International course on water and water management in the Philippines: 4 January - 2 February 2018

Weerd, M. van; Gatan-Balbas, M.; Verheijen, J.; Mangabat, c.

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Hoogheemraadschap van Rijnland

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Cover: participants of the water course 2018

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International course on water and water management in the Philippines 2018

Editors

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Isabela State University, Mabuwaya Foundation and Leiden University

Cabagan, the Philippines and Leiden, the Netherlands

2018

Hoogheemraadschap van Rijnland

Message

Water / Winter Course 2018

In January 2018, 15 students of |Leiden University student went to the Philippines to meet their fifteen counterpart students of Isabela Staye University, with whom they would participate in the Winter Course of 2018. 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 2018. We are proud of the results and the fact that we could contribute to this activity.

We can now speak of a tradition, and I am confident that this eight 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 eighth international water course that took place in the Philippines from 4 January – 2 February 2018.

The 2018 Course would not have been possible without the funding and 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 and coordinated by the Institute of Environmental Sciences (Kiki Boomgaard, Ellen Cieraad), Faculty of Social Sciences of Leiden University (Janneke Verheijen and Merlijn van Weerd), Isabela State University (Cecille Mangabat) and the Mabuwaya Foundation (Marites Balbas and Merlijn van Weerd).

Participants from Isabela State University were screened from the different colleges and we thank Dr Edmundo Gumpal and colleagues of CFEM, Dr Bella Reyes and colleagues of PTIA, Dr Jane Cabauatan and colleagues of CDCAS, Dr Ambrose Hans Aggabao and colleagues of CTE, Dr Rufino Calpature and Dr Orlando Balderama and colleagues of the College of Engineering at Echague, Dr Precila de Lima of Cauayan Campus and Dr Clarinda Galiza of ISU Campus San Mariano for their support.

The Cagayan Valley Program on Environment and Development (CVPED) of Isabela State University (ISU), headed by Cecille Mangabat with staff members Eso Tarun, Onia Gunayon and Lenlen Morillo provided support while the students stayed in Cabagan.

Meals in Cabagan were provided by Prof Dominador Zipagan and students of the Hotel and Restaurant Management Course.

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, Joni Acay, 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 2018 students and staff visited the Biodiversity Management Bureau of the Department of Environment and Natural Resources in manila for presentations on biodiversity and conservation in the Philippines. Dave de Vera of the Philippin Association for Intercultural Development (PAFID) gave presentations about Indigenous Peoples and conservation.

Sam and colleagues of the Kalahan Educational Foundation (KEF) welcomed and toured the students in the Ikalahan Ancestral Domain in Imugan.

National Commission on Indigenous People (NCIP) Regional Director Ruben Bastero gave a presentation about the indigenous people of Region II and the work of the NCIP. Regional Director of the National Economic Development Authority (NEDA) Ferdinand Tumaliuan gave a presentation about the Regional development plan of Region II.

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 batangay officlas 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

The participants of the 2018 course in Imugan, Sante Fe (photo by Merlijn van Weerd).

Traveling to Dunoy (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 4 January – 2 February 2018. Thirty students participated in this course, 15 through Leiden University and 15 through Isabela State University. The students were enrolled in different studies:

Cultural Anthropology and Development Sociology, Development Communication, Education, Political Science, Chinese Culture and Languages, International Studies, Public Administration, Hotel and Restaurant Management, Tourism and Hospitality, Biopharmaceutical Sciences, Civil Engineering, Electrical Engineering, Agricultural Engineering, Agricultural Technology, Agriculture, Biology, Forestry, Environmental Science

The theme of the 2018 course was water management, sustainable development and natural resource utilization in the municipality of Baggao. 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 and the National Museum of the Filipino People.

The group visited the Biodiversity Management Bureau of the Department of Environment and Natural Resources in Quezon City for presentations on biodiversity and conservation in the Philippines. Dave de Vera of the Philippine Association for Intercultural Development (PAFID) gave presentations about Indigenous Peoples and conservation.

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 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 sustainable development related issue 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

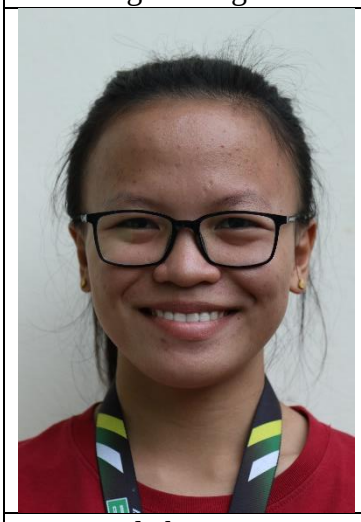
Participating Students

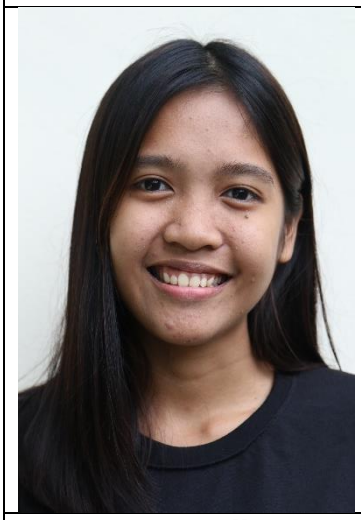
Leiden University students

		
Hanne Cox Cultural Anthropology and Development Sociology	Regie Gabinete Tourism and Hospitality	Chris Klerks Biopharmaceutical Sciences
		
Laura Righetti International Studies	Alec Schellinx Chinese culture and languages	Kirsten Steunenberg Public Administration

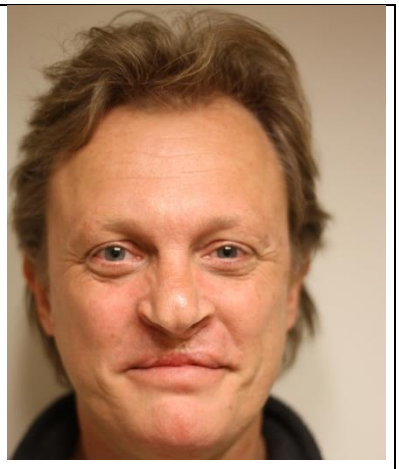
		
Daan te Witt Civil Engineering	Laura van der Stelt International Studies	Jerry van Rijn International Studies
		
Maaike van Woerden Political Science	Rik Verhave Biology	Eva Zegelaar International Studies
		
Daisy de Hoop Cultural Anthropology and Development Sociology	Anne-Marie Vogelzang Cultural Anthropology and Development Sociology	Dilara Erzeybek Cultural Anthropology and Development Sociology

Isabela State University (ISU)

		
Eryl Karl S. Agustin Civil Engineering	Guirliedane A. Palapal Civil Engineering	Mark Christian B. Fernandez Civil Engineering
		
Kyrvie Elisha L. Baguion Agricultural Engineering	Divine Grace N. dela Cruz Electrical Engineering	Manilyn D. Macuray Agricultural Technology
		
June Spencer A. Cera Agriculture	Alvin P. Ramos Agriculture	Orleans Pearl P. Deus Hotel and Restaurant Management

		
Jaylord L. Dela Cruz Education	Richelle Acain Incina Development Communication	Vicson C. Cammayo Biology
		
Jessa D. Macapallag Forestry	Julius Rae R. Allam Forestry	Jaysel A. Sibal Environmental Science

Staff

		
Marites Gatan-Balbas Course Coordinator Mabuwaya Foundation	Cecile Mangabat Course Coordinator Isabela State University	Merlijn van Weerd Course Coordinator Leiden University
		
Joni Acay Mabuwaya Foundation	Arnold Macadangdang Mabuwaya Foundation	Janneke Verheijen Leiden University
		
Bernard Tarun Mabuwaya Foundation	Mario Pedrablanca Mabuwaya Foundation	Dorina Soler Ferrer Mabuwaya Foundation

		
Nanette Cataggatan Mabuwaya Foundation	Amante Yogyog Mabuwaya Foundation	Leonalyn Tumaliuan Mabuwaya Foundation
		
Jovilyn Mamauag Mabuwaya Foundation	Eso Tarun Isabela State University	Onia Isabela State University

Program Water Course 2018: 4 January – 2 February 2018

Day	Date	Locality	Activity	Accommodation
Thu	4 Jan	Arrival all students in Manila	Evening: welcome	Manila: Pension Natividad
Fri	5	Manila	Welcome, BMB, EMB, Dave	Manila: Natividad
Sat	6	Manila	Dave, Intramuros, Nat Museum	Manila: Natividad
Sun	7	Travel: Manila - Imugan	Travel to Imugan	Imugan
Mon	8	Imugan	Imugan	Imugan
Tue	9	Travel: Imugan - Cabagan	Travel to Cabagan via Magat	Cabagan: CVPED Hostel
Wed	10	Cabagan	am: welcome, pm: lectures	CVPED Hostel
Thu	11	Cabagan	Lectures and workshops / preparation proposal	CVPED Hostel
Fri	12	Cabagan	Preparation proposal	CVPED Hostel
Sat	13	Cabagan	Preparation proposal	CVPED Hostel
Sun	14	Travel: Cabagan – San Mariano	Travel to San Mariano / rearing station/ Dunoy	Dunoy: tents and hostel
Mon	15	Fieldwork trial San Mariano	Dunoy	Dunoy: tents and hostel
Tue	16	Travel: San Mariano - Cabagan	Back to Cabagan, rest	CVPED Hostel
Wed	17	Cabagan	Preparation and presentation proposal	CVPED Hostel
Thu	18	Field	Area study: travel to Baggao	Field
Fri	19	Field	Area study	Field
Sat	20	Field	Area study	Field
Sun	21	Field	Area study	Field
Mon	22	Field	Area study	Field
Tue	23	Field	Area study	Field
Wed	24	Back to Cabagan	Back to Cabagan, rest	CVPED Hostel
Thu	25	Cabagan	Area study: reporting / Fiesta	CVPED Hostel
Fri	26	Cabagan	Area study: reporting	CVPED Hostel
Sat	27	Cabagan	Area study: reporting	CVPED Hostel
Sun	28	Cabagan	Area study: reporting / free	CVPED Hostel
Mon	29	Cabagan	Presentation results. Farewell party	CVPED Hostel
Tue	30	Travel: Cabagan - Banaue	am: travel to Banaue. Pm: Banaue	Banaue Hotel
Wed	31	Banaue	Banaue / Batad	Batad: Hillside Inn
Thu	1 Feb	Batad	Batad	Batad
Fri	2	Travel: Banaue - Cabagan/Manila	am: travel to Banaue. Pm: travel to Manila/Cabagan	Manila: Natividad

Traveling by truck through muddy tracks from Dunoy (Photo by Merlijn van Weerd)

On the way to the field in Baggao (Photo by Merlijn van Weerd)

Interview by Alec and Julius **(**Photo by Merlijn van Weerd)

Jerry and Manilyn and their host family in Blue Waters in Baggao (photo by Merlijn van Weerd)

Student Reports

MAIN ROADS IN BAGGAO, CAGAYAN, PHILIPPINES

Mark Christian B. Fernandez & Daan W. te Witt

INTRODUCTION

Roads can have a large impact on the surroundings in many ways. The development of new or better roads can affect the environment and the people. Better roads will give people access to education, healthcare and livelihood. In terms of environment, biodiversity, tourism and agriculture can be affected by roads. In the Philippines, government institutions are in charge of the planning and development of roads.

The Philippines is a mega-diversity country (Se 2018, pers.comm.) and roads can have negative impacts on the environment in which this diversity is present. These negative impacts include "habitat loss and fragmentation, wildfires, overhunting and other environmental degradation" (Laurance et al. 2014). Especially in the Philippines, this is damaging since the country is "the hottest of the hotspots" when it comes to biodiversity (Se 2018, pers.comm.).

On the other hand, rural road investments can also have an economically positive influence on agricultural yield and thereby on the income of farmers, although additional actions might be needed (Laurence et al. 2014). These investments can also have a positive influence on employment and income opportunities, with possibilities for tightening the gap between the rich and the poor (Asian Development Bank 2003), which is also a goal mentioned in the Cagayan Valley Development Plan (CVDP) 2017-2022 (Israel 2018, pers.comm.).

In the AmBisyon Natin 2040, the long-term vision of the Philippines for the year 2040 is given and this vision includes a better transport system and good transport facilities. The CVDP 2017-2022 also mentions connectivity as a core strategy to strengthen urban-rural linkages. Right now, Region 02 has the lowest road density in the entire Philippines (Israel 2018, pers.comm.)

Baggao is one of the 29 municipalities in Cagayan province with a total land area of 92,060 hectares which is divided into 48 barangays. The road system covers 0.307% of the area while the forest covers more than half of the land. Currently, one of the major development projects of Baggao is the Transport Infrastructure Support that ensures "essential transport infrastructure and handling facilities, farm-to-market roads, in major rice and corn trading routes" (Baggao, Cagayan Development Plan).

The region also wants to develop international tourism (Israel 2018, pers.comm.) and Baggao has several tourism sites to offer found in different barangays, such as the Blue Waters in Pallagao, Duba Cave in San Miguel and Kalimudinan Falls in Santa Margarita. There are also different endemic fauna species found in the municipality such as the Isabela Oriole, Golden Crowned Flying Fox, and the Philippine Eagle. In terms of agriculture, rice fields can be seen along the road which covers 27.22% of the land area of Baggao (Acay 2018, pers.comm.). This can be explained by the fact that farmers are inclined to work near a (new) road for easy transport of their products (van Weerd 2018, pers.comm.).

In this research we want to determine the current status of the main roads of Baggao. The focus lies on the main roads as a system and will therefore not focus on the congestion within barangays and villages. The key concepts in this research will be the condition of the road, the intensity of a road and the utilization of the road according to its purpose. The results of this research can serve as baseline information for assessing the potential impacts of road development on biodiversity, agriculture, tourism and livelihood.

RESEARCH QUESTION

What is the current status of the main roads in Baggao?

Status includes road condition, intensity and travel purpose.

Sub-questions:

- What is the general condition of the road?
- What is the intensity of the main roads in the system?
- For what purpose(s) was the road built?
- For what purpose(s) do people use the main roads?

METHODS

The measurements of the study were done in 5 days from January 19 to 23. We stayed in Barangay Remus since this is a central point in the municipality. From there we took public transport to reach the 7 road parts where we gathered our data (Figure 1).

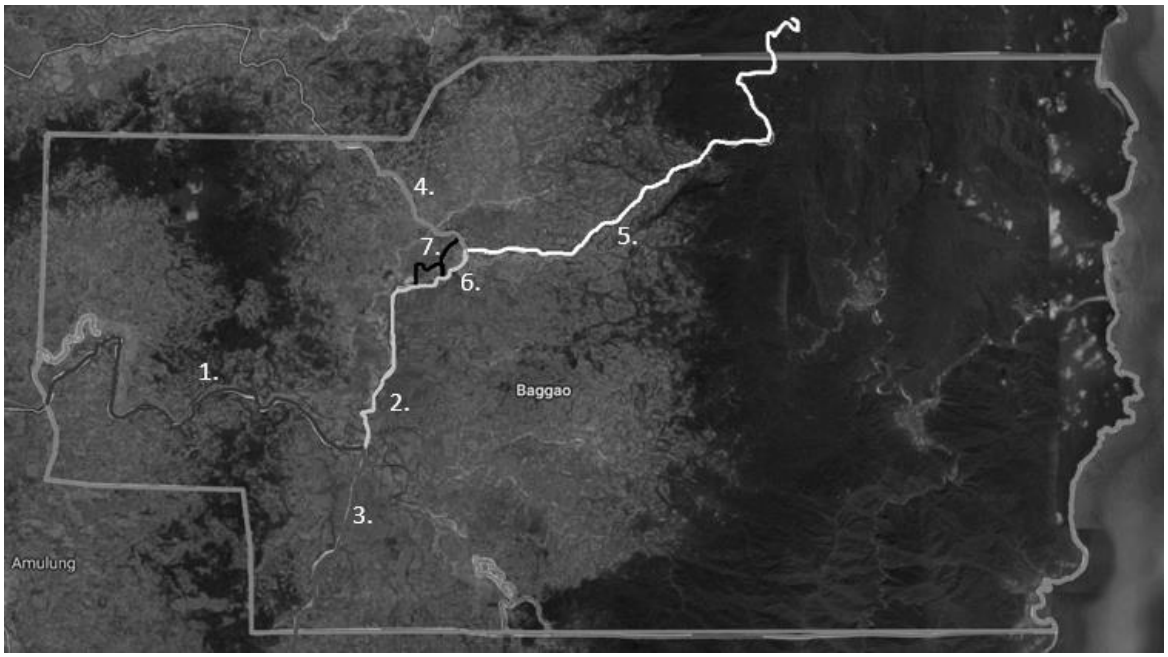


Figure 1: The 7 road parts where we gathered our data (Google Earth Map 2018)

The road condition was classified into 4 as follows: 1) asphalt, 2) cemented, 3) gravel and 4) dirt. We traversed and observed the roads to know the status of the entire road system of Baggao. To make a map, we used Microsoft Visio and the CMGP Road Classification Map from the Municipal Planning and Development Council (MPDC) to identify in which Barangays we worked. We also used the Application MyTrack to map the problems of the road.

The intensity of the roads is measured by counting the numbers of different types of vehicles (motorcycle, tricycle, van, light vehicles, trucks and others) that pass the road in an hour. A hand tractor was included in the light vehicles (Figure 2). A *kulong-kulong* (open tricycle) was

included in the tricycles and is mostly used for transport of products (Figure 3). Pedestrians were counted but not included in the intensity (Figure 4). We measured the intensity of the roads in both directions because this intensity may differ. We also interviewed residents along the road about their estimations of how many vehicles pass by on weekdays and on Sundays which is the market day. To determine the difference in vehicle size, the different types of vehicle that use the road are equalized to one vehicle-unit (vhl-u) (Table 1). The purpose for which people use the roads were determined through random interviews on the people passing by and through observations. We interviewed the Municipal Engineer to determine the purpose to build the road. The followed time-schedule is also included here (Table 2).

Table 1: Vehicle-unit table presenting type of vehicle and their equalized unit

Vehicle-unit table	
Motorcycle	0.6
Tricycle	0.8
Private light vehicle	1.0
Van	1.1
Truck	1.8

Table 2: Time schedule and activities during fieldwork in Baggao, Cagayan.

Date	**Activities**
Thursday 01-18-18	Travel to Baggao Interview with the Municipal Engineer
Friday 01-19-18	Alcala-Baggao Road including San Jose - Quibal Road (Location 1, 2 and 3)
Saturday 01-20-18	Gattaran Capissayan-Bolos Point Road (Location 4 and 5)
Sunday 01-21-18	Mapping of Roads and Analyzing of the road
Monday 01-22-18	Alcala Baggao Road vs National Irrigation Administration (NIA) Road Construction Site visit Second visit Local Government Unit (LGU) (Location 6 and 7)
Tuesday 01-23-18	Inventory of road going from Barangay Remus to Blue waters and Alcala-Baggao Road from San Jose to the boundary of the Municipality

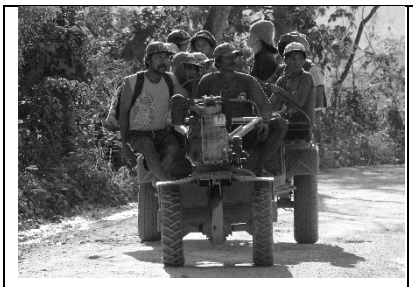


Photo 1: Hand Tractor was considered as Light Vehicle. (Photo by M Fernandez 2018)

Photo 2: Open tricycles were used for business (Photo by M Fernandez 2018)

Photo 3: Pedestrians were not included in the intensity. (Photo by M Fernandez 2018)

RESULTS

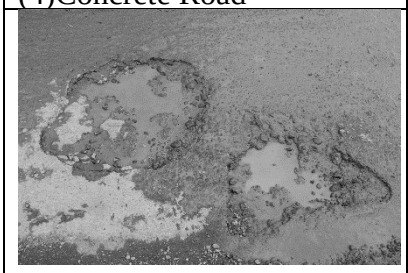
Status and main problems of the roads

In identifying the current status of the road, we will start by giving an overview of the situations we encountered on the road. There are 3 types of roads present in Baggao, namely concrete roads (Photo 4), gravel roads (Photo 5) and dirt roads (Photo 6). The most common problems on concrete roads are holes in the road (Photo 7), missing parts in the road (Photo 8) and problems with the top layer of the roads (Photo 9). Holes in the road are observed on bridges. These holes can be very big and deep. Most holes however, are of a much smaller size and their cause is (unfinished) reconstruction work. For reconstruction, road workers make holes in the road to remove all the concrete. That is how the missing parts arise. These parts are also due to (unfinished) reconstruction work. The bad top layers are only bothering light vehicles and originate from intensive road use and durability factors, like the weather. A different and smaller problem are congestion points. We encountered them in different types like bridges (Photo 10), narrow roads (Photo 11) and roads under construction (Photo 12), which can of course also be a positive fact, but then for in the future. Also missing parts in the road can be congestion points since in that case all traffic must use one lane too. These last 4 types of problems could also be summarized under narrow roads, since that is a problem they all have in common. However, the origin is very different and that is why they are shown here separately.

(4)Concrete Road

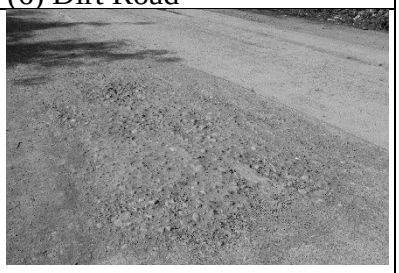
(5) Gravel Road

(6) Dirt Road

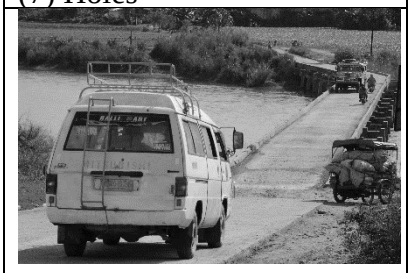


(7) Holes

(8) Missing Parts

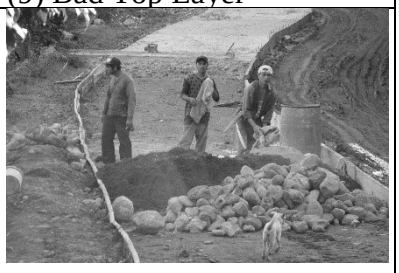


(9) Bad Top Layer



(10) Bridge

(11) Narrow Road



(12) Under Construction

Photos 4-12: Status and main problems of the roads in Baggao (Photos by M Fernandez 2018)

Main Roads

There are two major roads in Baggao. These are the Gattaran Capissayan-Bolos Point road (Photo 13) and the Alcala-Baggao road (Photo 14), which are both national roads. The Alcala-Baggao road intersects measurement points 1, 2 and 6 (Figure 2). The Alcala-Baggao road meets there the Gattaran Capissayan-Bolos Point road, which intersects measurement points 4 and 5 (Figure 2). Other roads important to introduce here are the NIA road intersecting measurement point 7 (Figure 2), and the San José – Quibal road intersecting measurement point 3 (Figure 2). This figure also gives an overview of the main conditions of the road, the intensity measurement points and the construction sites.

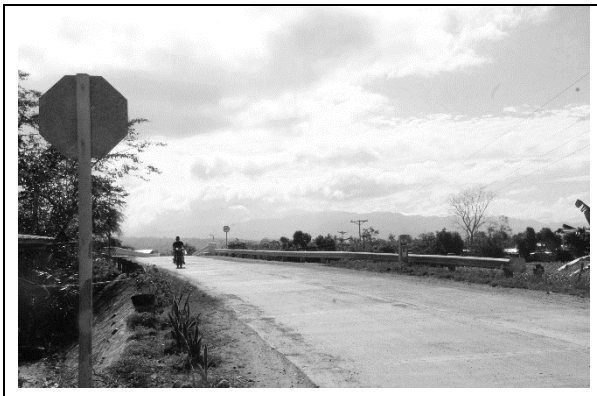


Photo 13: Gattaran Capissaya-Bolos Point Road (Photo by M Fernandez 2018)

Photo 14: Alcala-Baggao Road (gravel road) (Photo by M Fernandez 2018)

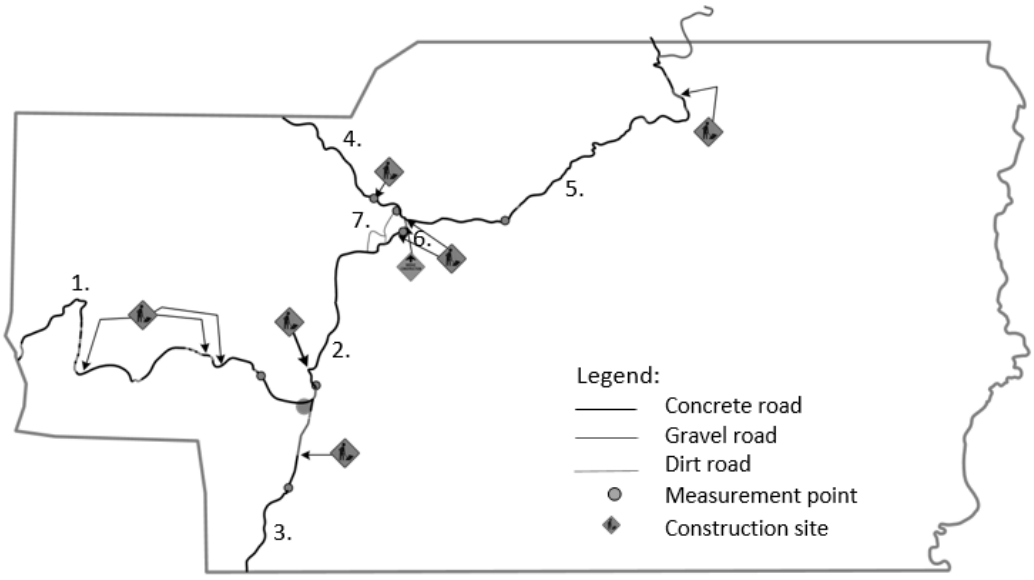


Figure 2: Map of the condition of the roads including measurement points and constructions

Condition of the roads

Alcala-Baggao Road part 1 (Municipal boundary to Barangay San José)

This road connects the two municipalities, Alcala and Baggao. The road is the longest and most used road to go out of Baggao. However, some problems were found in the different portions of this road. This road will pass through three barangays namely: Poblacion, Temblique and Bitag Grande. From the boundary, the road is wide and mostly concreted, but there are still 13 small parts that are not yet concreted. However, 3 of these parts were under construction during the measurements. The parts that are not concreted are all gravel roads. Congestion points occur in Barangays Poblacion and Temblique because of the holes and one lane roads. There are two concrete bridges in this barangay with observed holes and bad top layers and are considered in critical condition. Although there are some holes and missing parts, the road in Barangay San Jose is considered generally good. In total, there are 11 fragments where there are holes in the road, 2 fragments of bad top layers, 18 fragments of missing parts in the concrete road and 2 narrow fragments. All these fragments are distributed on the whole road, except for the first few kilometers coming from the municipal boundary, that part has less of these fragments.

Alcala-Baggao Road part 2 (Barangay San José to Barangay Tallang)

This road passes through Barangays Annayatan, San Isidro, Nangalinan, Barsat Proper, and Dallang. The road is concreted up to Tallang but there are congestion points occurring in different part of the roads. The Abusag Bridge connecting San Jose and Annayatan is narrow. This is an overflow bridge which often becomes impassable during heavy rains. Bad top layers can be seen in Barangays San Isidro, Nangalinan and Barsat proper. In Dallang, one lane of the road has a hole which is already full of water while the other lane has a bad top layer. Most of the road in Tallang is concreted except the road going to the bridge connecting the two national roads which are under construction. In total on this road there is 1 dirt road part and there are 5 top layer problems, 8 fragments of holes in the road, 12 missing fragments of either 1 or 2 lanes broad, but 3 of these parts are under construction. The northern part of this road is in a very good condition and the southern part covers most of the problems mentioned here.

Alcala-Baggao Road part 3 (Barangay San Jose to Barangay Bitag Piqueño)

This road is a provincial road and is still under construction, but some parts are already concrete specifically those in Bitag, Piqueño. Some points are half concreted. From San José the road is a gravel road followed by a dirt road, going over in a concrete road under construction. The concreting of this road part started on January 7, 2017 and was supposed to be finished on October 3, 2017. However, the construction is still ongoing.

Gattaran Capissayan-Bolos Point Road parts 4 & 5

The Gattaran-Capissayan Bolos Point road leads to Santa Ana which is one of the centers of tourism in Cagayan. Tourist going to Santa Ana can drop by in Baggao. The road is generally in good condition and of good quality. Especially on road part number 4 (Figure 2), the road is not showing any problems as mentioned previously. The road was constructed in 2014 but some parts are still under construction especially the parts located in Barangay Santa Margarita, which covers most of road part 5. From Barangay Remus going east on this road part, at first only 10 problems with the top layer are observed. Then there are in total 10 short fragments (10, 20, 30 meters) of road missing, either 1 or 2 lanes broad. 2 Of these fragments are currently under construction (Figure 2). When the road splits in one road going down to the Blue Waters and one road going to the Bolos-Point, the road going to the Blue Waters is a concrete one for a big part of the route and the road going to Bolos Point is a dirt road.

Alcala-Baggao Road part 6 (Barangay Tallang to Barangay Remus)

Since the bridge leading to Remus is still under construction, the people are currently using the NIA road (road part 7) which is considered as a municipal and barangay road. The construction is still working on the foundations of the bridge. The foreman of the construction says it's going to take 4 to 5 years to finish the bridge. The planning is to finish the bridge in 2 years, but a construction worker thinks it is going to take longer. Also, the roads leading to the bridge still need to be concreted, especially on the side of Barangay Tallang.

Alcala-Baggao Road part 7 (NIA road)

Although the condition of this road can be classified as dirt road and the road is of bad quality, this is now the most used road in the municipality to go from the Alcala-Baggao road to the Gattaran Capissayan-Bolos Point road, since it is the only option.

Intensity of the roads

The results of the intensity measurements are given here (Table 3). The locations of the measurement points are shown on the map in this section (Figure 8).

Table 3: Intensity measurements per road part in two directions taken in 1 hour time and their equalized intensity in vehicle units per hour (vhl-u / h).

Road part	Motorcycles	Tricycles	Vans	Light Vehicles	Trucks	vhl-u / h
Intensity to San José						
1.	30	6	3	7	5	**42.1**
2.	122	40	2	13	11	**140.2**
3.	20	3	0	2	0	**16.4**
4.	49	8	0	5	12	**62.4**
5.	24	7	0	0	2	**23.6**
6.	70	35	0	4	3	**79.4**
7.	56	14	1	7	3	**58.3**
Intensity from San José						
1.	50	12	10	14	6	**75.4**
2.	142	31	5	21	10	**154.5**
3.	25	5	0	0	0	**19**
4.	56	11	1	12	16	**84.3**
5.	16	8	0	2	2	**21.6**
6.	105	38	0	2	3	**100.8**
7.	68	22	1	10	2	**73.1**

Purposes to build the roads

Alcala-Baggao road

The Alcala-Baggao road was opened in 1986 for agricultural land of San Jose and for irrigation system. The road connects the two municipalities, Alcala and Baggao. The road is being used by farmers to transport farm inputs and products. It connects the Northern part of Baggao to the center which is Barangay San Jose. The road also leads to the southern and eastern barangays of the municipality. The connecting road to Bitag Piqueno is constructed for faster access to the capital city, Tuguegarao, as well as for easier transport of rice as one of the major crops planted in the municipality. The NIA road is not considered as being built with the purpose to be a main road but for irrigation management.

Gattaran Capissayan-Bolos Point road

The road provides better access for tourism, especially to the Blue Waters and Binaybay Falls. The Gattaran Capissayan-Bolos Point Road gives the people from Pallagao, Santa Margarita, Agaman Proper and Alba the chance to go to the market within a shorter period. In addition, according to one of the respondents, the road is also used for transporting logs coming from the forest area of Baggao.

Purposes to use the roads

Van operators use the Alcala-Baggao Road in going to Tuguegarao City. People go to the city for education, work, banking and shopping. Van operators from the adjacent municipality Gattaran also use the Gattaran Capissayan Bolos Point Road to Alcala Baggao Road in going to Tuguegarao City.

Tricycles are used by the people of Baggao in going to the market, school and offices. People also use open tricycles for their business. Motorcycles are often used in the municipality particularly by residents from the far-flung barangays to go to school, work and getting their needs from the market.

The roads are also used by the trucks for delivering goods and construction materials. Farmers use the road with their hand tractor to deliver their products to the market such as corn and rice. Trucks carrying sands and stones also use the road since there are a lot of construction sites of roads both local and national.

DISCUSSION

Road condition

The condition of the road is generally good but there are also just a lot of bad parts where reconstruction is needed. It would have been better to give the place of each road problem on a map in the report and to give more quantified data about the length of the concrete and non-concrete parts and the sizes of the holes, missing parts and bad top layers in the road. We didn't succeed in obtaining this full information in this research, but it could be subject of further research.

Road intensity

The first thing that the results of the intensity measurements (Table 3) show is that the motorcycle is the most used vehicle in Baggao. Some measurement points have a high number of counted trucks. This can be explained by road construction sites nearby. The difference in vehicle units passing by in the different directions is sometimes significant but a critical difference is never observed. We judge that this difference is because of the time of the day. In the morning people go to their work and to the market and in the afternoon, they go back for example.

Measurement point 1 has now an intensity that's little under average. This could mean that not that many people go out of the municipality and that they are doing most of their daily activities inside the municipality. The intensity could also be explained by the fact that, although the road is concreted, it is not in a good state. The intensity could rise if the construction works on the road are finished but due to the construction of the new San José-Quibal road leading in the direction of Tuguegarao will be finished. We expect that this road will be used much more by traffic leaving the municipality with a destination south of Baggao. According to different interviews, most of the times people leave the municipality only to go to Tuguegarao.

Therefore, the intensity on road part 1 will drop and the intensity on road part 3 will rise. Measurement point 2 has now a very high intensity of vehicles and that's logical since this road is concreted and it is the main road between San José and the whole northern part of Baggao. We expect this to remain stable.

The intensity on road part 4 is about average and the intensity on road part 5 is very low. However, most of the traffic of road part 4 is coming from the barangays near the point where the Alcala-Baggao road and the Gattaran Capissayan-Bolos Point road meet each other and only little traffic was observed taking this road to or from Gattaran. The purpose to build this road was mainly to attract tourism so when tourism sites are becoming more accessible we think the intensity may rise on this road. We don't expect it to become a high intensity road though. Road part 5 has a very low intensity and this can be explained by the fact that this road is placed in a relatively more rural area. Almost nothing can be found on the east side of this road, except the Blue Waters, which may a reason why the intensity may rise in the future. Still, we expect the intensity of this road to stay low.

Road part 6 is near the bridge construction site and the intensity here is strongly related to the intensity of the NIA road of road part 7. When the bridge will be finished, almost all traffic travelling on road part 6 will choose for road part 7 and then the intensity will rise significantly in road part 6 and drop significantly in road part 6.

It is however important to realize that intensity differs in time, not only during the day, but also during the weeks and during the year. On Sundays for instance, it's market day and then there is much more traffic. Also during the harvest season there are more trucks on the road. Our results are just measurements of one hour of time during these periods and are therefore not very reliable. However, they can give a good estimation and that's the most important thing in our research.

Road purpose

The purpose to build the Alcala-Baggao road is clear and matches the purpose for what people use the road. However, for Gattaran Capissayan-Bolos Point road, this is not the case. The road is in a very good condition but is only really used near the intersection with the Alcala-Baggao road. The road should improve tourism but then still it will not be as intensely used as it should be. The purpose for the San José-Quibal road is clear and we believe it will be used as planned. The main problem in this subject was getting to know the purpose for which people use the road and that appeared to be difficult since we can't just stop everyone on the road and ask where they are going and why. Another approach may need to be derived.

Recommendations

Our main recommendation for Baggao are to really think about where they are developing new roads and to consider reconstruction as well as new construction. New or better roads can have a positive influence on the people, but the ecological impacts also need to be considered. This is not really visible in Baggao right now, since the government, either national provincial or local, is developing better roads everywhere in the municipality (Figure 8) while older and higher intensity roads need reconstruction.

However, we don't think Baggao is doing a bad job. Their road system really developed in the last few years and will continue to develop in the coming years, which will give a lot of benefits for the people of Baggao. We just think a modest change in the view of road development would be good.

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HEALTHCARE AND ROAD DEVELOPMENT IN BAGGAO

Kyrvie Baguion, Chris Klerks

INTRODUCTION

Access to adequate healthcare is considered to be one of the fundamental human rights (United Nations 1948). The Sustainable Development Goals adopted by the United Nations in September 2015 also state the importance of access to adequate healthcare (United Nations 2015). However, remote areas in low and middle income countries often lack access to adequate healthcare (Peters *et al.* 2008). Currently, about half of the world's population lives in rural areas and are affected by this problem (WHO 2010). In many of these rural areas there is no access to acute care, which is vital in prevention of disability and death (Hirshon *et al.* 2013).There could be numerous reasons for a low uptake or accessibility of biomedical healthcare. Some of these reasons could be lack of road access, lack of financial means and disinterest by the local government or the general population (Van de Walle 2002).

Baggao is a municipality in the province of Cagayan, situated in Region 2 of the Philippines. It is sparsely populated with 82,782 residents in 2015, situated in an area of 920km² (Acay 2018). The municipality has one hospital, which is located in Tungel. In 1995, only 14 out of its 48 *barangays* housed a *Barangay* Health Station (BHS). Currently, the municipality has 17 *Barangay* Health Stations and 1 Main Health Center. Most of the BHS employ only a midwife as healthcare professional and the rest are *barangay* health workers (Javier 2018, pers comm.). The BHSs deliver basic healthcare services to citizens of the *barangay* and the surrounding *barangays* that do not have a BHS. Some of the services that can be delivered by the BHS are: vaccination, vitamins and paracetamol distribution and consultation from *barangay* health workers, which can bring the patient in contact with a doctor when deemed necessary. In reality the provided services may vary between the *barangay* health stations.

The municipality employs 7 doctors either working for the local government or district hospital, which leads to a doctor to population ratio of 1:11,826 when excluding private clinics (CLUP 1997; Onate 2018, pers comm.), which is far off from the WHO adopted recommended ratio of 1:1000 (JLI 2004; Planning Commission 2011). Another problem is that all the doctors are located in either San Jose or Tungel. For emergencies it is of importance to have fast access to professional medical care. The state of the infrastructure could be of major importance when the doctors are only centrally localized. Our research intended to assess the correlation between the quality of roads and the uptake of biomedical healthcare services.

With this research we hope to find out whether the state of road infrastructure is directly correlated to the accessibility or uptake of healthcare in remote areas. We hope to get an insight in the current healthcare situation of the municipality of Baggao and to see how the population copes when they lack accessibility to healthcare. The results of this research could be useful for defining the focus of infrastructural development in attempt to improve the access to healthcare.

Research question

Are biomedical healthcare accessibility and uptake improved with road developments in the municipality of Baggao Cagayan?

- What is the current state of healthcare in *barangays* with different accessibility from main roads?
    - Medicinal supplies and stocks
    - Professional healthcare providers
    - Emergency care availability
- Does the road quality in and to the *barangay* reflect the healthcare accessibility and uptake?
- Is access to healthcare the main limiting factor of healthcare use within the municipality? Other possible causes:
    - Costs
    - Use of alternative healthcare
    - Lack of education

METHODS

Table 1: Time table for the fieldwork in the municipality of Baggao in January 2018

Date	**Location**	**Activity**
18 January	San Jose	- Visited the municipal health office - Interviewed 1 key informant (head nurse)
19 January	San Jose	- Visited the Baggao district hospital - Visited Rescue 116 - Interviewed 6 respondents and 2 key informants and 6 patients
20 January	Remus Sta. Margarita	- Visited the Remus *Barangay* Hall - Visited the Sta. Margarita BHS - Interviewed 12 respondents and 2 key informants
21 January	Remus	- Report writing
22 January	Mansarong (Sta. Margarita)	- Interviewed 5 respondents

We interviewed 23 respondents using a questionnaire. The questionnaire consists of 5 questions that will provide us with general information about the respondent, 5 questions that will give us information about the respondent's use of healthcare and his opinion on the accessibility of healthcare and a question that gives 8 scenarios of different diseases and accidents. The scenarios differ from a range to mildly harmful to lethal and from chronic to acute in order to give us a broad view on the respondent's reaction in these situations. We asked the respondent to motivate his choice.

The results of the last question will be used for statistical analysis. We grade the results for the choice for professional healthcare with 1 point and the choice for neglect or alternative healthcare with 0 point. By using a one sided T-test with $p<0,05$, we compare the results of the different *barangays* where people stated the access of healthcare being either generally good, with positive answers from >50% of the respondents or bad with negative answers from >50% of the respondents. The data used for this is the question about accessibility in the survey.

The respondents' ages and occupations are collected during the interviews in order for us to attempt to avoid having respondents from one age group or a single occupation, since these things could correlate with the results of the survey.

If no statistical difference can be found between areas that the respondents consider to have good access to the hospital or bad access to the hospital, we will use our existing data to find out which is the main reason for not using available professional healthcare services. Some of the possible reasons can either be from a financial nature or by lack of education.

For background and information on the current state of healthcare, we consulted key informants that were working for the municipal health office, the district hospital or a BHS. The interviews for these key informants had room for different questions when we noticed during an interview that they had good knowledge about one of our sub questions. During interviews with the BHS-respondents we would ask whether they had any problems with supplies and whether people had trouble reaching them by road.

RESULTS

Baggao is a large municipality that houses 48 *barangays.* Due to difficulty of transportation and infrastructural incapability by the state of the roads, the delivery of primary healthcare services to the far flung *barangays* and *sitios* like Mansarong is sometimes delayed. However, according to the Annual Accomplishment Report of 2016 from the Municipal Health Office (MHO) of Baggao, Cagayan series of healthcare programs were conducted to all *barangays* wherein oral health services, prenatal check-up for pregnant women, immunization and vaccination for children and laboratory services like sputum examination, blood malaria smear, urine microscopy, blood typing, pregnancy test, stool and other healthcare services were provided. Intensive information, education and communication campaigns were also conducted to the different *barangays* of Baggao to provide knowledge and awareness to the community about Family Planning, Water Sanitation, Leprosy, Malaria and Cardiovascular Disease Prevention and Control. The education of the inhabitants of the municipality is one of the main government efforts. This was also stated in an interview with the midwife of Sta. Margarita, which was one of our key informants.

In an interview with one of our key informants, Dr. Garry Onate, the chief of the Baggao District Hospital, we found out that there used to be three public hospitals in the municipality of Baggao but these merged into one. The reported reason for this was the lack of staff. The number of patients that they used to attend to has not dropped according to the chief of the hospital. In the same interview, Dr. Onate mentioned that the accessibility to this hospital has improved due to the construction of the national road. Supplies to the hospital are frequent. It was said this used to be a problem in the recent past.

Respondents from the general population of San Jose stated that they have good road access to the hospital with reported travel time of 15 minutes (Figure 1). Respondents from Sta. Margarita and Remus generally reported negatively about the road with reported travel time of 1,5 to 3 hours to the hospital in San Jose (Figure 1). It was often mentioned here that the only available bridge leading to San Jose can flood in periods of rain, which makes it inaccessible.

Respondents of *Sitio* Mansarong stated their travel time can be up to 6 hours, having to cross two rivers by foot and being in an area which is inaccessible by *tricycle*, which we observed as one of the most important vehicles for human transportation in the area.

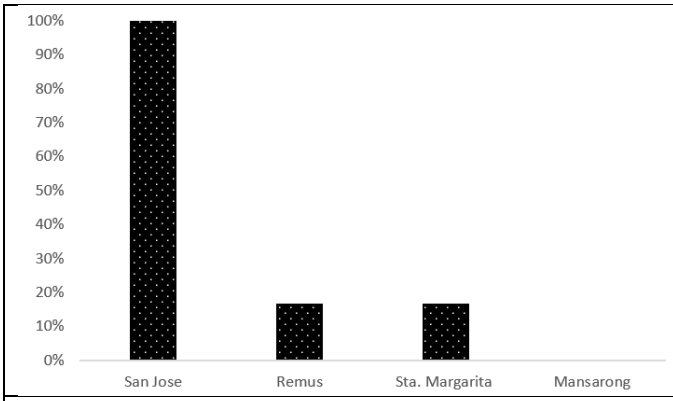

Figure 1: Percentage of respondents in different *barangay* in the municipality of Baggao that stated that there is good road access to the nearest hospital from their home.

The results from the last eight questions of the survey allowed us to score our respondents and calculate a mean for every *barangay.* These results show us that both Remus and Sta. Margarita 'proper' do not differ in the preference for professional healthcare over San Jose, which is used as control due its close proximity to healthcare services. The only significant difference was found in the *Sitio* Mansarong (Figure 2). P-values found after using an unpaired one-sided t-test, comparing San Jose with the other samples are: P=0.108 with 5df for Remus, P=0.098 with 5df for Sta. Margarita Proper and P=0.037* with 4df for Mansarong. Assuming there is a normal distribution in the scores and a consistent variance. Due to the lack of data points we cannot prove normality with a Shapiro-Wilk test.

