did you prepare, and if yes, how?
D. How did you feel during the typhoon?
E. What was the situation during the typhoon (together, silence, talking)?
F. Do you remember everything that happened during and shortly after the typhoon?

2: Do inhabitants of Blue Waters have traumatic experiences related to Typhoon Ompong?

A. Do you often think back of Typhoon Ompong? *(ask further)*
B. Do you sometimes have nightmares about typhoon Ompong?
C. What has been the effect of typhoon Ompong on your children?
D. Did you experience typhoon Ompong as traumatic?

3: How did the inhabitants of Blue Waters cope with the aftermath of Typhoon Ompong?

A. How did you cope with the typhoon Ompong?
B. Do you talk about typhoon Ompong with your family?
C. Do you talk about typhoon Ompong with your neighbors?

FLORA ASSESSMENT OF SITIO BLUE WATERS AND THE ECOLOGICAL IMPACT OF TYPHOON OMPONG

Celine Huisman and Valerie Ranchez

INTRODUCTION

The Philippines is one of the 17 megadiverse countries in the world (ASEAN Centre for Biodiversity 2010). It has high rates of both species numbers and species endemism for tropical biodiversity (Gentry et al. 1992). There are 7,620 different plant species in the Philippines, of which 5,832 are endemic (Myers et al. 2000). But it is also one of the hotspots of biodiversity on the planet (Myers et al. 2000), making it a very important area for conservation.

A major threat to the biodiversity aside from deforestation by logging (Macapallag & Zegelaar 2018), are typhoons like Ompong that struck the Philippines on the 15th of September 2018. A higher proportion of typhoons will be in the highest categories with the changes in climate that will occur (Webster et al. 2005). Typhoons are a major threat for plant species, for heavy rainfall and wind can impact plant composition and structure (Sanchez & Islebe 1999). This has been studied in subtropical forests in Taiwan, where there was defoliation observed (Lin et al. 2011). It has been studied in other places, but it has not yet been studied in the municipality of Baggao.

Last year, a tree inventory of forested and non-forested area in Blue Waters, Baggao, was made by students (Cammayo & Verhave 2018) to recommend on the management of these species. This is needed for economic reasons as well. People in the area use NTFP, or non-timber forest products like *Rattan* and *Sarakat* for medicinal or other practical purposes in Malisi, Baggao (Cera & Steunenberg 2018), which is comparable to Blue Waters. The logging of timber is also practiced in Blue Waters as of 2018 according to another report (Macapallag & Zegelaar 2018), although it is illegal under Philippine law.

Blue Waters is located in the municipality of Baggao and there are plans for assigning a protected area there, but they are not yet definite (Van Weerd 2019, pers. comm.). Blue Waters is also aiming at becoming a tourist spot revolving around their Blue Water Cave, which tourists from inside and outside the country visit (Gabinete & Deus 2018). This means it is also essential to conserve this biodiverse area from a tourism perspective. However, there was no mention of the possible effects of a typhoon on these tree species in Blue Waters. This is very important to study for the management of the species and to know where conservation is most important.

RESEARCH QUESTIONS

What is the structure and diversity of the trees in forested and non-forested area of Blue Waters, Baggao, and the ecological impact of typhoon Ompong?

To answer the main research question, we asked the following sub questions:

- Which tree species are present in Blue Waters in forested and non-forested area after typhoon Ompong?
- What is the canopy cover (%) of forested and non-forested area after typhoon Ompong?
- Have the answers on the above questions changed compared to before Ompong in 2018?
- What are the habitat types of forested and non-forested habitat in Blue Waters?
- What are the architecture and measurements of the tallest trees in forested and non-forested area in Blue Waters?

METHODS

Plant species inventory

The method for the plant species inventory is the same as Cammayo & Verhave in 2018. The two transects of 1 km they chose are also used in our research (Figure 1).

Figure 1: Google Earth image of the two transects to be used in the research. The left one represents the transect along the non-forested area, the right one is the transect of the forested area. Source: Joni Acay.

The survey of flora started on the 20th of January, 2019 and was completed on the 22nd of January, 2019 (Table 1). Habitat survey forms from Mabuwaya Foundation were used to assess the flora of both transects. All details related to the five biggest trees was recorded, including date of survey, local name of species, plant family, diameter, tree architecture (Figure 2), and height (Figure 3). Furthermore, habitat type and canopy cover (%), were noted, as well as other interesting observations. This was done every 100 meters in a plot of 10x10m on both sides of the transect, not exactly the same plots as last year.

Questionnaire about ecological impact

To complement findings in the field, we developed a questionnaire about the ecological impact of Ompong. Our target group were inhabitants of Blue Waters and we interviewed 10 people through availability sampling. These were semi-structured interviews (Appendix III). Our interviews were conducted on the 18th, 19th, and 22nd of January, 2019 (Table 1).

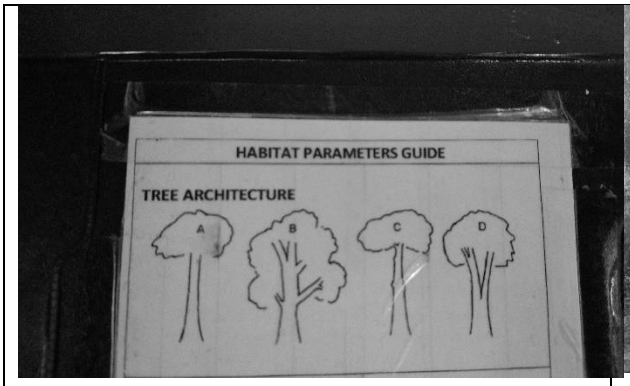

Figure 2: Guidelines for determining tree architecture, provided by Bernard Tarun (Photo by C Huisman 2019)

Figure 3: Celine Huisman and behind her Valerie Ranchez writing down the height of the five tallest trees in one of the plots of transect 2 (Photo by B Tarun 2019)

Table 1*:* Schedule of the research at Blue Waters between the 18th and 23rd of 2019

Date	**Activity**
18th of January 2019	Arrival at Blue Waters Interview with barangay captain
19th of January 2019	Interviews villagers
20th of January 2019	Transect 1
21st of January 2019	Transect 2
22nd of January 2019	Interviews villagers Organizing transect data
23rd of January 2019	Organizing transect data

RESULTS

Tree species diversity

The habitat survey encompassed 22 plots, from which 11 were in forested area and 11 were in non-forested area. There were 24 species found in non-forested area and 45 species in forested areas (Appendix I and II, respectively). We observed 8 more species opportunistically outside the plots.

In 2018, 25 species were found in non-forested area and 55 in forested area, which means there is a slightly higher diversity measured in 2018. In non-forested area, there were 15 species encountered in both 2018 and 2019, 11 species only in 2018, and 10 species only in 2019 (Figure 4). In total, 36 species were encountered in non-forested area in the two transects of 2018 and 2019. In forested area there were 21 species that were observed in both 2018 and 2019, 20 only in 2018, and 25 only in 2019 (Figure 5). In forested area, 66 species in total from both 2018 and 2019 were observed.

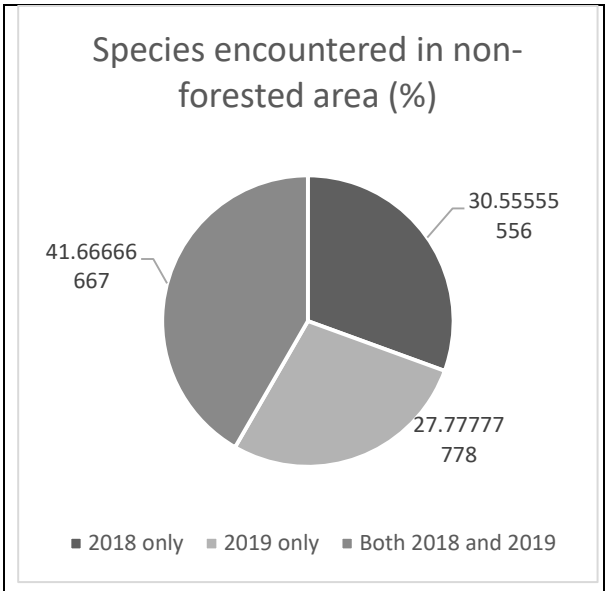

Figure 4: Species encountered in non-forested area over the years 2018, 2019, and in both years.

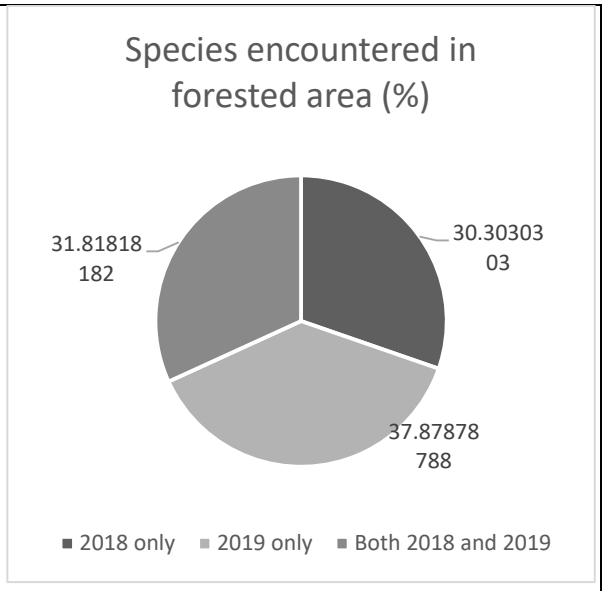

Figure 5: Species encountered in forested area over the years 2018, 2019, and in both years.

Canopy cover

The canopy cover was not normally distributed and showed a significant difference between forested and non-forested area in 2019 (Wilcoxon; $p < 0.001$). Compared to 2018, there seems to be more canopy cover in both forested and non-forested area in 2019, but because of the lack of raw data from last year, this has not been statistically tested (Figure 6).