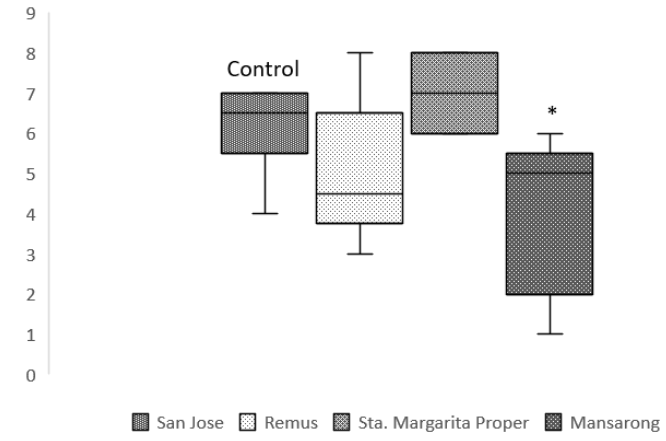

Figure 2: Mean of scores per different *barangay* from the questions about healthcare choice. A higher score means a stronger preference for choosing biomedical healthcare services over alternative healthcare services with San Jose as control group. Compared with unpaired one sided T-test *= $p<0.05$

During our travels in the municipality of Baggao we found out that road conditions differ throughout the municipality. The national road is paved and, where completed, is wide and seems to allow for fast and safe transport. Still a lot of dirt roads exist in Baggao and bridges are not present in every place, why only high trucks or cars are able to pass (Photo 1). These modes of transport are quite often not accessible to the people living in these areas. Some of the dirt roads were also very susceptible to deformation by heavy trucks that would leave very deep tracks in the road, making it harder to pass the road by foot.

An event where a problem with hospital access exists is giving birth. Government policy dictates that women have to give birth within the birthing facility, which is a free service. The

reason for this is an attempt to bring down the cases of maternal death and the ability to handle swiftly when any complications occur. Due to the long travel time and bad road conditions it happens that people give birth during their transport. Respondents also stated that transportation for giving birth can be too expensive and that, because of this, they prefer to give birth at home. Rescue 116 is a good addition to the provided healthcare service in this case. Since volunteers are located in different *barangays* it allows them for quick emergency help and assistance in evacuation.

Hector August Miguel, operations head at Emergency 116 told us in an interview that Emergency 116 is a municipal unit that offers emergency help for Baggao inhabitants. In every *barangay* there are people present from the *barangay* quick response team. Emergency 116 conducts seminars and trainings in every *barangay* to train these teams. The unit has 8 ambulances for the entire municipality. Because of limited medical facilities it is part of their mission to educate the residents in emergency handling.

Photo 1: A picture of a river crossing the only road leading to the *Sitio* Mansarong, illustrating the problems with road access to professional healthcare services.

Respondents in all of the researched areas have stated they will use alternative healthcare practices in some of the example cases from the research. The numbers of these differ per *barangay* but still lead to a high average of 75% that have said to use alternative healtcare practices in at least one of our example cases (Figure 3). In most of the cases the treatment would be herbal. Only three of our 23 respondents stated they would visit an *albularyo* (a traditional healer*).* In the *Sitio* Mansarong all respondents stated to use herbal medicinal practices (Figure 3). One of our respondents explained that the community will always first attempt to try curing something themselves with the recourses they have easy access to before they would endeavor the 5 hour journey to the hospital.

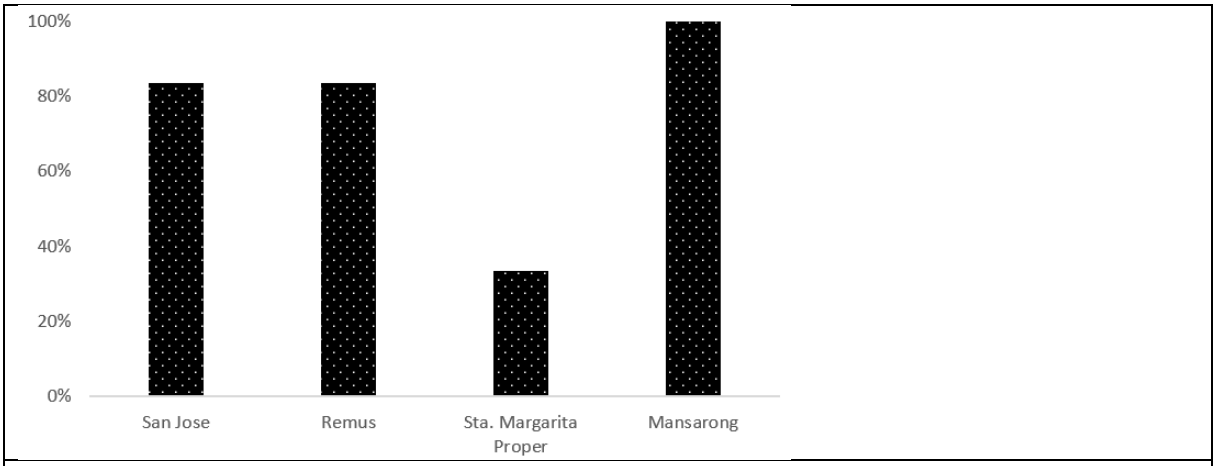

Figure 3: Percentage of respondents from different that choses to use alternative healthcare in at least one of the example cases from the survey

DISCUSSION/CONCLUSION/RECOMMENDATION

The results of the survey tell us that the respondents outside of the municipal capital have trouble getting access to a hospital by road. Something that has been mentioned often as a reason for this was either mud (notably, the research was conducted in rainy season), or river crossings with bridges that often flood. For the most distant place we researched, the *Sitio* Mansarong, people stated that it could take them up to 6 hours to get to an hospital and that they had to rely on people carrying them down the road. Due to the lack of staff three hospitals had to merge into a single district hospital located near San Jose. The lack of staff could be caused by the brain drain of healthcare professionals in the Philippines (Brush 2007). According to the chief of the hospital the road access to the hospital improved a lot in the recent years and that this had a positive effect on their supplies even though the amount of patients have not declined according to the hospital chief.

Our data show a weak connection between the actual travel time to the hospital and the preference for professional healthcare services. We have to discard our hypothesis that these are related. Interestingly, Sta. Margarita Proper shows very low numbers of alternative healthcare use when compared to San Jose (Figure 3). In the interview with the midwife that is located in the BHS in Sta. Margarita we found out that education in healthcare is also an important government task. We expect a connection between her effort in this and the low numbers in the use of alternative healthcare. This is something that shows the importance of BHS services.

The rates of using alternative healthcare methods are high in the other *barangays* (Figure 3). Very often the respondents would use herbal treatments, using baby papaya, garlic or oregano, sometimes in situations that could have a lethal ending. This information combined with our other data tells us that people are not always familiar with the severity of their conditions and thus will not always reach out a healthcare professional, do not have faith in biomedical healthcare or miss the financial means to reach out to biomedical healthcare. It was interesting to see that respondents were very familiar with dengue and rabies, but not with other infections or signs of cancer.

From this research we can conclude that citizens do experience trouble when they have bad road access to a hospital or other healthcare professional but that this does not necessarily means that people will always use alternative forms of medicine when the accessibility to healthcare is limited.

The municipality of Baggao shows a lot of effort into improving their healthcare and offers good services to their citizens through the BHS and district hospital. We would recommend the municipality to keep investing in improving infrastructure with focus on paving existing dirt roads and creating bridges for hard accessible areas. We would like to advice to focus on education as well as it seems to have an important role in people and their healthcare decisions. Including a first-aid compulsory first-aid course in high-school could help with this. Another option is to open another hospital in Tallang (Acay 2018, pers comm.) which is currently an important marketplace for *Barangays* that are remote from San Jose (Acay 2018, pers comm.).

Further research into this topic could be done with bigger and more diverse sample groups. Even though we attempted to have a random population for our sample, we ended up with a lot of storeowners, because these were the people available during daytime. This could have had an unwanted influence on our data and conclusion. The statistics used in the result section give weak confidence in the data. To make sure the results scores of the survey follow a normal distribution, the survey could be tested using a bigger group in similar circumstances. The problem with this is that the remote community in this research would be too small in order to do proper statistical testing.

For the comparison study we would like to advice to visit other local government units and ask them for their information on the local healthcare. This data does not seem to be publicly accessible. The duration of our study didn't allow us to look into this information.

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APPENDICES

Questionnaire Healthcare accessibility

Background:
1. Name:
2. Age:
3. Occupation:
4. Residence:
5. Household size:

Local:
6. Are you using professional medicine, if yes: for what? :
7. What healthcare services within the *Barangay* have you used in the past 5 years?:
8. Are you, or have you had any diseases or accidents in the past 5 years? If yes, which?
9. What do you think of the accessibility of healthcare in this area?
10. Do you ever seek medical attention with other healthcare suppliers: *Albularyo* for example?

Seven examples of injuries and diseases will follow in this question. Please indicate for each of the example whether you would go to: The hospital, The *Barangay* Health Station, *Albularyo*, or do nothing.
11. After your dinner last night you have a painful stomach and diarrhoea.
12. You cut your hand during cooking/farming last week. Now the hand is swollen, red, hot and painful.
13. You recently got stung by a lot of mosquitos, after that you got a fever and headaches. It might be malaria.
14. You fell from the motorcycle and broke your arm.
15. You feel a lump in your neck, it's been there for a few months already.
16. You got bitten by a dog that might have rabies.
17. You got bitten by a cobra.
18. You think you suffer from high blood.

TOURISM IN BAGGAO, CAGAYAN

Guirliedane Palapal and Laura Righetti

INTRODUCTION

Recently, the Philippine online newspaper Rappler published an article entitled; "El Nido to impose daily visitor limits in 3 iconic tourist sites". These sites are the Secret Beach, the Small Lagoon and the Big Lagoon. Indeed, the number of tourists in El Nido, Palawan, in the Philippines, continues to increase; the Municipal Tourism Office reveals that the average of tourist arrival increased by 30.7% in the last three years (Fabro 2017). Contrasting to this mass tourism industry, the municipality of Baggao has a very different story regarding the topic of tourism. In the last years the number of tourists visiting the municipality equaled approximately a few thousands per year on a municipality with a population of 82,782 (Wikipedia 2015). However, this municipality in the North-East of Luzon, part of the Cagayan province, has a great potential for the development of tourism, especially due to its biodiversity and landscapes. That is why, tourism has been considered a priority goal within the province in the Ambisyon 2040 Long-Term Vision (Israel 2018).

In the pamphlet handed by the staff of the Municipal Tourism Office of Baggao, seven places where advertised, namely Duba Cave and Underground River, Laglagto River, Blue Water Falls and Cave, Lipit River, Kalamudingan Falls, Valley Cove and the Hotspring. We chose to narrow down our study to the three highlights of the area; which are the Duba Cave, the Blue Waters and the Hotspring. We focused on three areas, mainly due to the limited timeframe we had and the significant distances between the different places. First of all, the representatives of the Tourism Office shared with us their data concerning the number of tourists visiting the three major attractions of Baggao in 2016 (Table 1). The peak season of tourism in Baggao coincides with the Lenten season, which is during March, April and May. During this period, the number of tourists visiting the main touristic spots climaxes up to a few thousands per month, whereas during the rest of the year, the number of tourists only reaches a few hundred per month. The LGU is nowadays putting considerable effort into the development of this sector. That is why, the LGU is funding programs for tour guides, such as first aid and tour guide trainings. Twenty-five of the 50 members of the tour guide organization are active. Six are situated in Blue Waters, eight in the Hotspring and six in Duba Cave. Also, during the Opening Ceremony of the field work, the 18th of January in the Municipal Town hall of Baggao, we observed that when the representative – Raona O. Mabutas – was presenting the work of her Office, it already seemed like she was advertising. Her presentation was mainly based on pictures of the touristic spots, and flyers about the touristic destinations in Baggao were distributed to us.

Table 1: Number of tourists in the three major touristic destinations in Baggao in 2016.

	Domestic	**Foreign**	**Total**
Duba Cave	13,092	9	13,101
Hotspring	14,786	9	14,795
Blue Waters	11,027	13	11,040
Total	38,905	31	38,936

Recently, the LGU passed Municipal Ordinance (MO) No. 2017-07 which imposes "tourist fees to local and foreign tourists" visiting the municipality's tourist destinations (Municipality of Baggao 2017). The entrance fee is 30 pesos per person, and this income is shared between the LGU (50%), the *Barangay* (40%) and the Tourism Council in Baggao (10%). Thanks to these

fees, the different agencies are able to conserve and maintain the area, but also to develop tourism and its activities. The establishment of the Municipal Ordinance started on 17 January 2018, and the *Barangay* official should pass it.

The Baggao municipality could therefore be a potential new tourist destination and thanks to tourism for boosting its economic development. The main debate about tourism's outcomes is still at the heart of discussions: do the positive impacts of tourism overcome the negative ones?

In order to study the factors which could encourage positive development of tourism in Baggao, while avoiding the negative impacts we first assessed the current situation. Then, we interviewed the community members and investigated whether they support the idea of developing tourism in their own *Barangays*. We also considered the various disadvantages – mentioned by the respondents – of welcoming more tourists. Lastly, we shifted towards the local government's perspective to research how the local government could promote tourism in Baggao. These factors could encourage the development of tourism only if they are in agreement with each other; if there is a discrepancy between the local government's wishes and those of the local people, the potential development of tourism will be hard to institute.

RESEARCH QUESTION

What is the current state and the future of tourism in Baggao?

- What is the current state of tourism in Baggao?
- What are the different opinions among the community members regarding tourism?
- To what extent does tourism economically benefit the community members?
- What are the plans of the local government in promoting tourism in Baggao?

METHODS

We used both qualitative and quantitative data gathering methods in order to obtain a range of results.

Qualitative Data

We obtained qualitative data in two major ways: through interviews and observations. Semi-structured interviews were conducted with the Local Government Unit Representatives. These interviews involved representatives of both Tourism and Engineering Offices concerning the current tourism situation and also the local government plans regarding the promotion of the municipality as a tourist destinations. We have considered these representatives as our key informants. The Local Government Unit (LGU) provided us with precise data, which allowed us to draw an accurate current situation regarding the tourism industry in Baggao.

We also visited the three major tourist destinations identified by the Tourism Office. This allowed us to create a profile of these places which includes the travel time, travel costs, the fees to be paid, the activities that can be done in the area, the facilities in place for tourists and the type of tourists that usually go there. In order to profile these locations, diverse methods such as observations and photography were used.

Interviews regarding the expectations of the community was also conducted with the people living around the tourist spots. Respondents were chosen through random sampling and availability sampling. Seven interviews were conducted in Barangay San Miguel including the fee collector for Duba Cave, a resort owner and the other interviewees are community members. Seven interviews were also conducted in Barangay Asinga-Via where the Hotspring is located.

These interviews were conducted with the fee collector/caretaker, a tourist, a tour guide and four community members. Six interviews were conducted in Blue Waters, in the *Barangay* Pallagao; these include five community members, four of which are farmers and a tourist.

We also interviewed the owner of Vicimar Hotel in San José.

Quantitative Data

The quantitative data was gathered through a survey of 100 people in San José. The random sample includes students, shop owners, and sales boy/ladies. The respondents for this data gathering method were selected through availability sampling. We asked the people about the places tourists usually go to and whether they have already been there or not. We followed up with two other questions; the first one being "Would you like to welcome more tourists in Baggao" and the second "What should the LGU do to increase the number of tourists".

Table 2: Our time schedule of the field work in Baggao, 2018

Date	Activities
18/01 (Thursday)	Arrival (a.m) **San José** (p.m): Interviews with tourism office representatives of the municipality
19/01 (Friday)	**Duba Cave**: profiling, interviews with local people, the collector, the owner of the resort "Duba Cave Resort" and *Barangay* officials
20/01 (Saturday)	**Hotspring** (a.m): profiling, interviews with local people, tourists, the collector and care taker of the area, *Barangay* officials **Barangay San José** (p.m): interviews with the local people
21/01 (Sunday)	**Blue Waters**: profiling, interviews with local people and tourists
22/01 (Monday)	**Barangay San José** (a.m): interviews with the tourism office representatives (p.m): owner of the Vicimar Hotel, interviews with local people
23/01 (Tuesday)	Departure

RESULTS

The Municipal Tourism Office of Baggao, Cagayan identified Duba Cave, Hotspring and Blue Water as the three major tourist destinations in the Municipality. These three places are proclaimed as Fish Sanctuaries by the Bureau of Fisheries and Aquatic Resources because they are home to thousands of eels (Mabutas 2018, pers.comm.).

Photo 1: Duba Cave (Photo by L Righetti 2018)

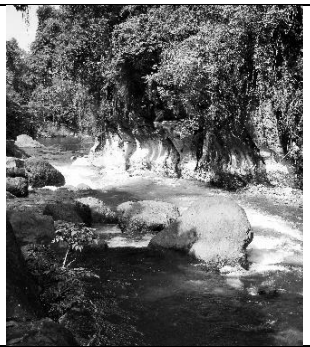

Photo 2: Hotspring (Photo by L Righetti 2018)

Photo 3: Blue Waters (Photo by R Gabinete 2018)

Duba Cave and its Underground River are found in *Barangay* San Miguel, 30 minutes away from San José by motorcycle. The gravel road leading to the site can be accessed by motorcycle and tricycle though some prefer hiking to the area. The Hotspring located in *Barangay* Asinga-Via is a 45 minutes to 1hr 30 minute drive from San José depending upon the weather. To access the place, one may take the Asinga-via-Annayatan Road which is still to be paved and during which the Pared River has to be crossed by boat. During rainy season, only motorcycles can access the area due to the road's dirt and gravel nature. However, during the summer season the place can be accessed by van and by public utility vehicles, such as jeepneys and tricycles (Dumayag 2018, pers.comm.). Blue Waters can be accessed after 1hr 30 minute drive from San José to Pallagao and another 30 minute hike to the site itself. The road leading to the *Barangay* is still under construction.

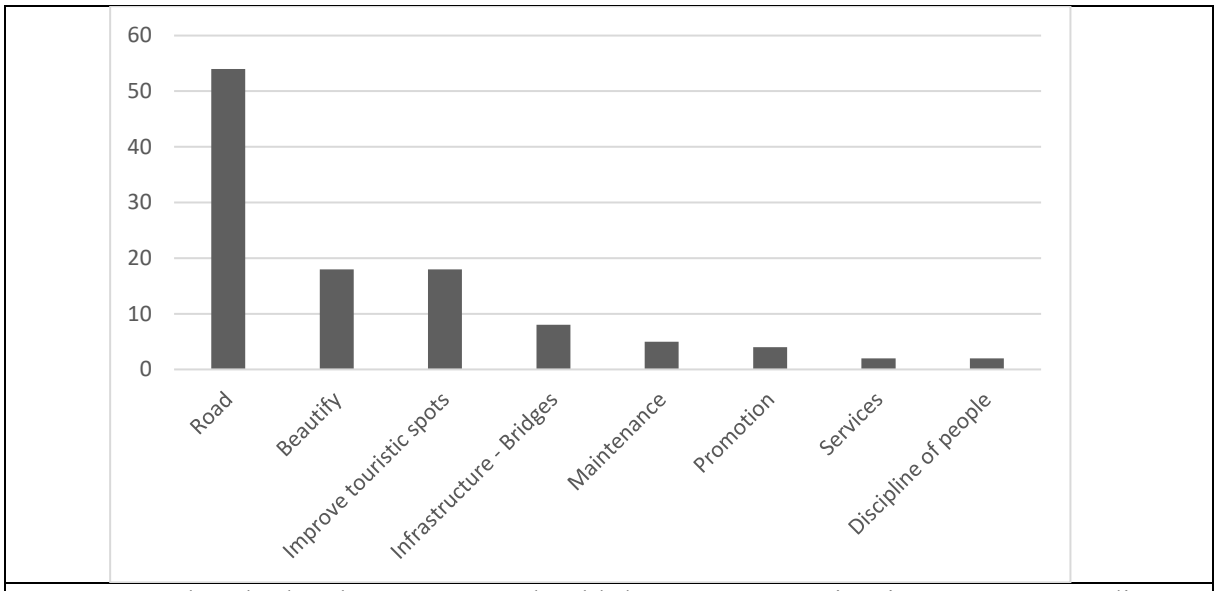

Figure 1: What the local government should do to attract tourists in Baggao, according to 100 respondents in San José. Multiple answers possible.

We interviewed 100 local people in San José, and our first question was: "What places do tourists usually go to in Baggao?" It was an open-question and respondents could provide multiple answers. The three main answers were Blue Waters (76 respondents), Hotspring (61) and Duba Cave (61). Other responses included the Valley Cove, Seven Steps, Laglagto and agriculture. We followed up this question with: "Which of these places have you already been to?" We expected that most of them had already been to these places as the spots are not far from San José, especially the Duba Cave. Nonetheless, only 37 of the respondents had already been to Blue Waters. This means that only 49% of the respondents who recognized the Blue Waters as a touristic spot had been there. 82% of the respondents stating the Hotspring as a touristic spot had already been there, and 79% of the local people assessing Duba Cave as a touristic area had already visited the location.

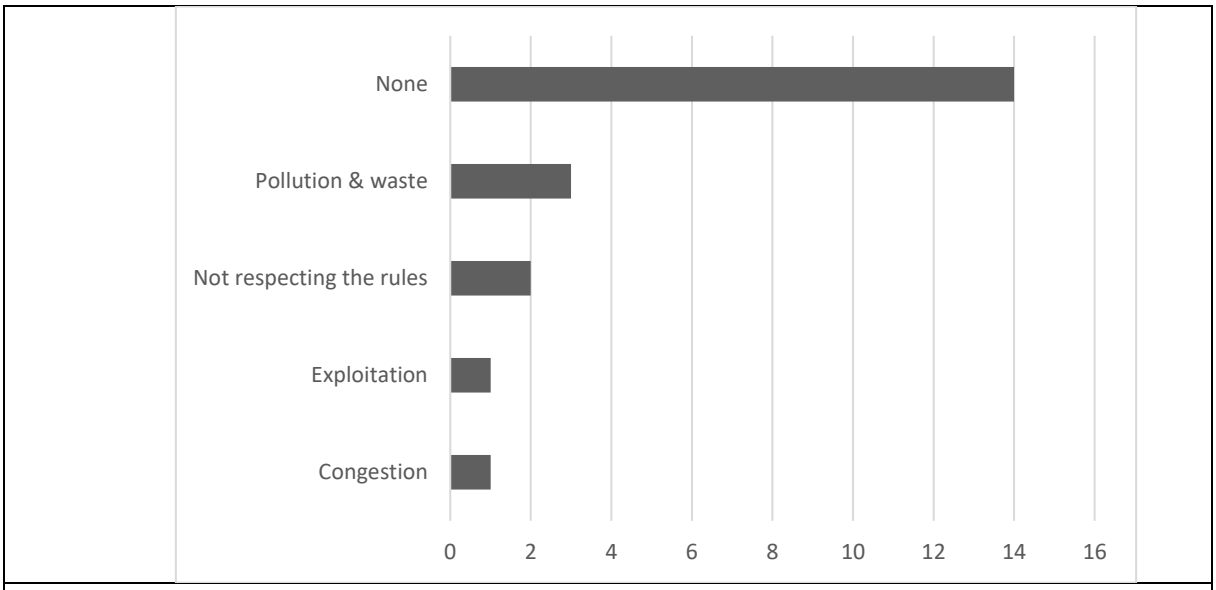

Figure 2: The disadvantages of mass tourism such as Boracay according to respondents from San Miguel, Asinga-via and Pallagao. Multiple answers possible.

In Duba Cave, the Hotspring and the Blue Waters, we asked the community members: "Would you like if your municipality became as touristic as Boracay?" Without any hesitation, all respondents answered positively to the question. Most of the respondents see mass tourism as an avenue of economic and social development in the community. Indeed, they perceive this as an opportunity for employment and livelihood. When asked about the disadvantages fourteen or 67% of the respondents living near tourist destinations see no disadvantages of large scale tourist activities in their places (Figure 2).

DISCUSSION / CONCLUSION / RECOMMENDATIONS

What is the current state of tourism in Baggao?

We found out that though the different spots are already catering thousands of tourists every year, the facilities in the area remain poor. In some areas, plans have been made in order to rehabilitate these facilities.

Cottages. Duba has several cottages assigned for picnics. These cottages are all made of wood, for the beams and posts, and of galvanized iron for roofs. They were provided by the local government for tourists' use. However, the place has been vandalized, even though Ordinances against vandalism and littering have already been passed in the area (Photo 4). The issue regarding cottages in Hotspring comes from another factor. In 2016, the typhoon Lawin destroyed the cottages, and they have not been rebuilt since. In the Blue Waters' area, two cottages have been constructed but are now in a poor condition (Zegelaar 2018, pers.comm.).

Photo 4: Vandalism in Duba Cave (Photo by L Righetti 2018)

Comfort Rooms (CR). The Duba Area has no proper comfort rooms though *Barangay Kagawad* Cesar G. Laguian has mentioned that there are plans concerning the construction of concrete comfort rooms in the area. On the other hand, the Hotspring area has a separate comfort room for men and women but the wooden CRs are not enough to address the needs of the thousands of tourists coming to the area during the Lenten season (Dumayag 2018, pers.comm.). This often leads to unsanitary actions by the tourists. Blue Waters has no comfort rooms in the area itself - the nearest is 30 minutes hike away (Zegelaar 2018, pers.comm.).

Accommodation. All of the four cottages designed for night stays in the Hotspring have been destroyed by Typhoon Lawin in 2016 and until now are not yet rehabilitated. That is why, tourists who wish to stay the night have to camp next to the parking. Though tourists mostly come for the day trip in Blue Waters, some tourists, especially foreign tourists, avail homestays from the people living near the site (Villanueva 2018, pers.comm.). Tourists can also stay in hotels in the town center.

What are the different opinions among the community members regarding tourism?

After interviewing 20 respondents in the different areas of Duba Cave, Hotspring and Blue Waters, we noticed that they all recommend their own area for the development of tourism. They mostly recommend their own area because of the spot's beauty, but also for other factors, such as the pride they feel when tourists visit their area and the income it generates for the *Barangay* (Ballesteros 2018, pers.comm.). Another aspect that appeared clearly through the semi-structured interviews is that the local people believe that the LGU should primarily act as a funder. They mainly wish the LGU would focus on improving their touristic spot and also build / rehabilitate the different roads that lead to the spots. For instance, to access the Hotspring we had to put the motorcycle on the boat to cross the Pared River because no bridge has been built to connect the roads from each side.

The topic which had more various outcomes concerned the fees. As stated in the introduction, the LGU recently passed a Municipal Ordinance which increased the entrance fee of the touristic attractions in Baggao to 30 pesos per head. Before the Ordinance, each touristic site had its own entrance fee; Duba Cave's entrance fee was 10 pesos, while in Hotspring and Blue Waters the fee used to be 20 pesos. All the local people interviewed in Hotspring agreed with the rise of the fees, simply because it means that the *Barangay* generates more income which is then spent for the maintenance of the area, the cleanliness and the improvement of the touristic spot. However, the opinions differed in Duba Cave and Blue Waters. Indeed, in Duba Cave, the entrance fee's increase had been applied immediately without informing the

Barangay's community members. Therefore, the two first housekeepers we interviewed did not even know about the entrance fee's increase. Also, the seven community members interviewed in Duba Cave consider that by rising the entrance fee it will decrease the number of tourists. They affirmed that most of the people from the municipality will not be able to afford this, considering that children have to pay the entrance fee as well. Moreover, visiting Duba Cave is not the priority for expenditure so the rise in fees will have a negative impact on the number of tourists (Gubatan 2018, pers.comm.). The people living in the *Barangay* where the touristic spot is located do not pay the entrance fees and they are not included in the data from the tourism office. For instance, local residents of Asinga-Via do not pay to visit the Hotspring. However, every month, one Zone of the *Barangay* is assigned to clean the touristic spot (Mabutas 2018, pers.comm.). Therefore, thanks to this rotating system, the area is always maintained.

To what extent does tourism economically benefit the community members?

According to our 20 respondents, their *Barangays* benefit economically from tourism thanks to the entrance fee imposed by the Municipal Ordinance. The income gained by this fee allows the *Barangay* to spend this revenue in the maintenance and the improvement of the touristic spots. The entrance fees can be used for projects such as building cottages and the establishment of electricity connection (Canceran 2018, pers.comm.). Regarding the community members, some of them personally benefit economically from tourism. In Duba Cave two of the women interviewed earn income from tourism, as during the peak season they sell food, snacks and flowering plants in the touristic spot. In Hotspring and Blue Waters, some of the men interviewed generate income from tourism. Indeed, when there are tourists, especially foreign tourists, they are employed as tour guides – two men in Hotspring and two men in Blue Waters – and another man we interviewed in Blue Waters is paid to carry the tourists' luggage. However, all these men also work full-time as farmers, but have these extra jobs when tourists visit these spots. Still, most of the community members interviewed do not benefit economically from tourism, but in Duba Cave it was mentioned multiple times that they feel that they benefit from tourism, in the sense that they feel happy and gratified to welcome tourists (Sibbaluca 2018, pers.comm.).

However, one of our interviewees, Tadek Wala, the owner of the Duba Cave Resort, noted the economic disadvantages associated to tourism. Indeed, the issue with tourism in Baggao, is that this industry is very vulnerable. The amount of tourists visiting the areas depends on the weather conditions and the seasons (Wala 2018, pers.comm.). It is a vulnerable sector in the sense that many factors can influence the number of tourists, such as political instability and diseases. Also, natural disasters have a large influence in the Municipality of Baggao. For instance, the typhoon Lawin in 2016 decreased the number of tourist, and destroyed all the cottages in Hotspring. The second economic disadvantage mentioned by Tadek was the loss of economic self-reliance. If Baggao developed its tourism towards mass tourism like Boracay, the local people would abandon their traditional jobs and shift all the economic activity towards the sector of tourism (Catibog-Sinha 2012, 128).

What are the plans of the local government in promoting tourism in Baggao?

According to Ms. Raona O. Mabutas, Municipal Tourism Officer, the Department of Tourism, in convergence with the Department of Public Works and Highways has allotted a Five Year Budget (2018-2022) of 500 Million Pesos for the construction of roads to the different tourist destinations. For this year, an initial budget of 35 Million Pesos has already been approved. If this plan materializes, the construction of these roads will start this year (Dayag 2018, pers.comm.). In terms of promotion, the local government has allotted 100, 000 pesos for signage and posters (Mabutas 2018, pers.comm.).

Recommendations

Our first recommendation is for the LGU to continue its plans concerning the roads' rehabilitation and construction. Indeed, all of our respondents emphasized the fact that roads' bad condition was the first factor hindering the development of the tourism industry.

Our second recommendation for the LGU, is to develop partnerships with Non-Governmental Organizations (NGOs) for two reasons. This cooperation would have the purpose to develop the community members' knowledge on the industry of tourism. NGOs could sponsor programs, during which the local people would learn about tourism and its impacts, including the negative impacts. Indeed, all the respondents claimed that they hope for the growth of tourism in their area towards the notion of mass tourism. However, 67% of the respondents did not mention any harmful impacts large-scale tourism could generate. Therefore, if the community members learn about the different aspects of tourism, they will be able to monitor tourism themselves in their area.

Our third recommendation concerns the implementation of the rules. We observed that in these three touristic spots, there were some cases of vandalism and littering, especially in Duba Cave (Photo 4). Even though the rules are written on the board at the entrance of these areas, they are not always respected. That is why, the LGU should employ people to ensure that the rules are being followed.

ACKNOWLEDGEMENTS

We thank the Local Government Unit of Baggao for the hospitality and support, Kuya Maynard of the Municipal Environment and Natural Resources Office (MENRO) for helping us reach our different locations, Até Vina and Kuya Onofre Saladino for hosting us and for the nice time we spent with their family. We also thank all the officials from the *Barangays* of San Miguel, Asinga-Via and Pallagao for their help and for their time. Likewise, we thank Ms. Mabutas for her time and for giving us access to all the documents and data we needed for our research. Lastly, we thank all our respondents, from the Barangays of San Miguel, Asinga-Via, Pallagao and San José for their time and answers.

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APPENDIX

Questionnaire: Community Members

Sociodemographic profile

1. Name
2. Age
3. Highest educational attainment
4. Occupation
5. Ethnic group

Questions related to the topic

Current State of tourism

- Presence of tourists
- What period of the year (how often)
- Places of origin (from the municipality/province/foreign countries…)
- Places they usually visit (why?)
    - What places do they recommend (why?)
- Activities they do
- Do they pay fees?
    - Do you think they should/should not?
- How do you find the presence of tourists?
- Does your barangay benefit from tourism? (how and who in particular?)
    - If not, is tourism harmful to your barangay?
- Do you benefit personally from tourism? (how?)

Future of Tourism

- How could your barangay benefit from tourism?
- Do you think Baggao should promote tourism? (why and why not?)
- What do you think should be done in order to attract tourists in the municipality?
    - Could/Should the local government have a role in this development?
        - If yes how?
    - Could/Should the non-government organizations have a role in this development?
- Do you think that the number of tourists will increase in the coming years? (10/50years) Why?
- Would you like if your municipality became as touristic as Boracay?
        - What would be the advantages and disadvantages?

THE PRODUCTION AND MARKETING OF NON-TIMBER FOREST PRODUCTS IN SITIO MANSARONG, BARANGAY SANTA MARGARITA, BAGGAO

Daisy de Hoop and Richelle Acain Incina

INTRODUCTION

Timber is used by many people all over the world for numerous purposes. The production and the markets for timber are therefore highly visible, highly structured and well established (Koppel 1995). But is the cutting of forests for timber sustainable? Or should it be a topic of concern because we are destroying the forests? Although the harvesting of timber from the forests gives a high return at one moment, it will take many years before the same piece of forest can be cut again. In this sense, the loss of the world's forests in just a few centuries is a fact (Polet 1991).

Today's interest is about non-timber forest products, which are less ecologically destructive than timber harvesting and thus have greater potential for sustainable forests management (Solomon 2016). They also have a much shorter turn-over period than timber products (De Beer and Mcdermott 1996). Non-timber forest products are any biological or organic materials or services other than timber that are produced in forests and which are extracted from forests for human use; they do not require harvesting trees (NTFP, non-dated). Non-timber forest products include various items such as medicinal plants, dyes, mushrooms, fruits, resins and saps and also raw materials that can be made into ropes, baskets, mats, fences, clothes and many other consumer products (Koppel 1995). To conserve the world's forests, it is important to find new non-timber forest products, develop new non-timber forest products markets and improve the existing marketing systems, so that the forests will become too valuable to destroy (Byron and Ruiz-Pérez 1996). The marketing and sale of non-timber forest products are also ways of boosting and creating income for poor forest-based people and communities (CIFOR, non-dated).

Our research is an in-depth area study focusing on the marketing and sale of non-timber forest products by the community members of *Sitio* Mansarong, *Barangay* Santa Margarita, Baggao, the Philippines. The community members of *Sitio* Mansarong are mainly farmers of rice, corn, bananas and beans. Besides, most of them are also producing and selling non-timber forest products in their spare time as an extra source of household income. The community members of *Sitio* Mansarong want to spend their days as efficiently and productive as possible. As one of them told us: 'I do not want to do nothing, so I make and sell non-timber forest products next to farming to earn more money' (Soriano 2018, pers.comm.). The relevance of our research: it contributes to or it creates the awareness of the environmental and the economic importance of non-timber forest products. It also helps to better understand the current situation.

RESEARCH QUESTION

How do the community members of *Sitio* Mansarong, *Barangay* Santa Margarita, Baggao, the Philippines, produce and sell their non-timber forest products?

- What are the used raw non-timber forest products?
- What is the process of the producing and the selling of non-timber forest products?
- What are the profits of the producing and the selling of non-timber forest products?

METHODS

Table 1: Time schedule

Date	***Activities***
January 17, 2018 Wednesday	Prepare and present our field study proposal
January 18, 2018 Thursday	Conduct informal talks at the DTI-office in the Municipal Hall in *Barangay* San José, Baggao
January 19, 2018 Friday	Conduct four interviews with producers and sellers of non-timber forest products in *Sitio* Mansarong, *Barangay* Santa Margarita, Baggao
January 20, 2018 Saturday	Conduct six interviews with producers and sellers of non-timber forest products and do participatory observation in *Sitio* Mansarong, *Barangay* Santa Margarita, Baggao
January 21, 2018 Sunday	Conduct six interviews with producers and sellers of non-timber forest products in *Sitio* Mansarong, *Barangay* Santa Margarita, Baggao
January 22, 2018 Monday	Conduct informal talks at the market in *Barangay* Tallang, Baggao and conduct one interview with the president of the Baggao Weavers Association in *Barangay* Santa Margarita, Baggao
January 23, 2018 Tuesday	Visit Blue Waters, Baggao and travel back to CCVPED, Cabagan
January 24, 2018 Wednesday	Rest day
January 25, 2018 Thursday	Fiesta in Cabagan and Bambanti Festival in Ilagan
January 26, 2018 Friday	Write our field study report
January 27, 2018 Saturday	Write our field study report
January 28, 2018 Sunday	Finish our field study report
January 29, 2018 Monday	Prepare and present our field study report

The most important methodology in our research to gather information was conducting interviews (Appendices I and II). In total, we conducted 16 interviews with community members of *Sitio* Mansarong who are involved in producing and selling non-timber forest products and one interview with the president of Baggao Weavers Association in *Barangay* Santa Margarita. All interviews which took 30-45 minutes were conducted together by us; we both asked questions and we both took notes. Richelle translated for Daisy.

Another research methodology to gather basic information was conducting informal talks. We had a lot of this 5-10 minute conversations at the DTI office in the Municipal Hall in *Barangay* San José and at the market in *Barangay* Tallang. Richelle conducted the informal talks and translated it afterwards to Daisy.

We also used the research methodology observation. To get a better understanding of the production of non-timber forest products, we twice observed how non-timber forest products, in this case soft brooms, are made. During the observations we were allowed to ask questions, take photos and record videos.

We selected our respondents through availability sampling (thus depending on who is home, who has time and who wants to talk) and through snowball sampling (we asked our respondents if they knew other possible respondents that fit our research).

RESULTS

Socio-demographic background

Out of the 17 interviews we conducted, 10 respondents are male (59%) and 7 respondents are female (41%). The youngest respondent is 22 years old and the oldest respondent is 68 years old, with an average age of 45 years old. The respondents belong to different kinds of ethnic groups: *Igorot*, *Ilokano* and *Itawis*. All the respondents are involved in producing and selling non-timber forest products.

Collection

Before the respondents can produce and sell non-timber forest products, they need to extract raw non-timber forest products from the forests, which include tiger grass, rattan (poles and splits) and *nito*, bamboo, *darumaca*, *pattaga* and *ban-ban* (Table 2 and Photo 1). They also extract food items from the forest to sell or to use for own consumption, which include honey, bamboo shoots, rattan shoots, rattan fruits and rambutan (Table 3 and Photo 2). Many respondents, especially the men, extract the raw non-timber forests products themselves, but when the raw non-timber forests products are too far away in the forests, especially rattan, it is too difficult for the respondents to extract them themselves. In that case, they ask the *Agta* (indigenous people who are more familiar with going further into the forests) to extract the raw non-timber forest products for them.

Rattan is threatened because of two reasons. First, the increasing population leads to an agricultural expansion and as a consequence, rattan becomes further away in the forests to gather. Another reason is that rattan in *Sitio* Mansarong was extracted by outsiders in large amounts. As a response, the government of *Barangay* Santa Margarita came up with a law that prohibits outsiders from gathering rattan in the forests of *Sitio* Mansarong without a permit. Community members of *Sitio* Mansarong do not need a permit. But because of the long turn-over period of 10 years, there is still less rattan.

The other raw non-timber forest products are easier to extract because they are not too far away in the forests and the villagers also plant some (especially tiger grass) in their backyards and in their farms.

Table 2: Extracted raw non-timber forest products

Raw non-timber forest products	***Season of extraction***
Tiger grass	February-April
Rattan (poles and splits)	All year round
Nito	All year round
Bamboo	All year round
Darumaca	All year round
Raw non-timber forest products	***Season of extraction***
Pattaga	All year round
Ban-ban	All year round

Table 3: Extracted food items

Food items	***Season of extraction***
Honey	May-July
Bamboo shoots	All year round
Rattan shoots	All year round
Rattan fruits	September-November
Rambutan	September-November

Photo 1: Raw tiger grass (Photo by D de Hoop 2018)

Photo 2: Snails for own consumption (Photo by D de Hoop 2018)

Production

After the extraction of the raw non-timber forest products, the community members of *Sitio* Mansarong clean and dry the materials before making them into finished products. All finished products are made by hand. The finished non-timber forest products produced by the community members of *Sitio* Mansarong include soft brooms, baskets, swings, hats and bags. (Table 2, Photos 3 and 4). One respondent is only producing and selling baskets (6%), two respondents are only producing and selling soft brooms (12%) and the remaining 14 respondents are producing and selling a mix of several non-timber forest products (82%) (Figure 1).

We asked our respondents why they are involved in the production of finished non-timber forests products and all of them said that it is an extra source of household income next to farming. So it is not their main source of income. Notably, all respondents told us that they produce the finished products when and because they have spare time, or if they get orders. One respondent mentioned that she also produces it when she is in an urgent need of cash money.

The most important finished non-timber forest product in *Sitio* Mansarong are soft brooms, because these are easy and fast to make in their spare time and the raw non-timber forest products are simple to extract from the forests (or, in some cases, even their own fields). The community members of *Sitio* Mansarong are barely making baskets anymore, because as mentioned before, the quantity of rattan in the forests is declining and the production is harder and also takes more time. Besides, there is competition with cheaper plastic baskets sold in the market.

Most of our respondents learned to make finished non-timber forest products from their father or mother, others from their spouse. When we asked one of our female informants about whether she plans to teach her children (aged 5 – 10) to make soft brooms and/or baskets, she said that in fact, they were already involved in production of soft brooms. Knowledge on basket production is passed on less, she added, because of the difficulty of accessing rattan and the labour time.

Table 4: Finished non-timber forest products, amount of time for production and prices

Finished non-timber forest products	***Amount of time for production***	***Price Sitio Mansarong***	***Price market Barangay Tallang***
Soft broom	10-20 pieces a day	P50-P300	P100-P350
Basket	1 piece a day	P80-P100	P100-P150
Swing	1 piece in 3-5 days	P500-P700	P700-P1,500
Hat	1 piece in 1-2 days	P250-P300	P300-P350
Bag	1 piece in 7 days	P2,000	P2,000-P2,500

Photo 3: Production of soft brooms (Photo by D de Hoop 2018)

Photo 4: A finished basket (Photo by D de Hoop 2018)

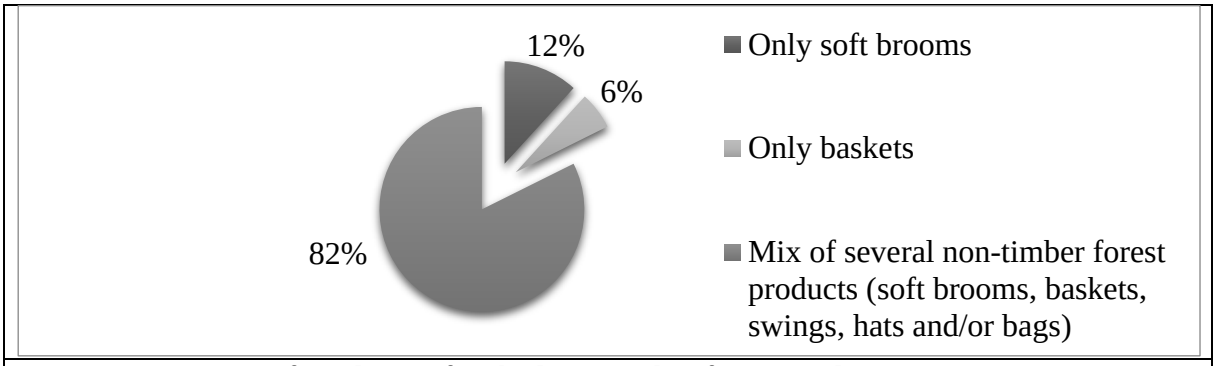

Figure 1: Division of producing finished non-timber forest products

Marketing

Every Monday, it is market day in *Barangay* Tallang and the community members of *Sitio* Mansarong can sell their finished non-timber forest products there. They only sell to the market when they produced enough products. Most of them try to sell it every week, but that is not always possible because they do not always have enough spare time to produce enough products.

We also asked about the transportation of the finished products from *Sitio* Mansarong to the market in *Barangay* Tallang and many community members told us that they use the truck that is going to the market or a sledge pulled by a carabao. Transport takes about half an hour by truck (20 pesos per person, plus 40-50 pesos per 50 brooms), or approximately 1,5 hour with their own carabao (no costs involved). Some of them carry it all the way to *Barangay* Tallang. Everybody mentioned that the conditions of the road are very bad and that they would sell more products if the road was better. There are plans from government to improve the road, but the community members in *Sitio* Mansarong are still waiting for it.