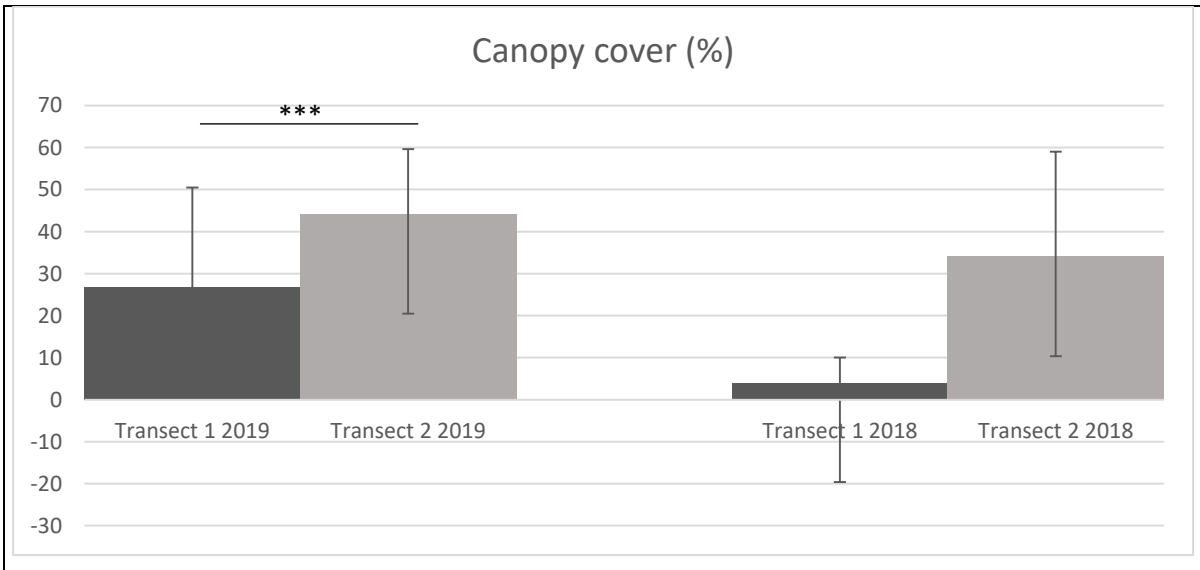

Figure 6 : Canopy cover percentage of the two transects of both 2018 and 2019.

Habitat type

A total of 22 plots were surveyed, yielding five (5) different habitats in both forested and non-forested area. In transect 1, the majority of plots (7) were cultivated and in transect 2, all plots were at some stage of secondary growth forest (Table 2).

Table 2: Different habitat types per transect. T1 represents transect 1 (non-forested), T2 represents transect 2 (forested).

Hapitat Type	**T1**	**T2**
Cultivated	7 (63.6%)	0
Grassland	1 (9.1%)	0
River Bed	1 (9.1%)	0
ESG	2 (18.3%)	9 (81.7%)
ASG	0	2 (18.3%)

Average height, diameter and the architecture of trees

The height of the trees of transect 2 are almost double compared to transect 1 (Table 2). The data of the height of the 5 tallest trees showed a significant difference between transect 1 and 2 (Shapiro-Wilk; $p < 0.05$, Wilcoxon; $p << 0.001$).

The diameter is more than 1.5 times higher in transect 2 than in transect 1 (Table 3). We found a significant difference in this as well (Wilcoxon; $p << 0.001$).

The tree architecture data of transect 2 shows individuals with type C architecture, whereas we did not encounter any such trees at transect 1, which makes transect 2 more diverse in tree architecture (Figure 7). The forested area is significantly different from non-forested area in tree architecture (Chi-squared test; $p << 0.001$).

Table 3: Average height and diameter of the five tallest trees of each plot of transect 1 and transect 2.

	Transect 1	**Transect 2**
Average height (m)	10.9	20.1
Average diameter (m)	20.3	31.4

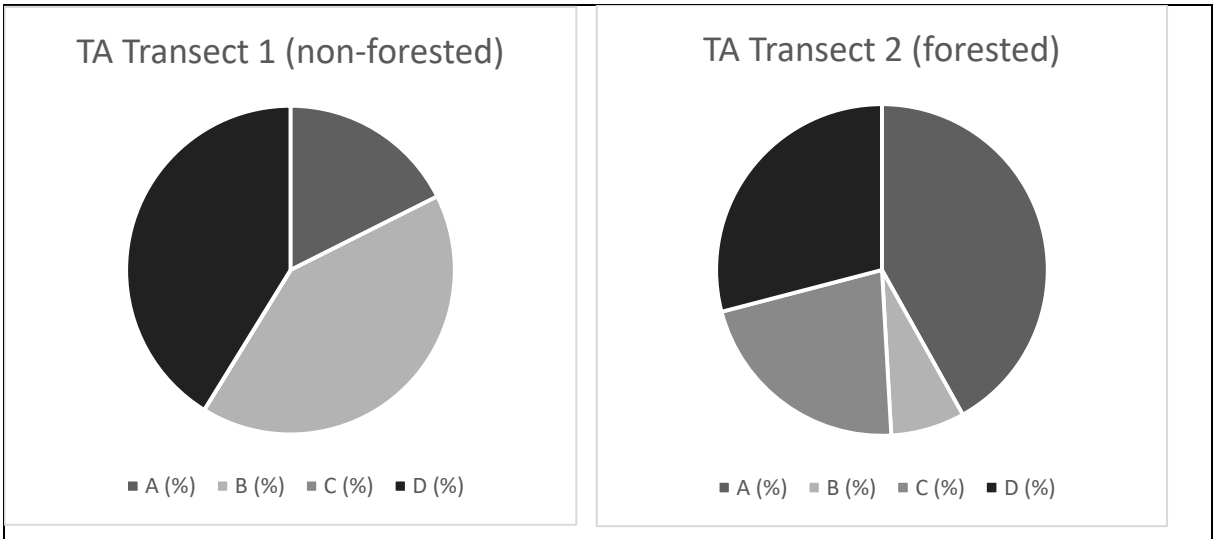

Figure 7: Tree architecture (TA) of forested versus non-forested area, divided in four categories: A, B, C, and D (see also Figure 2).

Interview results

All respondents reported fallen leaves, branches and trees after the typhoon Ompong. One respondent told us the leaves grew back after a month. Five out of 10 respondents reported one or more fallen individuals of *white lauan* (*Shorea contorta*). And also other tree species like *red lauan* (*Shoreane grosensis*), *narra* (*Pterocarpus indicus*), *gmelina* (*Gmelina arborea*), mango (*Mangifera indica.*), *ipil-ipil* (*Leucaena leucocephala*) and coconut were mentioned to have fallen. Damaged or vulnerable trees were said to be *white lauan* (*Shorea contorta*) and *red lauan* (*Shoreane grosensis*) most often, as well as *narra* (*Pterocarpus indicus*).

Some of respondents are aware of the replanting of the trees, in which they get the seedlings around the forest. Some also respond that they just let the forest replenish on its own. Some villagers said the red and white lauan were replanted after the typhoon. One respondent told us that Typhoon Lawin had already damaged some of the trees, which had not been able to regrow now that Typhoon Ompong hit the area.

Respondents use different kinds of tree species for firewood, also fallen branches after typhoons. They also use timber to build house and furniture like, bed, chairs and desks. They get the wood that they use in the non-protected area of the forest, while there is no definite decision on the assignment of a protected area near Blue Waters yet. Respondents also get fruits like citrus fruits, *lumboy* and *uway;* some respondents also sell fruits if there is a lot. They report typhoon Ompong has not influenced the availability of the forest products they use.

DISCUSSION

More species were present according to the survey of 2018, which might suggest there is an effect of Ompong on the species diversity. However, we used a different method to gather data of species diversity: we did not include all the trees in our plots, only the five tallest trees. We did take note of other trees, but we might have missed species this way and could not compare relative abundance. Both surveys (2018 and 2019) found species the other did not, possibly because of Ompong, but it is more likely differences also arose because we took different plots than 2018 and both our sample sizes were small to begin with.

The non-forested and forested area of 2019 have different canopy cover, which makes sense because the non-forested area was mainly cultivated area with no to very little trees at all. The absolute values of canopy cover were higher in both forested and non-forested area between 2018 and 2019, which leads us to speculate that the forest is resilient to typhoon Ompong. This is backed by many respondents that say the forest replenishes on its own and that typhoon Lawin was stronger than Ompong. The canopy cover is not the same as 2018, even being higher. This could be due to small sample size or the researchers not using similar ways of estimating canopy cover. If you argue that canopy cover is an indicator for the health and thus resilience of a forest against typhoons, it seems forested area is more resilient against typhoons. Also, it seems the canopy cover has not changed or even increased, suggesting the area of Blue Waters has resilient vegetation.

The main habitat seems to be early secondary growth forest and cultivated area. Particularly meaningful is the notion that there were two plots in transect 2 that contained advanced secondary forest. This is only present when there has not been a major disturbance to the forest for 50-200 years (Chazdon et al. 2006), also backed by the notion of the people in Blue Waters that trees recover after just one month after a typhoon. This can be taken to mean that Ompong and even Lawin has not been a ‘major disturbance’ and the forest is resilient against typhoons.

Other forms of disturbances that have produced this secondary growth forest like large scale logging and slash and burn agriculture that most often cause secondary forest in the Philippines (Lasco et. al. 2001) seem then not to be present in transect 2, even before logging became illegal in 2002 (The LawPhil Project n.d.). Interesting to note is the belief of the people of Blue Waters that the area is protected already, while this is not yet definite.

We have observed that there is a difference in average height, diameter and tree architecture of the tallest trees when comparing forested and non-forested area. The tallest and thickest trees are the oldest trees and they have probably been logged or cut for converting the land in transect 1 and not in 2 which is believed to be protected area. Because they were so old, it takes a long time to regrow them to their original size in the non-forested area. The conditions to do so may also not be favorable in non-forested area. The tree architecture is more diverse in transect 2 probably because there are also more different species there. We also have investigated more trees in transect 2.

When comparing the interview results with the survey results, it is interesting to note that half of the people said they knew of white lauan (*Shorea contorta*) that had fallen down or knew it was vulnerable to typhoons. This is a critically endangered species and is one of the five tallest trees that we encountered in our plots two times, both in forested area. This might be helpful information for the management of the forest and the conservation of the white lauan, which fruits are also used by the community.

Overall it seems that the forested area is more diverse in community and structure than non-forested area. We have also provided additional information to the flora assessment of 2018. There are also indicators of resilience to typhoon Ompong, particularly of the forested area with higher canopy cover, fast recovery rate mentioned by the people of Blue Waters, and the presence of advanced secondary growth forest.