We went to the market on a Monday and at that day there were no new finished non-timber forest products delivered from *Sitio* Mansarong. We saw other competitive products, especially plastic baskets. They are much cheaper than rattan baskets. The price of a medium rattan basket can be 250 pesos. The price of a medium plastic basket is only 50 pesos. The demand for rattan basket is low, because someone at the market told us that only the older people are interested in it.

Notable thing about tiger grass: tiger grass is harvested from February to April. Many soft brooms are made at this time, causing the price to go down. Some of our respondents told us that therefore, they store part of the raw material and wait until the prices go up later in the year and then sell it to the market.

Baggao Weavers Association

The Baggao Weavers Association is a Sta. Margarita-based organization which is involved in the production and marketing of finished non-timber forest products to help less educated people, to help those who do not have land to cultivate and to maximize the use of raw materials. They recruit the members by three days of training. Before, they had 102 members but at this moment there are 45 members left, because they do not have enough funds to pay all the workers and they do not have the capital to produce more products. There is only one person in *Sitio* Mansarong who delivers finished products to the Baggao Weavers Association, at about 45 minutes walking distance of Mansarong. Other respondents do not join this association because the price they get for their finished products is lower than the prices offered at Tallang market and they prefer to sell their products individually.

DISCUSSION/CONLUSION

The most important reason why the community members of *Sitio* Mansarong are involved in the production and marketing of finished non-timber forest products, is to earn an additional cash income from it without putting a big amount of inputs in making the finished products.
All respondents had a main source of income, e.g. farming or carpentry, which provides more profits.

Respondents shared that there is a lack of time to produce more finished non-timber forest products because there are more profitable activities to spend their time on. Besides the increasing difficulties to obtain some raw materials, especially rattan, the condition of the road gives them hard time in transporting their finished products. Also there is the competition of other products, like cheaper plastic baskets in the market.

This is also the reason why the claim in the introduction about considering the forest as a source of economic value by non-timber forest products cannot be confirmed by our data. The Mansarong community members told us that the use of non-timber forest products is good because it does not require cutting trees, but they only mentioned this when we explicitly asked it. They did not mention it themselves; they only mentioned the money when we asked why they are involved in non-timber forest products.

ACKNOWLEDGEMENTS

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APPENDIX I
Socio-demographic profile

1. Name	
2. Gender	
3. Age	
4. Ethnicity	
5. Language/dialect	

APPENDIX II
Interview questions

English	***Tagalog***
6. How would you describe NTFPs?	Ano ang iyong pakahulugan sa NTFP?
7. What NTFPs do you produce? And in what quantities do you produce them?	Anong klase ng NTFP ang inyong ginagawa? Maari ba kayong magbigay ng Halimbawa ng mga produktong ito? Gaano karami ang inyong ginagawa?
9. What raw materials are extracted from the forest to produce your NTFPs? In what quantities? Who is taking care of that task?	Anu-ano ang mga bagay na nakukuha nyo mula sa kagubatan upang makagawa ng NTFP? Gaano karami? Sino ang kumukuha sa mga ito?
10. When did you started to make and sell NTFPs?	Kalian kayo nagsimulang gumawa ng NTFPs?

11. Why did you started to make and sell NTFPs?	Bakit mo naisipan na gumawa ng mga NTFP?
12. How do you make your NTFPs? By hand or machine?	Paano nyo ginagawa ang mga produktong ito? Mano-mano bao may ginagamit kayong makinarya?
13. How long does it take to make your NTFPs?	Gaano katagal ang paggawa ng isang NTFP?
14. Do you like making your NTFPs?	Gusto nyo ba ang paggawa ng NTFP?
15. Who taught you to make NTFPs?	May nagturo bas a inyo kung paano gumawa ng NTFP? Sino?
16. What is the average price of your NTFPs? Is it enough to live from? What are the other sources of household income? What are the profits?	Magkano ang presyo ng isang NTFP? Sapat ba ito para sa ikabubuhay? Ano pa ang ibang pinagkukunan ng ikanabubuhay ng pamilya?
17. Where are the NTFPs sold? Why there? How do you take your NTFPs there? How often do you take your NTPFs there? What about the transport costs? What do you think of the conditions of the road? Are they good/bad?	Saan nyo ibenebenta ang mga ito? Bakit ditto nyo naisipang dalhin ang mga produkto? Paano nyo dinadala ang inyong mga produkto sa pamilihan? Paano ang gastos para sa transportasyon ng mga produkto? Ano ang masasabi nyo sa kondisyon ng daan? Mabuti ba o Hindi?
18. Is there a particular person or organization where you deliver your NTFPs?	Mayroon bang partikular na organisasyon o tao kung saan nyo dinadala ang inyong mga produkto?
19. Who buys the NTFPs? Also tourists?	Sino ang bumibili ng inyong mga produkto? Mga mamamayan din ba ng Mansarong o mga turista?
20. Is the local government involved in the making and selling of NTFPs?	Ang pamahalaang local ba ng Baggao ay kasangkot sa proseso ng paggawa ng NTFPs?
21. Do you get funds to make and sell your NTFPs?	May iba pa bang sumusuporta sa pondo ng paggawa ng NTFP?
22. What are, in your opinion, the impacts of NTFPs on the environment? Is it positive or negative?	Ano sa inyong palagay ang mga epekto ng paggawa ng NTFP? Masaba o Mabuti?
23. How do you see the future of NTPFs?	Sa palagay nyo may kinabukasan bas a paggawa ng NTFP?

INFLUENCE OF ETHNICITY ON FARMING IN MANSARONG

Divine Grace Dela Cruz and Hanne Cox

INTRODUCTION

We conducted our research in Mansarong. Mansarong is a *sitio* of Barangay Santa Margarita in the municipality of Baggao, Cagayan, in the northeastern part of the Philippines. The road being used today to get to the sitio, used to be a logging road (Macadangdang 2018, pers.comm.). The centre of Mansarong, situated at about seven kilometers from Santa Margarita, was called Kilometer 7 to help loggers navigate the area.

Mansarong has developed into a sitio of considerable size in the 70s and 80s (Dirkx 1995). Originally, the area of Mansarong was only inhabited by Agtas, a tribe of hunter-gatherers. In 1966, the first new settler, who is nowadays referred to as the founding father of the sitio, came down from Benguet Province to look for land. By 1970, there were about 5 families who came from Benguet. More farmers from Benguet, and later from Bontok, Kalinga, Apayao and Isabela were invited to Mansarong. The initial settlers, attracted by fertile soils in the surroundings of Mansarong, came to develop new farmlands (Dirkx 1995). At present, the sitio is home to a number of cultural groups.

In Mansarong, people settled along the logging road over a distance of about 6 kilometers. But at the same time, they live in small groups together in rather homogenous groups when it comes to cultural and family background (Dirkx 1995).

"The speed at which change takes place depends to a large extent on the contact people have with other cultures and new ideas, and on the ability of the individuals within the society to initiate and accept change (FAO 2018)". Because of this we are interested in how things, specifically farming techniques and farming traditions, changed in Mansarong. We want to get to know what influence the settlement of other ethnicities has on farming.

There are a lot of previous studies about the many differences in land use and farming techniques used. In 1979, Nair stated that the choice of farming systems is greatly influenced by the three major groups of physical factors namely soil, climate and topography (Anzia 1992). Dirkx, in 1995, did a research in Mansarong about the different techniques used in farming. He stated that upland farming and illegal carabao logging were two of the most important livelihood supporting activities. Notably, he found that each ethnic group, Ibaloi, Itawis and Ilokano, had their own preference in terms of farming techniques. For example, the Ibaloi do *kaingin,* which is a slash and burn technique to clear the land, and fruit tree plantations and even though they are familiar with root crops (sweet potato) in other areas, here they said it would be too laborious, or physically impossible due to the slopes. The Ibaloi farmers in Dirkx' research were not willing to introduce wet rice farming because they considered it useless, since there is no continuous supply of water in this part of the Sierra Madre. Shifting cultivation of the relay agroforestry type was the most prevalent type of agricultural land use among all ethnic group in Mansarong in 1995 (Dirkx 1995).

From the information about the farmers in Mansarong which we got from Dirkx, it seems that ethnicity can also play a part in farmers' decision making about farming techniques. In this study, we aimed to find out if Dirkx' findings have changed after 22 years and explore the factors why. We also made an inventory of the different crops cultivated in Mansarong. With this information and the information about the different ethnicities in Mansarong, we can make a comparison with Dirkx' statements.

This research shows how agriculture in Mansarong has changed within the last 22 years and what role ethnicity played in this. It gives information about changes in agriculture, if there has happened some in Mansarong since 1995 or not.

RESEARCH QUESTION

This research attempts to answer the question "What influence has ethnicity in choosing farming techniques among farmers in Mansarong and how has this changed during the last two decades?"

The sub questions are:

1. What are the ethnic backgrounds of the farmers in Mansarong?
2. What crops do they farm?
3. What farming techniques do they use?
4. Why do they use these specific farming techniques?

METHODS

Date	**Activities**
01-18-2018	Arrival at Barangay hall in Santa Margarita.
01-19-2018	Arrival in Mansarong and getting to know the host family. We did four interviews and visited one farm.
01-20-2018	We did seven interviews and did observations along the way.
01-21-2018	We did four interviews, visited one farm and did observations.
01-22-2018	We did three new interviews and asked additional questions to three other previously interviewed farmers.
01-23-2018	Going to Blue Waters and next to Cabagan

We used several methods of data gathering during this research: semi-structured interviews, observations and participatory mapping.

During the first four days of our research, we did 18 semi-structured interviews with farmers. For this we used questions which we thought about forehand. The questions are included in the appendices. We prepared 18 questions, but during the interviews we asked follow-up questions. These interviews were mostly conducted in the Mansarong Upland Farmers Multi-Purpose Cooperative, other interviews we did at farmers' home or on the field while observing and mapping. To find respondents, we used availability sampling. The first few days, we walked around Mansarong to find farmers and looked who was home or had time for us. We also used the snowball sampling by asking some informants if they knew other farmers who could be useful for our research, but this we used only after two days. With this sampling method we actually got some interesting respondents.

Next to the semi-structured interviews, we did observations while interviewing, but also while walking through Mansarong. We looked at the different crops and how people were cultivating the land. The last method we used was participatory mapping. During the interviews, when we could join a farmer to his or her land, we asked if he or she could draw a map of the land. We did this together with our respondent. Sometimes we noticed that they mostly draw the main crops and forgot about fruit trees which are standing at the side of the field.

RESULTS

Ethnicities

Most of our respondents in Mansarong are of Ibaloi descent, which is a tribe of Igorot. Kankana ey is also a tribe of Igorot. So in total we had 13 Igorot respondents. We only had few Agta and Ilocano respondents.

Table 1: Number of interviewed farmers in Mansarong sorted by ethnicity

Ethnicity	Ibaloi	Kankana ey	Igorot	Agta	Ilocano
Number of respondents	7 (39%)	1 (5%)	5 (28%)	2 (11%)	3 (17%)

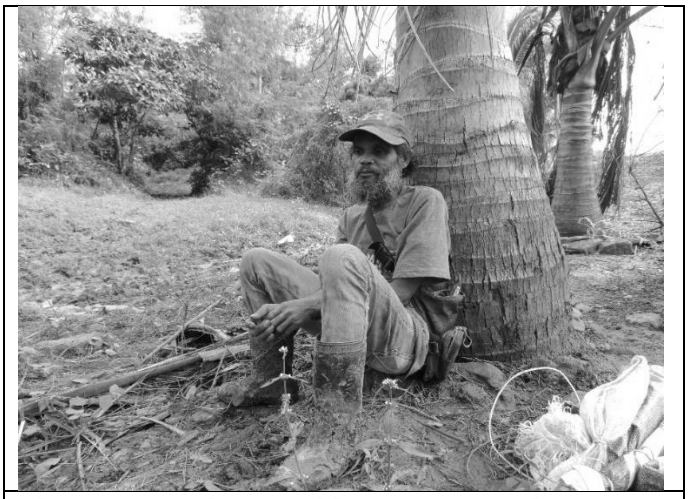

Photo 1: Rodrigo Pablo, an Agta, during our interview (Photo by H Cox 2018)

Crops

In Mansarong, we found 17 different crops being cultivated by the farmers (Figure 1). Of these 17 crops, fruit trees count as one, although it is not specified which fruit trees these are exactly. This is because the respondent did not tell us which one it was. Some farmers specified banana, mandarin or coconut tree. So those trees we counted apart from the fruit trees. The most cultivated crops in Mansarong are corn, rice and banana (Figure 1).

Most of our respondents have switched from cultivating banana to corn. This started to happen around 2007 when banana trees were infected by a disease called *Tungru* and there was no pesticide to avoid this from happening. While in corn, there are available pesticides and herbicides in the market to ensure the good growth of crops.

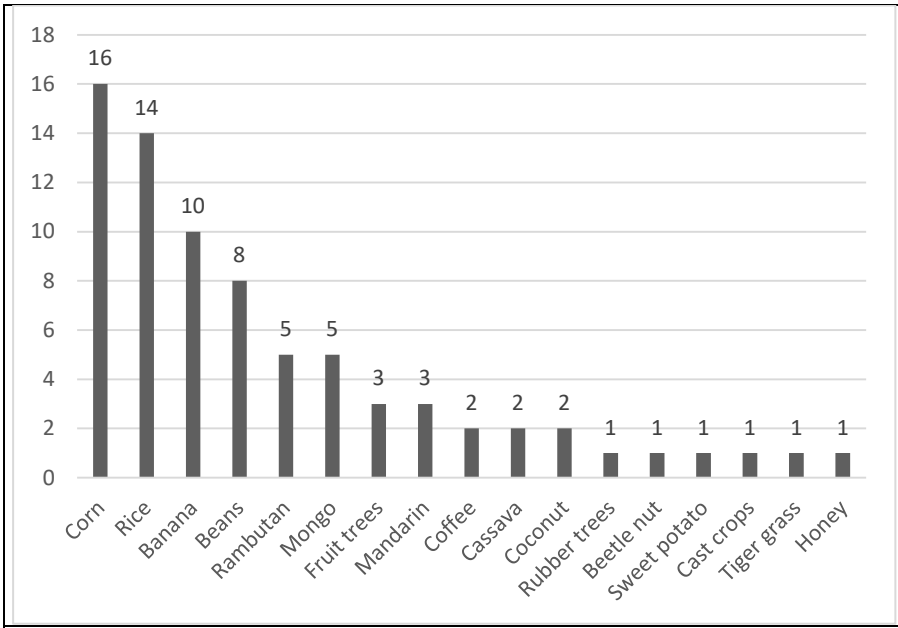

Figure 1: Number of respondents N=18 who cultivate the different crops in Mansarong

To be able to compare our results to Dirkx', we made a table of our respondents from each ethnicity with the crops that they cultivate (Table 2). We can see that the Ibaloi and Igorot cultivate more different crops than the Agta, Ilocano and Kankana ey. We also see that all the different ethnicities have some crops in common namely corn (all five cultivate it), rice and banana.

Table 2: Different crops cultivated in Mansarong, sorted by ethnicity of the farmer

	Ibaloi	**Agta**	**Ilocano**	**Kankana ey**	**Igorot**
Sweet potato		1			
Banana	3	1	1		5
Corn	6	1	3	1	5
Upland Rice	5	1		1	4
Beans	3		1		4
Coffee	1				1
Rambutan	2			1	2
Mongo	2		1		2
Fruit trees	2				1
Cassava	1				1
Beetle nut	1				
Rubber trees	1				
Coconut	2				
Mandarin	3				
Tiger grass	1				

To see how these crops are sorted on the land, we drew together with one of the farmers, a map of his farm which shows how he arranges his crops to make use of the full potential of his land. The farmer is from Ibaloi descent and cultivates a 5-hectare land (Figure 2). The river separates

the corn from the rice. Fruit trees and root crops are situated on places where it will be easy to access when they are ready to harvest; this is mostly at the sides of the field. Just recently, the farmer opened up a small portion of his land for rice. The burnt trees, that were cut down so the rice will not be under a shade, were still visible on his farm.

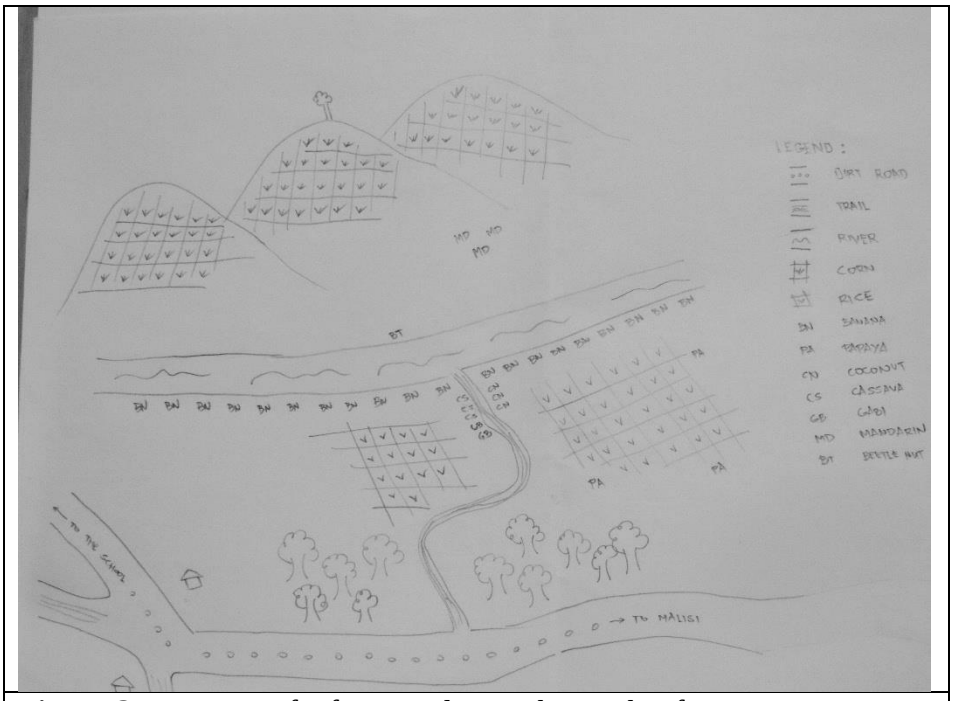

Figure 2: Drawing of a farm made together with a farmer

Farming techniques

Through the years, there have been new farming techniques introduced in Mansarong. The most recent being Rubber Tree Plantation in addition to the already being used farming techniques such as *Bangkag*, Rain Fed Wet Rice Cultivation (RFWRC), Inter-cropping, *Kaingin* and Root Crop Plantation.

Our respondents from every ethnic group practice Bangkag and RFWRC. All groups except Igorot does agroforestry (Figure 3).

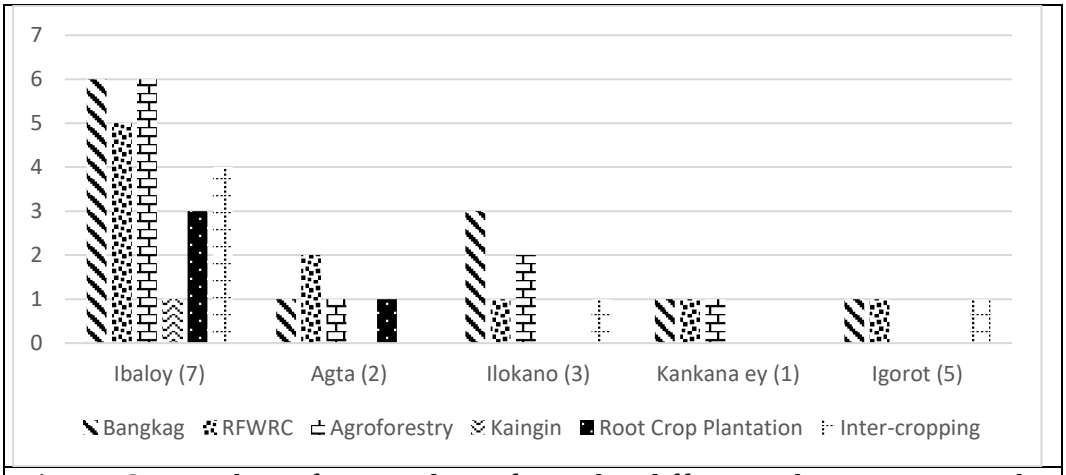

Figure 3: Number of respondents from the different ethnicities using the different farming techniques

We were able to observe a farmer spray his land with herbicides.

Photo 2: Gaspar, a farmer from Mansarong spraying herbicides on his land (Photo by H Cox)

Traditional practices

Because our respondents were enthusiastic to talk to us about their farm and how life is in Mansarong, we were able to gather information about traditional practices done by the different ethnic groups.

Both Ibalois and Ilocanos have a rite before they start planting, when pests attack the land, and after they harvest their crops. The Ibalois call it *Pumakan* and the Ilocanos call it *Atang*. The rite starts with an offering of either a chicken or a pig, a glass of liquor and tobacco. While offering these things, one would perform a prayer. The prayers differ accordingly to the purpose of the rite. Before they start planting, they pray for a good harvest. When pests (i.e. rats, birds, insects) attack the land, they pray on the deity of the pest and invite it to feast on the things they prepared and then ask for the deity to move along after it is finished. And lastly, after they harvest, they call on the gods to share the thanksgiving meal they prepared, which usually consists of a chicken and *dikit* which is a delicacy made from glutinous rice. They call on the gods to share the food with them.

Still, there are some differences in the things they, Ibalois and Ilocanos, offer. Ibalois add a traditional wine called *Tapey* and spare change to their offer. While Ilocanos add *Apog*, a powdered shell, together with beetle nut. In the end the food offered will be eaten by the people working on the land. But first the deity or god has to have the time to eat from it.

Another practice that we found in Mansarong is that the Igorots hang a corn or rice stalk on their kitchen ceiling, depending on which crop they are about to harvest (Photo 3). They do this to prevent getting itch from harvesting.

Photo 3: An Igorot tradition: Rice hanging at the ceiling before harvesting in Mansarong (Photo by J Sibal)

DISCUSSION

What crops do farmers cultivate in Mansarong and why?

The people in Mansarong cultivate a lot of different crops. The two most planted crops are corn and rice (Figure 1). Corn is a fast growing crop and farmers cultivate it for profit. Although it is very labor intensive, it is easier than rice to cultivate in this area. They choose corn above rice because there is no irrigation possible upland. Most of our respondents practice rain fed wet rice cultivation for their own consumption. If there are some left from their harvest, they will sell it. Another reason for the big amount of corn in Mansarong is the banana disease from 2007. When several farmers' banana trees got infected with the disease, some of them shifted to corn. Other saw that it was working for their neighbors so they also decided to shift to corn.

Beside corn and rice, some farmers cultivate beans, vegetables and legumes. This is mostly for own consumption, but if there is something left, they will sell it. A lot of farmers also have some fruit trees on their fields. The most common fruit trees in Mansarong are banana, rambutan, coconut and mandarin (Table 2). These are mostly situated around the field to mark the boundaries of their land, and in between the crops.

Lastly there are some crops which are cultivated by just a few of our respondents. Examples of these are sweet potato, coffee, cassava, beetle nut, rubber trees, and tiger grass. Coffee was brought by one farmer from Benguet, Baguio to Mansarong. He used coffee in the first place to mark his land, to show others that the land was his. Other farmers who cultivate coffee got it from him. Rubber tree is also something new in the area, but much more recent, and this is also becoming popular. Some farmers have it already and others are still considering it. We only found one respondent, an Agta, who told us that he harvests honey, only for the profit. This honey he gets from the bees in the wild. Lastly, we had one respondent who cultivates tiger grass. He does this to make soft brooms which he sells.

What farming techniques do the farmers use and why?

The result we gathered about what farming techniques are currently being used in Mansarong does not suggest that different ethnic groups prefer different farming techniques (Figure 3). People cultivate what they cultivate mostly because of economical and practical reasons.

In our interviews and observations, two techniques for working on the land always come up. And those are *Bangkag* and Rain Fed Wet Rice Cultivation.

Bangkag is cultivating the land with a plough. The plough is pulled by a carabao. All ethnic groups of our respondents use this farming technique (Figure 3). They do it to till the land and they also use the carabao for transport of the goods and themselves. Although, not all farmers have their own carabao. Some farmers lend the carabao from another farmer when it is time to till the land or when they have harvested. For planting, keeping the land clean and harvesting, they work with their hand, mostly without any tools. An exception is the sprayer which they use for the pesticides or herbicides (Photo 2). When it is time to harvest, they often call in the help from other farmers, mostly for corn, because this is a large task which takes a long time and a lot of effort. Help is not restricted within an ethnic group. People extend help to whoever needs it.

Rain Fed Wet Rice Cultivation is the cultivation of Upland rice that can grow with no irrigation. Rain water would suffice for the growth of this type of rice. Farmers, from all the different ethnic backgrounds, use this type of rice cultivation in Mansarong because irrigation is not possible upland (Figure 3).

Other techniques being used are:

Kaingin which is the slashing and burning of unwanted trees and weeds. It is mostly used for clearing the land before they cultivate anything. We also had one respondent who used Kaingin after every harvest. This is because he harvests tiger grass and this is the easiest way to clear the land after harvesting. Some respondents told us that they don't do it anymore because they know that opening up areas is now prohibited.

Some of our respondents have fruit tree plantations or plant fruit trees around their other fields. This type of farming can be called agroforestry. Respondents who do agroforestry say that the trees serve as a windbreak for their crops. For most of our respondents it was not their main activity, they have these fruit trees next to their normal crops.

Most of our respondents practice inter-cropping which is a system of farming in which farmers sow more than two crops at the same time. They use this technique so they can maximize land use while reducing the risk associated with single crop failure. Intercropping provides the households of our respondents with a multiple of crops they can harvest for own consumption.

Some of our respondents who cultivate a limited area of land, practice crop rotation which is growing different crops on the same plot of land in successive seasons. They do this to reduce the use of fertilizer and still manage the soil's nutrient requirement, and these of course help to maximize yield.

What ethnicities can be found in Mansarong?

We were able to find respondents who belong to or at least descend from one of five cultural groups namely Agta, Ilocano and Igorot, from which we found two tribes: Ibaloi, Kankana ey (Table 1). We were told that there are also Ifugao and Itawis present in the area but we did not have the opportunity to talk to them. We found 7 Ibaloi, 1 Kankana ey, 5 Igorot, 2 Agta and 3 Ilocano.

Ibaloi and Kankana ey are two tribes under the Igorot. Unfortunately, we had 5 respondents who did not specify from which tribe they are, that is why we put them under the general ethnicity Igorot (Table 1).

We had three respondents who have parents with different ethnicities, so they actually have a double ethnicity. In these cases we choose to put them under one of these two. The mixes are: Ilocano-Igorot, Agta-Igorot and Igorot-Itawis. We have put them under Igorot because they mentioned in the interview that they had more history with the Igorot culture or that they still practice some Igorot traditions.

Traditional practices

During the interviews, we found that we had a few respondents who are still practicing these rituals. The ones who still practice it, do it because they have a strong belief in it. They see the advantages of it. They believe that when giving an offer before planting, they will have a much better harvest. Also, they believe that when they had a good harvest, they have to give the thanksgiving dinner, otherwise the next harvest will be less good because they were not thankful. They also told us that the offer against the pests and rats really works to get rid of them. Although, they have to do it in the right way, otherwise it may not work. This is a reason for a lot of people to not do the offers themselves, but to ask a quack doctor, as our respondents called him, to do it for them. One of our key respondents told us that the ability to do the practice in the right way is a blessing from God. He said everyone can do it but not everyone can do it in the right way. This was also confirmed by the other respondents who told us they can do it, but are not sure they do it right.

Many respondents though do not practice it anymore. Sometimes only their parents have practiced it and in other cases the respondent stopped with it after a while. The most found reason for not practicing it anymore is the shifting to another belief, mostly Christianity. Around 1950, there came missionaries who introduced Christianity. A lot of people in that time shifted from their original belief to Christianity. As a result, their children, who were our respondents, are often raised with the Christianity belief. These children have often seen their parents giving the offers, so they know how it works and what it is for but they have never practiced it themselves because they have only known the Christianity belief. Some other respondents still do these practices before and after harvesting, next to their Christianity beliefs. They told us that they still practice these rituals, but no other. They choose these because they still believe it works and do not dare to stop it because they are afraid their harvest would fail.

CONCLUSION

After this research we can answer our research question “What influence has ethnicity in choosing farming techniques among farmers in Mansarong and how has this changed during the last two decades?”

The data that we have gathered in this research shows change from what Dirkx found out in 1995. Ethnicity plays little to no part in farmers’ decision making about farming techniques and crops anymore. Practices used to be done by the elders of the different ethnic groups is being forgotten. We have seen that the reasons for choosing crops and farming techniques is influenced by other factors, like Anzia (1992) also already stated. The biggest reason for choosing a particular crop is profit. The farmers want to make as much profit as possible and that is the reason they choose corn; it is a fast growing crop which sells easily. Another factor that influences farmers’ decision as to what specific crop to cultivate is their neighbor. If they see a certain crop working good for their neighbor and they have profit from it, other farmers will also try to cultivate that crop. We also did not found a big influence of ethnicity in choosing

farming techniques. The farming techniques they use, are mostly also chosen for economic and practical reasons. Working on a land with a carabao, *Bangkag*, is the cheapest but also the most practical way. Any newer machines are too expensive for the farmers in Mansarong. So we can say that the influence of ethnicity in choosing farming techniques has changed during the last two decades but that the farming techniques used, are still the same as in 1995.

Next to this we found an influence of ethnicity on farming namely the rites and offerings they do on the field. But since only a few practice these, eradication of traditions is very visible and so, also modernization is visible in terms of the emergence of new ideas and beliefs. In a span of 22 years, with the introduction of new practices and ideas, changes happened. The arrival of new entities like NGOs and missionaries contributed to the change in the farming practices of the farmers in Mansarong.

ACKNOWLEDGEMENTS

Foremostly, we would like to thank our host family Gaspar Tony and Precy Tony. We had a very nice stay at their place and we are very thankful they opened up their house for us. Next, we also would like to thank our two key respondents Marcelino Laoyan and Alejandro Logno. They gave us a lot of important information.

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APPENDICES

Questionnaire/questions for interview

1. Name
2. Age
3. Sex
4. Occupation / livelihood
5. Ethnicity
6. Number of children
7. Education attainment
8. Were your parents farmers as well?
9. At what age did you start working on the field?
10. What crops do you farm?
11. Do you own land to farm?
12. How much hectares of land do you own?
13. How much hectares of land do you cultivate?
14. Why do you farm these crops?
15. What techniques do you use to farm these crops?
16. Why do you use these particular techniques?
17. How long have you been using this technique?
18. What sustainable land use methods do you use?

AGROFORESTRY IN BAGGAO, CAGAYAN: PRACTICES AND MOTIVATIONS IN MANSARONG AND PAGAPAG

Jaysel Sibal and Maaike van Woerden

INTRODUCTION

Agriculture is a major source of livelihood for residents of the Philippines. Cash crops like rice and corn make up a large share of the country's agricultural production. However, unsustainable practices like large scale slash-and-burn farming have led to forest depletion (Persoon et al. 2009). The rapid land-use changes undergone by the Philippines in the last century has proven to be a leading threat to biodiversity and a cause of soil infertility (BMB 2018). To prevent further environmental problems, multiple national and local measures have been taken in the last decades. In 1995, an executive order was issued calling for communities that live in or near public forest lands to work together with the Department of Environment and Natural Resources (DENR) to help rehabilitate, manage, conserve, and utilize these lands. These local communities were to be represented by a people's organization (PO) and receive assistance from the DENR, local government units, non-governmental organizations (NGOs) and other government agencies to achieve these goals, including through the promotion of agroforestry (DENR 1996).

Agroforestry is a sustainable approach to land-use management in which agriculture and forestry are combined into an integrated production system to get maximum benefits (Kidd and Pimentel 1992; Nair 1998). In agroforestry, trees are incorporated into farmlands. While these trees grow, farmers can benefit from low growing crops such as rice and corn. Eventually they grow simultaneously, diversifying their output with fruit and other tree-based crops. Agroforestry can help control erosion that would otherwise be worsened through monoculture (Avery et al. 1991). Diversification of crops can also lead to more resilience, while the planting of trees can help restore biodiversity in an area (Kohli et al. 2008).

Mansarong is a village located on the edge of a forest, in the Northeastern municipality of Baggao, Cagayan. In the 1980s, logging companies came to the thickly forested area. The road built by the logging companies led to an influx of farmers, attracted by the opportunities to easily transport their crops. Their monoculture practices, along with the logging, led to quick land-use changes and deforestation. Since 1998, the DENR, the local PO, and various NGOs have been promoting community based forest management and agroforestry practices in these agricultural lands. According to Renato Ganase, Chairman of the people's organization in Mansarong, planting trees would help "restore biodiversity and ecological balance" in Mansarong (NELARDECO 2010).

With our research, we aim to get a general idea of the agricultural land use in Mansarong after two decades of agroforestry initiatives, and what motivations the farmers have for continuing these practices. We also compare the reasons for the presence of agroforestry in Mansarong with the explanations for the remaining monoculture in the neighboring Pagapag. This helps identify which factors lead to the practice of agroforestry in a specific area, and the impact of outside interventions compared to an untargeted area.

RESEARCH QUESTIONS

Main Research Question

To what extent, how, and why do farmers in two *sitios* in Baggao practice agroforestry?

Sub-questions

To what extent is agroforestry present in Mansarong and Pagapag?

How do the farmers differ in their practice of agroforestry?

Why do farmers in the area practice agroforestry?

Why was agroforestry promoted in Mansarong?

How was agroforestry introduced to various farmers in the area?

What motivations do farmers in Mansarong have to practice agroforestry?

Do differences exist in the practicing of agroforestry between Mansarong and Pagapag?

If so, what factors can account for these differences?

METHODS

Table 1. Time schedule during the field research.

Day	***Date***	***Activities***	***Location***
Thursday	18/1/2018	A.M: Travel from ISU Cabagan to San Jose, Baggao P.M: Short introduction to Baggao Interview with MENRO official Travel to Sta. Margarita Interview with *Barangay* secretary.	San Jose and Sta. Margarita
Friday	19/1/2018	A.M: Travel to Mansarong Meet host family P.M: Hike and observe agricultural fields Interview key informants	Mansarong
Saturday	20/1/2018	Interview farmers and visit farms	Mansarong
Sunday	21/1/2018	Interview farmers and visit farms	Mansarong
Monday	22/1/2018	Interview farmers and visit farms	Pagapag
Tuesday	23/1/2018	Travel back to Cabagan	Mansarong - Cabagan

This study was primarily conducted in the *sitio* of Mansarong, and partly in the *sitio* of Pagapag. The data was gathered through personal, semi-structured interviews with the farmers and through visiting some of their farmlands. To attain some background information on Mansarong and agroforestry, we interviewed a staff member of the Municipal Environment and Natural Resources Office (MENRO), the *barangay* secretary, and a *barangay* councilor. The farmers we interviewed in Mansarong were selected upon the recommendation of the key informants in the area and by using opportunity sampling. According to the secretary and councilor, almost all residents in the two *sitios* depend on farming for their livelihood, so all residents in the area were potential respondents. In Pagapag we used snowball sampling for finding available and representative respondents. We interviewed a total of 17 farmers and asked all the relevant questions provided in the questionnaire (Appendix). The interviews were conducted in Ilokano,

their own dialect. Whenever relevant, we asked follow-up questions to get clarification or more information on a certain topic. The respondents were mostly male, since the males in the area spend more time farming than the females. We did participatory mapping with the help of our respondents to create a visualization of what crops they planted in their land and come up with descriptive data. We redrew these maps for clarity. We took pictures of examples of agroforestry and monoculture in Mansarong and Pagapag to help create some visualization of the agricultural lands.

RESULTS

Of the 17 farmers we interviewed, 10 from Mansarong and 1 from Pagapag said that they were currently planting (fruit) trees on their farm (Figure 1).

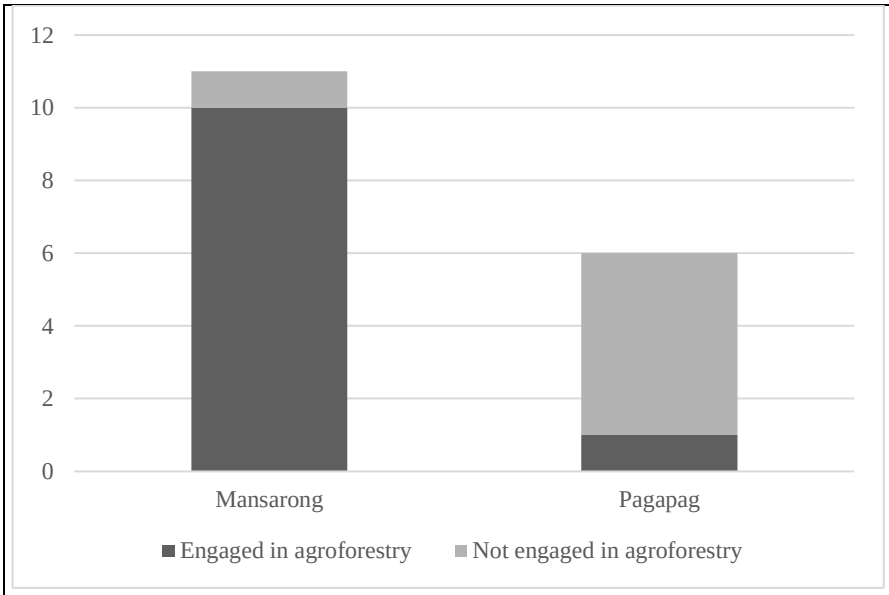

Figure 1: Number of interviewed farmers who are engaged in agroforestry in the *sitios* of Mansarong and Pagapag, Baggao.

By conducting the interviews with the farmers in Mansarong, we were able to identify which specific organizations were responsible for promoting agroforestry, and what resources they gave to the farmers (Table 2). The DENR and several NGOs introduced agroforestry in the area through the New Lands Resources and Developers Association (NELARDA), the people's organization that has been active in Mansarong since 1996. NELARDA has environmental protection, conservation, and reforestation as its goals. According to the current chairman, Renato Ganase, 80% of Mansarong's population is currently a member of the association. These members are automatically invited to these trainings, however, non-members in Pagapag also mentioned that they received invitations to attend seminars.

Table 2: Agroforestry projects in Mansarong as mentioned by respondents

Year	Organizations/programs	Trainings and/or seedlings given	Number of respondents who mentioned being a part of this project
1998-2000	PROCESS Luzon	4 trainings	3
2005	Conservation International Philippines	Mango seedlings	1
2008-2009	PROCESS Luzon	3-4 trainings Seedlings for coffee and cacao	1 (mentioned that almost 20 farmers attended the trainings)
2011	DENR	Seedlings for rambutan, cacao, and coffee	3
2011-2014	Department of Agriculture (DA) - Comprehensive Agrarian Reform Program	Seedlings for rambutan and lanzones	1
2016	DENR- National Greening Program	Seedlings for rambutan, lanzones, and cacao	3

When asked why agroforestry was promoted in Mansarong specifically, several respondents mentioned that the topographic location of the area is very suitable for the growing of fruit trees, due to the fertile soil and rainy climate. According to respondent Marcelino Laoyan, various trees would be suited to grow on the farmlands' steep slopes which would lessen soil erosion in the area. Other respondents mentioned that they believed that fruit trees were promoted in Mansarong over other types of trees, because they would increase the livelihood and income diversity for its residents.

By visiting farms and using participatory mapping, we were able to find that farms in Mansarong had different tree cover intensities and different agroforestry practices. Some farmers, like Alfredo Ganase, have a large percentage of tree cover, and practice intercropping of trees and corn, as well as strictly planting trees on sloped areas (Figure 2).

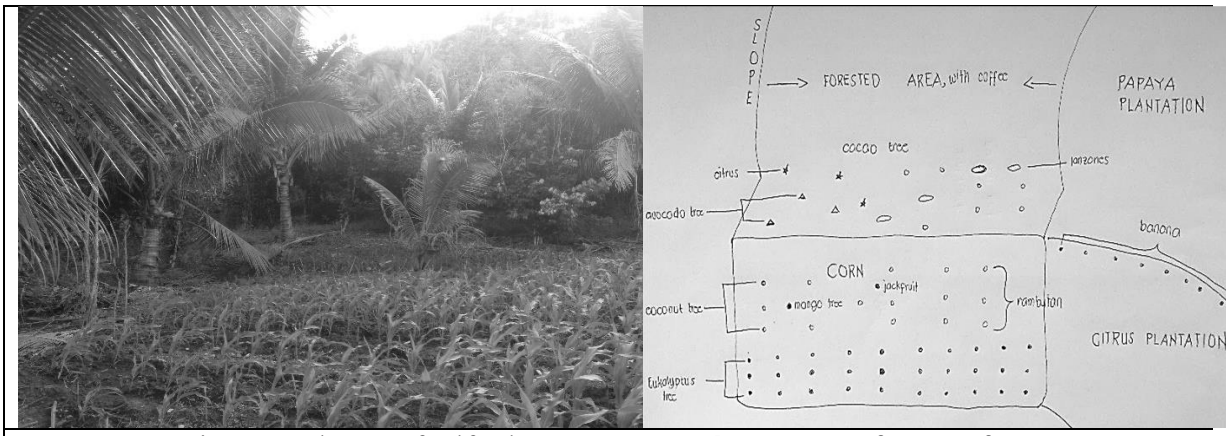

Figure 2: A picture and map of Alfredo Ganase's 3.2-hectare agroforestry farm in Mansarong. By our estimations, about 50% of the farm is covered by trees, such as avocado, citrus, coconut, mango, and eucalyptus. (Photo by M van Woerden 2018)

Through our interviews and mapping, we found that corn is still the primary crop cultivated by farmers, even by those practicing agroforestry. Some farmers practice intercropping and use trees to create boundaries (Figure 3). Others strictly separate the areas where they grow trees and corn (Figures 4 and 6). One respondent, James Laruan, only plans to grow corn on the same land as his citrus seedlings until these grow tall enough to bear fruits (Figure 5). The fruit trees planted by farmers were mostly rambutan, lansones, coconut, and citrus. Coffee and cacao were also planted by several agroforestry farmers in the area. Not all seedlings were received from the organizations. Several respondents informed us that they bought their own seedlings, and others mentioned receiving them from family or community members.

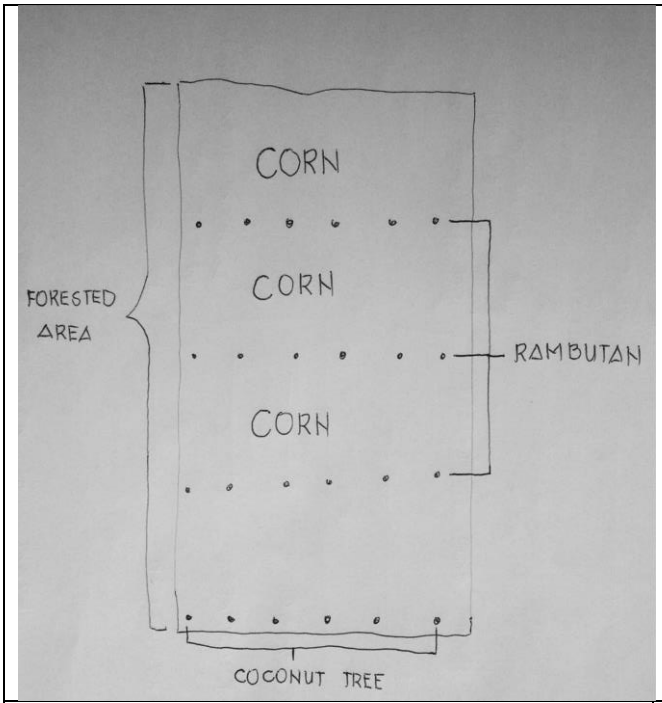

Figure 3: A 1-hectare farm in Mansarong. Estimated tree cover is less than 10%.

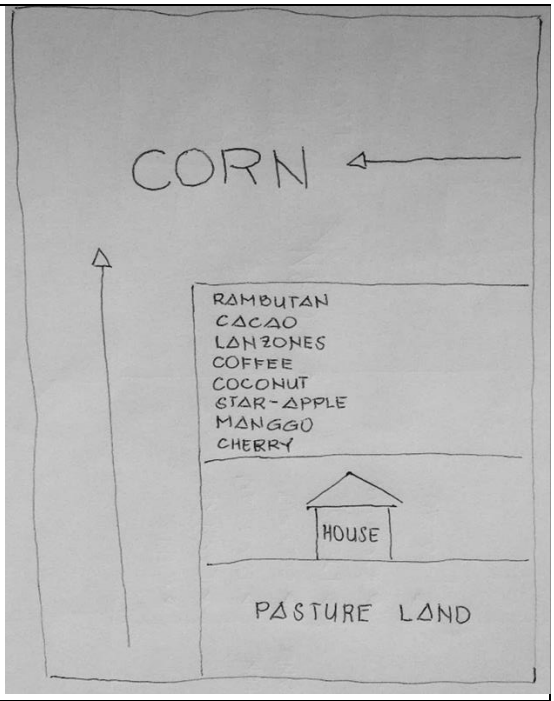

Figure 4: A 2-hectare farm in Mansarong. Estimated tree cover is 20%.

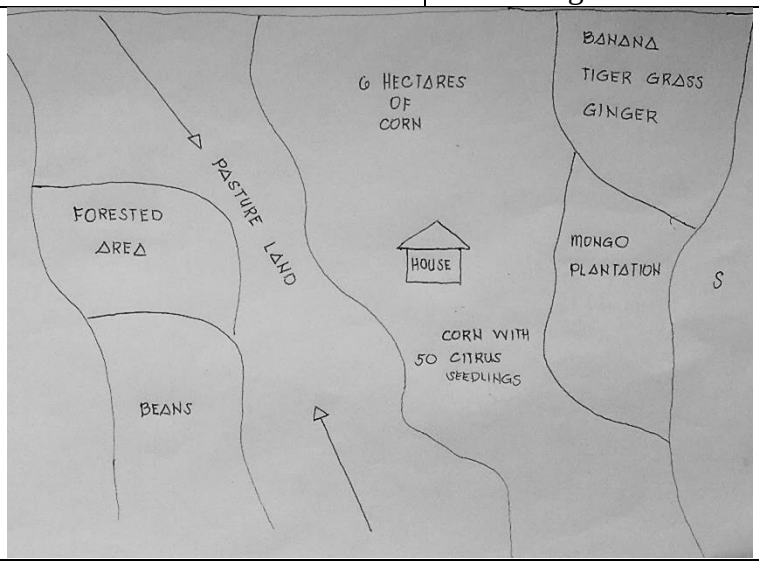

Figure 5: A 10-hectare farm in Mansarong. Estimated 15% tree cover.

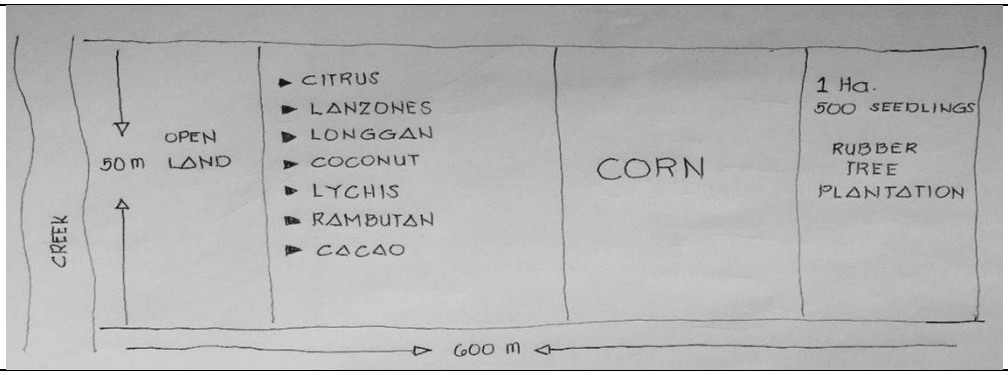

Figure 6: A 3-hectare farm in Mansarong. Estimated tree cover is less than 50%.

The farmers in Mansarong and Pagapag that were practicing agroforestry provided several reasons for doing so, ranging from environmental to income related (Figure 7).

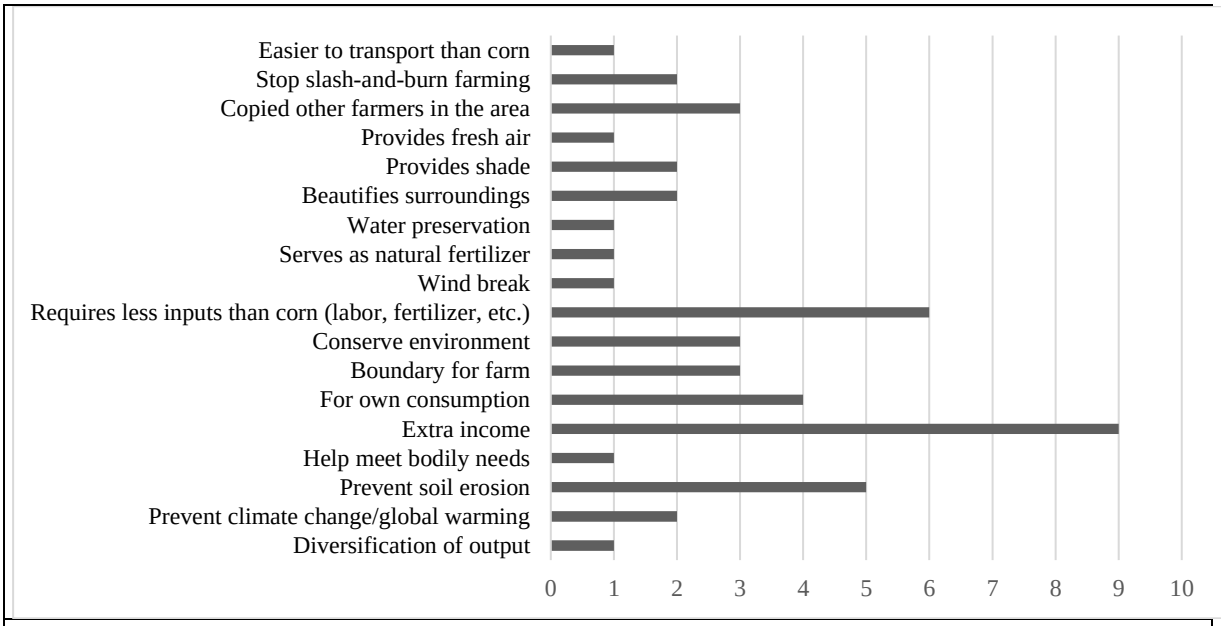

Figure 7: Motivations of farmers in Mansarong and Pagapag for planting agroforestry trees on their farm. Note: some respondents gave multiple answers.

On the last day of our research, we walked to the neighboring village of Pagapag, to observe some of the differences in farming between the two *sitios*. All respondents we interviewed in Pagapag said that they were not aware of any farmers in their community practicing agroforestry. Farmers in Pagapag mostly plant corn, and some cultivate irrigated rice. This contrasts with Mansarong, where according to the respondents, all farmers practice agroforestry (Photo 1).

We also asked farmers who were only planting corn what their reasons were for not practicing agroforestry (Figure 8).

Photo 1: A farmer on his monoculture cornfield in Pagapag (left) and a farmer on his banana plantation in Mansarong (right). (Photos by J Sibal 2018)

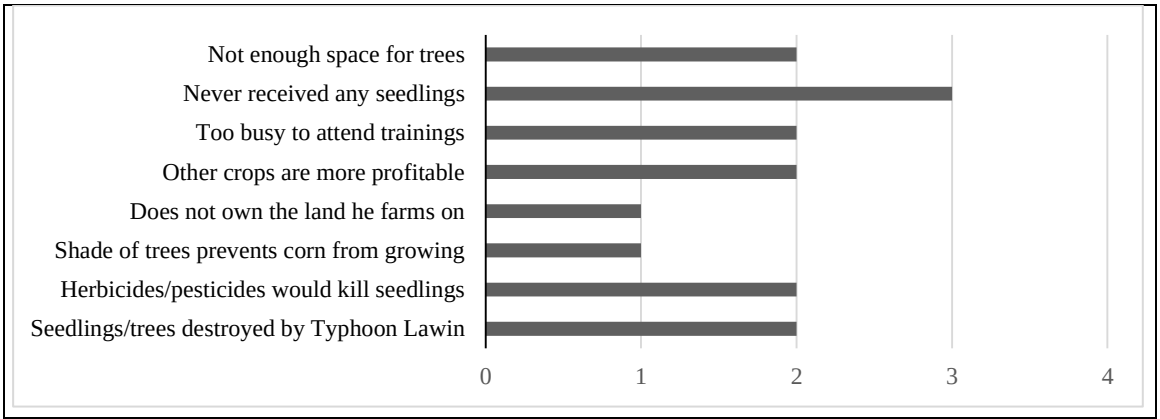

Figure 8: Motivations of farmers in Pagapag and Mansarong for not practicing agroforestry. Note: some respondents gave multiple answers.

DISCUSSION

Through our interviews we were able to infer that the trainings and seedlings in the Mansarong area were provided with the goals of improving the environment, aiding reforestation, and providing an extra source of income for the residents. The majority of the farmers practice agroforestry in the area, which proves that the multiple efforts of NELARDA, DENR, and several NGOs have had an impact on the area. This impact can not only be observed on the farmlands in Mansarong, but also in the gardens of the homes and alongside the roads, where many planted trees grow along with forest trees. The agroforestry farmers that we interviewed only named benefits of the trees that they had planted on their farms, and all seemed to be generally satisfied with the trainings and resources provided. Many were open to planting new tree species on their farms such as rubber trees. General factors that we identified for agroforestry being introduced multiple times in Mansarong are the fertile soils and an influential PO, the NELARDA, that has many members in the area involved in promoting the trainings and seedling distributions.

We found that the personal motivations for practicing agroforestry listed by farmers varied greatly, although extra income and less inputs were the most popular reasons. The farmers who had been living in Mansarong the longest were more likely to mention environmental reasons, such as less erosion, reforestation, and preventing climate change, as reasons for planting trees on their farms. One farmer explained that, over the years, he was able to see the land-use changes in the area himself, and this, along with stories told by his elders, convinced him that the land needed to be conserved. Farmers who were newer to the area were less aware of the environmental benefits of agroforestry. Rather, they were more likely to say that they were planting fruit trees because they enjoyed the taste or because they saw other farmers do it. Almost none of the younger farmers had attended trainings or seminars on agroforestry, and knew less of the history of the area, and were therefore less informed on the importance of planting trees for environmental reasons.

The intensity of trees planted on farms by those who practice agroforestry in the study area differs greatly, ranging from less than 5% tree cover to more than 50%. We found that this can be partly explained by the fact that some farmers still rely on corn for most of their yearly income, since this crop can be harvested twice a year, while fruit is only seasonal. We noticed that on larger farms, more trees were planted, while farmers cultivating less land were more likely to mention that they prefer planting more corn, especially in Pagapag. We think this can be partly explained by the fact that the fruit trees take longer to grow, and therefore have more

long-term profits than short term. If there is not a lot of space on a farm for trees to grow along with corn, a farmer would experience less profit for a few years while the seedlings mature, an investment that some farmers are not willing to make.

We found that farmers in Pagapag are not really practicing agroforestry, because most farmers are not aware of the projects and trainings, since their location was not as directly prioritized by the DENR and NGOs as Mansarong was. In general, we found there was confusion about the possibility to be a member of NELARDA by residents of Pagapag. A few farmers in Pagapag were invited by NELARDA to attend some trainings, but said they were too busy at the time to attend. Another factor we thought was relevant was that all farmers we interviewed in Pagapag mentioned that no one in their close community was practicing any type of agroforestry. This contrasts with Mansarong, where the community not only provides resources but also inspiration for farmers to plant trees on their farms. One Mansarong farmer summarized this by telling us that all farmers in a community just follow what one farmer does.

A key informant expressed worry about the future of agroforestry in the area, since the population growth could lead to more expansion of farmland. He believed this land would be used for the farming of corn, which provides quick profit, rather than the more sustainable fruit trees.

Recommendations

Although we found many examples of agroforestry in Mansarong, not all were ideal for improving the environment and reducing soil erosion. For example, many steep slopes were still planted with corn, rather than trees. The contour farming promoted in several trainings was abandoned by many farmers, because they did not like the way it looked compared to the straight rows they are used to. Many farmers also mentioned that herbicides and pesticides would kill any tree seedlings they will plant, but one successful agroforestry farmer we interviewed put sacks over the seedlings during spraying as a solution. We therefore recommend the provision of more training on agroforestry, specifically on contour and multistory farming. Sharing of tips from experienced local agroforestry farmers may also be an effective strategy to motivate other farmers in the community, particularly the younger generation and those from Pagapag.

Photo 2: Our host family and us. (Photo by R Incina 2018)

ACKNOWLEDGEMENTS

To the government officials of Baggao, thank you for giving us the opportunity to conduct our research study in your municipality, specifically at Barangay Sta. Margarita, *sitio* Mansarong. To councilor James Laruan and his wife Espi Laruan, thank you for accommodating us in your house and also for the *masarap* foods. Thank you to all respondents in *sitios* Mansarong and Pagapag for your time and for answering all our questions, especially our key informants- Marcelino Laoyan, Alejandro Logro, and Renato Ganase. Thank you also to MENRO Richard Vargas, who accompanied us in visiting one of the farms in Mansarong.

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APPENDIX

Questionnaire

For all respondents:

a. Personal information

Number of interview:
Name:
Age:
Sex:
Occupation/ livelihood:
Ethnicity:
Number of children:

For officials/ NELARDECO:

b. Open ended questions

What specific agroforestry projects were implemented in Mansarong?
When were these implemented?
What were the reasons for promoting agroforestry in the area?
What resources were provided (seedlings, trainings, etc.)?

- By who?

- Do you think this was enough to start effective agroforestry projects?

What funding was provided?

- By who?
- Do you think this was enough to start effective agroforestry projects?

What different crops and trees were encouraged to be grown by agroforestry farmers?
How were the farmers for agroforestry in Mansarong selected?
How many farmers were selected?
Do you know how many farmers continue to practice agroforestry?
Why do you think some farmers quit agroforestry?
Why do you think some farmers continue to practice agroforestry?
What has been the impact of agroforestry so far in Mansarong?
Do you think agroforestry will continue in Mansarong?

For all farmers:
Do you own your own land?
How many hectares of land do you currently cultivate?
Do you practice agroforestry?

IF NO:

Would you have participated in an agroforestry project if given the opportunity?

- Why or why not?

What crops do you cultivate now?
How much labor do your crops require?
What other inputs do your crops require?
What do you think of other farmers practicing agroforestry?

IF YES:

What year did you start agroforestry?
Is there anyone who suggested you practice agroforestry?
Why did you want to establish an agroforestry farm?
Did an agency/ institution assist you with establishing an agroforestry farm?

- If so, which one?

What kind of help did you receive from them (seedlings, money, etc.)?

- Do you think this was enough?

What crops did you cultivate before agroforestry?
What crops did you cultivate right after the agroforestry project?
What did other people in Mansarong think of you practicing agroforestry?
What crops are you growing now?
Do you think agroforestry is more profitable than your previous way of farming?
Do you think that practicing agroforestry has a good impact on the environment?
Does agroforestry require more labor than your previous farming method?
What are your main reasons for continuing agroforestry instead of going back to your previous way of farming?
Why do you think other farmers in Mansarong have abandoned agroforestry?
Have you expanded your cultivated field since you started agroforestry?

- If yes: by how much?
- What do you cultivate on this land?

Will you continue practicing planting more trees? Why or why not?

THE INTRODUCTION OF RUBBER TREES IN MANSARONG, BAGGAO

Eryl Karl S. Agustin & Anne-Marie Vogelzang

INTRODUCTION

A large portion of the population of the Philippines is dependent on agriculture for their livelihood. As of July 2017, 25.2% of the population works in agriculture (Philippine Statistics Authority 2018). The main crops people farm are rice and corn, and other common crops are ginger, potato, beans, cassava and fruits such as banana, papaya, watermelon and pineapple. Sometimes, new crops are introduced to farmers in certain areas. This may change the livelihoods of the people in this area for the better or the crop may be incompatible with the environmental conditions of the area leading to a loss in livelihood (van Weerd 2018, pers.comm.). This usually results in the farmers returning to their previous crops.

Rubber trees have been successfully farmed in the Mindanao region in the Philippines but the investors want to expand these plantations to other regions as well because there is an increasing number of typhoons there. These damage the plantations resulting in a loss for the investors. One of the places where the company is introducing rubber trees is the *sitio* of Mansarong, *Barangay* Santa Margarita, Baggao, Cagayan, Philippines. Nevertheless, this does not mean that there are no typhoons here. Agriculture is the main livelihood of the people in Mansarong. At the center of Mansarong, there are small stores and a farmers' cooperative. Additionally, there are 17 households in Mansarong and it is the last point with electricity along the road towards the coast.

Rubber tree farming is part of agroforestry, which implies that the trees are intercropped (Bhagwandin 2004). This is an effective form of utilizing land as the farmer can produce other crops while the trees are growing. Intercropped farming also has benefits for the soil. Hence, it has ecological and economic benefits. Nevertheless, with rubber trees, intercropping can only be done with some crops such as root crops like beans. For example, intercropping with corn is dangerous as it can catch fire and damage the rubber tree. Agroforestry in general generates good livelihoods, income and food security. This is due to the diversity of their crops. As a result of this, government agencies and NGOs introduce local farmers to different kinds of agroforestry. Rubber is produced worldwide in countries near the equator (Firestein 2018). It is used for products such as tires, shoes and many more.

We focused our research on the introduction of rubber trees to farmers as we are interested in the effect of rubber tree plantations to the future of this area. The rubber tree also requires a different type of work which will impact people's work life as well as their social life. Additionally, the rubber tree will change the view as agricultural land will be reforested. It is important to look at the introduction of this crop as it will inform us about how people are informed about the project and about how to farm rubber trees, what people expect to happen to the environment and their social life, and their motivations to either join the project or not.

RESEARCH QUESTIONS

How are rubber trees introduced in Mansarong? And how is it perceived?

- Who introduced the farmers to rubber tree farming? And why?
- How are farmers approached by the company?
- Why do farmers participate in this project?
- Why do farmers not want to participate in this project?

METHODS

Schedule	No of interviews	Activities
Jan. 18 2018	1	We interviewed the MENRO Representative in the Municipal Hall of Baggao.
Jan. 19 2018	2	We interviewed the person in charge of NELARDA and one of the owners of the land used as a demo-farm for the rubber tree plantation. We also visited the plantation.
Jan. 20 2018	6	We interviewed people who also want to plant rubber trees and people who don't want to plant. Then we visited a cornfield and interviewed the person who manages it.
Jan. 21 2018	6	We did an informal interview and went to the house of two respondents who are unsure if they want to join the project. Then we conducted two more formal interviews.
Jan. 22 2018	2	We went to the rubber tree plantation of the Ganase siblings and interviewed three of the workers on that plantation. Afterwards we observed how they cleaned the weeds around the rubber trees.

We conducted all interviews together. One asked the questions from the topic list and some follow up questions and the other acted as a translator. We prepared a topic list for semi-structured interviews (appendix A). We got different and new information in every interview so this approach allowed us to get the most relevant information from each respondent. We only have qualitative data as we did not have much information about the status of the project before we went into the field. Additionally, as it is a new project, there are a lot of variables unknown making it difficult to create a closed questionnaire.

We also visited three farms. This allowed us to confirm answers we heard during interviews and ask follow up questions and other things we saw which were relevant for our research. This also allowed us to get a better understanding of the size of the plantation and the rubber trees within this context. During two of our visits we conducted interviews on the farm as a type of participatory observation and during one of our visits we just observed. We wanted to see how the rubber trees are maintained and cleaned by the workers on the land to get a better understanding of the type of labor and the labor intensity.

Furthermore, we used both snowball sampling and availability sampling methods to find our respondents. Snowball sampling allowed us to find the most appropriate respondent for our research but it was not always successful because some people mentioned they knew others who had the same or a different perspective on the project but then they would not give us a name. Availability sampling was very successful as there is a farming cooperative in Mansarong which acts as a meeting place for people. All people we met there were willing to help us with our research.

RESULTS

During our fieldwork in Mansarong, we conducted 17 interviews with 21 people in total. Out of the 21 respondents, 15 were male and 6 females. Our youngest respondent is 22 years old and the oldest is 68 years old, but most of our respondents are between 35 and 50 years old. They also belong to different ethnic groups such as Ilocano, Igorot, Itawis and Visaya.

Who introduced the farmers to rubber tree farming? And why?
Rubber trees were introduced to farmers in Mansarong by a private company called Two Degrees Incorporation (TDI). This is a company which also owns the rubber tree plantations in Mindanao. Our respondents told us that the main investor of TDI is Filipino national, Lucio Tan. TDI has presented a proposal to the Department of Environment and Natural Resources (DENR), a national government agency that gives permission (or issues permit) for projects like this. The DENR is responsible for evaluating environmental consequences. After TDI has received permission, they approached Renato Ganase, the chairman of New Land Resources Developer Association (NELARDA), as TDI had an interest in expanding the rubber tree plantations from Mindanao to Baggao. It was explained to us that NELARDA is responsible for biodiversity conservation and protection, and for agroforestry. Furthermore, NELARDA manages the Community Based Forest Management (CBFM). The chairman of CBFM then met with the members to discuss the project and as they were in favor, the project was started in Mansarong in December 2016, and the planting of the seedlings started in October 2017.

TDI claims in the agreement with NELARDA that one of the reasons for introducing rubber trees to Mansarong is to provide more income and to bring development to the area. This will result in a better livelihood for the farmers who take part in this project because rubber tree plantations are a type of sustainable farming. Additionally, the agreement includes that the project supports the National Greening Program (NGP) of the Government, which aims to reforest the Philippines and combat climate change.

To summarize, TDI has initiated the project of introducing rubber tree plantations to Mansarong. They have expanded their business from Mindanao and provided a new source of income and livelihood to the area.

How are farmers approached by the company?
TDI and NELARDA conducted public consultations in Mansarong in order to introduce rubber trees to the farmers and spread knowledge about the project. This is an open meeting where representatives of the partaking parties are presenting information and people can ask questions as well. At the public consultation the chairmen of CBFM, a representative of the DENR, a representative of TDI, Alvin Pua, and a representative of MENRO, Johnny Columna, were present. In total there were two public consultations but we heard from some of our respondents that they were not able to attend both of them and others were only able to attend one of the two. One of the reasons was because they were too busy working on their farm. In the public consultations people learn about the project and the agreement as well as the impact of the rubber tree on the environment and what to expect from farming it. People were also told that there would be specialists from Mindanao to teach them every step of farming rubber trees. They are also employed by TDI and live next to the farmer's co-op in Mansarong. The specialists do not teach farmers through seminars but they go to the plantation to teach them there. This is because not everybody could attend both consultations and this left them uninformed on how to plant rubber trees. People are informed about the existence of these consultations through personal communication. Renato Ganase is also partly responsible for this.

For now, the farmers are only taught how to plant and clean the rubber trees as harvest is still four to five years away. Our respondents were still unsure how they will be taught about the harvesting of rubber trees. Some expect a seminar, so everyone can be taught at once and others think they will receive personal help from the specialists, similar to how they are taught now. We heard from our female respondents that the company actually prefers to teach women how

to harvest the sap because they believe they have gentle and soft hands that will not scar the tree. They are the ones who will cut the bark at time of harvest. Rubber trees are also very sensitive; this means that farmers cannot use pesticides to get rid of the weeds. Farmers are employed by TDI to clear the weeds by hand (Photos 3 and 4).

TDI has provided seedlings for the farmers. Nevertheless, there are only two specialists who have the exact knowledge of how to plant the rubber tree seedlings. Therefore, the seedlings are stored in somebody's garden (Photo 1). Here, the seedlings are cared for by the owner of the garden who is paid the same wage as the laborers on the land.

Photo 1. Rubber tree seedlings ready for planting. (Photo by A Vogelzang 2018)

Photo 2. Overview of the rubber plantation with planted seedlings, and the windbreaker trees. (Photo by A Vogelzang 2018)

Photo 3. Lionora Dumayag cleaning the weeds around the rubber tree using a machete. (Photo by A Vogelzang 2018)

Photo 4. Small rubber trees where the weeds around it have been cleared. (Photo by A Vogelzang 2018)

Our respondents have also gained general knowledge about the rubber tree. For example, it usually takes 8 to 10 years before latex can be harvested but in Mansarong the seedlings are grafted so it will only take 4 to 5 years to be able to harvest. We also heard that the latex can only be stocked for three days. TDI might also build a factory in Alcala, Baggao, to process the latex intro products. Nevertheless, we have heard from some respondents, the factory will definitely be build, while others say it will only be built if Mansarong produces enough latex. This, again, shows miscommunication about the promises of TDI.

TDI promises land owners of the rubber tree plantation PHP 5000 and a sack of rice (50 kilos) per month, but they will only receive this after they have planted all the seedlings. The salary of the workers on the plantation is also paid by TDI, they receive PHP 200 a day. Additionally, TDI provides all the seedlings and other financial support needed to plant and maintain the seedlings such as equipment. The seedlings are PHP 1500 each, which means farmers rely on TDI in order to farm this specific crop. All these promises make it very attractive to join this project.

Furthermore, the Ganase siblings started planting rubber trees in their land to serve as a demo-farm last October. One of our respondents mentioned that they are the first people to convert their land so people also cannot blame the Ganase siblings for introducing rubber trees because if it does not work out well in the end, they will also be at a disadvantage. The demo-farm allows people to visualize what their farm will look like, what kind of work they will have to conduct and to decide whether they want to farm rubber trees as well. The Ganase siblings, who own the biggest plot of land in Mansarong, have planted rubber trees on 33 hectares of their land (Photo 2). The land still looks like an open land but the rubber trees are already planted here and this area will be forested in the future.

This is the only farm yet but in the future the plantation will be scattered over multiple land areas of different farmers. The rubber trees are placed in rows. The rows are 10 meters apart and the trees within a row were separated by 2 meters. The workers on the field work in pairs and finish cleaning the weeds around the rubber tree of one row in one day. There are about 180 rubber trees in one row.

At the consultations, people were also informed about and presented a reserve list. This acts as a waiting list for the people who want their land to be converted to a rubber tree plantation. Our respondents told us anyone can if they want to. Nevertheless, there is a distinction between people who have a title on their land and people who don't. People with a title are put on the bottom of the list. This is one of the reasons some people are hesitant to work with the company - it is perceived as suspicious. Furthermore, the minimum land to be converted is half a hectare. Respondents who were more enthusiastic put their names on the list in the first consultation and hence get to convert their land earlier. Next to public consultations, people also get informed about the rubber trees themselves through personal communication. Friends and neighbors tell about what they have learned at the consultations and further distribute this information.

To summarize, TDI has held public consultations to inform farmers in Mansarong about their aims and what to expect from farming rubber trees. People were told about these consultations through personal communication and this has been effective as we did not meet anyone who was unaware of the rubber plantation. We do believe the information provided in these public consultations might be biased as TDI would not mention any possible negative effects while trying to convince people to plant rubber trees on their land.

Why do farmers participate in this project?

We interviewed people who have already planted rubber trees (N=3), people who want to plant them but have not yet had the opportunity to do so (N=8), people who have not yet decided whether want to change their crops to rubber trees (N=2) and people who do not want to plant rubber trees at all (N=2) (Figure 1). The other five people we interviewed were positive about rubber tree plantations but they did not own any land to plant rubber trees themselves. These people were somehow involved in the plantation though, either as a caretaker or as laborer. The majority of our respondents are positive about rubber tree farming.

Most of the farmers who wanted to plant rubber trees are the ones who actually attended the public consultations held in Mansarong. They felt informed enough to make the decision to change crops. Farmers see a brighter future if they will farm rubber trees. For example, they see an increase in income. Land owners will be provided with the expensive seedlings, payment for the laborers, fertilizer and other equipment and they will receive a high salary themselves as well. Additionally, maintaining the trees is labor intensive in the short run but not in the long run. One of the farmers even said his wife and children could work on a rubber tree plantation when he has other obligations. It is also attractive for the laborers without land to work on a rubber tree plantation as they receive PHP 200 a day instead of PHP 120 to 150 for working on a corn field. The laborers on the rubber plantation also informed us that TDI is considerate of the travel distance, so they allow the farmers to leave the plantation early and to have a long lunch break for the labor intensive work. Furthermore, farmers are still allowed to intercrop the small rubber trees with root crops such as ginger or beans. The farmers foresee that this type of farming will lead to a sustainable livelihood as it will benefit them economically and socially. Furthermore, as it is not very labor intensive work in the long run, people can do other jobs such as carpentry next to the rubber tree farming.

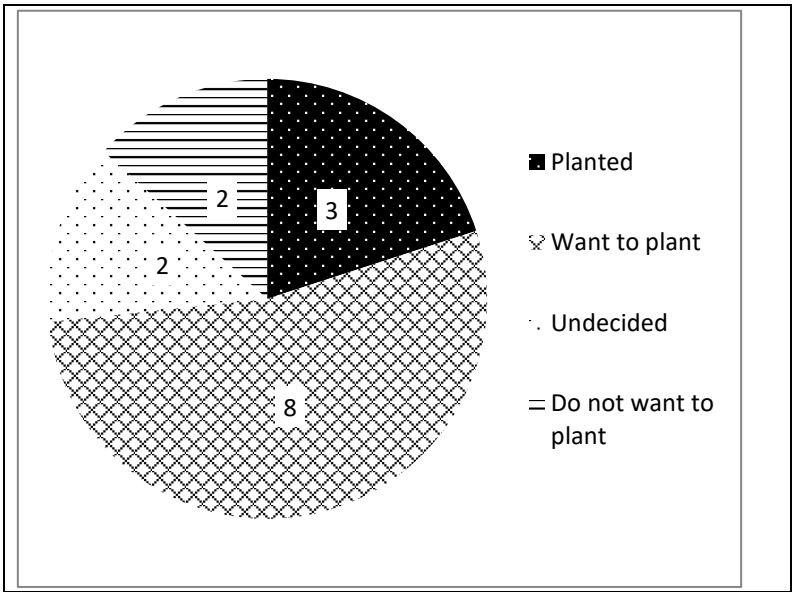

Figure 1. Perspectives of people in Mansarong on rubber tree farming.

Another motivation for people to switch to rubber trees is the good effect on the environment. We were told by land owners that the trees prevent soil erosion, will provide a forested area and be good for the water supply as the trees will provide shade. An aspect of rubber trees that kept returning in our interviews was that the trees don't need to be cut for harvest unlike corn fields which become an open land twice a year after harvest. This will also be good for the biodiversity because the trees may be inhabited by birds. One farmer strongly believed that the DENR wouldn't agree to the plantation if it would be bad for the environment, and he told us that the DENR is actually the one who recommended the rubber trees to this area. Furthermore, one respondent said his main motivation to change crops from corn to rubber was the benefit to the quality of the soil. As rubber trees are sensitive, farmers are not allowed to use fertilizer that much. The farmers will only use fertilizer twice a year when it's an adult tree, unlike corn which uses a lot of fertilizer, hence damaging the soil. This implies that the farmers also think about their lands in the long term. The economic improvement of the life of farmers is also a motivation to convert crops to rubber trees. For example, a respondent was recommended to farm rubber trees by a relative in Mindanao who farms rubber there. The relative has benefitted and our respondent told us he wants to be rich like his relative. The fact that rubber tree plantations are successful in Mindanao also acts as proof for people in Mansarong that it will work out well.

We have also heard that people in Mansarong will get a bigger share of the profit after harvest than the farmers in Mindanao. In Mansarong, 60% goes to the company and the 40% goes to the farmers of a certain share, while in Mindanao the company gets 70% and 30% goes to the farmers. Another benefit that farmers mentioned about the introduction of rubber trees is that TDI promised to improve the road. People are happy TDI will aid to this long standing problem of low quality access roads. A better road is necessary to transport the latex, but since this can only be harvested after four to five years, the company will not yet start building it. We have heard different stories about this road. Some people say it will be cemented while others say it will just be fixed. Some people say TDI will definitely improve the road; others say only if there are enough farmers that participate in the project. Some people say the smaller roads to the farms will be fixed as well, while others are unsure about that. A better road will not only benefit the rubber tree farmers but also farmers who do not choose to participate. Nevertheless, people who keep farming other rice and corn do not expect a big increase in income because even though transport may be a bit cheaper, the price is set by supply and demand.

Even though we found that most people were positive about rubber tree farming, we also noticed those people who barely converted all of their land to rubber. This indicates that there are some uncertainties about the plantations. There may be speculation about land disownment or environmental damage. One of our respondents used a metaphor to describe this mentality: you wouldn't drive a car without a spare tire. The farmers use it as a back-up plan but they also mentioned that they would convert the rest of their land to rubber if TDI asked them to. We also interviewed someone who said he only converted half of his land to be able to compare the income of both crops when the rubber tree could be harvested. At that point he would either convert everything to rubber or he would switch all of his land back.

To summarize, farmers participate in rubber tree farming as they expect a higher income that will benefit their livelihoods, as well as less labor intensive work in the long run. In addition, a motivation is that it will benefit their environment and the quality of the land.

Why do farmers not want to participate in this project?

There are also people who do not want to participate in rubber tree farming. Some farmers don't want to because they say that it is too labor intensive. We've noticed that these farmers are usually a bit older and they also mention young people can still work easily. This is a very technical reason to not want to farm rubber but there are also more intricate reasons.

There are rumors that the company might grab their land. People are afraid that their land will be disowned. An indicator of this is that TDI prefers to make plantations on land without a title, as some respondents told us. Some people also say they have seen the agreement and afterwards decided not to join the project but others saw the agreement and were happy with the conditions so they did join the project. Farmers who do not want to plant rubber trees are also skeptical whether the company will actually keep to the agreement.

Some farmers do not participate because they have heard rumors about bad effects of rubber trees. For example, there are rumors that the rubber trees might drain the continuous source of water flow in the area as they think it will suck all the water out of the soil. Others are afraid that local people might burn their land planted with rubber trees because it is owned by a private company. The people who do want to, or already have planted rubber trees often have heard these rumors but do not believe them. The people in Mansarong have communicated with each other about their opinions on rubber trees. This has led to people encouraging and discouraging each other.

Next to people who do not want to farm rubber trees at all, there are also people who are still undecided. They are first observing to see how it goes with other farmers because they are scared that something might happen to the land they grew up on. They are willing to wait for proof that the rubber tree will not damage the land. This shows there is also a sentimental value attached to their land. Additionally, some parents still have some control over what will happen, and when land is shared with siblings they also need to come to an agreement on what to farm. One of our respondents is also suspicious because the private company pays for everything. Moreover they think all the profit might go to the private company, so they want to wait for at least one year before planting rubber trees. Another reason why some farmers do not want to farm rubber is that the product cannot be consumed unlike corn and rice, which people can both produce for an easy income and can consume for own use. Especially farmers with smaller plots of land are careful in converting their land because it is their only livelihood and they are scared of fully relying on rubber trees without knowing the effects.

To summarize, people do either not want to farm rubber trees because they are cautious of working with a private company or they are unsure of the effects it will have on their lives. These effects include environmental damage, income levels and livelihood. These people want proof before changing crops.

DISCUSSION

We have collected a lot of information about the introduction of rubber trees in Mansarong but this does leave us with some aspects to discuss. To start with, Lucio Tan, the president of TDI, has also invested in big companies such as Fortune Tobacco Corp., Asia Brewery Inc. and Philippines Airlines Inc. (Britannica 2018). He is one of the biggest businessmen of the Philippines (ibid.). This shows the capacity of TDI and hence the amount of impact they might have over the future of Mansarong. We have also heard about the content of the agreement between NELARDA and TDI and this raises some questions. Mansarong is part of the area where the Community Based Forest Management Agreement (CBFMA) is established. This means that Mansarong is part of the wildlife sanctuary for the Isabela Oriole, a critically endangered bird species that endemic to the Philippines and only lives in the low land forest of the Sierra Madre mountain range in Luzon. As we understand it, NELARDA has given permission to TDI to convert forest land into rubber tree farms. This would damage the environment of the Isabela Oriole and other wildlife in this area.

Furthermore, we have also learned that TDI would rather convert the land of farmers who do not have a title on their land than the land with a title. This is suspicious as it suggests the company might want to take ownership of the land. While some farmers are scared this might happen, the ones who have given or will give their land think these are rumors that should not be believed. In addition, we were told that the agreement specifies that TDI will have the right over the land where rubber trees are planted as long as the agreement stands. They are able to claim this as they pay for the seedlings, labor, equipment etc. However, most farmers are not aware of this.

There are also rumors about the effect rubber trees have on the environment, specifically the water supply. Worldwide there has been a concern about the hydrological effects of rubber trees (Environmental Research Web 2009). Ziegler argues that, even though previous agricultural practices have an impact on the environment, rubber trees have a much bigger impact on hydrology, erosion and landslides (ibid.). This implies that there is a certain truth to the rumors. From the perspective of TDI, however, it seems like they would not make such a big investment in this area if they did not think the project would be a success. For example, if the trees are

unable to grow properly due to the environmental conditions, it would be a bigger loss to them than to the farmers, who can convert their land back to their old crops.

To refer back to the introduction, where we mentioned the effect a new crop can have on the environment, it is important to the farmers that a new crop adds something to their livelihood. For example, we heard that cassava was also introduced to Mansarong in the past. One of our respondents told us this was not successful though because it was just as labor intensive as their old crops and there was no market for cassava in the region so it was not worth it to change.
We have noticed during our research, that a lot of people have different and sometimes contradicting knowledge about rubber trees and the project of TDI. This implies that their way of spreading knowledge, through public consultations, is not the most effective way. Somewhere, information is missed or misunderstood and people are also unable to attend meetings sometimes due to work obligations on their farm. Moreover, the agreement the farmers have to sign is in English. During our interviews, only few people could understand basic English. This means there is a big chance that farmers have not fully understood what they are signing up for.

Besides that, the farmers of rubber are offered a higher salary than the land owners of rice and corn are able to offer. It is likely that this will result in the majority of the laborers having a preference of working on a rubber plantation. However, what will the effect of this be for land owners of rice and corn fields? Who will they employ? This may have as a consequence that the land of these farmers will also be converted to rubber, due to a lack of available labor force. On the other hand, it is also a possibility that the land owners of rice and corn will have to offer a higher salary at the cost of their own profit.

Additionally, the fact that TDI prefers to let women handle the rubber trees, as mentioned before, may have consequences in the long term as well. For example, will it be easier for women to find a job as a laborer? What effect will this have on the social relations in the area and within households? The division of household tasks might be redistributed for example. This might be relevant for other researchers to follow up on.

CONCLUSION

So, how are rubber trees introduced in Mansarong? And how is it perceived? The private company TDI is responsible for introducing rubber trees to Mansarong. This company provides all the necessities to construct rubber tree plantations such as seedlings, equipment, knowledge through help from specialists, payment for labor and a salary for the land owner. The company conducted two public consultations to inform the people in Mansarong about what their project entails and what to expect from farming rubber trees on their land. Farmers also got a small introduction about how to farm rubber trees but most information is given on the farm by the specialists.
The people of Mansarong have different views on the introduction of rubber trees. While most people are positive, some are suspicious. The positive people anticipate a better future due to a higher income, sustainable farming, better livelihood due to less labor intensive work in the long run and an improvement in natural environment. They also appreciate that TDI will improve the road condition to Mansarong for latex transportation. A lot of people have converted some of their land to rubber trees but not all of it as they also are unsure of the effect it might have. The suspicious people believe rubber trees will damage the environment or they do not trust the company as they are afraid of land grabbing for example. Everyone in Mansarong has knowledge of the project and people also talk individually about whether to join or not. Some people encourage others while others discourage friends and family.

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APPENDICES

Appendix A

Topic list for farmers farming rubber trees	**Topic list for farmers who do not farm rubber trees**
1. Are you planting rubber trees?	1. Do you farm rubber trees?
2. How long have you been planting rubber trees?	2. Why don't you farm rubber trees?
3. Why did you start planting rubber trees?	3. Did you attend any public consultation about the rubber tree?
4. Who approached you?	4. What did you learn?
5. When did you start planting rubber trees / when will you plant rubber trees?	5. Did anyone encourage you to plant Rubber Trees? If so, how did they try to convince you?
6. Is the land already used for cultivation or is it a new land?	6. Did any people try to discourage you to plant rubber trees? Why?
7. Do you know how to farm rubber trees?	7. What do you farm now?

8. How did you get the knowledge?	8. How long have you been farming? Is it your own land?
9. Is there a seminar about rubber trees?	9. Would you plant rubber trees if it wasn't through a private company? Why?
10. Are you still going to farm your old crops if the rubber trees are grown?	10. Have you heard any bad rumours about the rubber trees?
11. How is it to work with a private company?	11. What do you think of the condition of the road?
12. What do you think of the condition of the road?	12. How do you think it will change if it will be cemented by the private company?

THE HISTORY OF MIGRATION IN VILLAGES MALISI, MANSARONG AND PAGAPAG BAGGAO, AND THE INFLUENCE ON THE CURRENT CULTURAL PRACTICES

Dilara Erzeybek and Jaylord Dela Cruz

INTRODUCTION

The Philippines is known to be a culturally diverse area. It includes the migration history of different ethnic groups who came from other parts of the world such as the Agta and spread throughout the country. The Sierra Madre Mountains is one of the areas where these indigenous people chose to settle. A vast majority of the 12 Million indigenous people in the Philippines reside in the uplands which they claim as part of their traditional territories (De Vera 2007).

Most of the municipalities in Cagayan, located in the northeastern part of the Philippines, have a unique topography that consists of lowlands and uplands. One of these is the Municipality of Baggao, which is an area where many ethnic groups migrated to. People from different tribes started living together in different areas which led to a multi-cultural society. Sta. Margarita is one of its barangays with *sitios* (small villages) where mixed-ethnicity society exists. The paved roads going to these villages do not reach these communities, so we could say these communities are isolated from the outside world. That is why we wanted to reconstruct these migration patterns and to discover their motives for migrating to the villages Malisi, Mansarong and Pagabag. The Agta were the first settlers in the upland areas in Baggao (Acay 2018). Malisi is one of the villages in Sta. Margarita where the Agta chose to settle. Despite the immigration of Austronesian farmers about 4000 years ago and for centuries of Spanish and American Colonization, the Agta have maintained their existence along the Sierra Madre Mountain Range in North Eastern Luzon (Minter 2010). As time passed by, other ethnic groups migrated to the surrounding areas and permanently settled on other locations and established their own small village. These are the *Ilokano, Igorot, Itawis,* and many other minorities. Moreover, we looked for their current cultural practices, how the different groups live together and how the individuals self-identify ethnically. One of our final goals is to create an inventory on how the population of the villages look like, including the households and ethnicity, as there was no census available up until now.

RESEARCH QUESTION

What are the migration histories of the current inhabitants of the villages Mansarong and Malisi and how have these influenced the current-day ethnic identities and cultural practices in these communities?
- When did the (ancestors of) current inhabitants of the three communities settle in the respective villages, and from where did they come?
-How do these current inhabitants identify themselves ethnically and what do they consider remnants of their traditional culture or ethnic group
-How are the members of different tribes living together despite their language barrier?
-What does the mixed-ethnicity in the villages look like and what does it tell us?

METHODS

It was important for us to be careful in using certain terms and defining them such as ‘tradition’, because in the social sciences, there are continuous attempts to define the understanding of tradition, as it has been proven empirically and theoretically to be inadequate (Handler 2010).

We will refer to tradition as an interpretive process that embodies both continuity and discontinuity, as it is ongoing process and not something static. Before starting the data gathering in the field, we looked for specific literature about the locations we would visit: villages Malisi, Mansarong and Pagapag. This includes the academic articles written by scientists, local and foreign researchers, and books. We stayed in the two villages where we conducted our data gathering. We went first to Malisi which was the farthest area among all the other research areas and after two days we went back to Mansarong for the continuation of our data gathering. We also visited Pagapag for additional data. We went to these places with a little knowledge of their culture based on the academic articles we knew during the proposal. Before we started to do the interview, we had an agreement to conduct the interviews in English, together with an Ilokano translation, so the respondents can understand them. The answers from our respondents were in Ilokano and these were translated back to English, so we could take down notes. In the field, we used semi-structured interviews and we started with an informed consent, introducing ourselves first to the respondents as student-researchers and asking whether they were willing to participate with an interview session. During our selection for interviews, we used random sampling to find respondents. In the areas where we conducted our research, we used snowball sampling as well and we asked our respondents if there were other people who could give us more information about our topic. We consider most of our respondents as key-informants, as some of them were the leaders of the villages and some of them were the elder ones who explained more regarding the history of the specific tribe. In Malisi, we conducted 7 interviews and 1 focus-group interview with a group of Agta members. The additional value was that we had more and different inputs as people were able to add up to each other's answers. We interviewed younger respondents too, but usually they could not answer as well as the elder generation. (The questions we formulated for our semi-structured interviews are included in the appendices). We had specific questions which we wanted to ask, but in practice it was usually the informant who gave us more detailed descriptions of situations and most of the time it turned out as an informal conversation. Our questionnaire should rather be regarded as a topic list, to help us structure our interviews. Photography was part of methodology as well, as images can tell a lot about the people, their surroundings and about the traditional materials they presented during the interview sessions. Photographs are useful evidences in our research. It is relevant to ask permission in advance of taking a photograph, but also afterwards to protect the privacy of our target respondents. Refusal should be respected (van Weerd 2018). We looked at how the members of different tribes react and cooperate with each other and it was interesting to find out what the community as a whole or the tribes as separate groups find important when acting and performing cultural practices.