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We like to extend our endless thank you to the Local Government Unit of the Municipality of Baggao, for allowing us to conduct our research in Barangay Pallagao, Sitio Blue Waters. To the Barangay Captain for welcoming us in his barangay. To Mr. Toto Porteo for welcoming us in his house and for making us feel very comfortable during our fieldwork. To Mr. Bernard for guiding us until we finished the two transects. And for all the residents of Pallagao, Blue Waters for letting us enjoy the nice and lovely place of yours.

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APPENDICES

Appendix I: Species list non-forested area (T1)

	Local name	**CS**	**Scientific Name**	**Family name**
1	Mango**		*Mangifera indica*	Anacardiaceae
2	Pahutan*^	VU	*Mangifera altissima*	Anacardiaceae
3	Guyabano**		*Annona muricata*	Annonaceae
4	Rattan		*Calamus sp.*	Arecaceae
5	Narra	VU	*Pterocarpus indicus*	Dipterocarpaceae
6	Dao		Dracontomelon dao	
7	Bugnay		*Antidesma bunius*	Euphorbiaceae
8	Binunga		*Macaranga tanarius*	Euphorbiaceae
9	Takip-Asin*^	VU	*Macaranga grandifolia*	Euphorboiaceae
10	Alagaw		*Premnao dorata*	Lamiaceae
11	Sablot		*Litsea glutinosa*	Lauraceae
12	Santol		*Sandoricum koetjape*	Meliaceae
13	Balete		*Ficus benjamina*	Moraceae
14	Tangisang bayawak		*Ficus variegata*	Moraceae
15	Is-Is		*Ficus sp*	Moraceae
16	Tibig		*Ficus nota*	Moraceae
17	Hauili		*Ficus septica*	Moraceae

	Local name	CS	Scientific Name	Family name
18	Malamakopa		*Syzygium sp.*	Myrtaceae
19	Guava		*Psidium guajava*	Myrtaceae
20	Kamias		*Averrhoa bilimbi*	Oxalidaceae
21	Coconut		*Cocos nucifera*	Palmae
22	Pomelo		*Citrus maxima*	Rutaceae
23	Ipil-ipil		*Leucaena leucocephala*	Mimosaceae

Appendix II: Species list forested area (T2)

	Local Name	CS	Scientific Name	Family Name
1	Tangisang Bayawak		*Ficus variegate*	Moraceae
2	Avocado		*Persea Americana*	Lauraceae
3	Dita		*Alstonia scholaris*	Apocynaceae
4	White lauan*^	CR	*Shorea contorta*	Dipterocarpaceae
5	Bagtikan		*Parashorea malaanonan*	Dipterocarpaceae
6	Narra		*Pterocarpus indicus*	Dipterocarpaceae
7	Red lauan*^	CR	*Shorea negrosensis*	Dipterocarpaceae
8			*Tetrameles sp.*	*Tetramelaceae*
9	Takip-asin*^	VU	*Macaranga grandifolia*	Euphorboiaceae
10	Yemane**		*Gmelina arborea*	Lamiaceae
11	Rattan		*Calamus sp.*	Arecaceae
12	Molave	VU	*Vitex parviflora*	Lamiaceae
13	Tibig		*Ficus nota*	Moraceae
14	Antipolo*^	VU	*Artocarpus blancoi*	Moraceae
15	Hauili		*Ficusseptica*	Moraceae
16	Bolong-eta		*Diospyros pilosanthera*	Henaceae
17	Kamias		*Averrhoa bilimbi*	Oxalidaceae
18	Kamagong	CR	*Diospyros blancoi*	Ebenaceae
19	Dapdap		*Erythrina variegate*	Leguminosae
20	Philippine Ebony		*Diospyros ferrea*	Ebenaceae
21	Apitong^	CR	*Dipterocarpus grandiflorus*	Dipterocarpaceae
22	Mayapis^	CR	*Shorea palosapis*	Dipterocarpaceae
23	Tindalo*^	VU	*Vitex parviflora*	Fabaceae
24	Kalingag		*Cinnamomium sp.*	Lauraceae
25	Kalantas*		*Toona calantas*	Meliaceae
26	Niog-niogan*		*Ficus pseudopalma*	Moraceae
27			*Artocarpus nitidus*	Moraceae
28	Hagimit		*Ficus minahassae*	Moraceae
29	Malabayabas		*Tristaniopsis decortita*	Myrtaceae
30	Wild citrus/Kaburaw		*Citrus sp.*	Rutaceae

	Local Name	CS	Scientific Name	Family Name
31			*Palaqium sp.*	Sapotaceae
32	Red Nato	VU	*Palaquium luzoniense*	Sapotaceae
33	Puri-puri*		*Teijsmannio dendronahernianum*	Verbenaceae
34	Kalantas*		*Toona calantas*	Meliaceae
35	Wild citrus		*Citrus sp.*	Rutaceae
36	Alagaw		*Premna odorata*	Lamiaceae
37	Yemane**		*Gmelina arborea*	Lamiaceae
38	Kakawate**		*Gliricidia sepium*	Fabaceae
39	Star apple/Caimito**		*Chrysophyllum caimito*	Sapotaceae
40	Bignay		*Antidesma bunius*	Euphorbiaceae
41	Sinaguelas**		*Spondias purpurea*	Anacardiaceae
42	Tiger grass**		*Thysanlaena latifolia*	Poaceae
43	Langka		*Artocarpus hetorophyllus*	Moraceae
44	Mahogany		*Swietenia macrophylla*	Meliaceae

Appendix III: Questionnaire ecological impact Ompong

Personal information

Number

Name

Age

Sex

Occupation

Ecological impact questions

How did the trees look like after Ompong?

Were there trees that fell down and what kind of trees?

What are the fallen trees and branches used for?

Are the trees that fall down replanted?

Do you know what agroforestry is?

Is agroforestry practised around here?

What forest products do you normally use?

Has this changed after Ompong?

THE IMPACT OF TYPHOON MANGKHUT/OMPONG ON RELATIVE BIRD SPECIES DIVERSITY AND ABUNDANCE IN SITIO BLUE WATERS BAGGAO.

Philippe Dols and Dane Christian P. Tuliao

INTRODUCTION

Theoretical framework

Typhoons of certain strengths can have devastating effects on ecosystems because of for example deforestations by typhoons (Lin et al. 2011). Earlier researches showed that a significant relationship between cyclonic event pressure or distance and species abundances is possible (James et al. 2012*)*. Forest areas which are exposed frequently to typhoons are also known for having an increased vegetation resilience (Lin et al. 2011). This destroyed vegetation could possibly form fundamental habitat for birds living in this area. The fact that animals largely depend on their habitat for existence means that a destruction of their habitats by for example a typhoon can result in a decreased abundance of animals in that area. There is also a possibility that the relative species abundance is barely impacted by typhoon Ompong due to for example a high recovery rate because of a high resilience. Another possible effect of typhoons on bird abundance is that the hunting rate on birds by humans is increased in the timespan around typhoons (Esselstyn et al. 2009).

The research area

Sitio Blue Waters, the area in which we will conduct our research is part of the Barangay Pallagao in the municipality Baggao, located in Northeast Luzon. The area exists of forests cultivated lands, pasture and grasslands. Previous inventories indicated that the area has a high bird species richness, 61 different bird species where observed and among them where endemic and endangered species (Van der Stelt 2018). Another characteristic of the area is that it must deal with a high number of typhoons. The most recent typhoon was Typhoon Mangkhut in September 14-15, 2018, a signal 5 typhoon with winds that topped 240 km/h in Luzon. Mangkhut caused several mudslides and killed at least 81 people in the Philippines (Washington post 2018).

RESEARCH QUESTIONS

Main question

- Did the bird species diversity, species composition and species abundance in Blue Waters area significantly change since exactly one year ago, possibly because of the destructive impacts of typhoon Mangkhut in September?

Sub-questions

- Did the local community observe significant increase in bird migration and mortality or non-ordinary bird behavior at time around the typhoon Mangkhut?
- Did the hunting rate on birds increase or was non-ordinary bird behavior observed in the time around a typhoon?

METHODS

To draw a reliable conclusion, we tried to stimulate the research techniques used in the previous survey as much as possible. We did this by using the same intersect method and location, same period and same moments of the day as the survey conducted in 2018. In this way, we tried to exclude research bias.

Transect point counts

The intersect method which was performed last year and which we replicated exist of a point count on two transect walks located near a non-forest area and the other in the vast forest. Both walks were done in the morning from 6 am to 10/11 am because the chance of spotting birds is the highest in the early morning. Both walks had a length of 1 kilometer and every 100 meters of this transect walk a point count was performed in which we did visual and acoustic identifications of bird species for exactly 10 minutes. At every point, we listed the English species name, the time, the number of individuals and activity of every bird seen or heard by one of us.

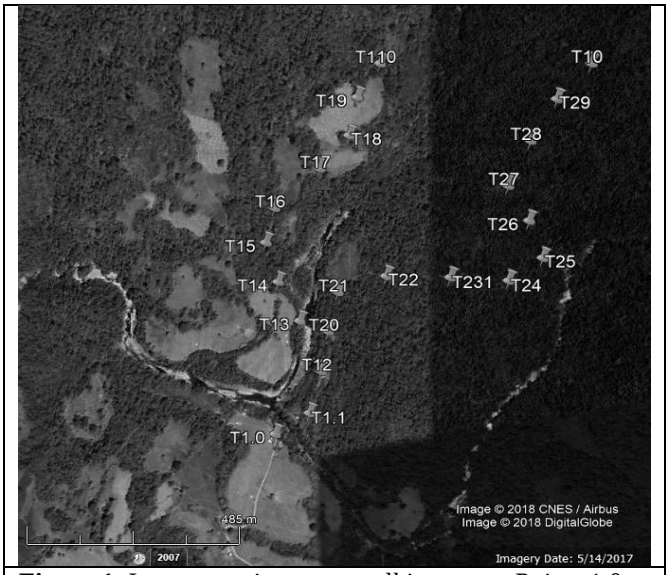

Figure 1. Intersect point count walking route. Points 1.0 to 110 is transect walk 1. Points 20 to 10 is transect walk 2.