Table 1: Activity schedule during our research

Date	**Goals**	**Location**
Thur. 19-01-2018	We were not able to cross the river with the truck, so 1 day loss.	Sta. Margarita, Barangay Hall, Baggao.
Fri. 20-01-2018	Arrival in Malisi, after hiking from Mansarong. Conducting 2 interviews & Photography.	Malisi, Sta. Margarita, Baggao.
Saturday 21-01-2018	Conducting 7 interviews, including 1 Focus-Group. Photography.	Malisi, Sta. Margarita, Baggao.
Sunday 22-01-2018	-Hike back to Mansarong to continue research. Conducted 5 interviews. & Photography.	Malisi & Mansarong Sta. Margarita, Baggao.
Mo. 23-01-2018	-Continuing Interviews (4) in Mansarong and Pagapag (6). & Photography.	Pagapag Mansarong, Sta. Margarita, Baggao.
Tue. 24-01-2018	Leaving Mansarong	

RESULTS

Malisi

The history of Malisi is a very interesting one. There were a couple of Agta living here, and the location had no name. Several of our respondents told us the same story about the war between the two Agta tribes *Dupaningan* and *Labin*, who also happen to have their own dialect. The grandparents of one of our earlier respondents were the ones who started promoting mixed marriage between a Dupaningan and a Labin, which was unthinkable earlier. They came to live in Malisi and since it is an Agta tradition to give a place a name when marrying, they called the village Malisi, which is derived from the word *Aglisi*, an Agta term for "avoiding" and in this case, for avoiding war. After the peace, the Labin and the Dupaningan both came to Malisi to live there together in peace. The name became a document for this place and this story is passed on to the younger generation, to not forget their history and where they came from. The Agta do not define themselves as Labin or Dupaningan anymore, but they want to be referred to as Agta. We found out that Malisi has 104 inhabitants and 27 households. The majority are the Agta households with 98 inhabitants and the others are 4 Ilokano and 1 Igorot (Photo 1).

One of our key-informants was a teacher in the elementary school of Malisi and confirmed that the school has had a big influence for this settlement to create stability and the increase of the households (Larunir 2018). We found out that the Department of Education (DepEd) helps in financing these kinds of projects and that there is a plan to use computers, energized by solar panels which will be put in action this June 2018. She thinks computers on solar panels will help lessen the language barrier and motivate students and they can learn how to use computers (Larunir 2018). Currently, there are 60 pupils in Malisi, from kindergarten to Grade 6. Majority of them are Agta. Others are mixed-ethnicity, such as Agta with Ilokano (10-15) and Igorot with Ilokano (about 5).

The second factor for the increase in households is the establishment of Christian religion, according to the missionary, Apolinard Mateo whom we interviewed through a phone call. Earlier, (comment: can you give a specific date), a pastor visited Malisi who established a small church for the Agta. There was only a small school and about 6 households. It was February 2016 when Mateo came to Malisi and he told us "There was a plan to demolish the school, since there were only few students going to the school" (Mateo 2018). To prevent this, he conducted a meeting and he mentioned that if they really want to have the school, they must stay on the area where the school is located so the population of the students will increase and there will be no reason anymore in demolishing it. Fr. Mateo convinced the Agta to settle and they had funding from the church for the building of the chapel first and later on for the houses of the Agta. During their first commune, many of them were converted to Roman Catholics. The priest lived there for almost 7 months.

The fact that Malisi is a mixed ethnicity-society creates also a language barrier for the children. Most of the children speak Iloko, which is from the Ilokano, but the modules at school are taught in the district's majority language which is Iloko. The survey conducted by the Municipality of Baggao of the ethnic groups was based only on the language that they speak commonly but not really the language that is being used in their houses. The data they have was used by the DepEd in determining the mother tongue in that area. The teacher, who happens to be an Ilokano, told us: "We need also teachers who speak Labin, so translation will be easier, and the children will be able to perform better at school. But we only have teachers who speak Ilokano" (Larunir 2018).

Thirdly, is that the language-barrier of the older generation is not that big, most of the inhabitants of Malisi speak Iloko with the non-Agta, also when they are trading in other areas, so they can understand each other, but with the Agta members they use their own dialect their Dupaningan and Labin. They find it important that their children will not forget who they are and what their history is, but when we asked about what these cultural traditions were, they could not give specific examples, and this was very contradicting to each other. They told us that they want to pass on the dialects Labin and Dupaningan to their children, which are actively spoken by the elder generation, but since the children speak Iloko at school, it is slowly forgotten by them.

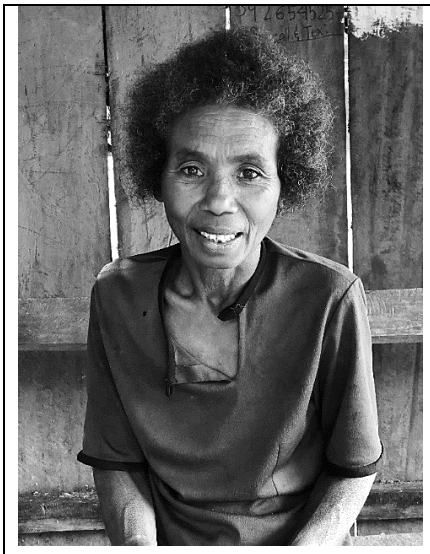

Photo 1: Siony Eder, an Agta, at her home in Malisi (Photo by D Erzeybek 2018)

Photo 2: From left to right; Ilokano child, Agta Child and Siony Eder with her grandchild whose parents are Agta and Ilokano (Photo by J Verheijen 2018)

The Agta Indigenous People Vice mayor in Malisi told us "It is very important to teach our children about the Agta culture, because in our society it is relevant to show and identify yourself as an Agta. "If you are recognized as an Agta, you will have privileges." (Rosalin Jr. 2018). He told us that sometimes they wear traditional clothes on special days, but they do not find it important anymore as Christianity is playing a higher role in their lives now for most of the people. We noticed that we got many contradicting answers regarding culture. Since the Agta in Malisi have been converted to Christianity not a very long time ago, we could still find traces of their earlier animism.

During our focus group discussion, one of the Agta elders that they consider specific parts of the forest in their area as sacred and it is not allowed to enter these without permission and hunting is not allowed here, as they are afraid the spirits will get angry. "Whenever we find a person wandering around in these parts of the forest, we will scare them by shooting an arrow close to this person, but not hitting him'' (Rodrigo 2018).

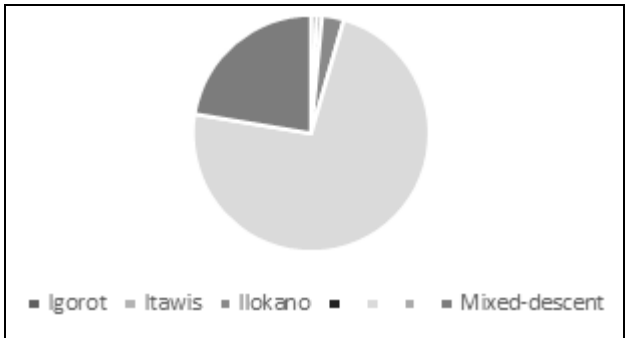

Figure 1: division of ethnicities in Malisi

A *balangau* (dog), and the *pana* and bolo (knife and arrow) are used as a traditional tool for hunting. The Agta used to hunt every day, but since there is a shift from hunting to farming, it

became less. Hunting in groups is called *An-anup* and alone *Sir-sirap*, which is better, so the forest will not get disturbed (Rodrigo 2018). The Agta told us that they do not have time to teach their children how to hunt, as they must farm, harvest and sell their produced goods. When they hunt, the trophy will be shared with all the households. Whatever is left, will be sold in other places. Other traditional Agta practices include chewing of *Mama*, a brown nut from of a palm tree that eventually turns the color of your mouth into red after a long time of chewing it. This habit is even adopted by the Ilokano who are present in Malisi, together with the traditional Agta broom.

Mansarong

The village Mansarong is another place where ethnic groups chose to settle (Table 2, appendices). We found out that most people who settled here are the Igorots, a tribe who originally migrated from Benguet Province (Photo 2). The Igorot Tribe is still divided into three different groups namely the *Ibaloys, Kankana-ey* and *Kalanguya*. The most common group who are currently present in Mansarong the Ibaloys, but according to them there is no cultural differences among the three groups, except for their native dialect that they use for speaking. Their native dialect is the same with how they call themselves, like for example the Ibaloy, they call themselves as Ibaloy and theycall their native dialect as Ibaloy. Mansarong consists approximately of 18 households, mostly Ibaloys and 1 Kankana-ey. Before the Igorot settled here, Mansarong used to be an Agta settlement, but as they were nomads. They left their lands to the Igorot and moved on. According to the Igorot, the Agta were the ones who named their place (as we discussed earlier, it is an Agta tradition to give places a name as a form of documentation). There was a certain Igorot family, who came from Benguet after the Martial Law and they were the first ones to explore the area in the year 1970. They found this place out of curiosity, because their place in Benguet was not good for farming as it was rocky. As they were already farmers, they looked for an area to farm on. The story about the area that they found was passed on to the other Igorot of Benguet, so their relatives also moved here. The current households in the area are related to each other, so they have the same migration history.

Most of the Igorot are still farmers. They consider this as their traditional way of living since their ways of farming before are still being practiced. The Igorot have a traditional ritual which is performed when they want to convert a forestland into a farmland. This traditional ritual is called *Ag-uma* (typical kaingin system), in this ritual they do *Ilew* (offerings) for the spirits. Usually pigs or chickens, followed by the *Ngilin*, it is the last part of their ritual where they do not work on the field for one day. Traditional beliefs like animism of the Igorot have decreased since most of them are converted as Christians. Despite their conversion to Christianity, they kept some of the cultural practices that they used to perform. The traditional *Ul-uli* or *Panag-uli*, is usually done before the weddings. The family of the groom will prepare native delicacies and a pig that will be given to the bride's family. The groom together with his family will ask permission to marry the bride on their house together with her family too. There were *Sab-ong's* before, which is their local term for arranged marriages, but not anymore. The traditional dance *Tayaw* for the Ibaloy and *Sayaw* for the Kankana-ey, is usually performed during wedding ceremonies. In this dance, they use traditional instruments called as *Gangsa* (Gongs) and *Salibao* (Drums). These are played together that creates harmonious sounds for them. This dance is only performed at request of the couple, not really mandated for a wedding these days, since the ceremonies are done in a Christian way now in the church. These instruments are kept by one family in Mansarong and sometimes, other member of their tribes borrow it from them. Most Igorot respondents confirmed that up until these days, they still practice the rituals around buried people. In the original traditional practice, family members believe that if the dead

person appears in their dreams (usually family members), it means the dead person wants to say something. As part of their belief, they cultivate the remains of the dead person and they will replace the cloth of the remains by a new one and they burry it again. After it, they call the family member who had a dream about the dead because they believe that the spirit of the dead person will possess the one who dreamed. These traditional practices are not being passed on to the younger generation, because of the influence of Christianity. However, there are also people who adopted burying the dead in cemetery. There are still families who keep the traditional beliefs alive as they teach it to the younger ones, but those are only a few as Christianity plays a more important role.

Photo 3: The traditional G-string, shown to us in Mansarong, which was traditionally worn by the Igorot (Photo by D Erzeybek 2018)

Photo 4: Traditional Igorot instruments which were shown to us in Mansarong. The "*gangsa" and the "salibao"* (Photo by D Erzeybek 2018)

Originally the Ibaloy do not speak Iloko, which is their common language now. Their knowledge on how to speak Ilokano was also an effect of their migration to Mansarong, since after the Agta, the Ilokano were the ones to settle in Mansarong. They learned the language by living with the speakers of it and they find it relevant to learn it, because it is very useful for them since it is the common language that they could use with other tribes like the Kankana-ey and the Agta who both own a different dialect. Since the Iloko language has been widely used in their area, it also affects their original dialect. The younger generation now in their area are speaking Ilokano rather than speaking Ibaloy. Only a few of them speak the dialect and most of them can only understand the dialect but have a hard time to speak it. One of the factors is because the school considered Iloko as their mother-tongue and uses it as medium of instruction from grades 1 until 3 which is not really their mother-tongue technically. This code switching is not really a big problem for the community, because they do not experience the language barrier between them since everyone knows how to speak Iloko. Other members of different tribes were also living there because of mixed-marriage, some of the Igorot were able to marry from another tribe but still choose to live in their area together with their other family members. The Igorot do not have a negative perception regarding mixed-marriage, in fact, they are very open with that idea as long as they love and respect each other in terms of cultural differences.

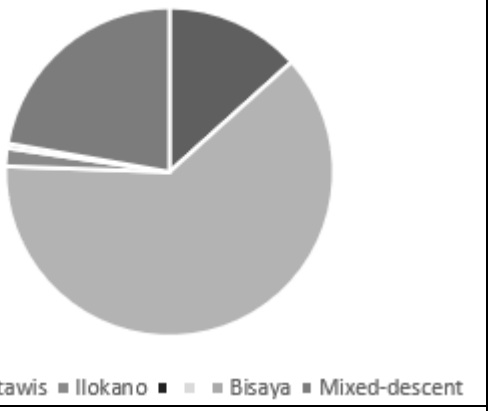

Figure 2: impression of the different ethnicities living in Mansarong

Pagapag

We found that there are two major ethnic tribes living here, they are the Ilokano and Itawis. Earlier, this area used to be occupied by the Ilokano, but then the New People's Army settled (NPA) here, so they decided to move to other areas. When the NPA moved to another area, they decided to come back to this area and build their new houses. Their ancestors did not know about this place, as it was found by coincidence when looking for a new place to live. Their original settlement Amulung was constantly flooded and they were not able to farm properly.

Photo 5: A carabao, used for transporting goods and for farming purposes in all villages we visited. (Photo by D Erzeybek 2018)

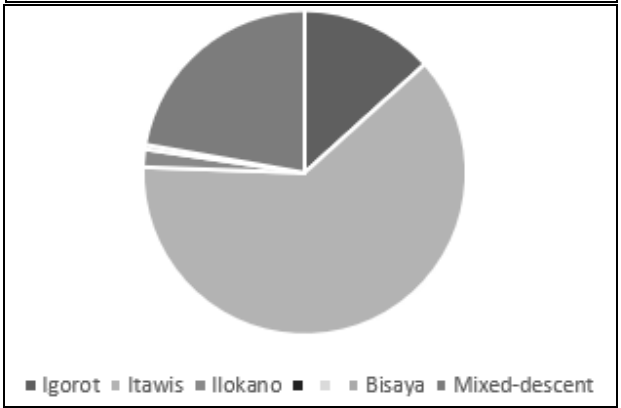

Figure 3: Impression of the different ethnicities living in Pagapag

Mixed marriage is also a factor for the Itawis tribe to migrate to Pagapag (Table 2, appendices). Before, there were no Itawis living here, but because one of the family members of the Ilokano married an Itawis, it was the time that the relatives of the Itawis decided also to live here. These two tribes do not have big cultural differences, except for the language. The Itawis adapted their cultures to each other and there are no big differences anymore. When we asked about the cultural traditions they could not give us a clear answer, as they themselves did not even know what their traditions are. However, they mentioned traditional methods used in farming such as the use of a *Nuang* (carabao) and they were not familiar with modern technologies. We could say that the cultures are diffusing (Verheijen 2018). The people of Pagapag support mixed marriages, since according to them, there are no real cultural differences between the tribes. The cultural diffusion affects the language they speak. Most of the younger generations of the Itawis in this area do not know how to speak their native dialect. The older Itawis learned the Iloko language, because they used to hear it from their surroundings and they started speaking it at home too to their children, which is influenced by the fact the children go to Mansarong elementary school where the modules are in Iloko.

CONCLUSION

An interesting point we noticed during our research is that most of the cultural practices of the different tribes are fading away with the arrival of Christianity, as generations pass by. Especially when we talk about animism (the belief in spirits, different deities and nature) which was the original form of belief regarding spirituality. First of all, it is noticeable that all tribes who were present in the three villages where we conducted our research, could not specify their tradition or culture. They told us that they do not have a specific culture, or would explain it in a minimal way. We usually got contradicting answers regarding the topic traditions a culture. They would rather speak about their belief in the Christian way of life. They refer to Christianity as one of the good developments they have had in their lives and it is important for them to teach these beliefs to their children and pass them to the next generations. The answers

regarding the importance of passing on Christian beliefs were similar with each tribe we interviewed in all three villages. Parents find it important to teach the so-called "good" things on to their children and grandchildren as it is the "better" way of life. We noticed that there are some contradictions in their beliefs, as we found traces of animism, especially in the elder generation, who could usually tell us more about this. The younger generation found it harder to answer these questions. We could tell that indeed, with the appearance of Christianity, all people are converted as Christians and eventually they are expected to pass these beliefs on to the next generation. Thus, Christianity is a big factor of why the original cultural practices and beliefs, such as animism, are disappearing, but it is rather the question whether these people are taught to do this by church, or out of own free. Our respondents told us, that it is what they want, and as mentioned earlier, it is the "right" way of living, but they surely did not say that the traditional way of live was necessarily wrong. Coming back to the earlier mentioned animism, it is not necessarily passed to the younger generation anymore, but they still cannot let go of certain beliefs and traditions, so they continue with some practices, as it used to be their habit. This shift towards the Christian way of life is not necessarily bad, as culture is not static, and it changes through time and generations. It is still interesting, but are not able to judge about it as it is their choice to do so, or not.

Agricultural Purposes is a factor that pulled them to move in their current areas. The commonality of the different ethnic groups among their other migration reasons was to find an area which can provide their needs for them to survive. The Agta did not know how to cultivate land, but they learned from the Ilokano, who are usually farmers. The Igorot and Ilokano who are farmers, wanted to find a land for cultivation to produce their own food for personal consumption and for trading. These three main ethnic tribes who settled in the different areas still rely on the traditional ways of farming.

The language is also a big factor on their current cultural practices. The different ethnic groups have their native dialects that originated on the places where they came from. We found out that language barriers do not exist in these areas, because they have a common language which is Iloko which is stimulated. The tribes find Iloko relevant to learn, because most of the people who stayed before on the area where they are living now, used it for communicating with each other, but most of them learned it by hearing it through their surroundings: acculturation, which agrees with the Theory of Behaviorism as part of language acquisition. This affects the usage of the native dialects of the different tribes, because most of the households who used to speak their native dialect before, do not use it anymore. The influence of the schools where younger generations study, consider Iloko as the mother-tongue of the three areas, so the younger generation are speaking Iloko rather than speaking their native dialects. Most of the parents do not find it important anymore to teach their native dialect to their children.

DISCUSSION

The migration history and current cultural practices of the three villages we visited have commonalities that we noticed during the data gathering. There are three main factors that floated among their reasons that really affects their current cultural situation. The first factor is the agricultural purpose who push them to find an area which is suitable for farming. This reason is remained until these days because on our observations, people are engaging on agricultural activities for their personal consumption and also to earn money. The second one is Christianity, with the places where they migrated, Christianity has been widely spread and with two main sectors, which are Roman Catholics and Pentecost that influenced the people to change their animism belief and divert their attention on what does the Bible says and teach. In this case, people in the different areas do not really practice anymore their traditional practices

and only few of them find it important to pass for the younger generation. The third one is the language that they speak, the different ethnic tribes learned one language which is Iloko, people find this language as relevant to learn because it is the language that other tribes could speak. The language adaptation affects their different native dialects that they used to speak before. The language adaptation resulted into the decrease of people in the different tribes who can speak the language and also the school were most of the children go, the school considered it Iloko as there medium of instruction from Grades 1 to 3.

ACKNOWLEDGEMENTS

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APPENDICES

Table 2: Population Inventory of villages Malisi, Mansarong and Pagapag

	Malisi (24-27 households, 104 inhabitants)	**Mansarong (17-18 households)**	**Pagapag**
Igorot	1 person	1 Ikankana-ey household 15 Ibaloi households (all from Kalanguya)	5 Ibaloi households (25-30 people)
Itawis	1 person	Probably few, number unknown	17-18 households* (120-140 people)
Ilokano	4 people	3 people	1 household (4 people)
Ibanag	None	Probably few, number unknown	None
Agta	98 people	1, but doesn't identify himself like an Agta.	None
Bisaya	None	1 person	1 person
Mixed-descent	-Ilokano + Itawis 5 children -Ilokano + Igorot 5 children -Ilokano + Agta (4 households, (10-15 children) -(quite a lot of children)	-Itauwis+Ilokano 1 person -Wisaya+Igorot 1 person* -Ilokano+Igorot 2 housholds (children unknown) -Itawis+Igorot 1 -Agta+Igorot 8 people	Quite a lot of children with mixed descent

*1 household in pagabak contains 5-9 members, according to the interviews

Semi-structured Interview Questions

Personal information: name : age : sex : ethnicity/tribe : language/s : number of children : livelihood : birth location : Interview Questions: **1. Settlement History** -What made you stay or move to this specific area? (ask about migration) -What do you know about the migration history of your tribe? (motives, push and pull) **2. Ethnicity/Identity** -What is your ethnicity? -How many people from your tribe are living in this village approximately?	-How is your tribe's relationship with other tribes? -Are there mixed marriages between the tribes/ethnic groups and what is your opinion about it? **3. Traditional practices and Indigenous culture** -What are your traditional practices? -Did you adapt to the cultural practices of other tribes or integrated them into your own cultural practices? If yes, could you explain more about this? -Do you still rely on your traditional ways of living? If yes, what are these traditional ways? **4. Preservation of Cultural Identity** -Do you think it is important to pass your culture and traditions on to the next generations?

COMMUNITY-BASED BIODIVERSITY CONSERVATION IN *SITIO* MALISI, SANTA MARGARITA, BAGGAO, CAGAYAN, NORTHERN LUZON, PHILIPPINES

Julius Rae R. Allam and Alec Schellinx

INTRODUCTION

The management of protected areas in the Global South is notoriously difficult as these tend to be understaffed, underfunded and subject to a wide array of external threats (Le Saout *et al.* 2013). The Philippines particularly exemplifies this critical problem. As a mega biodiversity country, it has been specially hit by decades of environmental neglect, and efforts to preserve biodiversity are, to this day, often impeded by various economic and political factors such as corruption, weak governance or the opposition of small but powerful interest groups (Posa *et al.* 2008). Difficulties notwithstanding, Posa *et al.* (*ibid.*) contend that conservation through the joint efforts of local communities and NGOs with the support of local government has enabled positive change in habitat and species conservation throughout the country. Persoon *et al.* (2004) also note that, in the past decades, community-based forest management has increasingly become mainstream as the local communities and most notably indigenous peoples are no longer considered as illegal squatters, but are instead being included in natural resource policy. To be effective, conservation efforts must be adjusted to the specific biodiversity features of each given protected area (Le Saout *et al*. 2013), and strong involvement of all the different stakeholders (i.e. not just the local government and NGOs but also the local communities) is thereby instrumental in the success of such ventures (Posa *et al.* 2008).

In August 2016, local officials in the *barangay* of Santa Margarita in the municipality of Baggao, declared 5,500 hectares of forest as a wildlife sanctuary. This intervention was primarily aimed at protecting the Isabela Oriole, a bird species endemic to the Philippines, but will likewise be beneficial to other endangered species such as the Philippine Eagle (Dale 2016). Also known as the ORIS project (a contraction of the bird's scientific name: *Oriolus isabellae*), this endeavour was initiated in 2012 by a partnership between a team of conservationists, Isabela State University and the Mabuwaya Foundation.

In the present study, we aim to understand to what extent local communities are involved in the ORIS project. More generally, we are interested in how the declaration of the wildlife sanctuary has influenced awareness within the local community for biodiversity conservation as well as what the main challenges are to preserving the Isabela Oriole's habitat. To do so we conducted field work in *sitio* Malisi, a small village located within the boundaries of the newly established wildlife sanctuary (See Appendix B).

Sitio Malisi, located in *Barangay* Santa Margarita, is part of the municipality of Baggao in the province of Cagayan, Northern Luzon. It is home to a little over 20 Agta households, as well as a few non-Agta households of Ilokano and Igorot ethnicity. The land area within which it is located is claimed by the Agta community as being a part of its Ancestral Domain. The title, however, has not yet been formally issued by the state. Farming and contractual labor constitute the main source of livelihood for its inhabitant. Hunting is still a regular practice for some within the community, primarily for personal consumption. Unregularly harvested non-timber forest products such as rattan or orchids provides the community with an additional source of revenue. Although not formally part of the Northern Sierra Madre Natural Park, Malisi and its vicinity are nonetheless species rich, and home to several endangered species such as Flying Foxes, Hornbills and the Isabela Oriole.

RESEARCH QUESTIONS

Has the declaration of the wildlife sanctuary influenced local communities' awareness with regard to biodiversity conservation?

How are the different individuals within the local communities involved in biodiversity conservation activities?

What are the challenges to biodiversity conservation in *sitio* Malisi?

METHODS

Time schedule

18th Jan.	➢ Visit to the LGU in St. Jose, Baggao and interview with MENRO staff in the morning. ➢ Travel to Malisi delayed, instead stay in *sitio* Dapir, Sta. Margarita, Baggao. ➢ Quick interview with Captain Molina in the late afternoon.
19th Jan.	➢ Arrival in Malisi in the afternoon. ➢ Settling and walk around the village. ➢ First interview conducted in the late afternoon.
20th Jan.	➢ Conducted 7 interviews in the morning. ➢ Focus group discussion with the heads of the local community in the afternoon.
21st Jan.	➢ Interview with the Indigenous People's Government (IPG) vice-mayor and one of the elders in the morning. ➢ Conducted 5 interviews in the beginning of the afternoon. ➢ Transect walk from Malisi to Rigga-ay with Mario Pedrablanca guided by Kenel Rosalem in the afternoon.
22nd Jan.	➢ Conducted 3 interviews in the morning. ➢ Discussion with the IPG vice-mayor about the organisation and structure of the IPG of Malisi in the late morning. ➢ Return to Mansarong in the afternoon. ➢ Interview with the Mayor of Malisi in the evening.
23rd Jan.	➢ Travel to Blue Waters in the morning. ➢ Quick second visit to the LGU in St. Jose and return Cabagan in the afternoon.
26th Jan.	➢ Telephonic interview with Father Apolinard Victor Mateo.

METHODS

In this study, we mainly gathered data through semi-structured interviews. We tried interviewing as many households as possible among families residing in *sitio* Malisi. In the end we talked to 19 community members, representing 15 households, including some members of the local Indigenous People's Government (IPG). Other respondents included, Captain Molina of *Barangay* Santa Margarita, Alexis B. Bautista of the Municipal Environment and Natural Resources Office (MENRO) of Baggao, one of the teachers at the elementary school of Malisi and Father Apolinard Victor Mateo, who was mentioned several times by the local community

as having initiated the building of houses in the village. Some of our interview questions were slightly adjusted or rephrased after realizing that these were not understood by most of our respondents, in turn leading to a feeling of unease both for them and for ourselves. General background information about Malisi was kindly provided to us by the recognized vice-mayor of the IPG in Malisi, during several interview sessions spread throughout the duration of our stay. A focus group discussion was thereby held on the second day of our fieldwork, which enabled us to further gather information about the area but also gave us a chance to introduce ourselves and the purpose of our stay to the community. Lastly, a transect walk was conducted departing from Malisi going to Rigga-ay, the place where most of the Agta households in Malisi till their land. On the way we looked specifically for traces of logging, evidence of agricultural and hunting activities within the forest as well as its overall condition.

RESULTS

Creating awareness among the local community is crucial for ensuring its involvement in the management of a protected area (Gatan-Balbas 2018, pers.comm.). The IPG vice-mayor, IPG secretary and other members of the IPG of Malisi that we interviewed were all aware and supportive of the declaration of the local government. Captain Molina of Santa Margarita indeed made mention of the regular attendance of the IPG vice-mayor to the meetings held on the 15th of every month with local officials. The content of these meetings is supposedly reported back to the community by the latter after each session. Yet, during our first batch of interviews we were surprised that most of the respondents (all those who were non-IPG members except for one) were not aware of the recent declaration of the area as a wildlife sanctuary. However, after rephrasing our question during our second series of interviews, simply asking what animals are found in the area and if any of these are protected, only few of our interviewees answered that they did not know any protected species, one of whom only moved to Malisi a few months prior to our interview (Figure 1.). Unfortunately, due to time constraints our first batch of interviews could not be conducted again to verify our hypothesis that even when not aware of the declaration itself, many might in fact have knowledge of some of the protected species found in the area. The results of our second batch of interviews seem to indicate that this would most probably be the case. Respondents who said they are aware of the presence of protected species, without exceptions, all mentioned the Isabela Oriole (*kiyaw*). Hornbills (*kalaw*) and Flying Foxes (*paniki*) were also mentioned by some interviewees. When asked how they knew that these species were protected, some respondents told us that it was the *barangay* officials that informed them (most probably through the reports of the IPG vice-mayor to the community), others answered that it was ‘Maam Joni’ or ‘Sir Mario’ who notified them, in other words they were notified by staff members of the Mabuwaya Foundation Joni Acay and Mario Pedrablanca.

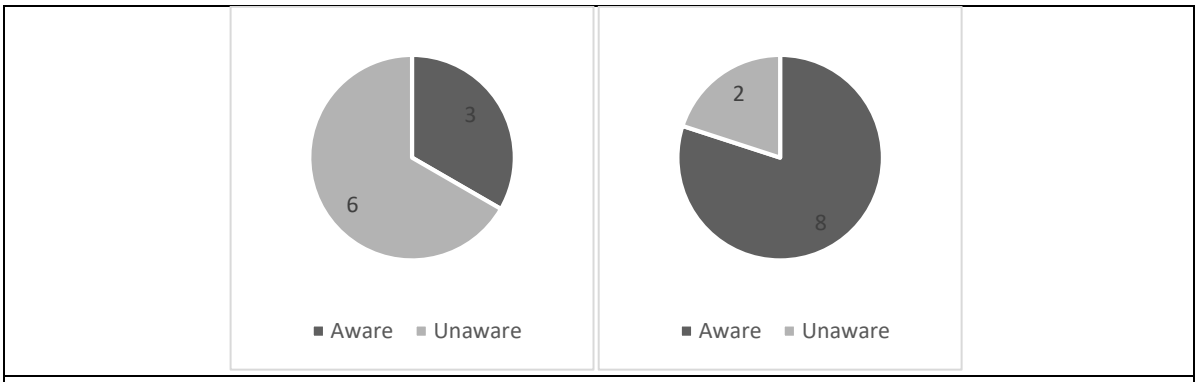

Figure 1. Respondent's awareness of the declaration of the wildlife sanctuary (left) and of the presence of protected species in the area (right).

With regard to the personal contribution of our respondents to biodiversity conservation, the most common answer was that they report illegal activities, such as logging, to the Department of Environment and Natural Resources (DENR), although some added that they still try to mediate with the intruders first before doing so. Local officials, both at the MENRO of the Local Government Unit (LGU) and the *barangay* captain of Santa Margarita also made mention of the involvement of the Agta-community of Malisi in forest patrolling activities on a voluntary basis (*bantay kalikasan*), as well as turning over of wildlife to the MENRO of Baggao. A minority of our respondents also mentioned that they tried to convince other community members not only to cut as few trees as possible but also to limit the expansion of agricultural lands in the area. It should be noted however that about half of our respondents did not know what their contribution to wildlife preservation might be or simply did not give us any answer.

The majority of our interviewees (10 out of 15) confirmed that they still practice hunting. Their catches consist mainly of wild-pigs, monkeys and wild chickens. Most of our respondents nonetheless mentioned that it was only occasional and that they were increasingly focused on

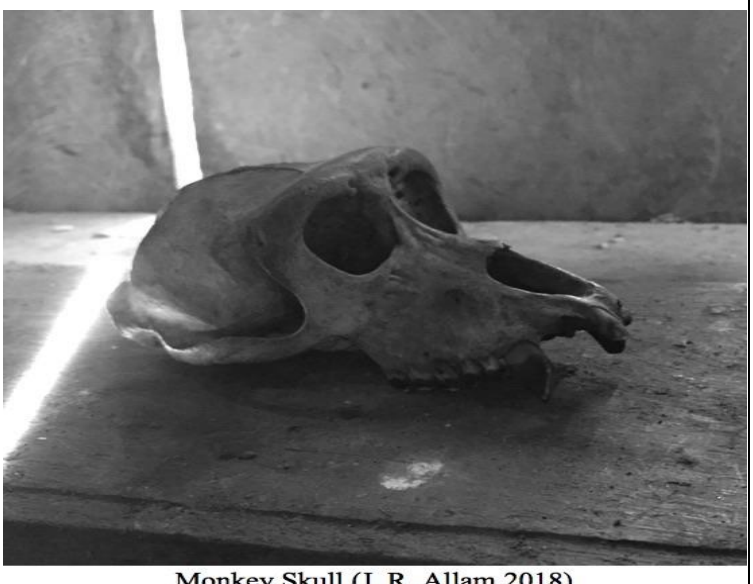
Monkey Skull (J. R. Allam 2018)

Photo 1: Monkey Skull (Photo by J Allam 2018)

farming to provide for their needs. We did not manage to get a clear answer of when precisely these changes started to occur, but we did find out some of the supposed reasons for these changes. Several respondents contended that the decrease of wildlife was the cause, while others mentioned the ban on hunting or protection of wildlife species. In the end it came down to an even simpler reason: farming provides a steadier source of income than hunting (Gatan-Balbas 2018, pers.comm.). For those who still hunt, it is practiced for personal consumption and is done only with the help of dogs, traps, bows and arrows. Only in very rare cases would surplus meat be sold to neighboring communities. During the focus group discussion, Rodrigo Corpuz, one of the elders of the community, further explained to us the two traditional ways of hunting: *syrup* (i.e. hunting alone) and *annanup* (i.e. hunting in a group of 10). He mentioned that as far as he is concerned the former should be prioritized over the latter, as it is less harmful to wildlife. A precaution, he argues, that is not taken by all neighboring communities.

According to the IPG vice-mayor, before opening a plot of land for farming purposes, community members need to have the explicit permission from the elders to do so. After finding a location where one would like to open land for cultivation, talks with the elders and other members of the community will be initiated. If permission to farm is not granted for that specific plot of land, for instance because it happens to be located within the boundaries of a sacred area, another parcel will be proposed for allotment to the person/household who submitted the request. Sacred lands cannot under any circumstances be used for farming, since there is a belief that these are inhabited by the forest spirits which are consulted for advice and protect the forest from outside intruders. The exact location of these sacred lands, the IPG vice-mayor explained to us, is known by the IPG mayor and is passed down from one generation to the next. When the land is being allotted, its boundaries are already fixed in order to limit possibilities for expansions. The IPG mayor thereby made mention that both the DENR and the National Commission for Indigenous People (NCIP) are providing them with guidance on how to best manage their land.

Photo 2: Farming land gained by clearing forest cover in Malisi (Photo by A Schellinx 2018)

Another interesting development in the community of Malisi is the recent house-building "frenzy" that was initiated by Father Apolinard Victor Mateo in early 2016. Assigned on a mission to supervise the construction of seven chapels for the Our Lady of Piat church in seven *sitios* spread throughout the Sierra Madre range, he spent a month in Malisi as part of his mission. After the chapel and the adjacent guest house were built, the house-building followed, in part to ensure that the school would stay in the village. Father Mateo indeed explained how, when told that the school was threatened with closure since there were too few pupils, he encouraged the Agtas to settle permanently near the school and try to get more people join into the community. Hence houses were built in order to facilitate this process. The zinc roofs were paid for by the church but the labor and the wood were to be provided by the community itself. Most of the more or less 30 structures standing in Malisi today, with a few exceptions such as the school and the teacher's cottage, were built in the past year. One of the teachers at the elementary school told us that when she first arrived in Malisi two years ago she counted no more than five houses. The IPG mayor also pointed out that construction was still ongoing, as some of the houses were still unfinished. The wood collected is for personal use only, he stressed, and can serve no other purpose than that of the building of houses.

DISCUSSION/CONCLUSION

Overall, little seems to be known about the declaration of the wildlife sanctuary itself by non-IPG members of the community in Malisi. Awareness for wildlife protection nonetheless appears to have increased since the ORIS project was set in motion in 2012. Hence, we believe that while the declaration itself has not yet been of much influence on the local communities' perception of their surroundings, the process prior to the establishment of the sanctuary seems to have had a positive impact on people's awareness with regard to wildlife conservation. The majority of our respondents were indeed aware of the protected species found in the area, most particularly the Isabela Oriole. They came to know this either through the *barangay officials o*f Santa Margarita or through some of the staff from Mabuwaya Foundation, which shows that

Photo 3: Illegal logging site deep in the forest along the way to Rigga-ay (Photo by J Allam 2018)

the dissemination of information, has been relatively efficient. Awareness notwithstanding, we find the participation and involvement of the local community in the ORIS project seemingly still very limited, as it only consists of patrolling and reporting of illegal activities. Forest survey trainings organized by the Mabuwaya Foundation are generally extended to MENRO staff members and rarely if ever include members of the local community. Similarly, the community of Malisi does not seem to be engaged in proactive biodiversity conservation activities yet, such as tree planting, habitat restoration and the likes. Hunting is thereby still a common practice for the majority of our respondents, and is thus likely to remain a challenge for biodiversity conservation in the coming years. Nonetheless, community members are seemingly aware of the consequences of abusive hunting, as one of the elders greatly stressed the fact that, as opposed to most neighboring communities, they favored more sustainable ways of hunting, as these are less harmful to the wildlife. They also appear to be looking for alternatives to provide for their daily sustenance. A shifted focus to agriculture seems to be one of these alternatives. An increasing reliance on agriculture may indeed provide a solution to this problem. However, it may in turn prove to be yet another burden to the protection of biodiversity within the wildlife sanctuary, as more forest cover would have to be cleared to open new farming lands. On a more positive note, the opening of new lands seems to be regulated to some extent as it requires approval of the elders and consultation of the community. Furthermore, the protection of its sacred forests by the Agta-community *de facto* acting as some kind of safety net for the safeguard of the forest. Considering this, it would be worthwhile to learn more about the size of these sacred areas and through what means these are protected from eventual intruders, something we were unfortunately unable to do in the course of the present study. Recent developments within the community, specifically the building of houses in the last year, have led to an increase in the harvest of timber in the vicinity of the village, although at a relatively small scale and on a temporary basis. Besides our respondents emphasized the fact that all wood collected was for personal use only, and served no other purposes than that of building a home for themselves. Once the building is completed the harvesting of timber will stop, assures the IPG mayor. We therefore believe it worthwhile to put a stress on the difference between on the one hand, illegal logging activities for profit (mostly carried by outsiders according to a MENRO staff member)—acts that are, according to the IPG mayor, strongly opposed by his community—and on the other hand, the small scale cutting of trees in order to foster some development for the community. While the former definitely is a threat to biodiversity conservation, the latter need not necessarily be so.

ACKNOWLEDGEMENTS

We would like to express our sincerest gratitude to MENRO Alexis B. Bautista of Baggao for his valuable help and the data he so kindly provided us before our departure. We would also like to thank Captain Molina of B*arangay* Santa Margarita for hosting us in the *barangay* hall on the first night of our trip when, due to unforeseen circumstances we were unable to reach our destination directly. We would thereby like to extend our thanks to IPG Vice-Mayor Marlon Rosalem of Malisi and all the other members of his community for their warm welcome and for their patience in answering our many questions, thereby providing us with much needed information about Malisi, its inhabitants, traditions and practices. Last but in no way least, we would like to thank IPG Mayor Jaime Rosalem of Malisi, who although not present during our stay, took the time to stop in Mansarong on his way back to answer some of our remaining questions.

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APPENDIX A: Questionnaires.

General questionnaire (the underlying questionnaire was mainly used as a reference. Some questions may have been omitted, while new questions were sometimes added and the order in which these were asked may have vary depending on the answers of the interviewee).

Name:
Age:
Occupation:
Ethnicity:
Civil Status:
Number of individuals in the household:

1. What kind of crops do you farm?
2. Where is your field located?
3. How long have you been tilling the land there?
4. Is it only for personal consumption or do you sell part of your harvest? If so, where?
5. Aside from farming, do you have any other sources of income? If so what are these?
6. Are you aware of the local government's declaration of the area as a wildlife sanctuary? If so:
    - Are you supportive of this project?
    - How did you learn about it?
    - How is the community involved in this project?
    - How do you personally contribute to wildlife conservation in the area?

(Question 6. was later rephrased as: What are the different animal species found in this area?
Do you know if any of these are protected?
How did you learn about it?)

7. Is logging still practiced in the area?
8. Is hunting still practiced in the area? If so:
    - What species are hunted?
    - Is it for trading or for personal consumption?
9. Where does the wood you used for building your house comes from?

Questions for the barangay captain Molina of Santa Margarita.

How many households are there in sitio Malisi?
Is the local community aware of the declaration of the area as a sanctuary?
Does the local community have regular contact with the barangay officials?
How is the local community involved in the project?
Are they any incentives for them to partake in the conservation of the area?
How does the local community manage the natural resources in the area?

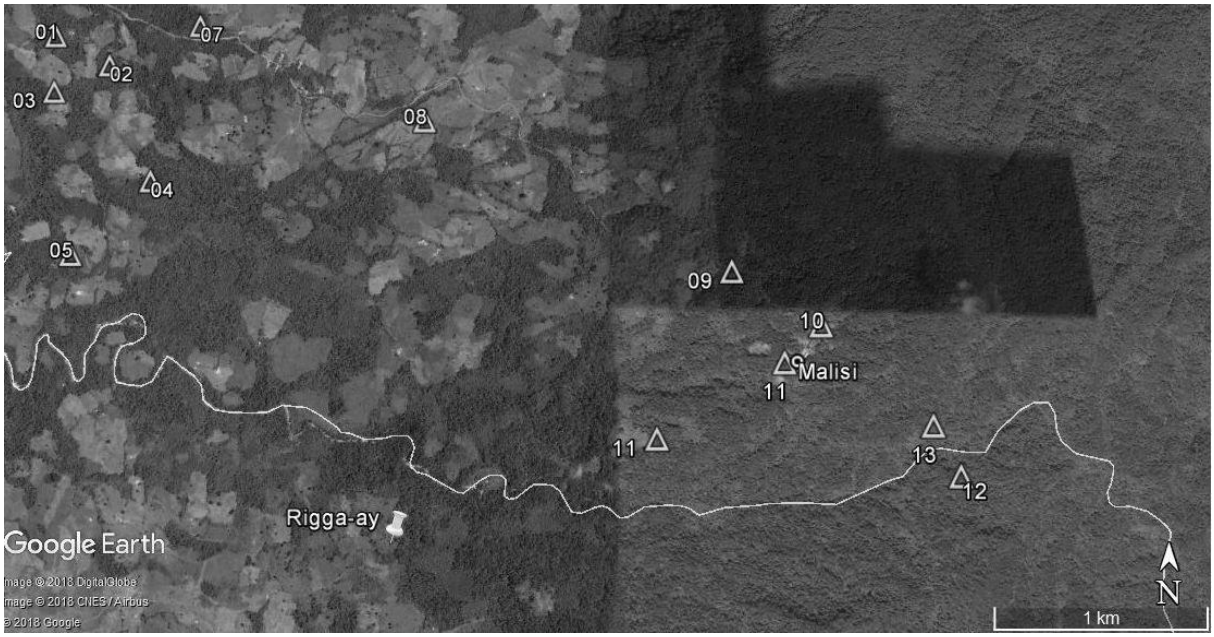
Questions for the elementary school teacher of Malisi.

How long have you been working at the Malisi elementary school?
Have you noticed any changes in the village during that period?
Who or what was at the origin of these changes?
What subjects do you teach?
Are subjects like environmental protection or biodiversity conservation part of the curriculum?
If so, do the students show interest in these particular topics?

Questions for the IPG mayor:

What has changed in Malisi these last few years?
Who or what was at the origin of these changes?
How do you experience these changes?
What do you know about the local government declaration of the area as a wildlife sanctuary?
Were you included in the decision-making process?
How do you and your community participate in the protection of the area?
Who taught you to farm and how long ago was that?
Why are you gradually giving up hunting in favor of farming?
What is at the origin of this change?
Are you planning to expand your farming activities in the future?
Do you and your community conduct tree planting activities?
What are you ambitions for Malisi overall?

APPENDIX B: Satellite image of Malisi and part of the Wildlife Sanctuary of Sta. Margarita.



(Image: Google Earth February 2016; Data: Mabuwaya Foundation 2018)

Legend

— Boundary of the Wildlife Sanctuary
△ Isabela Oriole sightings

THE SUSTAINABILITY OF NON-TIMBER FOREST PRODUCTS USE IN SITIO MALISI: AN INVENTORY

June Spencer Cera & Kirsten Steunenberg

INTRODUCTION

The term "Non-timber forest products" (NTFPs) encompasses all biological materials other than timber, which are extracted from forests for human use (De Beer & McDermott 1996). The general idea is that the harvesting is done from wild sources, but in a couple of cases some kind of domestication is also taking place to stimulate the production of such product (Persoon et al. 2009). The alternative label 'non-wood' unsatisfactorily excludes important material resources derived from the forests by rural people such as fuel wood, building poles and small wood for handicrafts and tools (De Beer & McDermott 1996).