Opportunistic counts

This opportunistic count method performed during our free time since the goal of the research was to see birds as many as we could. This method helped and provide us as an additional knowledge about the existence of the birds in Blue Waters. All birds encountered, heard or seen were done in between points or outside of the respective transects of points.

Species identification

For identifying specific bird species, we practiced bird spotting before the start of our survey. This was done by making use of a bird guide book, trainings and expertise of the members of the Mabuwaya Foundation, mainly Jouel who assisted us in the actual survey. Our focus was not only on real sightings of birds but also on vocal identifications as bird singing is species specific and indicate the presence of the birds in the area.

Interviews

Next to the bird survey we interviewed the inhabitants of Blue Waters and tried to find out if non-ordinary bird behavior and increased mortality have been witnessed by them. We asked the citizens if they experienced some notable bird behavior around the time of typhoon Mangkhut. We also asked the citizens if they saw an increase of bird corpses in the Blue Waters area after the typhoon. Lastly, we asked the respondents if they increased the hunting rate at the time around a typhoon. During this interview, we used lists with images of bird species living in the Blue Waters area to give the interviewed citizens the possibility to point at specific species. We asked them how familiar they are with the Isabela Oriole (*Oriolus isabellae*) by simply describing it. In this way, we can also hopefully draw a bird species specific conclusion.

Data Comparisons

To draw a conclusion on the data collected from our survey, we did a data analysis. We calculated the relative abundance per species by dividing the number of spotted individuals per species by the total number of intersect point counts, 44 in total. The relative abundance of the bird species found in both surveys, we compared the common species with each other to indicate if the populations increased or decreased. We also created lists of the bird species which were not observed in the other survey. We used the data gained from the interviews to find out if there is a significant amount of noticed non-ordinary bird behavior, mortality or hunting rate.

Table 1: Time Schedule

Day	Date	Activities
Friday	18 January	Travel to Baggao, Cagayan, visiting the municipal hall of Baggao and have an interview with MENRO, meet our host family.
Saturday	19 January	Trial transect walk and observation in the area which also served as an opportunistic bird survey, visiting the lagoon in the afternoon.
Sunday	20 January	Transect walk 1, arranging information in the afternoon, in the evening discussing progress with the group. evening: Interviewing the household family.
Monday	21 January	Transect walk 2, resting in the afternoon and arranging information, conducting one interview with one of the inhabitants of Pallagao. Meeting with the other participants and team leaders (Sir Jouel and Sir Bernard) for the research updates. afternoon: Interview session
Tuesday	22 January	Reverse transect walk 1, arranging information, bird survey in the afternoon for the opportunistic survey. afternoon: opportune time interview.
Wednesday	23 January	Reverse transect walk 2, after our last transect walk the whole group of this activity prepared some kind of simple *despedida* party for the house families.
Thursday	24 January	Going back to the ISU Cabagan campus via Municipal Office of Baggao, Cagayan. Meeting Session with the Mayor and the MENRO of Baggao.

RESULTS

Table 2. Results of bird surveys in 2018 and 2019 along two transects in Blue Wayters, Baggao

	2018	**2019**
Species diversity*	61	61
Total counts of individuals	437	425
Unspotted birds compared to other survey	25	25
Species coverage	59% (36)	59% (36)
Decreased sp. rel. abundance.	-	22
Increased sp. rel. abundance.	-	13
Neutral sp. rel. abundance	1	1
Not completely identified individuals	40 (3 categories)	79 (10 categories)
Observed threatened species	3	2
Endemic species observed	42	30
No. of individual possible same species but incompletely identified	3	47

**Sometimes species were not completely identified*

Approximately four months after typhoon Mangkhut took place in Blue Waters area, we spotted 36 of the same species as the bird survey exactly one year ago or approximately eight months before typhoon Mangkhut took place in Blue Waters area. We reached a coverage of 59% from the total 61 different observed species in both surveys. In our survey, we observed 12 individuals less than the survey of 2018. The number of different species and the number of non-common species are the same in both surveys. In 79 cases, we were not capable of completely identifying the full species name. We sorted the incompletely identified species into

10 categories. In our survey, we had 39 more individuals and seven more categories of incompletely identified species compared to the 2018 survey. 22 of the commonly observed species decreased in relative abundance in our survey compared to the 2018 survey. On the other side, of the 13 commonly observed species the relative abundance increased compared to the survey of 2018. In total, there are nine more species which decreased in relative abundance in our survey compared to the 2018 survey. In one case, the relative abundance of the commonly observed species did not change. In our survey, we spotted one threatened species and 12 endemic species less compared to the 2018 survey.

Interview results

We conducted conversational interviews in the afternoon with five respondents by simply asking if the hunting rate of birds increased after the typhoon Mangkhut happened, if there is any non-ordinary bird behavior before the typhoon occurred, how long it took, what kind of tools they usually use in hunting birds, why they hunt birds and for what purpose, and as special information about the Isabela Oriole (Oriolus isabellae), how familiar they are about Isabela oriole by simply describing the distinguishing characteristics or physical appearance of it. And show them the pictures afterwards.

Photo 1. Philippe Dols holding an airgun used for bird hunting (Photo by D Tuliao, January 2019)

As a result of this successful interview, we found out that most of them are hunting birds in their extra time using air gun or slingshot for food purposes but not by selling it to earn money to cover out the cost after the typhoon happened. Bird hunting has existed since the ‘80s as said by our first respondent, and most of them also said that hunting of birds eventually stopped because of the Mabuwaya Foundation. They also said that Jony Acay (Mabuwaya foundation staff) shared her knowledge about the importance of birds, the disadvantage of hunting birds, and they finally found that hunting of birds is not good since Blue Waters is a protected area. Nowadays, they are already regulating and practicing "NO to hunting birds" two years ago.

Overall, the rate of hunting birds has not changed before and after the typhoon because they were busy in fixing and repairing the structure of their houses. They also observed the normal population of birds has decreased due to the impact of the typhoon. Nonetheless, some of the respondents believed that the normal population of birds will restore after one week to one month.

In terms of bird behavior, all the respondents observed that the birds gathered and were noisy between one hour and 3 days before the typhoon. Loss of habitats will eventually affect the birds; there is a possible mortality since birds are dependent on their habitat because most of the birds in Blue Waters are endemic.

To describe the physical appearance of the Isabela oriole by our respondents, all of them said it is yellow in color and whenever they spot it they are in pairs and happy that one of the respondents said that when Jony Acay conducted the bird survey, he accompanied her and they are lucky that during their bird survey they had seen six Isabela orioles and they named it *"Kiaw"*.

CONCLUSION AND DISCUSSION

In general, we can conclude that we reached a large coverage of the 2018 survey. Slightly more than half of our total observed species diversity are in common with the 2018 survey.

Because we have 79 incompletely identified bird species, the total coverage can be higher than 59%. For example, 37 individuals of the Rufous-crowned Bee-eater were completely identified in 2018 but not in our survey. Same number of Red-keeled Flowerpeckers were identified in 2018 and the Brown-throated Sunbird was identified in 2019. The weather pattern can also play a big role in our results, at the first few days of our fieldwork and during our transect walks we noticed that bird species became less active during rainfall.

However, the fact that we conducted our survey at the exact same time of the year as the 2018 survey gives us a good indication of the species diversity and relative abundance changes. Besides, we used the same transect walking route as the 2018 survey; hence, this also results in a reliable survey comparison as birds are often territorial and mostly found in their specific habitat. A remarkable result in our research is that the number of decreased relative abundance compared to last year is higher than the number of increased species abundance compared in 2018. This difference in relative abundance can indicate a decrease of population size of at least 22 species in the blue waters area because of typhoon Mangkhut. This can mean that many species are vulnerable to typhoons while the other 13 species of which the relative abundance increased possibly could benefit from the typhoon impact. 41% of the total number of different species in 2018 that are not observed in 2019 are possibly the most vulnerable to typhoons and where not capable of repopulating their original damaged habitat. The 41% of the total number of different species in 2019 that where not observed in 2018 could possibly benefit the most of the typhoon impact and even prevent the repopulation of the original species by populating the habitat of the original bird species. One possible explanation of this difference is that some species depend more on their damaged habitat then others or have habitats that are more resistance/resilience against typhoons. For example, vast forest areas are possibly more vulnerable to typhoon damage then open areas, in this way the habitats of forest species are more impacted by typhoons then the habitat of open area species. The fact that we observed a high number of swiftlets compared to the 2018 survey, could be the result of their possibility to find a strong shelter during typhoons, swiftlets are commonly found in caves. The impact of hunting on birds is something we can exclude in our conclusion as all our respondents told us that their hunting activities stopped two years ago. The fact that the answers of the respondents indicates that some species start hiding or even migrate for the typhoon happens can mean that some species are capable to cope with typhoons. Next to the pre-typhoon behavior, most of the respondents told us that in the period after a typhoon a significant decrease in bird populations was observed. This after-typhoon observations can indicate that most bird species are indeed impacted by typhoons to certain extent.

In our opportunistic survey, we observed 8 species which we did not observe during our point counts. The opportunistic survey indicates that the total species diversity in blue waters area is higher than the diversity we found in the point count survey. Some species we observed in the bird survey could possibly falsely observed or mistaken for another bird species. Our survey is conducted by three different observers compared to the 2018 survey, this can also result in observer bias.

Photo 2. A critical endangered Isabella oriole perching on a branch at intersect point T1.08 (agro-forest area) (Photo by P Dols 2019)

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APPENDICES

Table 3. Survey results, sorted by the difference in species abundance in 2019 compared to the 2018 survey (from more abundant to less abundant).

Common Name	**Scientific Name**	**red list**	**Stat**	**End**	**No 18**	**No 19**	**AVG /PC 18**	**AVG /PC 19**	**diff**
Pygmy Swiftlet	*Collocalia troglodytes*		R	P	19	89	0.431	2.022	1.590
Grey Wagtail	*Motacilla cinerea*		M		2	22	0.045	0.5	0.454
Coleto	*Sarcops calvus*		R	P	2	18	0.045	0.409	0.363
Ashy Minivet	*Pericrocotus divaricatus*		M		15	25	0.340	0.568	0.227
Red-crested Malkoha	*Dasylophus superciliosus*		R	GL	6	13	0.136	0.295	0.159
Bar-bellied Cuckooshrike	*Coracina Striata*		R		2	8	0.045	0.181	0.136
White-breasted Wood-Swallow	*Artamus leucorynchus*		R		3	8	0.068	0.181	0.113
Philippine Pygmy Woodpecker	*Picoides maculatus*		R	P	1	6	0.022	0.136	0.113
Blue-tailed Bee-eater	*Merops philippinus*		R		8	11	0.181	0.25	0.068
Northern Rufous Hornbill	*Buceros hydrocorax*	VU	R	GL	1	4	0.022	0.090	0.068
Northern Rufous Paradise-Flycatcher	*Terpsiphone unirufa*		R	NP	1	2	0.022	0.045	0.022
Brown Shrike	*Lanius cristatus*		M		1	2	0.022	0.045	0.022
Philippine Fairy Bluebird	*Irena cyanogaster*	NT	R	P	2	3	0.045	0.068	0.022
Blackish Cuckoo Shrike	*Coracina coerulescens*		R	GL	1	1	0.022	0.022	0
Northern Indigo-banded Kingfisher	*Ceyx cyanopectus*		R	NP	2	1	0.045	0.022	-0.022
Spotted Kingfisher	*Actenoides lindsayi*		R	P	2	1	0.045	0.022	-0.022
Pygmy Flowerpecker	*Dicaeum pygmaeum*		R	P	2	1	0.045	0.022	-0.022
Philippine Coucal	*Centropus viridis*		R	P	9	8	0.204	0.181	-0.022
Coppersmith Barbet	*Megalaima haemacephala*		R		4	3	0.090	0.068	-0.022
Northern Black-and-White Triller	*Lalage melanoleuca*		R	NP	4	3	0.090	0.068	-0.022
Balicassiao	*Dicrurus balicassius*		R	P	10	8	0.227	0.181	-0.045
Yellow-wattled Bulbul	*Pycnonotus urostictus*		R	P	3	1	0.068	0.022	-0.045
Orange-bellied Flowerpecker	*Dicaeum trigonostigma*		R		3	1	0.068	0.022	-0.045
Kamchatka Leaf-warbler	*Phylloscopus examinandus*		M		4	1	0.090	0.022	-0.068
White-lored Oriole	*Oriolus albiloris*		R	L	5	1	0.113	0.022	-0.090
Blue-headed Fantail	*Rhipidura cyaniceps*		R	P	7	2	0.159	0.045	-0.113
Colasisi	*Loriculus philippensis*		R	P	16	11	0.363	0.25	-0.113
White-browed Shama	*Kittacincla luzoniensis*		R	P	11	5	0.25	0.113	-0.136

Common Name	Scientific Name	red list	Stat	End	No 18	No 19	AVG /PC 18	AVG /PC 19	diff
White-throated Kingfisher	*Halcyon smyrnensis*		R	P	11	4	0.25	0.090	-0.159
Yellow-vented Bulbul	*Pycnonotus goiavier*		R		8	1	0.181	0.022	-0.159
House Swallow	*Hirundo tahitica*		R		13	5	0.295	0.113	-0.181
Isabela Oriole	*Oriolus isabellae*	CR	R	L	11	3	0.25	0.068	-0.181
Green Imperial Pigeon	*Ducula aenea*		R		16	4	0.363	0.090	-0.272
Green-backed Tailorbird	*Orthotomus chloronotus*		R	L	24	9	0.545	0.204	-0.340
Luzon Hornbill	*Penelopides manillae*		R	GL	20	5	0.454	0.113	-0.340
Philippine Bulbul	*Hypsipetes philippinus*		R	P	62	29	1.409	0.659	-0.75

Table 4. Species observed in 2018 but not in 2019

Common Name	Scientific Name	red list	Stat	End	No	AVG/PC 18
Philippine Bush-hen	*Amaurornis olivacea*		R	P	1	0.027
Cream-bellied Fruit-Dove	*Ramphiculus merrilli*	NT	R	GL	1	0.027
Yellow-breasted Fruit-Dove	*Ramphiculus occipitalis*		R	P	1	0.027
Black-chinned Fruit-dove	*Ramphiculus leclancheri*		R	NE	1	0.027
Uniform Swiftlet	*Collocalia amelis*		R		1	0.027
Stripe-headed Rhabdornis	*Rhabdornis mystacalis*		R	P	1	0.027
Grey-streaked Flycatcher	*Muscicapa griseisticta*		M		1	0.027
Crake sp.					1	0.027
Blue-breasted Blue-Flycatcher	*Cyornis herioti*	NT	R	GL	2	0.045
Black-naped Monarch	*Hypothymis azurea*		R		2	0.045
Yellow-bellied Wristler	*Pachycephala philippinensis*		R	P	2	0.045
Sunbird sp.					3	0.068
White-eared Brown-Dove	*Phapitreron leucotis*		R	P	3	0.068
Luzon Striped Babbler	*Zosterornis striatus*	NT	R	L	3	0.068
Lemon-throated Leaf-Warbler	*Phylloscopus cebuensis*		R	P	3	0.068
Philippine Serpent Eagle	*Spilornis holospilus*		R	P	4	0.090
North Philippine Hawk- Eagle	*Nisaetus philippensis*	EN	R	NP	4	0.090
Rufous-crowned Bee-eater	*Merops viridis*		R	P	4	0.090
Golden-crowned Babbler	*Sterrhoptilus dennistouni*	NT	R	L	4	0.090
Thick-billed Flowerpecker	*Dicaeum agile*	LC	R		5	0.113
Yellowish White-eye	*Zesterops nigrorum*		R	P	7	0.159
Rufous Coucal	*Centropus unirufus*	NT	R	GL	10	0.227
Red-keeled Flowerpecker	*Dicaeum australe*		R	P	10	0.227
Philippine Green Pigeon	*Treron axillaris*		R	P	16	0.363
Swift sp.	-		-	-	36	0.818

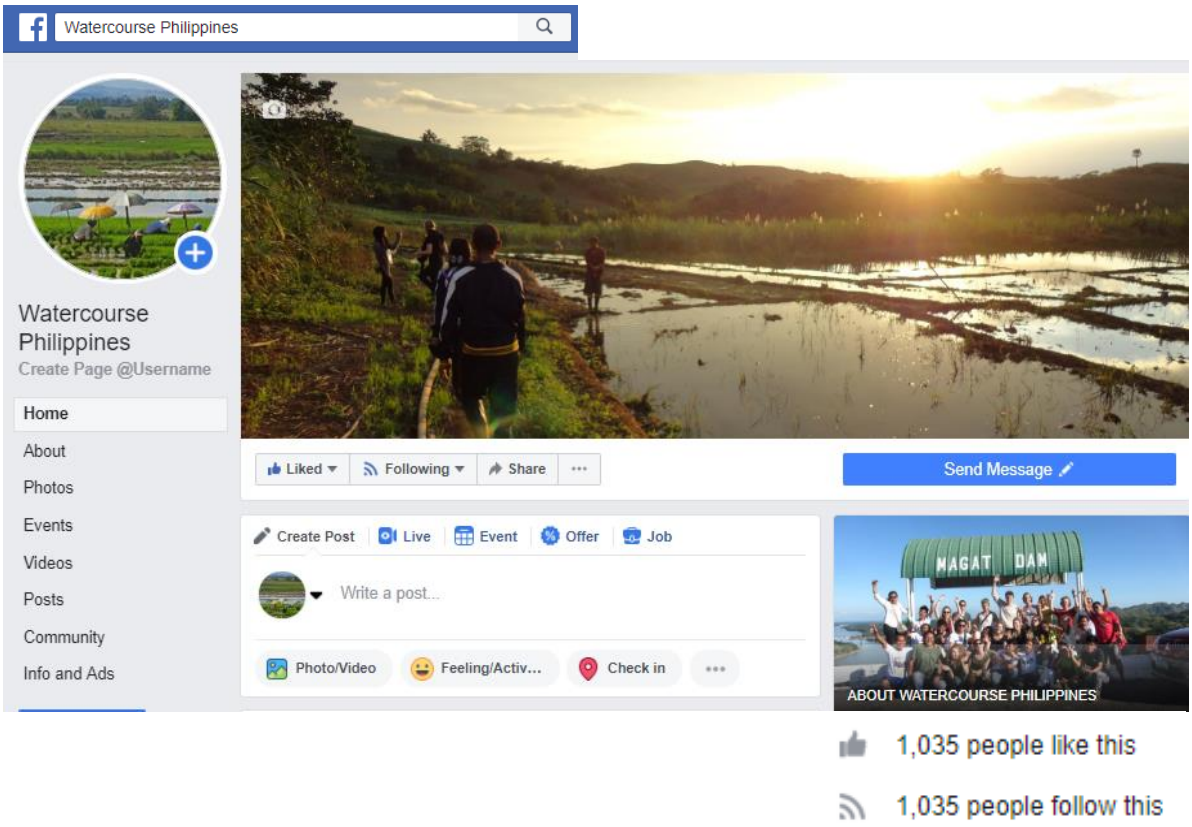
Table 5. Non-common species observed in 2019

Common Name	Scientific Name	red list	Stat	End	No	AVG/PC 19
Metallic-winged Sunbird	*Aethopyga pulcherrima*		R	P	1	0.022
Intermediate Egret	*Ardea intermedia*		R/M		1	0.022
Green-backed Heron	*Butorides striata*		R/M		1	0.022
Grey-faced Buzzard	*Butastur indicus*		M		1	0.022
Philippine Serpent-eagle	*Spilornis holospilus*		R	P	1	0.022
Barred Rail	*Hypotaenidia torquata*		R		1	0.022
Common Emerald Dove	*Chalcophaps indica*		R		1	0.022
Lesser Coucal	*Centropus bengalensis*		R		1	0.022
Hornbill sp.					1	0.022
Naked face spider hunter					1	0.022
swallow sp.					1	0.022
woodpecker sp.					1	0.022
Red Turtle-dove	*Streptopelia tranquebarica*		R		2	0.045
Scale-feathered Malkoha	*Lepidogrammus cumingi*		R	GL	2	0.045
Philippine Trogon	*Harpactes ardens*		R	P	2	0.045
Mountain Shrike	*Lanius validirostris*	NT	R	P	2	0.045
Brown-throated Sunbird	*Anthreptes malacensis*		R		2	0.045
Crow sp.					2	0.045
Flowerpecker sp.					2	0.045
sunbird sp.					2	0.045
Black-naped Oriole	*Oriolus chinensis*		R		3	0.068
Guaiabero	*Bolbopsittacus lunulatus*		R	P	6	0.136
tailorbird sp.					7	0.159
bee eater sp.					25	0.568
Swiflet sp.					37	0.840