The sustainable use of the NTFPs from natural resources is not a given. Sustainability of NTFP use will probably decline as Browder (1992) contends that resource depletion occurs during the 'expansion' (boom) phase as well as during the 'decline' (bust) phase. During the expansion phase, harvesters deplete the resource in a rush to cash in on quick profits and during the decline phase they are forced to overharvest to maintain living standards. (Neumann & Hirsch 2000)

The non-timber products of Sitio Malisi in *barangay* Santa Margarita in Baggao, Cagayan (in brief: Malisi) are an alternative source of income other than farming for many families living there (Pedrablanca 2018, pers.comm.). Many people living in that area are dependent on the forestland for their food, shelter and occupation. In addition, road linkage in Malisi is still a great problem in transporting the non-timber products to the main market of Santa Margarita, especially in the wet season (Pedrablanca 2018, pers.comm.). Malisi is an Agta-community, consisting of 24 households, of which two households are non-Agta. Approximately 104 people live in Malisi (Rosalem Jr. 2018, pers.comm.). The Agta-people do not have a background in farming; however, many households now own a farm in Malisi. Running a farm is something they learned from the Ilocano in the area. Farming and selling NTFPs are now the main sources of income for the Agta (Rosalem 2018, pers.comm.).

This descriptive research describes the results of interviews and an inventory of the NTFPs utilized in Malisi. The data can be used as a description of the condition of the current NTFPs utilized by this community. The goal of this study is to contribute to the knowledge about the sustainability of the use and the abundance of natural resources in Sitio Malisi, Baggao, Cagayan, Philippines.

RESEARCH QUESTIONS

The research question of this research is: What natural resources are available and are being utilized in Sitio Malisi as Non-Timber Forest Products?

In order to answer the main research question, the following sub questions will be answered:

1. Which natural resources are available in Malisi and are used as non-timber forest products?
2. Which items are made from non-timber forest products in Malisi?
3. Which non-timber forest products are currently harvested in a sustainable way?
4. What is the perception of the respondents about changes in availability of non-timber forest products now and in the past?

METHODS

Our research consists of two parts: interviews and one transect walk in the forest, which were conducted in Sitio Malisi. We conducted 12 interviews based on availability sampling, because we could only conduct interviews if the citizens of Malisi were home and not at their farms. The respondents were both male and female depending on who was available to be interviewed. In addition, we had a separate dialogue with the Agta mayor and vice mayor of Malisi. The interviews were semi-structured, since we prepared a questionnaire but also asked questions that came to mind during the interviews. We changed our questionnaire a little bit, as some terms turned out to be unknown to the Agta. An example of this is the term 'sustainability', which we could only use after explaining an example of sustainable harvesting. The interviews were conducted inside or outside the houses of the citizens and took usually around 15 to 30 minutes. Respondents spoke in Ilocano, hence, one of us needed to translate to the other who was taking notes. Recording was not used, leading to the absence of quotes in this report. In the afternoon of Saturday, 20 January, a focus group discussion was held. Four other students were present, as well as our teachers. Approximately 30 members of the community were present, including around 15 to 20 children. The focus group discussion taught us more about the history of Malisi and the general practices in the community.

The transect walk was a 1km-walk in the rainforest guided by a male citizen of the community. We stopped every 100 meters to get our coordinates (using GPS), observe which resources were available and observe the abundance of these resources and take photos of these resources as an additional output of our research. During the transect walk, the Agta guide told us the names and usage of the resources that we would encounter and give a brief explanation on how to harvest them.

Table 1: Time schedule and overview of activities

Date	**Activities**
Thursday 18 January 2018	- Arrival in Baggao - Evening in Dapir
Friday 19 January 2018	- Travel to Mansarong - Hike to Malisi - Informal talks with Ilocano household and vice mayor
Saturday 20 January 2018	- Conduct interviews - Focus group discussion
Sunday 21 January 2018	- Transect walk
Monday 22 January 2018	- Conduct interviews - Hike back to Mansarong
Tuesday 23 January 2018	- Visit Blue Waters - Travel back to Cabagan

RESULTS

History of Malisi in brief

During our focus group discussion with several citizens of Malisi, we learned about the short history of the community. Malisi means 'to avoid', which was in this case pointed to 'avoiding each other' or 'avoiding the war'. Two Agta tribes were in war with each other. Although they shared the same ethnicity, they had different dialects. After some time, two grandchildren of

the different tribes got married in the place that is now Malisi. This stopped the war and that is why Malisi is now called like this. The Agta consider this story as the 'document of this place' and they pass it on to their children so it will not be forgotten.

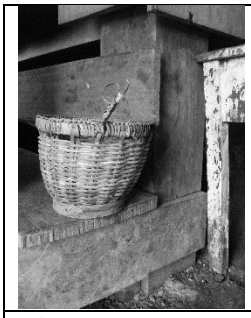
The community of Malisi used to be poor and was searching for development. Therefore, they initiated an education program for their children to the government. This was with the help of a priest named Apolinard Victor Mateo. The government agreed to the initiated education program, and that is when the elementary school was opened in Malisi in 2000. Ever since, the community has been developing and growing in population size. The citizens hope for further development and less poverty.

Government in Malisi

Malisi has a tribal government, with most tribal government officials living in Malisi. The Governor, Sir Ekong Malina, does not live in Malisi, but travels to the different Agta communities within the municipality of Baggao. His main role is to maintain peace and order. Other officials within the community are Vice-Governor, Mayor, Vice-Mayor, Secretary, Auditor, Treasurer, Barangay Police and Barangay Captain. We noticed several times that community members consult each other when decisions need to be made. This happened during the initiative to open a school in Malisi years ago, but would happen again in the hypothetical case of road construction to Malisi.

The sustainable use of NTFPs

During our interviews we asked the gatherers of NTFPs if they had noticed any changes in the availability of natural resources throughout time. All of our respondents noticed a decrease in availability of NTFPs around the community. Years ago, resources like rattan were available in the village or at its borders. Now, rattan can only be gathered in the deep forest. All respondents mentioned that gathering has become harder throughout the years, mainly because of the long way back carrying the harvests.



Photos 1 & 2: Baskets made by a member of the Agta community in Malisi (Photos by K Steunenberg 2018)

After this, we asked our respondents if they had ever worried about decreasing resources and if they had ever heard about the term 'sustainability'. Most respondents did not worry about declining resources, because the resources are still abundant in the deep forest. Rattan was often mentioned in this case: "rattan is so abundant high up in the deep forest." None of our respondents knew the term sustainability. We used an example to explain this: "if you find a mature *rattan* plant that you need to harvest, but younger *rattan* plants are covering the surroundings of the mature plant, which plants would you harvest?" All respondents answered that they would only harvest the mature plant, so the younger plants can continue growing. They also mentioned they would only harvest plants when they need the plants for own use or when an order for a basket or mat is made. This indicates some knowledge about

sustainable practices within the community. One respondent - Ma'am Eder Rosalem, wife of the mayor, age unknown, estimated 50-60 years - confirmed their knowledge about sustainable practices to us. She stated that years ago a community member would also harvest the younger plants around a mature plant. They did this because the mature plant would be easier to reach and cut, since dense forest and thorns would block the way. Years ago, community members came to a realization they were wasting the younger plants by doing this. Information is now shared among each other to only harvest mature plants, so the younger plants can grow on.

Use of NTFPs

Besides using NTFPs for generating extra income and as food, NTFPs could also be used as medicines, household equipment and shelter. Firstly, traditional herbal medicines in this community are still used since they are far from the nearest drugstore. They use several plants in curing different illnesses such as stomachache, sore eyes and headache. The following plants used to cure these specific sicknesses are *kuliwan, pudo, akkohong, dinaw, latok,* and *anapol*. Secondly, baskets, bags, soft brooms and mats are the most common things the community makes from NTFPs. The basic household equipment and utensils do help the community for their daily living. They can easily carry their things from one to another and make a comfortable place to lie down, rest and also to clean their floors by using the soft broom. Lastly, even though most of the roofs of the houses are galvanized, there are still households who use the *anahaw* leaves for roofing some parts of their houses, like the kitchen.

Future of Malisi

Asking community members about wishes for the future of Malisi, contradictory answers came up. The community members know about maintaining and protecting the forest. In the focus group discussion, where many children attended, someone stated: "we want our children to enjoy this beautiful forest in the way it is now", and many agreed. Vice-Mayor Marlon Rosalem told us that he is looking for a budget from the government, now that they consider the area theirs, as they have been living there for many years. He would like to use this budget to protect the forest and maintain the area as it is. On the other hand, our respondents told about their wish to have a concrete road from Mansarong to Malisi. Mayor Jaime Rosalem explained how this would make the transportation of goods easier. Moreover, they could open new farms and sell the additional crops easily on the market to generate extra income. They realized this would also create an opportunity for illegal loggers to reach the forest, which would on the contrary harm the forest again.

Farming and NTFPs

The Agta people used to be hunting and gathering for their provisions. Nowadays, their main occupation is farming. They learned farming from the Ilocano in the area and now grow crops like rice, string beans and corn. For many citizens in Malisi, farming is the largest source of income. 67% of our respondents had both farming and the harvesting of NTFPs as sources of income (Figure 1).

Vice-Mayor Marlon Rosalem explained how the hunting practices are happening less and less often, as a lot of Agta are occupied by their time-consuming farms. Occasionally, wild chickens, wild pigs, monkeys and monitor lizards are still hunted by the Agta in Malisi. They share their catches within the community and whatever is left, is sold in the market.

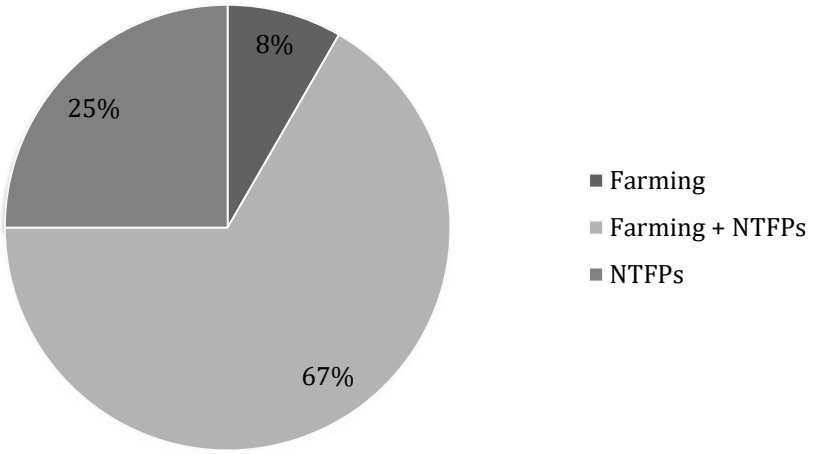


Figure 1: Occupation of households in Malisi

92% of our respondents generate income from harvesting NTFPs (Figure 1). Baskets and mats can be made for own use, for an order or for sale in the market. Other products made from NTFPs that we came across in our interviews were for example soft brooms from *buybuy*, some medicines and foods such as rattan fruit, honey and *anibung*; a palm of which the inner soft part can be eaten. Rattan is the resource that is harvested most often in Malisi (Table 2).

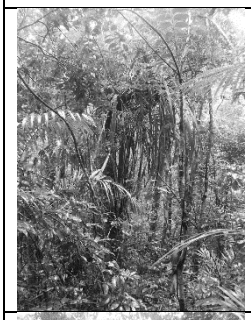
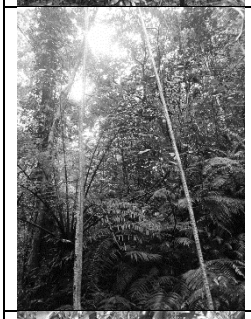
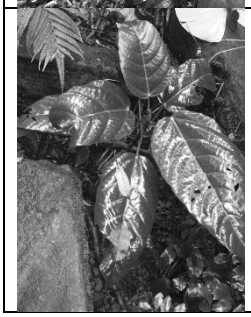
Table 2: Number of respondents that harvest a certain resource (n = 12)

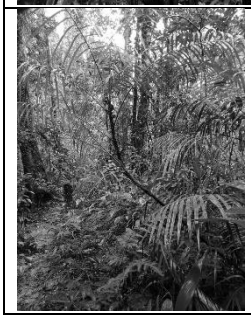
What do you harvest?	**Description**	**Number of respondents**
Rattan	A climbing palm with flexible stems	7
Rattan fruit	Fruit of the rattan plant	5
Sarakat	Plant with long leaves, used for weaving	4
Ayukan	Honey	4
Buybuy (from plantation)	Thin grass used for soft brooms	4
Pataga	Plant with long leaves, used for weaving	3
Anibung	A palm of which the inner soft part can be eaten	2
Lusigot	A vine, roots used for weaving	2
Anahaw	A palm of which the leaves are used for roofs	1
Sacon	A palm with red stems	1
Nito	A long black vine when mature, used for weaving	1
Kuliwan	Medicine, plant used for headache	1
Pudo	Medicine, roots used for stomachache	1
Akkohong	Medicine, roots used for stomachache	1
Dinaw	Medicine, roots used for stomachache	1

Transect walk in the forest

After interviewing, the second part of our research consisted of a transect walk in the forest. Eight different resources/plants were found (Table 3). Especially *sarakat*, *pataga*, rattan and *adika* were abundant in the forest.

Table 3: Transect walk in the forest: 1km walk, 100m/point (photos by authors 2018)

Picture	***Local + scientific name + description***	***Abundance***	***Transect point***	***Part used***	***Product***
	*Sarakat* Pandanus sp. Plant with long leaves, used for weaving	Abundant	2nd - 10th	Leaves	Mats, baskets, bags
	*Pataga* Pandanus sp. Plant with long leaves, used for weaving	Abundant	2nd - 10th	Leaves	Mats, baskets, bags
	*Lusigot* Aglaonema sp. A vine, roots used for weaving	A few	1st, 2nd, 7th	Root vines	Plates, baskets
	*Anibung* - A palm of which the inner soft part can be eaten	Scarce	6th	Inner soft part of the trunk	Food
	*Anapol* Poikilospermum sp. Medicine for sore eyes	Scarce	1st	Roots	Medicine

Picture	***Local + scientific name + description***	***Abundance***	***Transect point***	***Part used***	***Product***
	*Latok* Telosma sp. Medicine for stomachache	Scarce	2nd	Roots	Medicine
	*Benben/ darumaka* Donax cannaeeformis A plant with elongated stems which use for weaving	A few	3rd, 6th	Stems	Hats, baskets
	*Adika* Musa sp. Banana tree	Abundant	4th, 7th, 8th	Stems	Christmas decoration, mats
	Rattan Calamus sp. A climbing palm with flexible stems	Abundant	1st, 2nd, 4th, 5th, 6th, 9th, 10th	Stems and fruit	Bags, fruits, *bigao*,

DISCUSSION

Out of our 12 respondents, 92% has the harvesting of NTFPs or producing items like baskets as an extra source of income. Most of the NTFPs are gathered in the forest. As Persoon et al. already stated (2009), some kind of domestication could happen, which is the case with *buybuy* grown on a plantation in Malisi. The sustainable produce of the NTFPs is not a given. We noticed as described in the results that sustainability is not the priority, although members of the community knew about letting younger crops grow instead of using them. We did not encounter any signs of Agta wanting to cash in on quick profits, as they mostly used NTFPs for their own community or nearby villages. In addition, the harvesting of large amounts of NTFPs is still not profitable, as the road is not good enough to transport many crops or products.

From the interviews conducted we learnt about the different resources that are harvested from the forest and the opinions of the members of the community on the abundance of these resources. In the transect walk we could not exactly count the number of resources because of

rain and steep areas, but by observing and looking around at every point for the availability of resources, we can tell the abundance of NTFPs. Some resources were found in multiple points, also further away from each other, showing diversity in the forest (Table 3). Therefore, the availability of these resources is pretty high.

All our respondents who are engaged in harvesting NTFPs (Figure 1) said that the resources were easier to find before than to this present time. They added that they clearly noticed the changes of the availability of these resources for the past few years. One of the reasons is the conversion of forestland into farms, which has ultimately changed the way in which people live in Malisi (Rosalem 2018, pers.comm.). Although threats like land use change, creating farms and road construction are present in Sitio Malisi; the use of NTFPs also creates opportunities for the members of this community. Besides using NTFPs for their own community, it can create an extra income for people in Malisi in a sustainable way, as NTFPs like rattan, *sarakat* and pataga are still abundant in the forest.

ACKNOWLEDGEMENTS

We would like to thank Mayor Jaime Rosalem and Vice-Mayor Marlon Rosalem of Sitio Malisi for their hospitality and support, all respondents in Sitio Malisi for their time and answers and the Barangay Captain of Santa Margarita for his kindness and hospitality in lending us his office.

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Rosalem junior, P. 2018. pers.comm. Secretary Sitio Malisi, Municipality of Baggao, Cagayan, Philippines, 20 January 2018.

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APPENDICES

Appendix A: Questionnaire

Name
Age
Sex
Occupation / livelihood
Ethnicity
Role in household
Type of house

1. What type of non-timber forest products do you harvest?
2. Do you use other NTFPs than the ones you produce yourself?
3. Do you harvest the natural resources required yourself? If no, who does harvest? Age? Male/female?
4. Do you harvest for home consumption or for selling?
5. Do you have another occupation or source of income besides producing NTFPs?
6. Have you heard about sustainable supply and use of natural resources?
7. Are the natural resources used in NTFPs still abundant in the forest? Has this changed the last years? Are resources getting more difficult to find?

THE THREATS TO BIODIVERSITY IN BLUE WATERS, PALLAGAO, BAGGAO, CAGAYAN, PHILIPPINES

Jessa D. Macapallag and Eva Evertovna Zegelaar

INTRODUCTION

Countries with a high number of endemic species and high biodiversity are concentrated in tropical areas. These are also known as Megadiverstiy countries. An example of a country representing this Megadiversity is the Philippines (Myers and Mittermeier 1998). However, Philippines is also considered to be a Hotspot area. This means that it is an area with a high number of endemic species and an area that has lost more than 70% of its natural habitat. As a result, this poses a high threat to endemic species. Endemic species are of high importance because these are species that are unique to the country that they belong to. If they become extinct, then there is nowhere else in the world where these can be found again. Despite the high threat of endemic species in the Philippines, studies have shown that there is still hope for conservation measures in the country (Posa et al. 2008).

This field study report focuses on Blue Waters located in Pallagao, Baggao, Cagayan, Luzon, located in the Northern Philippines. The area is still highly forested, thus we can hypothesize that it has a high diversity of species. In our research we aimed to investigate the possible threats to biodiversity in Blue Waters. We researched whether the activities by individuals of the community inhabiting in the area threaten certain species and if there are any attempts to conserve the area and its species. In addition, we looked into the hunting methods that potentially pose a threat to the biodiversity of the area.

This study area is relevant because although the Philippines is known to have a high number of endemic species, it also has a very high number of threatened species (Myers and Mittermeier 1998). The primary causes of extinction is habitat loss and fragmentation due to unsustainable anthropogenic activities and extreme weather conditions (Brooks 2002). For instance, illegal logging is a threat to some forested areas the Northern Sierra Madre Natural Park (Van Weerd 2018, pers.comm). Illegal logging can be a threat to biodiversity if it is done unsustainably. If habitat degradation and human unsustainable activity continues to happen in the Philippines, the country will lose most of its endemic species (Brooks 2002). In an interview with the Municipal Environment and Natural Resources Officer (MENRO) of Baggao, Mr. Narciso B. Corpuz, he mentioned that the main problem in Blue Waters is the existence of illegal logging and hunting of supposedly protected species. However, they need more information on these activities, particularly about illegal hunting. Hence, our research on the hunting activities and other possible threats to biodiversity in the area will provide useful information to the municipality of Baggao to support the conservation of nature in Blue Waters.

RESEARCH QUESTION

What are the possible threats to biodiversity in Blue Waters, Pallagao, Baggao, Cagayan, Philippines?

Sub questions:

a) Which species are the most commonly threatened in Blue Waters?
b) Does the community inhabiting in Blue Waters use certain species for consumption?
    a. If so, for what forms of consumption?
    b. Are certain species threatened as a result of use by the community in Blue Waters?
c) Are there any attempts of conservation of nature in Blue Waters? If so, which?

METHODS

Table 1: Schedule of fieldwork activities

Date	***Activities***
Day 1: 18-01-2018	Arrival at Blue Waters in the afternoon. Meet our host family.
Day 2: 19-01-2018	Transect walk, picture taking &bioblitz
Day 3: 20-01-2018	Interviews & picture taking of possible threats
Day 4: 21-01-2018	Interviews& picture taking of possible threats
Day 5: 22-01-2018	Land cover imaging with drone &bioblitz
Day 6: 23-01-2018	Thank our hosts and travel back

We used three methods in gathering our data. These included interviews, picture taking/*bioblitz* and land-cover images.

Interviews: We interviewed members of 10 households that lived in Blue Waters in Barangay Pallagao (Appendix 1). Each household was represented by one respondent, either the wife or the husband. Other respondents were barangay officials and/or farmers. The questions (Appendix 2) were translated and interpreted between English and Ilocano to facilitate communication between the interviewers and the respondents. To understand which species community members hunt, we used photographs of certain species in Blue Waters. When asking whether the respondent hunts/gathers a species we showed him/her the photograph of the species. The species include shells, mammals, birds and amphibians. Most of the photographs illustrate species that are officially protected. In addition, due to the sensitivity of our topic we referred to the respondents as "Respondent", followed by a number.

Picture taking: In non-forested and forested habitats we took pictures of possible threats to biodiversity. These include hunting tools, deforestation and agricultural practices that pose a threat to biodiversity. The picture taking was conducted along two 1-km line transects: one in an agricultural area and one in a forested area (Figure 1).

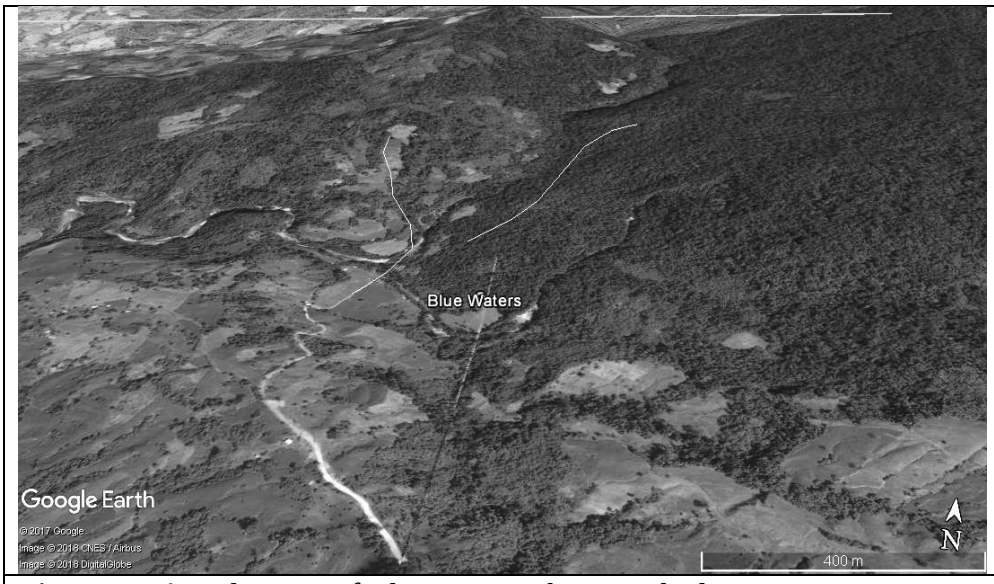


Figure 1: Aerial image of Blue Waters showing the line transects

Land-cover: Deforestation is a potential threat to biodiversity in Blue Waters. To show this we took land cover images of Blue Waters using a drone (DJ Mavic Pro), to compare forested and non-forested areas. We also took photos of agricultural areas nearby the forested areas.

RESULTS

There are different animal species found in the area and some of them are still being hunted by the residents for different purposes. These include food consumption, selling, pets, medicinal purposes or simply because they are viewed as pests or threats (Table 2).

Table 2: Protected animal species in Blue Waters, Baggao, Cagayan, Philippines as mentioned in the interviews

Species	***% of respondents hunting***	***Reason/s for hunting***
Bat (*Acerdon jubatus)*	60%	food consumption
Wild Pig (*Sus scrofa)*	40%	food consumption & selling
Philippine Deer (*Rusa marianna)*	30%	food consumption
Rufous Hornbill(*Buceros hydrocorax)*	20%	food consumption
Luzon Bleeding Heart Pigeon (*Gallicolumba luzonica)*	20%	as pet
Snake (e.g. *Python*)	80%	medicinal purposes or threat
Colasisi (*Loriculus philippensis)*	0%	-
Serpent *Eagle (Spilornis cheela)*	0%	-

Philippine Eagle *(Pithecophaga jefferyi)*	*0%*	-
Rat (*Rattus norvegicus*)	100%	pest
Frog (any species) (*Anura)*	0%	
Talkok snail (*Cornu aspersum)*	100%	food consumption
Agurung shell (*Conus geographus)*	100%	food consumption

100% of respondents hunt the *Agurung* shell and the *Talkok* snail. The *Agurung* shell can be found in abundance in the fresh water river of Blue Waters. Its abundance is something we have witnessed ourselves when we crossed the rivers daily. The respondents said that the *Talkok* snail can be found in abundance in trees, especially in forested areas. These two species are not prohibited to hunt and 100% of respondents are aware of this. *Agurung* is sometimes sold in nearby markets or in the community in itself for 30 pesos per cup.

Bats and Wild pigs are hunted by 60% and 40% of the respondents, respectively making these the most popularly hunted species that are supposed to be protected. These, including the Philippine deer and the Hornbill are mainly hunted for food consumption. Some respondents mentioned that they can find the Wild Pig in the market in a nearby Barangay, although they would not specify the exact location. We asked the respondents how often they hunt these and most of them either said once or twice a month, or whenever they see one of these in the wild when the men go hunting. These species can be found in the wild, although the respondents have said that they rarely see these animals, particularly the Wild Pig and the Philippine deer. The Bat and the Hornbill are seen more often (Respondent 1 2018, pers.comm.). The Luzon Bleeding Heart Pigeon is used as pet. Other protected species that are being hunted by 80% of the respondents are the snakes, particularly the Python. The snakes accordingly are used for medicinal purposes or seen as pest and threat to the lives of the residents. One of our respondents offered to give us some snake oil which is used to cure wounds and keep the skin soft (Respondent 3 2018, pers.comm.). The rat is usually hunted because it is perceived as a pest. Lastly, none of the respondents hunt frogs, the Colasisi or the Philippine Eagle.

An inventory of the different tools used by the residents for hunting was made through the interviews (Table 3). We asked the respondents to show us and/or explain to us the tools they use to hunt the species they said they hunted.

Table 3: Inventory of hunting tools in Blue Waters, Baggao, Cagayan, Philippines

				
Name: Snare trap "silo". Used for wild pig	***Name: Bow & Arrow Used for most species***	***Name: Air gun. Used for mainly birds***	***. Name: Slingshot "palsiit" Used for mainly birds, bats.***	***Name: Machete Used for larger animals, e.g. snake***
				
Name: Bat nets Used for: bats	***Name: Holes in ground Used for: bats***	***Name: Harpoon gun (fish) Used for: fish***	***Name: Fish net Used for: fish***	***Name: Rat poison "Racumin" Used for: rats***

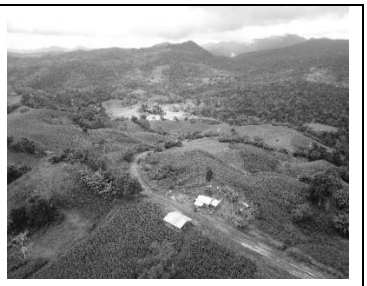
Other than threats to biodiversity through hunting of species, we encountered other threats that lead to the contamination and/or destruction of the natural habitats of Blue Waters (Table 4). The threats were witnessed primarily through observation in the line transects.

Table 4: List of other observed threats to biodiversity in Blue Waters in the line transects

Non-forested area	**Forested area**
Littering of plastics (snack packages) in agricultural land (observed)	Littering of glass bottles in blue waters lagoon, in between rocks (observed)
Fertilizer use. White, round, small balls laying around corn crops (observed)	1 Insecticide bottle (observed & photographed)
Multiple dead, large, white snail shells found in agricultural lands due to slash and burn practices (observed & photographed)	Spray fertilizers being washed in the river (Pers. Com.)
Agricultural land (observed & photographed)	Slash and burn agriculture (Observed & photographed)

Household houses built from wood collected from the forest land (observed & pers. com.)	1 dead snake killed by human (observed & photographed)
	Diamond shaped symbol carved on a tree trunk, which means that it will be cut down when it is fully grown. This symbol has been seen around several trees in the forested areas of Blue Waters and it is said to be used as a form of claiming trees for individual property before being cut. This is a method used in illegal logging. (Observed & photographed)
	Slabs of tree in logging trails in forested area in Blue Waters (Observed & Photographed)
	Rocks covered with sap of Narra tree in the logging trails in the forested area in Blue Waters (Observed & Photographed)

Table 5: Land cover images taken with a drone, to show forest and non-forest areas in Blue Waters, Baggao, Philippines

		
Figure 2	**Figure 3**	**Figure 4**

The land cover images show a clear divide between agricultural areas and forested areas.

Other than threats to biodiversity, we tried to observe any evidence of conservation initiatives in the region. We observed three primary informative sign posts to conserve the habitat of the region. Firstly, we observed an informative sign post (see Appendix 3) to protect the Balete tree. We also observed sign posts that would mention that littering is not allowed. Lastly, there are orange flags to protect the lagoons and cascades as sanctuaries.

DISCUSSION

Which species are the most commonly threatened in Blue Waters?

Does the community inhabiting in Blue Waters use certain species for consumption? If so, for what forms of consumption? Are there certain species threatened as a result of use in Blue Waters?

It is worth mentioning that all species in the Philippines are protected by the Wild Life Act, thus, we can already see that the implementation of this act is not entirely successful in Blue Waters. The results show that hunting and illegal logging are still taking place there.

Regarding the most commonly gathered species, the *Agurung* and the *Talkok,* the respondents do not use specific hunting tools to gather them. They usually gather these shells whenever they

desire to do so as they are in high abundance in the area. The gathering of these does not seem to pose a threat to the species because there are plenty in the area, some are sometimes sold in the market. Furthermore, the community is very small thus it seems that this practice remains sustainable.

The results demonstrate that some of the community members pose a threat to Bats, Wild Pigs, the Hornbill, the Philippine deer and the snake like the Python, species that are threatened and protected by the Department of Environment and Natural Resources (DENR). The respondents that hunt these are likely not aware of their protection, thus it can be said that the lack of information and ineffective implementation of laws are influential factors. An example of inadequate law implementation is when one of the respondents explained that after being caught by the DENR of hunting a wild pig, the DENR confiscated it, and ate it.

Regarding deforestation, land cover images with the drone clearly illustrate the separation between forested and non forested areas in Blue Waters. Results of the study demonstrate that there are human practices that lead to rapid deforestation, especially agricultural expansion through slash and burn practices. We also encountered a lot of littering, especially in agricultural lands. This suggests that there is barely any possibility to litter the trash in bins because there aren't any in the line transects. It also implies that the farmers littering in the agricultural land are not aware of the effects of littering plastics there. These activities were mainly witnessed by us.

Furthermore, our respondents said that the houses they built in the community are made from materials from the forested areas. These include, *bamboo, daradara, panau,* and *ipilipil* tree species. Another evident threat witnessed by us is the carving of diamond shaped symbols on tree trunks in the forested areas, meaning that the trees will be cut down in the near future. Moreover, we have seen slabs of tree and rocks with Narra tree sap on them in the logging trails of the forested areas in Blue Waters. These results show support towards MENRO Narciso B. Corpuz's claim when we interviewed him, as he said that illegal logging and deforestation are big issues in Blue Waters (Corpuz 2018).

Are there any attempts of conservation of nature in Blue Waters? If so, which?

Focusing on the final subquestion, we have witnessed attempts of conservation in the area. Firsly, Narciso B. Corpuz said that in December 2017, 6,000 board feet of Red Lauan had been confiscated from illegal loggers in Blue Waters area. He also said that in January 2018, 700 board feet of the same tree in combination with Narra timber had been confiscated from illegal loggers. According to Mr. Corpuz, the confiscated timber were used for school building projects. Although there is illegal logging happening in the area, it seems that the efficiency of catching the illegal loggers has been increasing recently.

As presented in the results, some community members living in the Blue Waters area are aware of the protection of the threatened species. The respondents who do not hunt the aforementioned protected animal species explain that they do not hunt these because "they are protected". In addition, some trees are protected as exemplified by a municipal ordinance to protect a Balete tree in the area (see Appendix 3). There are other signs of conservation, for instance, orange flags have been placed around the lagoon and cascade areas, indicating that fish are protected there. Nonetheless, the eel displayed in the inventory of hunting tools above the label of the harpoon (Table 3), is likely to have been hunted in that protected area because that type of fish is predominant there. Therefore, it is difficult to say to what extent the community members obey these laws.

Conclusion & Recommendations

Considering the results discussed above, it can be concluded that there are evident threats to biodiversity in Blue Waters. The threats are primarily caused by human activity, specifically hunting and agricultural expansion leading to deforestation. A positive aspect that we have encountered is the land cover images taken with the drone, as these show that Blue Waters is still a highly forested area. Evidence also shows that there are conservation practices being done there, meaning that the area may be positively going towards sustainable practices in the future and that several community members are a bit informed about the protection of specific species. Blue Waters is a beautifully forested area and we can see that the community is willing to conserve it.

Most of our research is based on interviews and observations. The main limitation of our data is whether the respondents were being truthful about their hunting practices. We tried to reduce this limitation by asking the respondents to show their hunting tools, constructing an inventory and observing in the line transects what threats to biodiversity we encountered.

As a form of recommendation for the protection of biodiversity in the area, we encourage the Barangay officials and other community members to gather more often to discuss the conservation laws and practices that are needed in the region. It is important to educate the communities about the importance of sustainable hunting and logging. We also encourage the municipality and conservation organizations like MENRO and the DENR to send more forest rangers to the area to improve monitoring of logging and hunting activities in Blue Waters.

ACKNOWLEDGEMENTS

We would like to express our deepest gratitude to our respondents from Blue Waters, Baggao, Cagayan. Thank you for your time and of course, for your honest opinions and answers to our questions. To Kuya Rodolfo Espe and family, thank you for accommodating us in your home. We really like your house and the people that gathered there. To the officials of the municipality of Baggao, thank you for the company and relevant ideas too! To all the people involved which were not mentioned here, we thank you!

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Respondent 1, 2018. Farmer in Pallagao community. Blue Waters, Baggao. 20 January 2018.

Respondent 2, 2018. Mother and Wife in Pallagao community. Blue Waters, Baggao. 20 January 2018.

Respondent 3, 2018. Mother and Wife in Pallagao community. Blue Waters, Baggao. 20 January 2018.

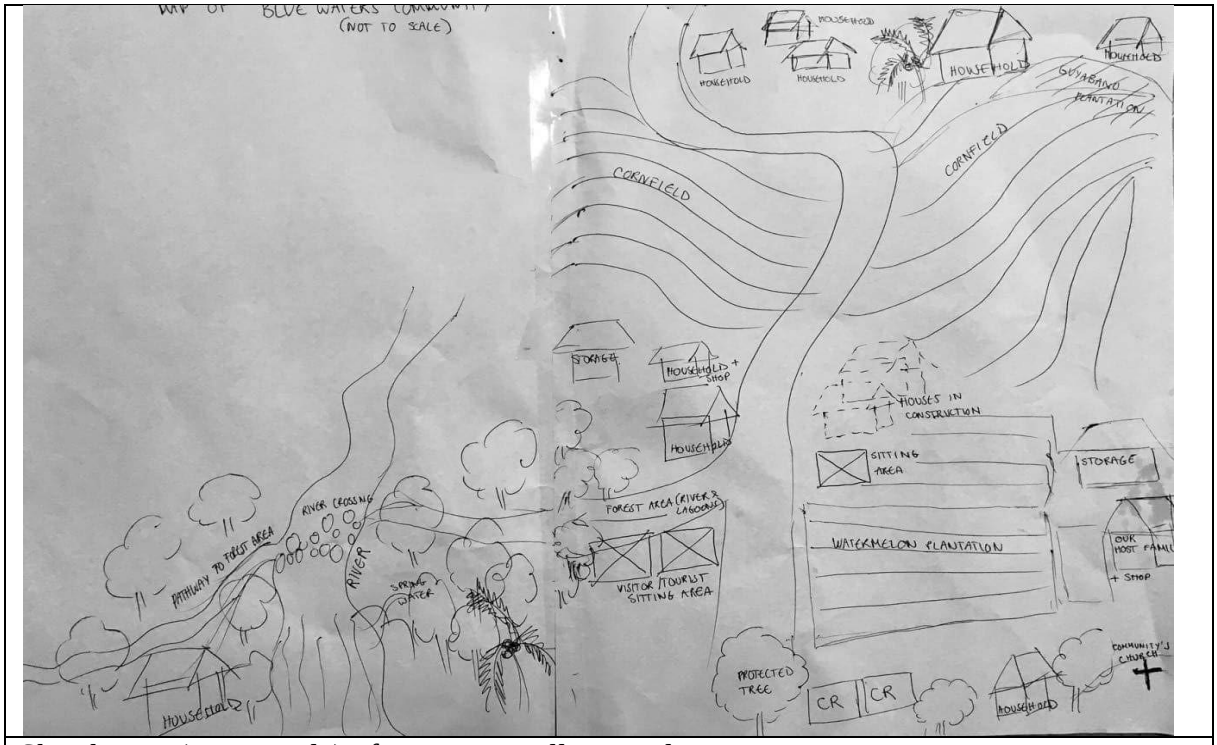
Respondent 4, 2018. Mother and Wife in Pallagao community, Blue Waters, Baggao. 21 January 2018.

Respondent 6, 2018. Farmer in Pallagao community. Blue Waters, Baggao. 21 January 2018.

Van Weerd, M. 2018. pers.comm. Professor at Leiden University, The Netherlands. Cabagan, Isabela, 9 January 2018.

APPENDICES

Appendix 1:



Sketch map (not to scale) of Barangay Pallagao, Blue Waters

Appendix 2:

Interview questions

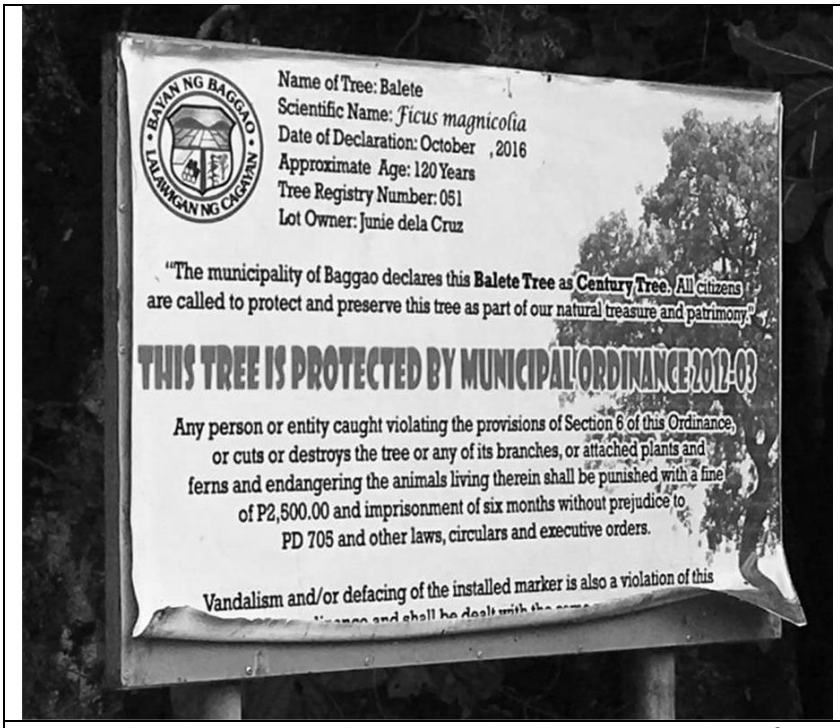
Demographic Questions:

1. What is your name?
2. What is your ethnicity?
3. How old are you?
4. Do you live in this area?
5. Since when do you live in this area?
6. How big is the family you live with?
7. What is your position in this family?
8. What is your occupation? Source of income?

Questions (Not always asked in order):

1. Have you seen this animal before? *show photograph*
2. Do you hunt this animal?
3. How often do you hunt it?
4. Why do you hunt it? For food consumption?
5. Do you sell it in the market?
6. What do you use to hunt it?
7. Do you have other jobs than hunting?
8. At what time of the day do you usually hunt?
9. What resources from nature do you use? What is your house made of (For building things?
10. Could you show us your hunting tools?
11. *Repeat the same questions for all the photographed species that you will show*

Appendix 3:



Protected Balete tree in Blue Waters by the Municipality of Baggao

DIVERSITY OF BIRDS IN THE FOREST AND NON-FOREST AREAS OF BLUE WATERS IN BAGGAO, CAGAYAN, PHILIPPINES

Laura van der Stelt and Alvin P. Ramos

INTRODUCTION

The Philippines is known as one of the 17 mega-diversity countries in the world for having more than 20,000 endemic species of fauna and flora (Conservation International). The diverse and unique habitats of the Philippines encompass a large amount of the total diversity on our planet (ibid.). However, its endemic species and habitats have been subject to increasing threats. Habitat loss is mostly stemming from the extensive logging that was executed in the past decades as well as other human-induced land conversions, like slash and burn farming (van Weerd 2018; Buensuceso 2018). Currently, the forest cover of the Philippines only has as little as 20 percent of its original area (van Weerd 2018). As the area of natural habitats decreases, the vulnerability to extinction of species increases (BMB-NAPWC 2018). Because of this, the Philippines was recognized as one of the 35 priority biodiversity hotspots and priority for conservation (Myers *et al*. 2000). The long-term survival of many endemic species located in the Philippines is (critically) threatened. The extinction of these species would be a great loss for the ecosystem and general biodiversity, encompassing both instrumental and intrinsic value.

In order to prevent species extinction, conservation is of paramount importance. To make conservation effective, an inventory of (regional) biodiversity is essential. A biodiversity inventory shows whether an area can be classified as a Key Biodiversity Areas (KBA) as well as determine the status of the species over time.

In Northeast Luzon, the Sierra Madre Mountain Range is a key biodiversity area in the Philippines where many endemic species can be found (Van Weerd 2018). At 1.4 million hectares, the Sierra Madre Mountain range covers a large number of protected areas, the largest of which is the Northern Sierra Madre Natural Park (NSMNP). Some areas that are located in the Province of Cagayan, particularly in the municipality of Baggao, are not yet included in the protected area system but are known as a refuge for endemic and threatened species (Acay 2018).

Our field research is located in the area of Blue Waters in Baggao. This particular research focuses on the wildlife found in the area and current situation of their habitats. Our focus will lie on birds, considering the limited time to conduct the research. We will focus on species diversity, since this is the most obvious and easy way to assess biodiversity within a short period of time. This goal is to observe as many species as possible. This investigation will contribute to the overall profile about the biodiversity in Baggao.

Blue Waters, Baggao

Blue Waters is part of Barangay Pallagao in the municipality Baggao. The area is known as an upcoming tourist spot for its beautiful lagoons and caves. Tourism is expected to increase in the coming years, since the municipality is actively trying to promote the area (Mabutas 2018). Blue Waters is still a quite good forested area with various patches of agricultural land. The area is categorized as lowland limestone forest, and the limestone found in the Sierra Madre Mountains is a striking feature in the forest. According to some theories, the limestone also attracts the Isabela Oriole and there seems to be a correlation with the presence of limestone and the Isabela Oriole (Acay 2018, pers.comm.). In the 1960's the area was used for logging,

and the logging road is still in use until this day. However, currently logging is probably only done to provide material for house-building. Even though the forest has been disturbed, most of it is still intact and preservation of the area seems to be important for the people living in the area as well as the municipality. Besides this, the area is becoming a more important site for bird- watching (Acay 2018, pers.comm.).

RESEARCH QUESTIONS

Main Question

What is the diversity of wild bird species in the area of Blue Waters in Baggao, Philippines?

Sub-questions

- How many of the species are endemic?
- What is the conservation status of the encountered bird species?

METHODS

Point counts

The aim of this biodiversity survey is to record as many species of birds as we can. We conducted a biodiversity survey of birds by means of transect walks. Within the transect walks we used the point counts method. The transect walks usually took place from 6 am to 10/11 am, since the birds are most active in the morning. One of the transect walks we conducted was located near a non-forest area and the other in the vast forest. Both transect walks are 1-kilometer-long with both point counts every 100 meters (11 points total per transect). At every point we stopped and searched for birds by means of visual observation (topography and colours of a bird) and acoustic method by identifying their specific calls for 10 minutes. Most were easily identified by our biodiversity specialist, Joni Acay. If confusions occurred we referred to the book "A guide to the Birds of the Philippines" (Kennedy *et al.* 2000). All birds heard and seen within 50 m radius through estimation in every single point were counted, and sex and age class were also noted in some instances through their specific colours. To attain reliable data, we visited each station reversely from point 10 to 0 on different days at different times of the morning.