Table 6. Opportunistically observed species in 2019

Common Name	Scientific Name	red list	Stat	End	No
Eastern Yellow Wagtail	*Motacilla tschutschensis*		M		1
Brahminy Kite	*Haliastur indus*		R		1
Spotted Imperial-pigeon	*Ducula carola*	VU	R	P	2
Buzzing Flowerpecker	*Dicaeum hypoleucum*		R	P	1
Spotted Dove	*Spilopelia chinensis*		R		1
Grey Heron	*Ardea cinerea*		M		1
Philippine Green-pigeon	*Treron axillaris*		R	P	12
White-eared Brown-dove	*Phapitreron leucotis*		R	P	1

Facebook blog Water Course Philippines 2019



Our Story

WATERCOURSE PHILIPPINES

Every year in January, since 2011, the international course on water and water management ("the water course", renamed as 'Area Study Philippines" in 2018) is organised in the Philippines. 30 students participate in this one month course: 15 European students through Leiden University and 15 Philippine students through Isabela State University. The students visit (inter)national organisations in Manila and surroundings to learn more about environmental issues. In Cagayan Valley, multi-displinary, intercultural teams conduct a short field study on themes related to water management, environmental conservation and sustainable development. The goal of the course is for students to learn about global issues regarding sustainable development and environmental conservation and to gather practical experience with fieldwork and working in interdisciplinary, international teams. The courses the students follow are diverse and include anthropology, biology, forestry, agriculture, business management, international studies and civil engineering among others.

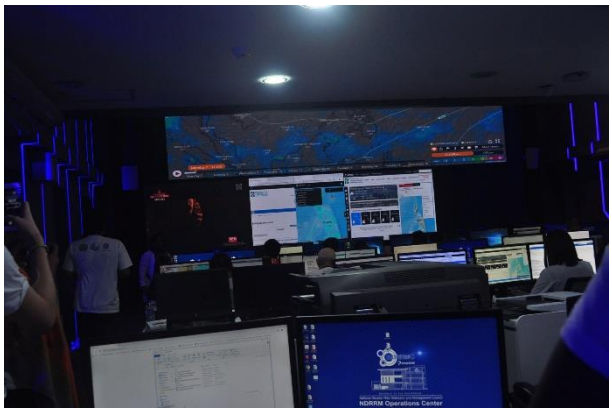
How Joke experienced the first day of the Area Study Philippines on 6 January 2019:
We started today with a nice breakfast at the hostel, and after that we did some introduction games to get to know each other. This really encouraged the mingling between the Dutch and Philippine students! After that, we went on a city tour through Manila, and learned about the history and the culture. I was impressed by the colonial history of the country and learned a lot new things. We walked around a lot and were happy to find out that we could have a lunch at the better MacDonald's of the Philippines: Jollibee! Happy with some food in our bellies, we went to the National History Museum and the National Anthropology Museum. The first one I liked the most, for it was more interactive. We closed the day off with a very nice dinner at the Harbor Restaurant. The sunset was amazing and the food was very nice. Also the desert that looked like a green napkin at first sight was really good! It was a busy but very nice first day!

How Justin experienced the first day of the Area Study Philippines on 6 January 2019:
This day, we visited a lot of beautiful places in Manila. We visited first the Luneta Park, where the most popular monument or statue of Rizal is located. We saw a lot of people not only Filipino but there's a lot of Foreigners also. It is a really popular tourist spot in the Philippines. Aside from that, we also went to Intramuros, it is an amazing place, a very historic and unforgettable place I've been. I'd really love to bring my family there someday. The next stop is the National museum, and it is very big! A day is not enough to tour around the museum. I've got to look a lot of preserved plants, bones, animals and so on. Lastly, my favourite part is when we ate at Harbor View Restaurant, it has a really nice view of the sunset and ocean and also the buildings at night, but most of all the foods are delicious. It was an unforgettable experience, I got to mingle with new friends even though I'm still a bit shy, we get to know each other, we have fun and I made another beautiful memory that I can keep and cherish 'til I get older.

How Jeffrey experienced a day of the Area Study Philippines on January 7 2019:
Goede dog! (Good day! in Dutch) . Another long and exciting day. Today we will be going to visit two of the very important organizations that has the role to role of saving lives during calamities and disasters, it is the National Risk Reduction Management Council (NDRRMC) and Philippine Red Cross (PRC). We are advised to wear a formal attire because it's well known organization. So we woke up early because we must meet 8 AM sharp. So, we first went to the main office of National Risk Reduction Management Council (NDRRMC). Their office is located inside Camp Aguinaldo. Actually it's my first time to visit inside Camp Aguinaldo, so I'm quite excited to visit the camp.When we enter the building of NDRRMC, they are quite in a hurry because they raised a blue alert which means there is potential hazard that they have detected. They taught us that there were two kinds of alert, the red and blue alert. So they conduct a lecture regarding disaster preparedness and how they are going to handle a potential hazards and disasters. Actually we learned a lot from the lectures that they gave us, and they also gave us a tour on their action center and other facilities they have in their building. After that the next organization that we visited was Philippine Red Cross (PRC). They are quite the same with NDRRMC in such a way that they are the organizations that preparing and helping

people for the incoming disasters. But the difference between NDRRMC and PRC is that PRC is a neutral organization meaning it is not affiliated with the government and other groups. But in times of disaster they join forces to bring relief to the affected families and individuals. All in all this is a great day because I learned a lot of things. And at last best thing to end the day. A DINNER! We went to the Vikings located at Mall of Asia grounds to have a dinner. Actually I'm expecting that this is buffet restaurant but I didn't expect that lot of choices ranging from Asian cuisine to Japanese food to European food. This is awesome! I'm bloated when we finished eating because I taste every food that i can see and it's delicious. All in all this day is both awesome and tiring but it's worth it!

How Iris experienced a day of the Area Study Philippines on January 7 2019:
Today we've had a very informative day. First we went to the National Disaster Reduction Risk Management Council, which was very interesting! We got a tour through the building and got a lecture on disaster reduction risks and how to deal with disasters, by the government and the locals themselves. After this we went to the Red Cross. Here we had several lectures on how the organisation was founded and all the things they do for the Philippines. It was a very interesting day and we got a lot of information from these organisations. After this we went to the Asian Mall, which is the biggest mall in Asia. To end the day properly we went to the vikings, an all you can eat restaurant in Manila. Here we all got to experience all different kinds of food from different parts of the world! We had a great time here and this was a very nice ending to this inspiring day!



How Maurits experienced a day of the Area Study Philippines on January 8 2019:
To the mountains. They say that every hero has a mountain to climb. Hercules climbed mount Olympus and Mozes went up the Sinaï. Today our journey to the mountains started. Leaving the comfort of Manilla armed with backpacks we went to Imugan. Songs of victory where sang, mostly karaoke. Provisions where bought, mostly chips. We were ready to go. On top of our mount, the jeepney, we went up. Through corners, over bridges and past cliffs. Nearly falling off, we held on to our dear lives. Did we lose one? Number 11, 15 or 32? I think we made it all. Victory was ours. We had arrived at the land of milk and honey. Green mountains and valleys, waterfalls and jungle. Today was a good day, but how to use these damn toilets

How Rina experienced a day of the Area Study Philippines on January 8 2019:
On this day, we take off to Manila and we went to Imugan. I think on this day we really know each other, like some of us have already talked about subjective information in our lives. When we are riding on the bus some of us sung a song and I think that is an indication that we are already comfortable to each other. This is the most enjoyable and cheerful trip that I experienced. We finally arrived in Imugan at 5pm and I experienced the coldest weather. I put on my 2 jackets and drink coffee time to time. At night, we had a lecture from Merlijn about the topics until 9pm. I'm very happy that I am really belong to this group and being educated by our coordinator and instructor. And I met Alyssa also as my partner for our research study. I'm really glad for it!

How John Paul experienced a day of the Area Study Philippines on January 9 2019:
Journey to the Northern Mountains.....The day started with a short lecture about the indigenous peoples here in the Philippines. Followed by introduction of what is Ikalahan Foundation is. The lectures focused on the preservation and proper use of nature since the place, Imugan has located at the middle of the Caraballo Mountains. After that, the students and staffs prepared for a bumpy ride going in the top of the Mt. Imugan with the use of jeepneys as the form of transportation. It’s quite a breath taking and jaw dropping experience for each of everyone especially those who preferred to stay at the top pf the jeepneys. Truly, Northern Luzon has very rich nature to be proud of. I considered this trip as one of the most unforgettable and I will cherish and treasure these memories.

How Layla experienced a day of the Area Study Philippines on January 9 2019.
Our day in Imugan already started in clouds of fog, rising up the mountain hills. But this would change during the day. After breakfast we had a lecture about the indigenous people in the Philippines and what that entails. Thus the rights of the communities and the possible conflicts with other groups moving into ancestral land. Then Kuya Sam came and enlightened us on the ways of the Kalahan people living in Imugan. This entailed the educations system and the way they take care of the environment surrounding their municipality. Around noon we went, on top of the jeepneys, uphill to the frontier between two regions. On one side of the mountains we could see the sunny hills with the plains of the Cargayan Valley and in the rainy clouds and the other side Central Luzon. Also the river running through this area is divided between those two regions. In the afternoon we went to the Imugan falls where we swam in the cold pond beneath the waterfall. On the way back we could appreciate the sun, which was now peeking through the clouds. We had some free time so some went into the village to play basketball with the local children. After dinner we had had two more lectures about the Philippine Government structure and the governance of the NDRRMC and also on the biodiversity. The Philippines has an enormous variety of endemic species, however also a great number of them are endangered. To conclude after a long day of interesting topics and a lot of fun we chose, together with our partner, the topic of research.