Field form filled in for every encountered bird

Point Code	Species	Time	Number of individuals	Contact	Activity	Notes
0	Swift sp.	9:45	2	H/S	F/P	-

*H=heard, S=seen, F=flying, P=perched

Photo 1. The lines represent the two transect walks that were followed in the area of Blue Waters. The left transect line (1) was alongside non-forest agricultural land, and the right transect line (2) was in the vast forest. Both walks are 1 kilometer long.

Opportunistic Survey

Since the main aim of this study was to see as many bird species as possible in the area, we included the opportunistic surveys. Opportunistic surveys could provide additional knowledge about the presence of bird species in a particular site. All bird species encountered (seen and heard) outside or between the point stations during a transect walk were noted in addition to the data needed for accounting as many bird species as we could.

Species Accumulation Curve

By this graphical way of showing the results of the total bird species listed in each performing days of point counts, we can determine how many species are located in the area, without having to see every species per se. In the first and second day the numbers of species increased by almost double but on the following days the numbers of new bird species were decreasing. This means that we saw enough bird species in the limited time we had in order to make a good estimation of the total number of bird species present in Blue Waters. To calculate the theoretical species richness in the area we used the programme Estimates and species estimator ACE.

Table 1: Time Schedule

Day	Date	Activities
Thursday	18 January	Travel to Baggao, Cagayan, visiting the municipal hall of Baggao and have an interview with MENRO, meet our host family.
Friday	19 January	Trial transect walk 1 which also served as an opportunistic survey, visiting the lagoon in the afternoon.
Saturday	20 January	Transect walk 1, arranging information in the afternoon, in the evening discussing progress with the group.
Sunday	21 January	Transect walk 2, resting in the afternoon and arranging information, conducting one interview with one of the inhabitants of Pallagao.

Monday	22 January	Second time transect walk 2 (reversely), arranging information + starting on the species accumulation curve in the afternoon.
Tuesday	23 January	Second time transect walk 1 (reversely), after our last transect walk we packed our bags and said good-bye to our host family, traveling back to Cagayan.

RESULTS

In the 5 days that the transect walks were conducted, we encountered 61 different bird species. It is clear that some of the birds are very abundant, like the Swiftlets and Philippine Bulbul. The Swiftlet is very prominently flying around, while the Philippine bulbul is quite vocal and has an easily recognizable sound. The 'shyness' of a bird or the absence of it can determine whether or not the observers encounter a specific bird species a lot or only rarely. Some birds are located in the area, but simply do not show themselves or fly away once they know that humans are in its vicinity. A more extensive research should be conducted in order to fully determine the species richness in the area. However, this research does provide a good indication of the richness and shows which birds are common and which are more shy/rare.

The sound of a bird is very important for the observation. Not only can you recognize birds by their sound (sometimes even kilometers away), but once the sound is heard it is also easier to see the birds that are nearby, since you can follow the sound. The call of the Rufus Hornbill was often heard, but since the bird can be heard even 500-1000 meters away, they are not included in the survey. However, we did observe the sound of the wings of the Rufus Hornbill once (transect walk 2), which means that they are located in this area.

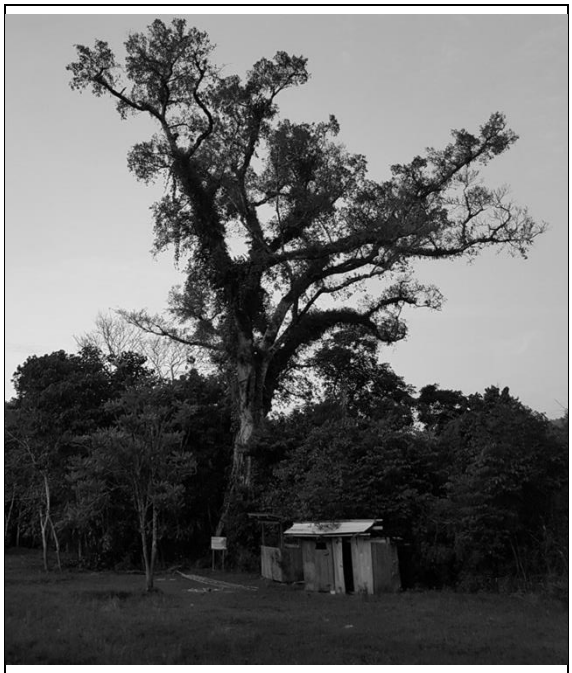


Photo 2: Century-old fig-tree in Pallagao which is crucial for birds, since many species find its fruits as food source. The government has classified this tree as protected (Photo by L van der Stelt 2018).

One of the most important birds observed in the area is the Isabela Oriole. During the survey we encountered groups of Isabela Oriole 4 times, 11 encounters in total. The Isabela Oriole is a Critically Endangered bird species, according to the IUCN Red List and is also endemic to Luzon (IUCN 2018, Kennedy *et al*. 2000). Because of this, Blue Waters is an interesting area for conservation and bird-watching.

During our survey, we noticed the importance of fruiting trees like the fig-tree and *ilang-ilang* tree. The fig-tree on Photo 2 is always occupied with many birds, among which is the Tarictic Hornbill. Luckily, this tree is protected by the government, so no harm will be done to the tree and the birds using the tree.

Table 2: Bird diversity and abundance in the area of Blue Waters, Baggao, Philippines (sorted by number of encounters).

#	Common Name	Scientific Name	No of encounters	Range	Cons. Status
1	Philippine Bulbul	Hypsipetes philippinus	62	PhE	LC
2	Swift sp.	-	36	-	-
3	Green-backed Tailorbird	Orthotomus chloronotus	24	PhE	LC
4	Luzon Hornbill	Penelopides manillae	20	PhE	LC
5	Pygmy Swiftlet	Collocalia troglodytes	19	PhE	LC
6	Philippine Green Pigeon	Treron axillaris	16	PhE	LC
7	Green Imperial Pigeon	Ducula aenea	16	R	LC
8	Philippine Hanging Parrot	Loriculus philippensis	16	PhE	LC
9	Ashy Minivet	Pericrocotus divaricatus	15	M	LC
10	Pacific Swallow	Hirundo tahitica	13	R	LC
11	White-throated Kingfisher	Halcyon smyrnensis	11	PhE	LC
12	White-browed Shama	Kittacincla luzoniensis	11	PhE	LC
13	Isabela Oriole	Oriolus isabellae	11	LE	CR
14	Rufous Coucal	Centropus unirufus	10	LE	NT
15	Red-keeled Flowerpecker	Dicaeum australe	10	PhE	LC
16	Balicassiao	Dicrurus balicassius	10	PhE	LC
17	Philippine Coucal	Centropus viridis	9	PhE	LC
18	Yellow-vented Bulbul	Pycnonotus goiavier	8	R	LC
19	Blue-tailed Bee-eater	Merops philippinus	8	R	LC
20	Blue-headed Fantail	Rhipidura cyaniceps	7	PhE	LC
21	Yellowish White-eye	Zesterops nigrorum	7	PhE	LC
22	Red-crested Malkoha	Dasylophus superciliosus	6	LE	LC
23	White-lored Oriole	Oriolus albiloris	5	PhE	LC
24	Striped Flowerpecker	Dicaeum aeruginosum	5	PhE	LC
25	Golden-crowned Babbler	Sterrhoptilus dennistouni	4	LE	NT
26	Blue-throated Bee-eater	Merops viridis	4	LE	LC
27	Philippine Serpent Eagle	Spilornis holospilus	4	PhE	LC
28	North Philippine Hawk-Eagle	Nisaetus philippensis	4	PhE	EN
29	Coppersmith Barbet	Megalaima haemacephala	4	R	LC
30	Northern Black-and-White Triller	Lalage melanoleuca	4	PhE	LC
31	Arctic Warbler	Phylloscopus borealis	4	M	LC
32	Lemon-throated Leaf-Warbler	Phylloscopus cebuensis	3	PhE	LC
33	Yellow-wattled Bulbul	Pycnonotus urostictus	3	PhE	LC
34	White-breasted Wood-Swallow	Artamus leucorynchus	3	R	LC
35	Sunbird sp.	-	3	-	-

#	Common Name	Scientific Name	No of encounters	Range	Cons. Status
36	Luzon Striped Babbler	Zosterornis striatus	3	LE	NT
37	White-eared Brown-Dove	Phapitreron leucotis	3	PhE	LC
38	Orange-bellied Flowerpecker	Dicaeum trigonostigma	3	R	LC
39	Spotted Kingfisher	Actenoides lindsayi	2	PhE	LC
40	Pygmy Flowerpecker	Dicaeum pygmaeum	2	PhE	LC
41	Blue-breasted Blue-Flycatcher	Cyornis herioti	2	LE	NT
42	Yellow-bellied Wristler	Pachycephala philippinensis	2	PhE	LC
43	Grey Wagtail	Motacilla cinerea	2	M	LC
44	Northern Indigo-banded Kingfisher	Ceyx cyanopectus	2	PhE	LC
45	Philippine Fairy Bluebird	Irena cyanogaster	2	PhE	NT
46	Coleto	Sarcops calvus	2	PhE	LC
47	Black-naped Monarch	Hypothymis azurea	2	R	LC
48	Bar-bellied Cuckooshrike	Coracina Striata	2	R	LC
49	Philippine Bush-hen	Amaurornis olivacea	1	PhE	LC
50	Black-chinned Fruit-dove	Ramphiculus leclancheri	1	PhE	LC
51	Northern Rufous Paradise-Flycatcher	Terpsiphone unirufa	1	PhE	LC
52	Cream-bellied Fruit-Dove	Ramphiculus merrilli	1	LE	NT
53	Northern Rufous Hornbill	Buceros hydrocorax	1	PhE	VU
54	Grey-streaked Flycatcher	Muscicapa griseisticta	1	M	LC
55	Yellow-breasted Fruit-Dove	Ramphiculus occipitalis	1	PhE	LC
56	Stripe-headed Rhabdornis	Rhabdornis mystacalis	1	PhE	LC
57	Philippine Pygmy Woodpecker	Picoides maculatus	1	PhE	LC
58	Crake sp.	-	1	-	-
59	Brown Shrike	Lanius cristatus	1	M	LC
60	Blackish Cuckoo Shrike	Coracina coerulescens	1	PhE	LC
61	Grey Swiftlet	Collocalia amelis	1	PhE	LC

*LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN= Endangered, CR = Critically Endangered

*LE = Luzon Endemic, PhE = Philippine Endemic, R = Resident, M = Migrant

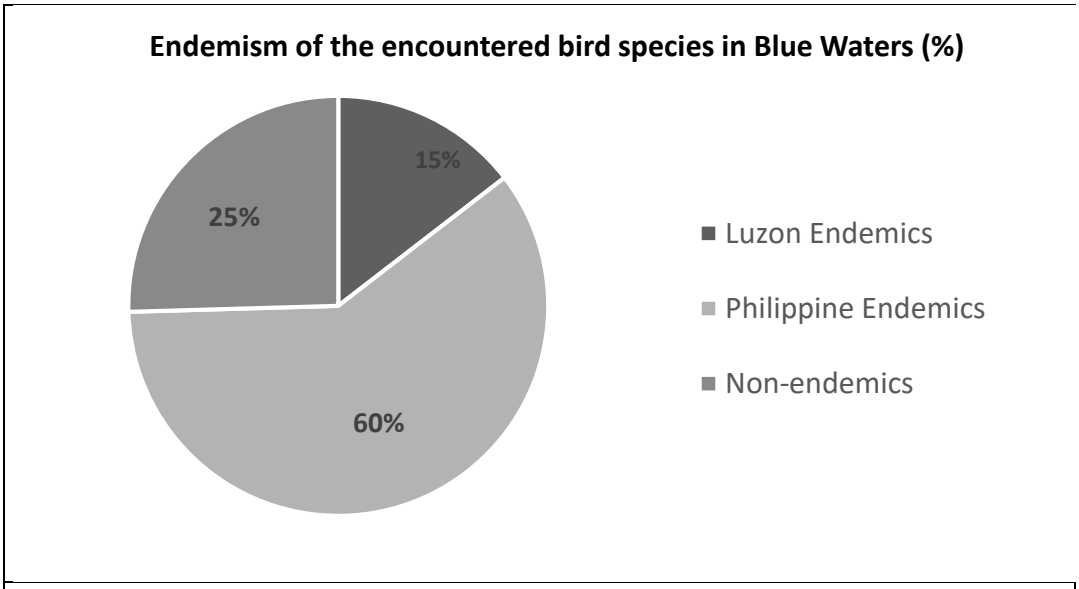


Figure 1: Percentage of endemic species (Luzon Endemic and Philippine Endemic) and non-endemics among the encountered bird species in Blue Waters, Baggao.

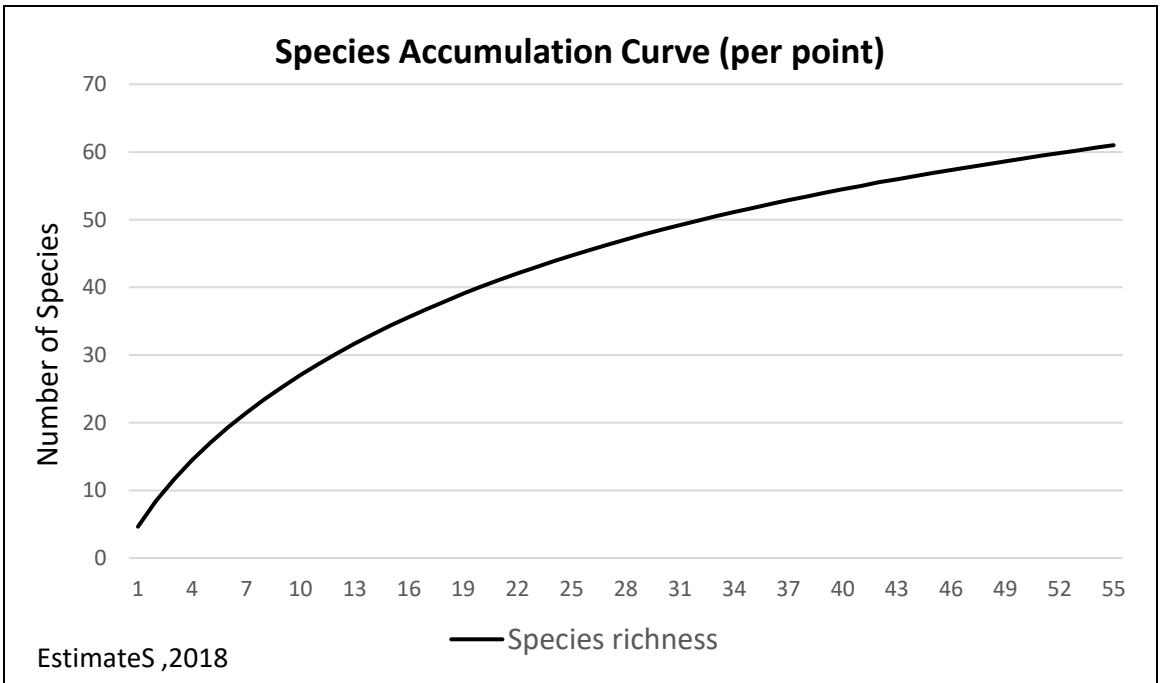


Figure 2: Species accumulation curve per point, combining 5 transect walks: three times transect line 1 in the non-forest area, and two times transect walk 2 in the forest area. For the first transect walk in the non-forest area on Jan. 19 an opportunistic survey was conducted.

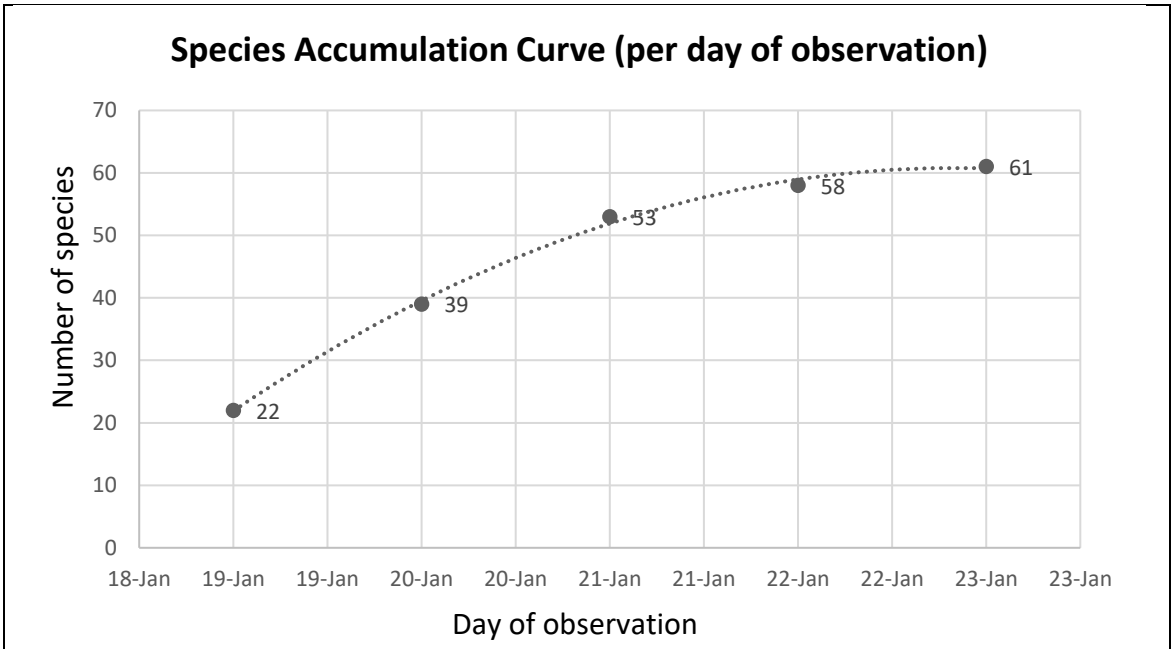


Figure 1: Species Accumulation Curve per day of observation, from January 19th until January 23th. This figure clearly shows that in the last day of observation still 3 new species where found.

Bird surveys must not focus on birds alone; it is important to also consider the habitat type of where the birds were encountered. In this way, we could assess and determine the significance of the vegetation in the area which is used as shelter or food-source. We noticed that the forest had a big number of bird species compared to areas with a forest edge, alongside cultivated land, pasture and grassland (Table 2). Most birds that were found in non-forest areas, were also spotted in the forest area. But some birds specifically like open areas or grass land, like the Plain Bush Hen or Grey Wagtail (Acay 2018, pers.comm., Kennedy *et al*. 2000). Some birds are not very picky and are common in different kinds of habitats, like the Philippine Coucal (Table 2).

Table 3: Bird diversity per habitat type in Blue Waters.

	Species	**ESGF**	**ASGF**	**Pasture**	**Grasslands**	**Cultivated**
1	Arctic Warbler	*	*			
2	Ashy Minivet	*				
3	Balicassiao	*				
4	Bar-bellied Cuckoo-Shrike		*		*	
5	Crake sp.			*		*
6	Northern Black-and-White Triller	*	*			*
7	Black-chinned Fruit-dove	*	*			
8	Blackish Cuckoo Shrike		*	*		
9	Black-Naped Monarch	*	*		*	
10	Blue-breasted Blue- Flycatcher		*			
11	Blue-headed Fantail	*				
12	Blue-tailed Bee-eater	*		*	*	

	Species	ESGF	ASGF	Pasture	Grasslands	Cultivated
13	Blue-throated Bee-eater	*	*			*
14	Brown Shrike	*				
15	Philippine hanging parrot	*	*			*
16	Coleto	*			*	*
17	Coppersmith Barbet	*			*	
18	Cream-bellied Fruit-Dove		*			
19	Crested Serpent Eagle		*		*	
20	Golden-crowned Babbler		*			
21	Green Imperial Pigeon	*	*	*	*	*
22	Grey Wagtail					*
23	Grey-streaked Flycatcher	*				
24	Northern Indigo-banded Kingfisher	*	*			
25	Isabela Oriole	*	*	*	*	
26	Swift sp.	*	*			*
27	Lemon-throated Leaf-Warbler	*	*			
28	Luzon Hornbill	*	*	*		
29	Luzon-Striped Babbler	*				
30	Orange-bellied Flowerpecker	*	*			
31	Pacific Swallow		*	*		*
32	Philippine Bulbul	*	*			*
33	Philippine Coucal	*	*	*	*	*
34	Philippine Fairy Bluebird	*				
35	North Philippine Hawk Eagle		*			
36	Philippine Pygmy Woodpecker	*				
37	Green-backed Tailorbird	*	*		*	*
38	Philippine Bush-hen				*	
39	Philippine Green Pigeon				*	
40	Pygmy Flowerpecker	*	*			
41	Pygmy Swiftlet		*	*	*	*
42	Red-crested Malkoha	*	*			
43	Red-keeled Flowerpecker	*	*			
44	Rufous Coucal	*	*			
45	Northern Rufous Hornbill		*			
46	Southern Rufous Paradise Flycatcher	*	*			
47	Striped Flowerpecker	*		*		
48	Stripe-headed Rhabdornis			*		
49	Sunbird sp.	*				
50	White-Brested Wood-Swallow	*				
51	White-browed Shama	*	*			
52	White-eared Brown-Dove	*	*			*
53	White-lored Oriole	*				*

	Species	ESGF	ASGF	Pasture	Grasslands	Cultivated
54	White-throated Kingfisher		*	*	*	*
55	Striped Wood-Kingfisher					*
56	Yellow-bellied Wristler	*				
57	Yellow-breasted Fruit-Dove	*				
58	Yellowish White-eye	*	*			
59	Yellow-vented Bulbul		*	*		*
60	Yellow-wattled Bulbul	*	*		*	
61	Grey Swiftlet		*			
	TOTAL	**43**	**38**	**13**	**15**	**18**

*ESGF = Early Secondary Growth Forest, ASGF= Advance Secondary Growth Forest

DISCUSSION & RECOMMENDATIONS

From our observations we can conclude that the area of Blue Waters is important and interesting for its bird diversity. 75% of the birds we encountered are endemic (Figure 1), which makes conservation of this area (and other areas in the Philippines where these birds live) crucial to the overall conservation of biodiversity. Considering the fact that the critically endangered Isabela Oriole is located in this area, Blue Waters also serves as an important area of research on this specific bird species.

In total, we have observed 61 different bird species. The species accumulation curves clearly show a flattening line, which indicates that the total observations are probably close to the actual number of species. Yet, we still encountered 3 new bird species during the last day of observations. Taking this into account, we can conclude that not all species present were observed yet and that more transect walks should be done in order to observe all species. It is likely that if we would have done more transect walk, we would have encountered a few new species. With the help of the program EstimateS, we modelled the theoretical species richness based on a species accumulation curve. The species richness estimator ACE gave an estimated species richness of 73 bird species in Blue Waters (EstimateS 2018).

Fortunately, most bird species encountered in Blue Waters are not threatened and most are categorized as Least Concern (Table 1). Some birds are Nearly Threatened and ‘only’ the Isabela Oriole is Critically Endangered and North Philippine Hawk Eagle as Endangered (Table 1). We hope that in the coming decades this area and its birds will be preserved and protected, so that it will contribute to getting all the birds to the category of Least Concern.

Tourism

Tourism is promoted in Blue Waters because of its beautiful waterfalls and caves. Yet, one should not close its eyes while walking towards the tourist spots. During the walk towards the lagoon of Blue Waters you are likely to hear and see many birds (as well as butterflies). But to truly see the interesting bird diversity, it would be a great addition to the tourist spot of Blue Waters to promote bird-watching tours. Promoting the bird diversity could attract many bird-watchers from all over the world, considering rare and endemic birds are located here (for example, the Isabela Oriole).

ACKNOWLEDGEMENT

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FLORA ASSESSMENT AT BLUE WATERS, BAGGAO, CAGAYAN VALLEY, PHILIPPINES

Vicson C. Cammayo and Rik Verhave

INTRODUCTION

The Philippines is one of the 17 megadiverse countries in the world (Conservation International) and is important because of its high rates of endemism (Myers et al. 2000). The Philippines is home to 5,832 endemic plant species (Mittermeier et al. 1998) out of a total of 7,620 (Myers et al. 2000) with a species/area ratio of 64.7 endemic plant species per 100 km^2. 327 of the endemic plant species are threatened or extinct (Brooks et al. 2002). Therefore, the Philippines is extremely important for the conservation of plant species. However, in the past decades a lot of deforestation has taken place. From 1900 until 1999 the forest cover has decreased from 70% to 18.3% (ESSC 1999). Nowadays there is a ban on logging in the Philippines, although illegal logging is still taking place. But this illegal logging is less than the achieved reforestation in the last decade so the forest cover rate is now slightly higher than 18.3% (Mangabat 2018, pers.comm.). It is important to map all the flora species richness in forested areas of the Philippines to get an overview of where conservation is the most important. An area which until now is not yet much investigated on plant species richness is that of the Blue Waters in Baggao, Cagayan valley, Philippines. The Blue Waters is a large forested area. The government is considering giving the Blue Waters a protected area status, because of the existence of caves (Acay 2018, pers.comm.). Therefore, an assessment on its plant species richness is necessary to create a map of the environment. Especially since the species richness of tree species is an important indication for the quality of the area.

RESEARCH QUESTION:

What is the tree species richness in the Blue waters?

- Which species of trees are present in the Blue waters?
- What is the canopy cover % of forested and non-forested habitat in the Blue waters?
- What endemic tree species are present in the Blue waters?

METHODOLOGY:

Time schedule:

Date	**Activities**
19 January	Practice methodology / Fieldwork transect 1
20 January	Fieldwork transect 1
21 January	Fieldwork transect 2
22 January	Fieldwork transect 2
23 January	Finish fieldwork

Figure 1: Two transect lines in the Blue Waters. Source: Joni Acay

We conducted our research by making use of 2 transect lines, one in a non-forested area and one in a forested area (Figure 1). Both transects were 1 km. every 100m, including 0m we determined all the tree species richness in a 10mx10m plot. Even numbers on the right side of the trail and uneven number on the left side, with numbers starting from 0 to 10. Altogether we used 22 plots. We started by determining the 5 biggest tree species present. Of these 5 species we measured more variables; diameter, tree architecture and height (Photo 1). Furthermore we determined several other variables: altitude, soil type, canopy cover %, distance to cultivated area and distance to water source to conduct a habitat survey (Appendix C and D)(Bibby et al. 1998). Afterwards we tried to identify as many tree species in our plot as we could. The criterion we used to call something a tree was a DBH of 5 and bigger. Afterwards we produced a list of present species, an abundance list and a species accumulation curve (SAC). To make the SAC's we used the software EstimateS. To set a prediction of the tree species richness in the environment we used the non-parametric abundance based species richness indicator Chao 1, because this prediction is a good estimator when you use few samples (van Weerd & de Haes 2010).

Photo 1: Vicson Cammayo and Rik Verhave are measuring the diameter of *Ficus sp*

RESULTS:

Tree species richness

Out of the 22 plots, 12 had a forested habitat and 10 had a non-forested habitat. In the plots with forested habitats we found 55 different tree species (Appendix A). In the plots with non-forested habitats, we found 25 different tree species (Appendix B).

To determine if this come close to the tree species richness in the area of the Blue Waters, we made a species accumulation curve (SAC) per habitat using EstimateS (Figure 3). The SAC of the forested habitat predicts 64.19 species in that habitat according to the Chao 1 mean, whereas we found 55 species.

The SAC of the non-forested habitat predicts 50.88 species in that habitat, whereas we found 25 species (Figure 4).

We calculated the average species richness per plot as a measure for forest cover (Figure 2).

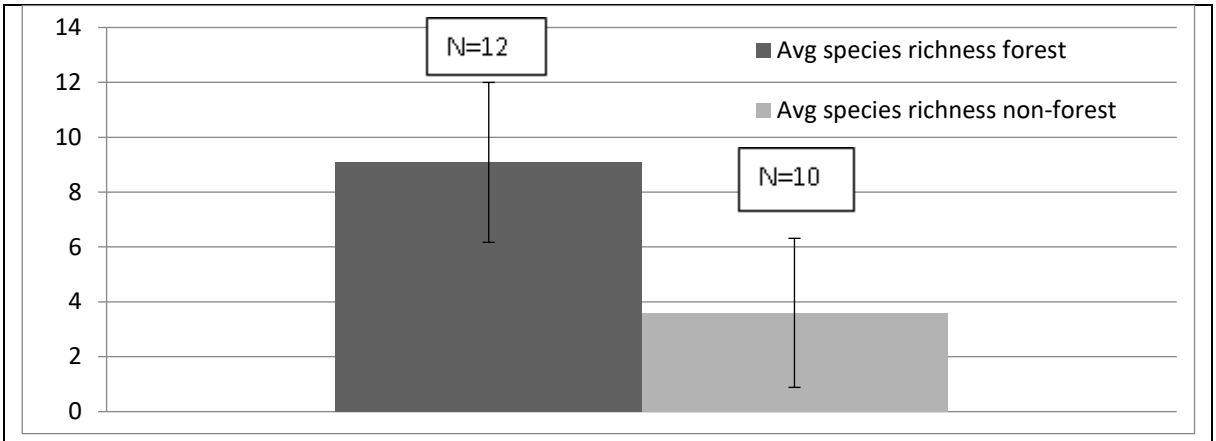

Figure 2 : Average species richness per habitat per plot

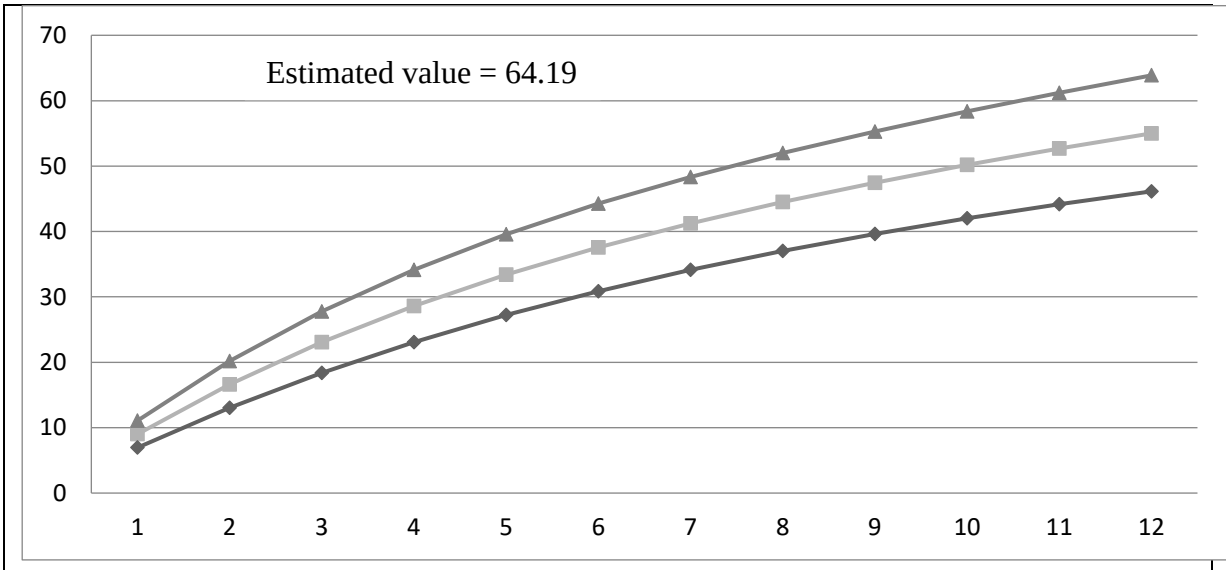

Figure 3: Species accumulation curve of tree species found in the plots with a forested habitat.

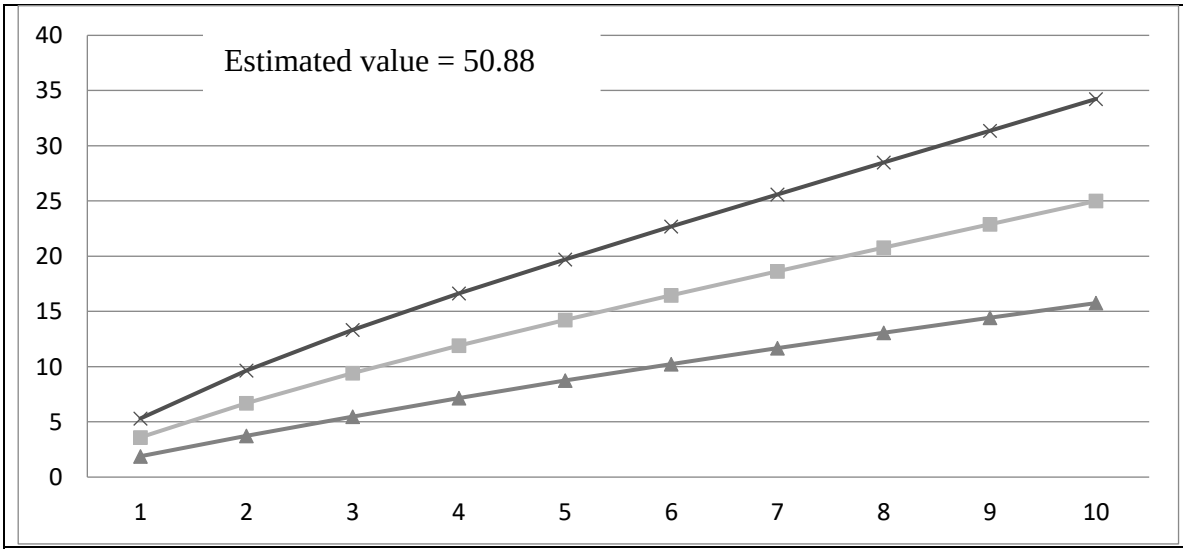

Figure 4: Species accumulation curve of tree species found in the plots with a non-forested habitat.

Abundance and canopy cover

For several tree species in the forested habitat we found an abundance of more than 10 individuals; *Shorea. contorta, Shorea. negrosensis and Leea. aculeata*. We found 35 individuals of *L. aculeate,* but mostly saplings (Appendix A).

In the non-forested areas, we found 15 individuals of *Pterocarpus indicus*. For 20 out of the 25 tree species, we found an abundance of 5 or lower (Appendix B). Of 15 species, we found only 1 individual. The average abundance per plot in non-forested habitat is around 7 individuals. A plot with a high abundance of tree may suggest but this value does not say much about the quality of the forest, because there could be a lot of small trees. Therefore, we use the canopy cover as a characteristic of a good forest (Figure 5).

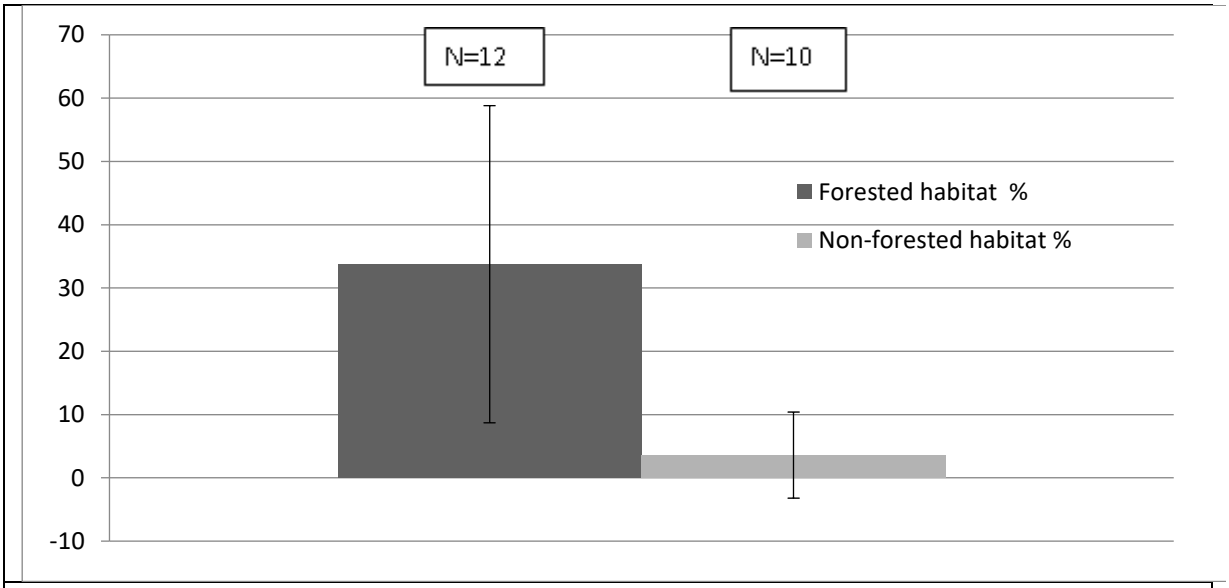

Figure 5: Bar graph of the average canopy cover % per habitat type.

Endemic species

We found 12 endemic species in the forest habitat in Blue Waters and 3 in the non-forest habitat (Table 1). In the forest habitat we found 9 threatened species and in the non-forest habitat we found 2.

Forest:	number	percentage	Non-forest:	number	percentage
species	55	100%	species	25	100%
endemic	12	22%	endemic	3	12%
Threatened	9	16%	Threatened	2	8%
VU	5		VU	2	
EN	0		EN	0	
CR	4		CR	0	

Table 1: Endemic tree species found in the Blue Waters

DISCUSSION

The research study was conducted at Sitio Blue waters, Pallagao to identify the tree species richness in the area. We found 55 different tree species in the forested habitat (Appendix A) and 25 in the non –forested habitat (Appendix B). On average, the species richness per plot is 9.1 in the forested habitat and 3.6 in the non-forested habitat. Also we found an average canopy cover of 33.75% in forested habitat and 3.6% in non-forested habitat. We found less species richness and canopy cover in non-forested habitat because of the land conversion into agricultural land and it became open area for cultivation of crops. We used the species accumulation curve (SAC) and we observed that in the forested habitat it does not yet reach the exact number of trees and probably; more trees are to be found in the forested area (Figure 3). With EstimateS we predicted to find 64 species in total. Likewise, in the non-forested are the number of species we found differs from the one we predicted. (Figure 4). We found 25 species and the estimated number of species is 51. This difference is probably caused by the presence of many single- and doubletons, species that we only found once or twice. EstimateS might think that there are a lot of rare tree species in the area, because we saw a lot of tree only once. Therefore it predicts to find more species if we examine more plots. This might be true because the non-forested area used to be forested so every species we found in the forest could be find in the non-forested area. However, we don't think that 51 species can be find since the area is used for agricultural purposes.

The abundance of tree species was sometimes hard to determine, because of the presence of many saplings. In practice we probably underestimated the number of saplings. While there were only many saplings in the forested habitat the difference in average abundance is probably bigger than we calculated.

We found several endemic species in the Blue Waters. Because this species only are present in the Philippines the conservation of their habitats is important.

Throughout the field survey we saw fruiting trees and Non-fruiting planted by the National Green Project (NGP). This is the reason why we found many individuals of *P. indicus* in the non-forested habitat.

Furthermore, we observed that quite a few plots were occupied by climbing bamboo, rattan, lianas and palms. Despite the fact that we stayed in the area for a very limited duration, we noticed that houses were made up of woods. In connection to this, we interviewed two respondents and based on the information they gave to us we could list the trees they cut in the forest to use for building houses; *Shorea. palosapis, S. negrosensis, and S. contorta.* In the field we also observed the signs of this logging. The signs we saw were a piece of cut log and several cut trees. In December 2017, 6,000 board feet of *S. negrosensis* (Red lauan) was confiscated by the Municipal Environment and Natural Resources Office (MENRO) and 2,700 bdft. of assorted trees including *P. indicus* were donated to the school (Bautista 2018, pers.comm.). With these cases, we would like to recommend that there should be more enforcement in the area to prevent logging, inform the local people of the importance of the trees and implement a monitoring plan. We did not yet see a big impact of these activities on the forest in the area but it is good to start and work now before too much trees are cut.

ACKNOWLEDGEMENTS

To the Local Government Unit of the Municipality of Baggao, thank you for allowing us to conduct our research study in your area specifically in Barangay Pallagao, Sitio Blue Waters. To Barangay Captain Venancio B. Barbosa Jr. of Blue Waters, thank you for spending your time with us during the conduct of our research study and for supporting us with the help of your local officials at Sitio Blue Waters. To Mr. Dominador Dela Cruz and Mrs. Florida Dela Cruz, thank you for the overwhelming and warm-hearted acceptance to your house during our field survey. To Mr. Jojo, our tour guide for the area, a round of applause to your voluntarily sharing of your time and effort to us. You made our trip to Blue Waters an amazing one because of the beautiful views. To the local people of the whole Sitio Blue Waters, thank you for the kindness and happiness you imprinted in our hearts.

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APPENDICES

Tree species found in forested habitat

	Local name	CS[1]	Scientific name	Family name	Ind
1	Pahutan*^	VU	Mangifera altissima	Anacardiaceae	2
2	Dita		Alstonia scholaris	Apocynaceae	5
3			Amorphophallus sp.	Araceae	2
4	Anonan		Cordia dichotoma	Boraginaceae	1
5	Pagsahingin*		Canarium asperum	Burseraceae	1
6	Apitong^	CR	Dipterocarpus grandiflorus	Dipterocarpaceae	2
7	Narra		Pterocarpus indicus	Dipterocarpaceae	6
8	white lauan*^	CR	Shorea contorta	Dipterocarpaceae	13
9	Red lauan*^	CR	Shorea negrosensis	Dipterocarpaceae	12
10	Mayapis^	CR	Shorea palosapis	Dipterocarpaceae	5
11	Kamagong		Diospyros blancoi	Ebenaceae	9
12	Philippine Ebony		Diospyros ferrea	Ebenaceae	6
13			Malotus sp.	Euphorbiaceace	2
14	Hamindang*^	VU	Macaranga bicolor	Euphorbiaceae	1
15	Binunga		Macaranga tanarius	Euphorbiaceae	7
16	Tindalo*^	VU	Afzelia rhomboidea	Fabaceae	7
17	Manareng		Lithocarpus sp.	Fagaeae	6
18			Cyrtandra sp.	Gesneriaceae	5
19	Bolong-eta		Diospyros pilosanthera	Henaceae	9
20	Molave		Vitex parviflora	Lamiaceae	1
21	Kalingag		Cinnamomium sp.	Lauraceae	2
22	Sablot		Litsea glutinosa	Lauraceae	3
23	mali-mali		Leea aculeata	leeaceae	35
24			Magnolia sp.	Magnoliaceae	1
25	Gis-gis		Memecylon sp.	melastomataceae	7
26			Aglaia sp. 1	Meliaceae	1
27			Aglaia sp. 2	meliaceae	1
28			Chisocheton sp.	Meliaceae	1
29	Santol		Sandoricum koetjape	Meliaceae	1
30	Mahogany		Swietenia macrophylla	Meliaceae	2
31	Kalantas*		Toona calantas	Meliaceae	1
32	Lasiadra		Melastoma polyanthum	melostomataceae	1
33	Ipil-ipil		Leucaena leucocephala	Mimosaceae	3
34	Antipolo*^	VU	Artocarpus blancoi	Moraceae	1
35			Ficus longesta	Moraceae	5
36	Tibig		Ficus nota	Moraceae	8
37	Niog-niogan*		Ficus pseudopalma	Moraceae	1
38	Hauili		Ficus septica	Moraceae	6
39			Ficus sp. 1	Moraceae	6
40			Ficus sp. 2	moraceae	1
41	Tangisang-bayawak		Ficus variegata	Moraceae	6
42			Psidium sp.	Myrtaceae	8

	Local name	CS[1]	Scientific name	Family name	Ind
43	Malakupa		Syzygium sp.	Myrtaceae	4
44	Malakape*		Canthium sp.	Rubiaceae	3
45			Ixora auriculata	Rubiaceae	6
46	Wild citrus		Citrus sp.	Rutaceae	2
47	Malachico		Glenniea philippinensis	Sapindaceae	8
48			Guioa sp.	Sapindaceae	1
49	Uas		Harpulia arborea	Sapindaceae	1
50			Palaqium sp.	Sapotaceae	2
51	Malakmalak*^	VU	Palaquium philippinensis	sapotaceae	2
52	Marasili		Solanum nigrum	Solanaceae	2
53	Puri-puri*		Teijsmanniodendron ahernianum	Verbenaceae	2
54			UN ID 1		6
55			UN ID 2		2

*=endemic, ^=threatened, [1]CS = Conservation Status: CR = Critically Endangered, VU = Vulnerable

Species found in non-forested habitat

	Local name	CS[1]	Scientific name	Family	Ind
1	Molave		Vitex parviflora	Lamiaceae	1
2	Balete*		Ficus Benjamina	Moraceae	1
3	Narra^	VU	Pterocarpus indicus	Dipterocarpaceae	15
4	Tibig		ficus nota	Moraceae	7
5	Kalantas*		Toona calantas	Meliaceae	1
6	Guava		Psidium guajava	Myrtaceae	6
7			Aglaia sp.	Meliaceae	1
8	Binunga		Macaranga tanarius	Euphorbiaceae	1
9	Wild citrus		Citrus sp.	Rutaceae	1
10	Ipil-Ipil		Leucaena leucocephala	Fabaceae	1
11	Alim		Melanolepsis multiglandulosa	Euphorbiaceae	1
12	Alagaw		Premna odorata	Lamiaceae	1
13	Bangkal		Nauclea orientalis	Rubiaceae	3
14	Tuai		Bischofia javanica	Bischofiaceae	5
15	Malakupa		Syzgium sp.	Myrtaceae	1
16	Melina		Gmelina arborea	Lamiaceae	1
17	Kakawate		Gliricidia sepium	Fabaceae	2
18	Guyabano		Annona muricata	Annonaceae	8
19	Pomelo		Citrus maxima	Rutaceae	1
20	Takip-asin*^	VU	Macaranga grandifolia	Euphorboiaceae	2
21	Hauili		Ficus septica	Moraceae	2
22	Star apple		Chrysophyllum cainito	Sapotaceae	1
23	Mango		Mangifera indica	Anacardiaceae	1
24	Hamindang		Macaranga bicolor	Euphorbiaceae	1
25	Lasiandra		Melostoma polyanthum	Melastomataceae	6

*=endemic, ^=threatened, [1] CS = Conservation Status: VU = Vulnerable

AGRICULTURAL PRACTICES IN THE SITIO OF BLUE WATERS

Manilyn D. Macuray and Jerry van Rijn

INTRODUCTION

The sitio of Blue Waters is located in *Barangay* Pallagao, which is part of the municipality of Baggao, Province of Cagayan, Philippines. The original inhabitants of what is now called Blue Waters, were the Agta. In 1978, the first migrants from Quirino & Isabela Provinces settled in what is now called Blue Waters, which led to the Agta re-locating. During the next decades, more migrants from different places came to Blue Waters, such as Remus and Tallang. Blue Waters consists of approximately 15 households of which 12 households' main occupation is agriculture-related (Barbosa Jr. 2018, pers.comm.). The main crops that are currently being cultivated are corn and rice (Ali 2018, pers.comm.). The farming system that is predominantly utilized by the farmers in Blue Waters is monoculture (Ali 2018, pers.comm.).