How Nitch experienced the Area study Philippines on January 10, 2019
This day we went back to Cabagan. Before that we passed by in Ikalahan Academy, the only school at Brgy. Imugan, Nueva Viscaya. We stopped there to check out their food processing factory which they processed native fruits like guava jam. After that, we ate our lunch in Diadi where we also talked to Merlijn with our partners. He discussed where we are going to conduct our study. We also passed by at Magat dam River, one of the sources of electricity in the whole Isabela. Magat dam was built on 1982 for three main purpose; for electricity, irrigation and flood control. After a long ride and very interesting day we are safely arrived at Isabela State University- Cabagan Campus.

How Alissa experienced a day of the Area Study Philippines on January 11 2019:
On the 11th of January, our group woke up in the dorms of the Isabela State University. At 10 am, our course was officially opened with a ceremony, where officials of ISU were present. The ceremony opened with a prayer and the national anthem of the Philippines. All the students were introduced, and were called to the front. We then took a group picture, together with students of previous area studies. After that, Merlijn spoke some words about the course; that it is the 9th time this course is held, and how many students have participated in it (240 I believe). I also spoke some words, together with Jeffrey, about our experiences in the first week. In the afternoon, we had two lectures: first from PAGASA (which means 'hope' in Tagalog), the meteorological institute that monitors natural disasters in the Philippines. And after that we had a lecture about farming. In the late afternoon, a pleasant surprise awaited us. We took tricycles to the city nearby. How many people can you fit on such a small bike? The answer is 5, plus the driver! The day ended with some music and games in the courtyard, which was very 'gezellig' as they say in Dutch!

How Neilkim experienced a day of the Area Study Philippines on January 11, 2019:
We woke up at 6:30 am. We ate our breakfast at 8am and after our breakfast we went to EIC building for the opening of the Water Course Area Study Philippines. The deans of different colleges attended the said event. We ate some cassava and sticky rice for our snack. After the program, we are able to walk around the campus with our Dutch students partners. We went in the different colleges of our campus and we have a limited time because we need to come back to the EIC building for the lunch. We had also the lecture from the PAGASA and Dr.Romero. We've learned a lot from this lecture. After the lecture we went to town of Cabagan. First destination is the municipal hall where the church of Cabagan is also located and also in the computer shop for us to search for our study, laundry shop and we have given a time also to buy some stuffs in the mall.

How Philippe experienced a day of the Area Study Philippines on January 12 2019:
Today we started our day with salty purple duck eggs for breakfast. After that new experience we had some lectures as a preparation for our researches and learned about conducting interviews and taking pictures. In the evening we had a little party. Irish facilitated a Zumba session and suddenly we were all dancing in the mid square of our campus, that was a really funny moment in which had a taste of each other's music.

How Simon experienced a day of the Area Study Philippines on January 13, 2019:
No big adventures today! Writing a blog for the Facebook page is an ungrateful task on a day like this. We traveled a lot the last 7 days and sometimes it was action-packed. But today and yesterday were also quite important. Writing a research proposal requires attention and dedication. You have to focus on the task ahead and the challenge of fieldwork. Sometimes I am reminded of the catchy phrase we heard in one of the presentations of last week: If you fail to prepare, you prepare to fail! And so, we set our minds to it and finished the proposal. Tomorrow we leave for Dunoy to practice fieldwork techniques. Looking forward to it!

How Dane experienced a day of the Area Study Philippines on January 13, 2019:
Well, first and foremost I would like to extend my thanks giving to the people who made this water course activity to be well organized and very prepared, specially to Ma'am Tess Balbas and team as our organizer, and to sir Merlijn and Sir Jouel as coordinator from Leiden University and Isabela State University, respectively for giving this opportunity to partake. Above all, I thanks God for making us strong in the field work, and for wisdom and knowledge to understand everything in the lecture. So, today is a free time that's why I planned to visit my house and my family in Balelleng, Sto. Tomas with my partner namely Philippe Dols from LU.

He is very smart and good friend of mine. My mother cooked foods for us especially to Philippe like mung beans (munggo) with Horse reddish (malunngay) and fried fish (tinapa), Caldareta, ginisang upo, and banana as well. After lunched, we visited our corn farm beside Cagayan River using my scooter. Philippe conclude that the Production of Corn is decreasing because of the existence of soil erosion, because our corn farm area can easily eroded by the overflowing flood cause by the extensive and intensive rainfall. And its because of the absence of river control or may be no strategic plan from our LGU for this problem to establish engineering or bio-engineering techniques to reduce or prevent landslide or soil erosion. With that, overall me and my family, Philippe is the first foreign special guest in our house. My mother told me that Philippe is really kind person and super gwapo as well. In addition to this, we surprised Mattia in her Birthday and we bought cakes for her, and she so happy, I love you friend, stay pretty and wish you more lucks.
#freetime #sundate #Sto.Tomas #Mattia'sbirthday #LOVEwatercourse #dane_experience

How Mary Claire experienced a day of the Area Study Philippines on January 14, 2019:
I am really excited to share to you the things that we've done the whole day. In the morning, Oh! We woke up very early because we will go to San Mariano by riding a bus. We went first to the rearing station wherein we saw a lot of baby crocodiles. We also have a little bit discussion with Merlijn and Tess about the Philippine Crocodile and watch captive crocodiles at the Mabuhay Buwaya and it is a really nice place. We went also to Dibuluan where the Dunoy Lake located and we walked for 1 and a half hour and I think it is really exciting to do such amazing things because it was my first time and my heart keeps on jumping now. Hahaha! What surprises me is that when we do a night-searching for crocodile and Sir Bernard catches one crocodile, it is really cool and amazing. I really enjoying every part of this course. Hope you guys that one time you will experience those kind of experiences. It is very exciting-relaxing-adventurous thing you can ever have in your life.#ilovewatercourse


How Eva experienced a day of the Area Study Philippines on January 15, 2019:
Struggling out of your tent after a less comfortable night, got rewarded by the magical scenery of Dunoy! We casually washed ourselves in the river. I could finally use my new gadget “wilderness wash”. Today was THE DAY that we would release our little croco sweet Malaya! She was so happy in her new habitat. It was a magical moment ❤️ After that some of us went back to “the tower” to spot some awesome birds and we saw a big Philippine crocodile! Finally, it was time for breakfast! Afterwards we had a little workshop how to conduct an interview. Some brave volunteers showed their skills, and then it was time for us all to let our inner social butterflies out. As it quickly gets dark in Dunoy, we started a little campfire and sung lots of songs that are still stuck in my head: “I like the flowers”! It was a beautiful day and it was a good preparation for the field research.

How Valerie experienced a day of the Area Study Philippines on January 15, 2019:
I started the day with a breathtaking view upon seeing the river that was placed beside the hostel that we are staying. A delicious coffee completed my day. After that with my partner Celine went to practice our research study which focuses on Fauna. We do also the identification of Flora species. Some of them are just new for me. We cross the river using a small boat and it feels so relaxing. We also released a crocodile and we named it "Malaya" Tagalog term for "FREE". Some teams also practiced the interview and it is very useful to everyone. And we ended the day with an enjoying bonfire, playing games and singing a newly song for us, Filipino (I LIKE THE FLOWERS, I LIKE THE DAFFODILS. I LIKE THE MOUNTAINS, I LIKE THE GREENY HILLS. I LIKE THE FIRESTONES, I LIKE TO WALK ALONE, DOOWAKADOOWAKADOOWAKADOOWADOO).

How Leymar experienced a day of the Area study on January 16, 2019;
The day was quiet fast were this would probably our last day in the beautiful paradise of Dunoy in San Mariano Isabela. Waking up this morning is really amazing were beautiful and lovely faces are seen. Looking to the Filipino students mingling with the Dutch students where the second rule in this course was an interesting view to look in. Where they can share their feelings, experience and future plans on the research proposal and everything that make sense. After having an early breakfast snack of a Sticky rice but known in the Philippines as “malagkit” and a hot coffee prepared by our host family uncle Victorino I think everyone found it delicious/liquor especially the Dutch students. Well this time we have a good activity that everyone feels excited on it. That is the planting of Bananas in the area of where the previous water course planted variety of trees. But before the activity, we had some lectures about the existence of Dunoy with the people around it. Uncle Victorino enlightened us about the story/history of the Dunoy and with the help of Sir Arnold Macadangdang that serve as the translator. With this conversation we were able to learn a lot of things pertaining to Dunoy, the Buwaya, and the people that are leaving in the area. After the long exchange of taught to uncle Marcelino. Breakfast is ready, were all of us feels hungry of the tour. Haha. But an interesting tour. We ate a lot of food this time, yes because we will do long distance walk so we really need to be energized and that we can only get in the food. Hahah. After taking heavy breakfast then rains starts to ruin our day, but we still need to start hiking so that we can still meet the plan for this day. Almighty God answered our prayers that the rains must stop. That’s why we still feel the presence of the lovely sun. Finally were here at the Narra area where we will do the banana planting. But before the planting Maam Marites Balbas told us story of the area and information about the cooperatives who are their partners in doing/organizing activities specifically in the area. After planting bananas, we took some rest and start walking again. From Narra to San Mariano maybe about 1 hour and half minutes of walk more. It’s really tiring but amazing and awesome experience this 2019. We already arrived at exactly 12 pm in Villa Miranda were the track is waiting for us. Yes, but still 2 hours more to be in Minanga San Mariano were the Rearing station located. All of us were tired but still make laugh to each other. Starts to share some jokes and some non-sense words which our way of comforting ourselves. There we are here and make some lunch first and after the nice food choice selection that everyone feel relax and comfort and full.haha. Afterwards Sir Merlijn and Maam Marites instructed us to get our pocket money to the financer which we will spent going in Baggao for a 1 week field study. And we are also instructed to do the shopping in Ilagan Robinson because we don’t have enough time to do in Cabagan. Were all of us sudden busy in the writing up of the proposal in which on the other day will do the presentation. Godbless!!!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How Celine experienced a day of Area study Philippines on January 19, 2019:
On the 19th of January Valerie and I woke up in the house of our host family to the sound of the driving rain. We decided it would be better not to conduct or field research about the flora of Blue Waters and instead started interviewing the villagers that were also waiting for the rain to pass. It was a shame to not be able to do field work, but it could be worse: Philippe and Dane were trapped on the other side of the river, cut of from the other groups and potential interviewees. Sir Jouel took the opportunity to at least explain to us the names of the trees and their uses around the covered gathering place of the village. One of the trees was the betel palm and it was explained to me that the farmers chew on it to repress their hunger while working on the field, mixed with tobacco, ground up shells and peppermint leaves. The people were eager to show me how it worked and it was very interesting, but unlike Joke, Philippe and Thomas, I was not all that eager to get all hot and lightheaded for the sake of science. In the end we did five interviews and rested a little in the afternoon, for we were both not feeling too well that day. In the evening we visited the host family of Thomas and Jaycee together with some of the others, including Alissa, who explained to us a surprisingly complicated 'simple' version of bridge. On the background there was playing an incomprehensible ninja movie that was inconveniently dubbed in German, but which nobody seemed to mind. It was one of many: the host family owned more than twenty of such movies, most including Vin Diesel as an action hero. At a for Dutch students very early time somewhere between nine and ten, we all put on our flashlights and walked through the mud, searching for our beds.

How Fevie experienced a day of Area study Philippines on January 20, 2019:
A very long-exciting and tiring experienced for this day. These is our first day in our Field study for our research. A quiet place, simple living of people in Mansarong I encountered. It was like reminiscing the odds of my childhood life. I am completely amazed by how people lived their daily lives as I can see the accessibility there is so hard, no signals, and no travel if you don't have a vehicle and you will walk in a dirty-muddy road because it was raining all throughout the day of interviews. But we are blessed that the Barangay Kagawad James organized a simple meeting for him to introduce us and for us to start the interviews to the people. To share also, we have the very hospitable host family, Kuya James and Ate Espi and with their shy-little-cute son, Jameson who always prepare us a "LEKKER" (delicious) food for us. Also the funny thing is that as we went home everyone is saying "Is this your house? Bye" (I felt like we are neighbors, Leymar, Iris, Ernst, Neil, Nitch and Mattia) it's like our own house already. The day was so tiring but as we look for what we've done for the whole day it's satisfied us. God is good!

How Rosaida experienced a day of Area study Philippines on January 20, 2019:
Yesterday we arrived in Blue Waters just in time for dinner (made by our host family, the Espes), so today was our first real day. It's quite a change, waking up here in Blue Waters. Unfortunately it was also very rainy, so up til now my impression of Blue Waters, besides its kind people, is lots of mud - and, as you can see from the photos, lots of beautiful greenery. I'm not entirely sure I will get used to it at all, in the week that we'll be here, but I think hospitality and kindness the people have shown here, already in this short time, will make it a little easier. We started the day with three interviews, and after lunch we had three more. The people we interviewed were so accommodating and in answering our questions that I'm sure we'll run out of respondents by the third day. The interviews themselves are very interesting, and I am happy that I get to work with Alissa and Rina. They bring ideas to the table that I would otherwise never have come up with, and I am very grateful.

How Rina experienced a day of the Area study on January 22, 2019;
We woke up early in the morning with my companion Alissa and Rosaida. This kind of feeling is very unusual that you are leaving far away and in different house with different people. The sounds of the small waterfalls and birds in this place is the first thing we hear once we woke up. We are so lucky because our host family always cooked food for us. We ate together with them as always, afterward one of our respondents is in the other side of the river so we need to cross the river so we can able to interview the respondents. I'm so nervous that time because the water is not really deep but the flow is strong. Sir. Bernard help me to cross the river and also when we go back. We are happy that all the inhabitants in Blue Waters is very open to us. At night we gathered at Jaycee and Thomas host family to have some snack and play cards with Rosaida, Celine, Jaycee, Valerie and Paul. The other students who also staying in blue waters went to Philippe and Dane's host family. Even we are not complete we still want to be happy.

How Thomas experienced a day of the Area Study Philippines on January 22 2019:
Hello! Today a story from Blue Waters! Tomorrow the other groups that are staying in Malisi and Mansarong will join us so we are conducting our last interviews today. We interviewed Dominador de la Cruz, Dane and Phillipe's host. He is a farmer on the other side of the (blue!) river but today there was a meeting in the village so we could interview him. He told Jaycee and me an interesting story about how he is experimenting with growing tiger grass instead of corn. Tiger grass is more resilient to typhoons than other crops so therefore it is an interesting crop for farmers in this area. In the afternoon Joke, Céline, Phillipe and I decided to take a hike up the hill to kill some time on our last day. And of course to enjoy the amazing nature from another angle! On the road we spotted two dead snakes... a reminder that the jungle is not just the domain of cute animals. At the end of the day we took a refreshing bath in the river. Blue Waters is not the worst place to not have a bathroom! This was already my last entry for this blog! Groetjes!

How Vera experienced a day of Area study Philippines on January 25, 2019:
Today we started the day with a short lecture by Merlijn. He gave us some information on how to write our reports, as we are finally done with our fieldwork in Baggao, and need to work very hard on our research reports this weekend. But before really starting our work, we went to Cabagan for the annual Fiesta! Of course we took the jeepney, so we could sit on top one more time. The Fiesta felt a bit like Kingsday in the Netherlands, with a lot of food stands, attractions and secondhand stuff. We went into the carrousel, which was a huge attraction itself for many Filippinos who were watching us. It was a nice ride, but halfway I actually really started doubting the safety of this thing, as with every turn I felt like bumping into the house standing close next to it. While still feeling a bit dizzy from the carousel we went to the house of one of the deans of ISU-Cabagan. During the Fiesta it is normal to open up your house for everyone to come and eat. So we had a very nice buffet at her place, at which not only the Watercourse crew was present, but many more friends and family of the host.
A few hours later me, Mary Claire, Layla and Dane went to see Danes mom at her work. She was working at a house which was also having a buffet, and we were very welcome to join them too. So there we had our second lunch. We had a nice talk with the people from the house, and took some pictures together so they could remember us. Oh and while eating there crawled a huuuge spider over the wall. But the host did not care, 'oh we have them so often, it's normal here' she told me...At the end of the day we went back to the campus on a tricycle. There were six people in the vehicle. It always just works out apparently. So that was a bit of relaxing, now we really need to start writing! Greetings from the Philippines, and salamat po for reading our blog!

Rosa's experience of the Watercourse 2019:
The first thing that I noticed about the Philippines was how busy everything was. It's hard not to notice all the bustling and hustling when you are in Manila, which is where the 2019 Water Course began. Hand in hand with this vivacity came culture; we visited impressive museums and ate delicious Filipino food, and learned more about the Philippines in three days than in all the months of preparation back home in the Netherlands. What I found notable, however, is that the busyness carried over to all places in the Philippines, and not only in the capital. This, ultimately, helped us in our research. My group looked into the psychological effects of natural disasters in small communities. We were lucky enough to conduct this research in Blue Waters, a small settlement consisting of a large handful of houses, where the main source of income was farming and tourism. Much like the streets of Manila, the main community space of Blue Waters was always lively. Finding people to interview was easy enough, and not just because the whole of Blue Waters could be travelled within a day. Instead, it was made easy by the kindness of the inhabitants and their willingness to open up to strangers. What's more, this opens and kindness was characteristic not only of Blue Waters, but also of the rest of the Philippines. It was this exemplary show of character which made this field school so amazing to be a part of.

Thomas' experience of the Watercourse 2019:
The watercourse adventure is already 2 months ago, while it feels just like yesterday when we had to say goodbye to our Philippine research partners and Mabuwaya staff. The watercourse was a great experience to get some hands-on knowledge about many sustainability issues. The course took off in Manila where we got to know more about the Philippines and the rich history of this beautiful country. After spending a few days in Manila, we continued the course in the North of Luzon. Here I stayed in a small village called Blue Waters. I got the opportunity to interview farmers together with my Filipino partner Jaycee on various topics such as typhoon preparations but also about land rights, agricultural insurances and nature protection. We also had a lot of lectures by Mabuwaya, Leiden University and Isabela State University on topics related to sustainability such as biodiversity, habitat loss, indigenous peoples and cultures, typhoons and field research skills. However, I learned the most from just being in the Philippines and experiencing all these lectured things in real life, adapting my lifestyle, meeting many nice, open people who were always interested in where we're from and why we traveled all the way to Northern Luzon instead of the white beaches of Palawan. This journey showed me how complex sustainability topics such as nature protection and poverty reduction are and how interrelated they are. The watercourse was truly an experience to never forget, just like all the inspiring people that I got to meet at the Isabela State University and in Blue Waters.

Philips experience of the Watercourse 2019:

The area study was a unique experience, it all started in Manilla where we met our fellow students from the Philippines with who we traveled though Luzon for a month and with who we went to many beautiful and special places like Imugan, Dunoy, Baggao and Batad. We learned a lot about varied subjects like for example Indigenous people, Natural disasters and nature conservation and reforestation. Next to learning about these subjects both from stories and practice we also learned allot from each other's cultures and had allot of fun together, mainly in the form of Videoke. It was a rich experience to visit among other things the National Disaster Reduction Risk Management Council, the parents of my research partner Dane, the crocodile rearing station, the municipality of Baggao and the Batad rice fields. We also did allot of cool stuff like catching and releasing a crocodile (in that order), restoring a piece of world heritage in the magnificent Batad rice fields, planting banana trees and off course conducting our own research. Dane and me went to blue waters to study the impact of typhoon Mangkhut on the bird species diversity and abundance by comparing our data from our transect walks with the data from Area study students who used exactly the same method a year ago. We found that 59% of the bird species we saw matched with the species seen a year ago. We saw 61 different species, among others endemic species like the critically endangered Isabella Oriole and the Rufous Hornbill but also wonderful species like the Red-crested Malkoha and the Indigo-banded kingfisher. The fieldwork days were also a step out of my comfort zone, especially the first days when Dane, me and our host family got isolated from the rest of the group by the river due to the rainfall but this was also an enriching experience, just like using a machete when we needed to go to the 'comfort room'. Altogether an unforgettable experience on which I could look back for a long time. For me personally as a biologist I have a better idea on what I want to work on in the future and especially learned how important it is to integrate locale communities when it comes to nature conservation and restoration projects. This successful trip wasn't possible without Merlijn, Tess, the Mabuwaya staff, my host family and the ISU supervisors and ISU hospitality, a great thanks to them for providing us with this experience.