With regards to monoculture in Blue Waters, there are several problems that occur. Since the monocrops are only for short-term basis, farmers can only harvest two or three times a year because crops are planted at the same time. Having only few harvests a year, causes the farmers to potentially lose a significant part of their yearly income in case of harvest failure (Orno 2002). Another problem that arises when practicing monoculture in Blue Waters, is that the fertility of the soil degrades. Soil degradation occurs because of using rice and corn for monoculture. Both of these crops require high amounts of nitrogen. As a result, nitrogen depletion in the soil occurs which causes the rice and corn to require more chemical fertilizers. The use of chemical fertilizers negatively impacts the quality of the soil (Brilliantes 2017, pers.comm.).

Farmers in Blue Waters also practice slash – and burn farming (Ali 2018, pers.comm.). The problem that arises with slash - and burn farming is that it negatively affects soil surfaces and causes slopes used for farming to be more susceptible to erosion (Orno 2002). This is an endogenous factor, meaning that the farmers affect their own farmlands by the decisions they make (Orno 2002). Since the decision to practice slash - and burn farming is endogenous, changes can be made by the farmers themselves. In order to mitigate the risks of losing income, lessen soil erosion, increase returns per unit area, reduce the usage of fertilizers & pesticides, and practice forms of agriculture that is less labor-intensive, possibilities to implement different forms of agriculture should be explored (Onno 2002).

Other forms of agriculture that this research wishes to investigate are multiple cropping and sequential cropping (Brilliantes 2017, pers.comm.). Blue Waters is special in its way of agriculture, as all the crops are rain fed, even though Blue Waters also experiences droughts. Our research is relevant and carries importance, as it is necessary to know the current situation of agriculture in Blue Waters, in order to explore possibilities for development of agriculture, and increase the livelihoods of the farmers in Blue Waters.

Photo 1: Panoramic overview of farmlands in Blue Waters (Photo by M van Weerd 2018)

In order to research the applicability of the aforementioned farming systems, several factors need to be explored. Firstly, this research wishes to explore the history of crops and farming systems in Blue Waters. Secondly, the current situation of agriculture needs to be explored along with the reasons why the current farmers of Blue Waters choose the crops that they cultivate, and which farming systems they use to do so. Thirdly, we wish to explore the suitability of the farmlands to different farming systems, whether farmers are educated on different farming systems, and whether they are willing to be educated and get help from outside of the sitio. Lastly, we want to find out what the possibilities for agriculture in Blue Waters are in the future, both according to the farmers and our own observations.

RESEARCH QUESTIONS

Our main research question is: What is the current situation of agriculture and what are the possibilities for development of agriculture in Blue Waters?

In order to answer our main research question, we devised the following sub-questions:

1. What is the history of agriculture in Blue Waters?

2. What are the current crops that are being cultivated in Blue Waters, and why?

3. What are the current farming systems that are being used in Blue Waters, and why?

4. Are the farmlands in Blue Waters suitable for different crops and farming systems?

5. Are there possibilities to educate the farmers on cultivating different crops and/or farming systems?

6. Are the farmers willing to cultivate new crops?

7. Are the farmers willing to change their current farming systems?

METHODS

During our fieldwork, we stayed with a host family, where we arrived in the late afternoon on January 18th, and left around noon on January 23rd. Staying with a host family allowed us to be close with the community, which aided our research in finding respondents. In order to answer our main research question and sub-questions, we conducted 10 interviews in Ilocano in Blue Waters with all of the farmers that were present at the time of our field work. In order to record our data, we took notes during the interviews. Since a lot of the crops were high maintenance crops, many farmers were working throughout the day. Therefore, we tried to interview the farmers during their breaks so that we would not disturb them. Even though our intentions were well meant, when we went out to observe all the crops in Blue Waters, we were approached by several farmers during their work. They were more than happy to take a break from their hard labor, to have a chat with us about their farmlands. Aside from interviews, we used our own observations and agricultural knowledge derived from academic articles and lectures to fill in answers that farmers were not able to respond to due to a lack of knowledge. We also used our own observations to either confirm or refute their answers. Once we got back to our host-family, we reviewed and organized our freshly gathered data. With the purpose of mapping our area of research, we used 3 different methods. Firstly, we made a rough sketch of our area of research during our fieldwork, and noted all the different households, farm fields and crops we encountered. Secondly, we used Google Earth images to make our map detailed scale wise. Lastly, we made use of the DJI Mavic Pro drone to take accurate, up-to-date aerial photographs so that we could finish our map as accurate as possible.

	
Photo 2: Aerial image of farmlands in Blue Waters (Photo by J van Rijn 2018)	**Photo 3:** Manilyn posing with one of our respondents (Photo by J van Rijn 2018)

Time schedule

Date	Activities
18/01/2018	- Arrival in San Jose - Interview with Gener Manding, Agricultural Technologist working for the municipality of Baggao - Meet with host family
19/01/2018	- Conduct interviews with farmers - Observations regarding farming systems - Photographic documentation
20/01/2018	- Start sketch map - Conduct interviews with farmers - Photographic documentation
21/01/2018	- Conduct interviews with farmers - Photographic documentation - Observations National Greening Program
22/01/2018	- Add missing data through interviews - Used the DJI Mavic Pro to document Blue Waters - Finalize sketch map with help from Romeo Espe
23/01/2018	- Exchanging gifts with our host family, and a “see you later” instead of “goodbye”

RESULTS

While conducting interviews, we discovered that before 2008, farmers in Blue Waters were cultivating cassava, guyabano and bananas as the main crops. Due to a change in demand and high labor intensity required for these crops, a switch was made to rice and corn (interview with Espe. Also, farmers attempted to plant coffee trees. However, harvest failure occurred because the labor intensity of these crops was too high. Besides these main crops, there are also many fruit trees found in Blue Waters. These are provided by the National Greening Program (NGP). Farmers depend heavily on the NGP for seedlings, as they are too expensive for the farmers to purchase themselves. None of our respondents were aware of the Agricultural Training Institute

(ATI) that is set up by the municipality of Baggao. Once we explained what the ATI was, 100% of our respondents were excited to hear about such a program and were willing to accept any help the ATI could offer them.

There is no artificial irrigation system present in Blue Waters, all the crops are irrigated by rainfall. During our research, we found that several households that are grouped together, cultivate the same farm field surrounding their households (interview with Manding) (pers. obs.). Every household has a connection to agriculture in one way or another: they either own farmlands, are agricultural laborers or are both landowners and agricultural laborers on someone else their farm (interview with Espe). Furthermore, we discovered during our fieldwork that other than monoculture, sequential cropping and multi-cropping are also presently used as a farming system (interviews with Espe and Tumbali). Besides the problems that come with monoculture described in the introduction, during our research we found another problem. Since the monocrops used in Blue Water are hybrid- corn and rice, seeds cannot be replanted, and thus need to be re-purchased after every harvest, which increases costs for the farmers. However, corn and rice are low-maintenance crops compared to coffee for example, and thus have the advantage of low labor costs (interviews with Espe, Manding and Tumbali).

Slash-and burn farming negatively impacts the soil, but during our research we found that this is the cheapest – and most effective way for the farmers to free up new patches of land. However, it should be noted that the current farmers in Blue Waters are content with the land they have, and do not have intentions of burning down more forests to free up land for cultivation (interviews with Espe, Dela Cruz and Manding). Since both the decisions to practice monocropping and slash - and burn farming are endogenous (meaning that the farmers affect their own farmlands by the decisions they make (Orno 2002), changes can be made by the farmers themselves.

Photo 4: Avocado seedling provided by NGP (Photo by J van Rijn 2018)

Photo 5: Mango seedling provided by NGP (Photo by J van Rijn 2018)

Photo 6: Coconut seedling provided by NGP (Photo by J van Rijn 2018)

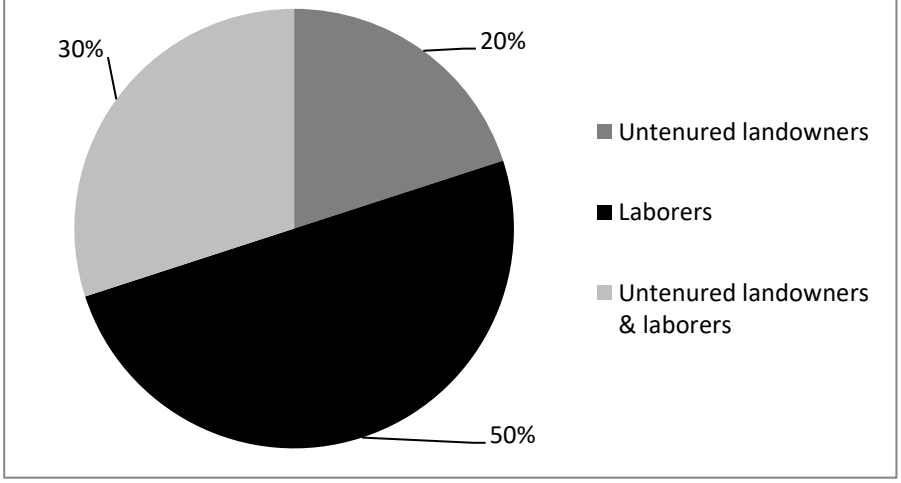

Figure 1: Percentages of respondents who are untenured landowners, laborers or both in Blue Waters

Out of 10 respondents, 20% of respondents claimed to own land, 50% of respondents told us they were laborers on someone else's land and 30% of respondents said to both own land, but were also working on someone else's land (Figure 1). According to our respondents, nobody officially owns land, because all of the land in Blue Waters is officially government property.

Photo 7: Bean seedling planted by Romeo Espe, as part of his multiple cropping system (Photo by J van Rijn 2018)

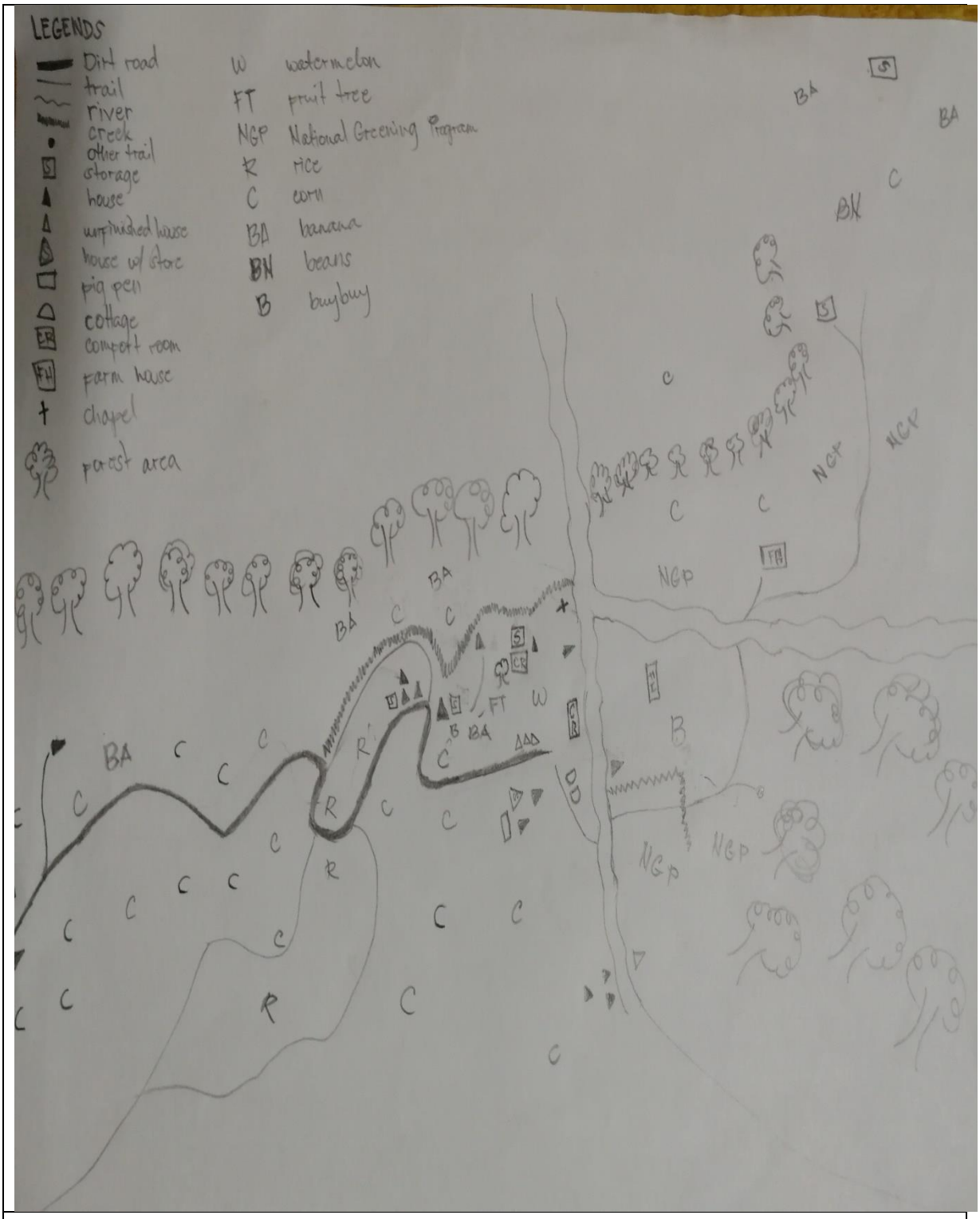

Figure 2: Sketch map of Blue Waters

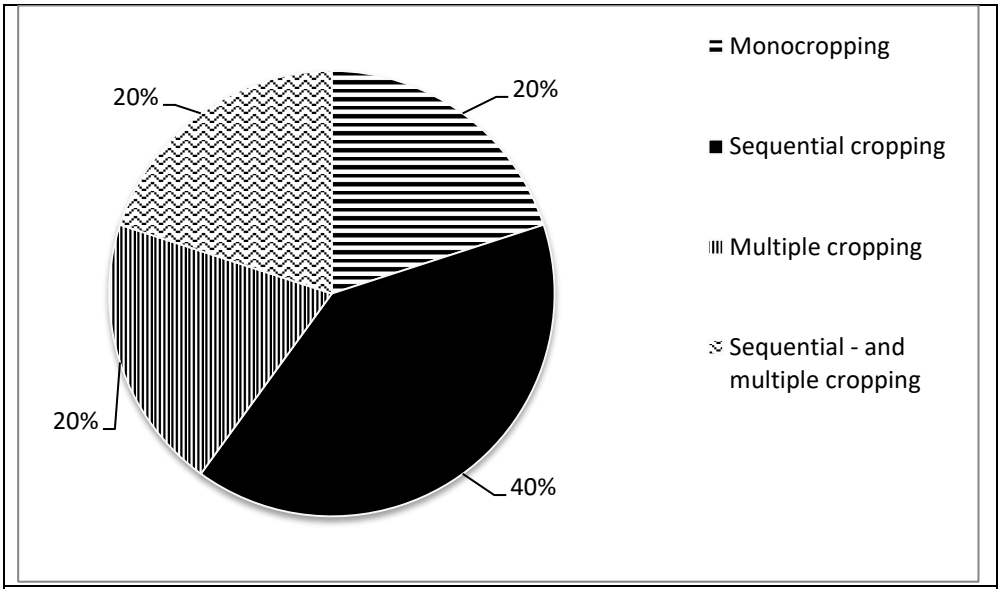

Figure 3: Percentage of respondents who are engaged in different farming systems in Blue Waters

Out of 10 respondents, 20% of respondents engage in monocropping, 20% of respondents engage in multiple cropping, 40% of respondents engage in sequential cropping and 20% of respondents engage in both sequential – and multiple cropping (Figure 3). Sequential cropping is a system where you change crops every season. It is important to know which crops to use as sequential crops. As an example, first rice and then mungbeans. The reason for this is soil maintenance. Rice requires a lot of nitrogen, while mungbeans (and other legumes) have the property of fixing the nitrogen concentration in the soil as a result of bacteria present in the roots of mungbeans (Ticman 2015, pers.comm.). Multiple cropping is where you produce different kinds of crops in just one land area. That is the importance of this system, as you will not produce only one crop. It is also a type of biological control agent to pest, as pest only attack one certain crop. Through multiple cropping a farmer will still harvest other crops if one crop fails due to the pest (Ticman 2017, pers.comm.).

Table 1: Types of crops found in Blue Waters and number of respondents who plant these crops

Type of crops	Number of farmers
Corn (hybrid)	9
Rice	4
Legumes	3
Watermelon	1
Buybuy	2
Guyabano	1
NGP seedlings*	2
Banana	3

*NGP seedlings consist out of pineapple – and citrus plants, as well as narra -, mango -, avocado -, coconut -, bamboo -, starapple -, coffee -, rambutan -, pomelo -, tamarine -, guyabano -, and santol trees.

During our research, we found that among the farmers practicing monoculture, every farmer cultivated rice and/or corn as their mono crop.

DISCUSSION/CONCLUSION/RECOMMENDATIONS

The current situation of agriculture in Blue Waters is very promising, because from our observations we can conclude that the farmers are familiar with other farming systems than monoculture already. Also, there is a lot of available human labor, and the area in which Blue Waters is situated is likely to attract more agricultural workers, due to its sheer beauty. Our respondents cultivate a wide variety of crops. Corn and rice are currently the main crops, but our respondents are also cultivating a wide variety of fruit trees and other high value crops such as legumes and buybuy (Table 1). The current farming systems that are being used by our respondents is a mixture of monoculture, sequential cropping and multiple cropping (Figure 3). Monoculture is the least beneficial farming system, both in outputs and soil maintenance (source). However, monoculture requires less labor than any other farming system and has a higher rate of success when it comes to harvesting. During our research, we observed that several farmers are already using sequential – and multiple cropping, which shows they are willing to adopt different farming systems. Sequential cropping has the potential for our respondents to have higher returns per unit area. However, some of the crops used for sequential cropping, corn and rice, are not compatible. Both of these crops are nitrogen consuming, which causes our respondents to use more fertilizers. As a result, the acidity of the soil is increasing which in the long-term, will cause a problem for the harvest.

When it comes to multiple cropping, there is a shortage of laborers according to our respondents. Consequently, part of the crops are rotting, which is a waste of land, and might incentivize the farmers to switch back to monoculture. When practiced correctly however, multiple cropping will also increase returns per unit area for our respondents. Our respondents who practiced multiple cropping started to do so after receiving seedlings from the NGP (2 respondents) and the Cagayan Integrated Area Development (CIAD) project (1 respondent), which is necessary for our respondents due to the high price and risk factor of these crops. In case of harvest failure, there are loans available for our respondents at the buying station in Tallang, where the harvest of our respondents is sold. With regards to the ATI, since Blue Waters is such a small community, we suggest for the ATI to send agricultural extension workers to Blue Waters. The agricultural extension workers can educate our respondents, along with any other farmers that are located in the area on different farming systems. Additionally, an inventory regarding what machinery could be used in Blue Waters could be made, and how this can be paid for. Currently, the road from Tallang, where our respondents sell their harvest, to Blue Waters is partly unpaved. Transport of harvest, especially in the rainy season, is mostly done by carabao. This costs 50 pesos per 60 kilos and takes a long time. When the road is paved, the harvest can be transported by large trucks throughout the year, which will lower the transport time and transport costs.

Considering all of the aforementioned, Blue Waters has many possibilities when it comes to the development of agriculture in the future. Farmers are willing to be educated on different farming systems, which could improve the quality of the soil. Also, they are willing to accept help from government programs such as the NGP and CIAD, allowing them to cultivate high value crops and generate a higher income. In addition, a paved road leading all the way to Tallang will increase revenues. In order for this to happen, help from the municipality of Baggao is all they need.

ACKNOWLEDGEMENTS

First and foremost, we want to thank our host family, Uncle Baddo, Anty Dinang and the kids, who made our field research a truly unforgettable experience in the most positive way one could think of. Next, we want to express our deepest gratitude to all of our respondents, who always welcomed us with warm smiles and as much time as we needed, whether they were working, eating, or about to take a nap after a hard and long day of work. Also, we would like to express our sincere appreciation to Gener Manding, for giving us insights concerning the ATI. One person we also explicitly want to mention is Jojo Pajo, who accompanied us to several farms which we would have not been able to find by ourselves without getting terribly lost. Lastly, we want to thank Hon. Venando B. Barbosa Jr., for the warm welcome to the sitio of Blue Waters, and bringing the community together to host us and the other teams conducting their research in Blue Waters.

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Ticman, C. 2017. pers.comm. November 2017

APPENDICES

Appendix A: Questionnaire for farmers

Name:
Age:
Occupation:
Ethnicity:
Original address:
How long have you been staying here?
Do you own the land you are working on?
Do you have children? If yes, do they work on your farm?
What are the crops that you grow?
How long have you been growing these crops?
Have you grown different crops in the past?
What is the size of your farm?
Do you get support from the government?
Are you willing to receive help from the government if there is any?
Are you aware of the Agricultural Training Institute?
Do you avail any loans?
How much is the cost for transporting your goods to your selling point?
Do you believe that the construction of a new road will benefit you as a farmer, and why?
How do you think agriculture will develop in the next 5 years in Blue Waters?

Appendix B: Questionnaire Municipal Official

Name:
Age:
Occupation:
What are the main crops cultivated in Blue Waters?
What is the population of Blue Waters?
How many farmers are there?
What farming system is mainly used in Blue Waters?
Is there any education and/or training provided by the municipality of Baggao for the farmers in Blue Waters?

Appendix C: Own observations

Crops cultivated in the area
Farming systems currently used in Blue Waters
Farming equipments

Appendix D: General information of our respondents

Name	**Age**	**Gender**	**Ethnicity**	**Occupation(s)**
Vangie Dela Cruz	54	Female	Ilocano	Laborer/store owner
Rodolfo Espe	27	Male	Ilocano	Laborer/tour guide
Benjamin Tumbali	42	Male	Ilocano	Laborer
Cristy Espe	29	Female	Ilocano	Housewife/owner/labourer
Dominador Dela Cruz	62	Male	Ilocano	Pure owner
Jong Galano	35	Male	Ilocano	Pure owner
Dexter Espe	32	Male	Ilocano	Laborer
Romeo Espe	54	Male	Ilocano	Pure owner
Lenlen Espe	18	Female	Ilocano	Housewife/pure owner
Eldie Dela Cruz	25	Male	Ilocano	Laborer
Gener Manding	39	Male	Ilocano	Agricultural Technician

ASSESSMENT OF TOURISM IN BLUE WATERS OF BARANGAY PALLAGAO, BAGGAO, CAGAYAN, PHILIPPINES

Regie L. Gabinete and Orleans Pearl P. Deus

INTRODUCTION

The Philippines is known as one of the megadiverse countries in terms of number of species per area (Van Weerd 2018). This makes the country more attractive to nature based tourism. In 2015, the tourism industry in the Philippines account for the country's 8.2% Gross Domestic Product (Philippine Statistic Authority 2016). Most of tourism activities are taking place in the pristine environment. The practice of sustainable tourism has long-term benefits for local community and at the same time will promote protection and conservation of the environment. (Fairer-Wessels 2017).

This study focuses on one such pristine natural site in the Philippines that is currently being transformed into a tourist destination. It would bring income to the community and barangay, but comes with the potential risk of environmental degradation. This area study is conducted in the Municipality of Baggao, Cagayan Province. It is located at the North-Eastern Cagayan.

Baggao promotes ecotourism destinations in different areas under its jurisdiction. There is an ongoing construction of road towards Blue Waters. The fact that a paved road will soon reach this beautiful spot, and thus potentially and presumably increase the number of tourists pouring into the area makes it particularly important to think about how the potential benefits can be optimized while potential threats can be diminished.

BACKGROUND OF STUDY AREA

Pallagao is one of the 34 barangays of Baggao and is located north eastern of the municipality. The focus of this research is Blue Waters which is located at Barangay Pallagao. It has a cave, where the water comes out and pours to the main lagoon. From the lagoon, the water is continuously flowing towards the river which has cascading waterfalls (Figure 1). It has a magnificent clear blue water. Its surrounding has relaxing sensation with birds chirping, water splashing and fresh whistling wind. During the trail to the lagoon there will be an encounter with wild fauna such as colorful butterflies and birds as well as interesting flora.

Lagoon	Cascading water	Waterfalls

Figure 1: Blue Waterfalls (Photos by R Gabinete and R Verhave. 20 January 2018

Blue Waters used to be a home for Agta people until 1978 (Espe 2018, pers.comm.). It was originally called *"Daligadig"* before the Bristol Exploration Club in 2014 explored the area and suggested the name Blue Waters. After the discovery, the name Blue Waters (BW) was formulated. Since Barangay Santa Margarita copied and named one of their *puroks* or sitios as *Daligadi*g, the barangay officials accepted the suggested name.

The community in the area is called *Purok* Blue Waters of Barangay Pallagao. Farming is the main source of living of most of the inhabitants. The reason for the influx of migrants to the area is due to search for land cultivation. In the past few years, during summer season, some of the residents generate income from tourism activities in Blue Waters such as tour guiding, monitoring and maintenance of the area.

Considering the Blue Waters' ecosystem, it is an important habitat of Philippine endemic fauna species including Isabela Oriole (Van Weerd 2018). It is also a habitat for multiple endemic flora species (Verhave & Cammayo 2018, this booklet). Blue Waters' uniqueness and its exceptional natural beauty currently attracts both domestic and international tourists (Acay 2018, pers.comm.). However, if the management of the area is not sustainable, this can lead to exploitation and destruction of Blue Waters' environment.

This study aimed to assess the current state and development of tourism in Blue Waters, more specifically the current state of the tourist facilities, regulations concerning maintenance, revenues, tourism activity and the upcoming plans for tourism development in Blue Waters, including the emerging challenges.

RESEARCH QUESTION

What is the current state of tourism in Blue waters and what are opportunities for sustainable further development?

Sub Questions:

- What are the existing recreational infrastructures in Blue Waters?
- What are the existing nature-based recreational activities and potential tourism activities in Blue Waters?
- What are the benefits of *Purok* Blue Waters community members in the current tourism activities?
- What are the effects of tourism and emerging challenges in Blue waters?
- What are the perspective of community members regarding tourism development in Blue Waters?
- What are the plans of local government towards Blue Waters' development?

METHODOLOGY

Time schedule

Day	Activities
Jan 18th – Thursday	1. Attended orientation in Baggao Municipal Hall. 2. Interviewed Department of Tourism. 3. Arrival at *Purok* Blue Waters and meet the host family.
Jan 19th – Friday	1. Conducted 12 household surveys in *Purok* Blue Waters. 2. Interviewed untrained tour guide
Jan 20th – Saturday	1. Interviewed trained tour guide 2. Mapped and counted the steps of trail from entrance to Blue Water cottages, photo documentation and area observation 3. Conducted additional 2 household surveys
Jan 21st – Sunday	1. Interviewed a group of local excursionists 2. Approximately 1 hour travel to Barangay Hall in Pallagao 3. Conducted focus group interview in Barangay Hall in Pallagao 4. Travel back to Blue Waters 5. Interview and survey with the collector of entrance fees in Blue Waters

Jan 22nd – Monday	1. Road photo documentation and observation 2. Interviewed 1 domestic and 1 local excursionist groups
Jan 23rd – Tuesday	1. Meeting the rest of the Area Study Philippines group 2. Brief Presentation in Baggao Municipal Hall

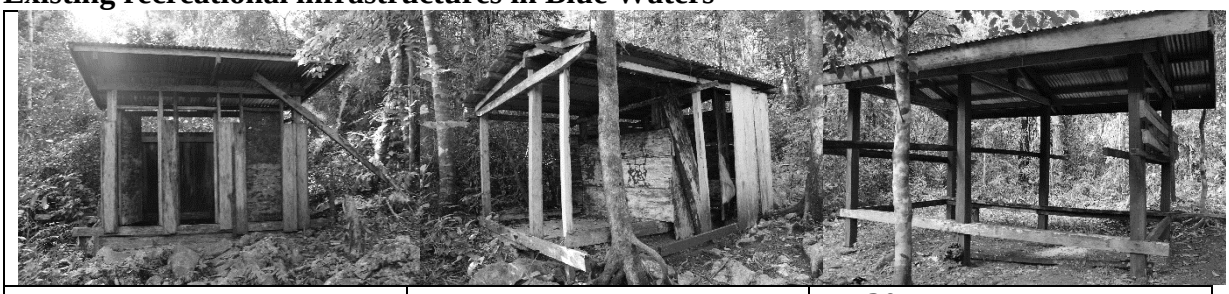
Primary data gathering was done using 3 sets of interview guides for the households living within *Purok* Blue Waters, the tourists who came to the area during the conduct of the research and, with key informants which include the personnel of the LGU Tourism office, tourist guides and the fees collector.

Using an interview guide, we conducted survey in every household located in the area including few households along the road towards *Purok* Blue Waters. Our respondents are the heads of the family, either male or female. The total household respondents is fifteen (15), which include those who live in *Purok* Blue Waters and two (2) households who claimed that they are from a different Barangay but live in neighborhood of *Purok* Blue Waters. We considered these two (2) households because they have an important role, having houses beside the road going to Blue Waters. A focus group discussion was conducted with six (6) elected and two (2) appointed Barangay Officials of Pallagao in their Barangay Hall. Observation in surroundings including tourism infrastructures and photo documentation were done to supplement the data gathered from the interviews and focus group discussion.

RESULTS

There were approximately fifteen (15) total households in *Purok* Blue Waters that were interviewed. Six respondents were male and nine were females depending on who is the available head of the family during the interview. Majority of the respondents' age were above 28 (73%). We also asked questions for the three tour guides which are all male that served as key informants (one trained and other two untrained guides).

Existing recreational infrastructures in Blue Waters



Changing room	Toilet	30 pax sitting capacity unfinished cottage

Designated garbage disposal area	22 pax sitting capacity cottage	Designated cooking area

Figure 2: Blue Waters Recreational Infrastructures near the lagoon (Photos by R Gabinete 20 January 2018)

There are existing infrastructures in the area. In the registration area, there are two waiting sheds where the regulation board is hanged. However, it is written in English and the community does not really understand it. It is also not visible. On the other hand, there are one comfort room, one bathroom and one garbage disposal. Regarding the recreational infrastructures in the site, those are made of wood and the roofs are made of iron. Many of these infrastructures are still on construction stage these include: three (3) cubicles of changing rooms; one (1) toilet; three (3) sitting cottages with the total capacity of approximately up to sixty-four (64) people; the designated kitchen has two (2) spots of firewood cooking place; three (3) division of garbage disposal. Most of the infrastructures were built in 2010. Funded through donations from local people and visitors as well as the 20 pesos entrance fee collection which started in 2015. Initially, the entrance fees were wholly remitted to the Barangay however, by 2016 the municipality issued Municipal Ordinance 2017-07 which requires that part of the collection should go to the Municipal LGU (50%) and the Tourism Office (10%) (Bueno 2018, pers.comm.). From its share, the municipal LGU built an additional cottage and one registration cottage.

Paved road	Dirt road	River Crossing
Old logging road	Old logging road	Walking trail

Figure 3: Blue Waters accessibility infrastructure (Photos by R Gabinete. 22 January 2018)

There is no regular public transportation from the center of Baggao Municipality. Tourists have to rent or drive their own vehicle. Accessibility infrastructure in the area is partly paved, dirt road, and walking trail. The paved road is an ongoing project funded by DOT Baggao. The dirt road is partly stony and when it rains some parts become muddy which make it inaccessible for transportation. From San Jose, Baggao it takes 1 hour and 40 minutes. Trekking from the registration area towards Blue Water Lagoon and Cave takes approximately 1,408 steps or 844.6 meters which can take 30-40 minutes.

Existing nature-based recreational activities and potential tourism activities in Blue Waters and adjacent areas

Blue Waters as a destination offers multiple nature-based recreational activities. According to our respondent, the existing tourism activities in the area are swimming, hiking, educational tourism, bird watching and caving. Swimming often takes place in the lagoon or below the

twenty cascading waterfalls flowing downstream. Hiking towards the Lagoon is possible for active tourists. It is done along the river that ascends hikers for minimum an hour. This allows for a combination of swimming and bird watching along the way. In early morning the fig trees are an exquisite place for bird watching because it invites diverse species of birds (Van der Stelt & Ramos 2018, unpublished data). Researchers identifies over sixty (60) different bird species in Blue Waters within a five days period (Van der Stelt & Ramos 2018, unpublished data). Furthermore, there are explored caves that are available for caving activities. There is a cavern with the length of 2,056 meters and depth of 61 meters. However, the exploration is not done and not accessible for everyone yet (British Cave Exploration 2015). Furthermore, that is just one out of roughly twenty (20) caves in the vicinity. Some are named after the person who discovered it like: Marvel, Nardos & Rod, one after what happened in it: *Naganakan* (Birthplace); and others are still unnamed waiting to be found. The anonymity doesn't end right there, approximately twenty (20) waterfalls are thus far unidentified and inaccessible for everyone (Espe 2018, pers.comm.).

The benefits of the current tourism activities for Purok Blue Waters community members

Forty-seven percent (47%) of household respondents says that they are benefiting from BW tourism activities while 53% do not benefit. Three of those who benefit are tour guides which all are male, they earn ranging from PhP120-300 depending on the number of the people in the group. During the FGD the barangay officials recorded the highest tourist arrival in its history with 1,600 visitors during Holy Week. Moreover, the peak season occurs during summer. This is only an additional income because this is not a whole year activity. There are months that people do not have income from tourism but there is no specific data.

According to our tourist respondents and the current fee collector, there is no entrance fee for the community members of Barangay Pallagao nor registration to visit Blue waters. Therefore, there is no record of visitors from Pallagao and thus the total of BW visitors. However, other communities including the neighboring Barangays such as Versoza and Santa Margarita are required to pay entrance fees. The collector sometimes even encounters social problem from the people who were asked to pay the entrance fee. Because they are not willing to pay.

The current collector who started in June 12, 2017, received a monthly salary of 2,000 pesos from Baggao LGU. One head of a household benefits by using cart to transport luggage of the tourists. The small store located next to the registration area also earn more profit from tourists. Another person benefitted from assisting tourists whom received food as compensation for the service. This means that people in the area are generally not dependent in tourism income.

The perspective of community members regarding tourism development in Blue Waters

The respondents were asked how they like having tourism in the area using a scale of one (1) as least to five (5) as the highest, 13% out of fifteen households gave 3 or neutral and the rest 87% stated that they really like it or 5.

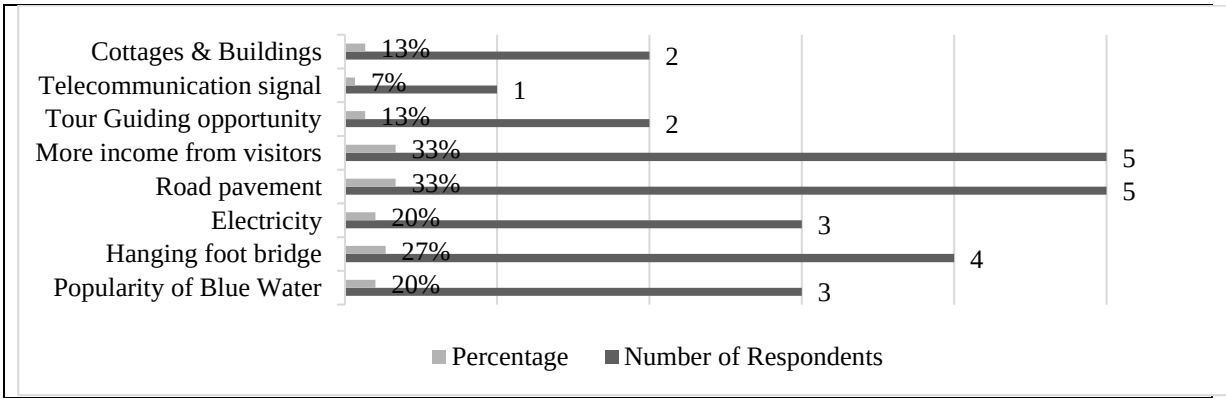


Figure 4. Future Tourism Development Wanted by Community Members in Purok Blue Waters

The information is gathered by asking an open question from respondents where they can suggest anything that comes to their mind. 33% of community members articulated that they want progression on road pavement and another 33% mentioned that they want an increase of visitors in order to have more business profit. They have diverse future development perception in Blue Waters (Figure 4).

Plans of local government towards Blue Waters's development

The current cemented road is the continuing project of Baggao DOT which they expected to complete this coming year. Baggao DOT is also planning to develop the facilities in the area although it is still not clear because there is still no allocated fund for the plan at the moment. Moreover, Baggao Local Government Unit (LGU) is planning to build hanging foot bridge crossing the river near the registration area in order to improve the accessibility to the site. DOT Baggao is currently promoting Blue Waters as an Eco-tourism Destination. They are also working on their ecotourism development plan in Blue Waters. (Mabutas 2018, pers.comm.).

DISCUSSION/CONCLUSION/RECOMMENDATIONS

Government development plan and perspective of the community members

Based on the results of our study, tourism is a developing activity in Blue Waters that started in 2007. There are existing basic infrastructures in the area since 2010 built by the Barangay Pallagao. The used fund was from voluntary entrance fees given by visitors. Some of the facilities were added by the DOT Baggao in 2016 to 2017. However, in general there is a need for maintenance of these facilities. Therefore, the current distribution of collected entrance fees is a challenge for Barangay Pallagao as the officials have mentioned, the share they are receiving is not even enough to pay the salary of person monitoring the area.

There is a plan to improve the accessibility to Blue Waters. The ongoing road construction project of the DOT Baggao that had parted from national highway at Barangay Santa Margarita leads to *Purok* Blue Waters. This aims to encourage more tourists to visit the destination. The LGU also plans to build a hanging foot bridge near the registration area for crossing the river (Mabutas 2018, pers.comm.)

Majority (87%) of household respondents are in favor of having tourism in the area. They believe that tourism will be a key to road development towards *Purok* Blue Waters and will provide them additional income from the tourists. LGU Baggao is supporting the development of tourism in the area by providing fund for a hanging foot-bridge. Similarly, DOT Baggao which formulates the ecotourism plan for BW also provide funding for the road project leading to the area. Combination of practicing ecotourism and proper management in Blue Waters will

lead to protection and conservation of the environment and will generate income to local community.

Record of tourist arrivals in Blue Water

The arrival of tourists in Blue Waters is dependent on the season. This means that tourism is not a whole year activity in the area. The volume of tourist arrivals during summer is much larger than during the rainy season due to the colder weather and more difficult access. A further study on the effect of season on tourist arrivals may be conducted to have a more concrete and information on exact period of peak and low season for tourism in Blue Waters.

The visitor statistics about Blue Waters is incomplete. This is due to the "payment exemption policy" for Pallagao Community. The guest registration input is based on the number of people who are paying entrance fee. Therefore, it does not represent the total number of visitors who came to the area. Complete record of visitors is important in a destination in order to have a clear overview and the history of tourist influx. This will enable the management and tour guides to prepare for peak seasons and cope to necessary management adjustments. (Kidd et. al, 2015).

Potential recreational activities

Based on our observation, the potential recreational activities that can be developed are butterfly -, firefly -, and flying foxes watching as well as owling at night. Butterfly watching, can take place everywhere in the area. There are large varieties of butterfly species in the wild. The firefly watching at night is possible along the river. The flying foxes watching can be practiced every afternoon before the dark because it's the time where flying foxes will look for food. Diversifying tourism activities in a destination will encourage different types of visitors (Moyle et al. 2017), which means more income to the community and BW Management.

Benefits of tourism in the community

Currently, 47% of households in Blue Waters benefit from tourism. However, this only occurs during summer season. The community members will be able to generate more income if they will receive proper training for processing non-timber products into souvenir items and other food products as well as tour guiding. It is also possible to organize households who are willing to offer their home for tourist accommodation. Both tourist and host family will benefit because they have the chance to learn from and experience each other's culture (Liu et al. 2012).

Current challenges

There are several challenges in Blue Waters which are either political, social, environmental, and technical in nature. The boundary conflict is an ongoing case. There is a possibility that the case result can affect the future development of tourism in the area. Littering and vandalism in caves are the most remarkable environmental challenges. It is necessary to address these emerging environmental problems in order to protect and conserve the condition of the site. It is also necessary to prevent the growth of exotic plant species which may negatively affect the ecological balance in the area (D'Antonio et al. 2016).

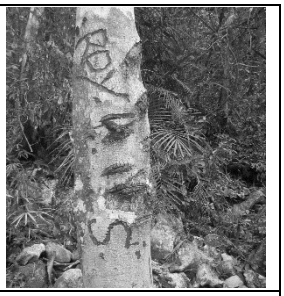
The Blue Waters management is under DOT Baggao which promotes it as an ecotourism site. As mentioned earlier, a bigger portion (60%) of the entrance fee collection goes to the Municipal LGU Baggao and only 40% goes to the barangay. This current sharing agreement found to be insufficient to enable the barangay to pay the salary of the entrance fee collector and the maintenance of the Blue Waters facilities and surroundings.

Visitors were found to often violate the Blue Waters rules and regulations through vandalism and littering as well as non-payment of entrance fees. It is necessary for the management to deal with every single tourist equally in order to encourage visitors to abide the regulations. Another challenge for management is to raise awareness to both community and the tourists about the regulation by translating them into the local dialect. The rules and regulations needs to be posted in strategic places that are visible to both the local people and the tourists.

Effects of tourism and emerging challenges in Blue waters

Scattered empty bottles in the rocks

Plastic garbage compiled in tree's rhizoid



Vandalism in a tree

Figure 5. Emerging environmental challenges (Photos by R Gabinete and J Acay 2018)

We observed littering in Blue Waters (Figure 5). Furthermore, 40% of our household respondents noticed vandalism inside the caves done by the tourists. Two of the local tourists interviewed frequently visit the area for the last 10 years. They claimed that there are some cases that people were picking orchids in Blue Waters. We furthermore observed vandalism in trees (Figure 5). Two (2) citrus seedlings were found growing near the Lagoon which points to human presence.

During an interview, two of our respondents mentioned that there is an ongoing case about the location of Blue Waters. This boundary conflict is between Barangay Pallagao and Barangay of Versoza. Both barangays claimed that Blue Waters is within their jurisdiction. This is due to the development of tourism in the area since the barangay officials of Pallagao mentioned that their Barangay IRA (Internal Revenue Allotment) tripled since they opened Blue Waters as a tourist destination.

The FGD also revealed that the tourists/excursionists are only visiting during summer season especially during the Holy Week *(Semana Santa), which* is a peak season for Blue Waters, and there are less visitors during rainy season. However, there are also cases where Blue Waters experienced drought (Acay 2018, pers.comm.) .The activity will be limited if there is no water and swimming will not be possible.

Blue Waters (May 2015)

Drought in Blue Waters (July 2015)

Figure 6. Illustration of Drought (Photos by J Acay 2015)

During the discussion, it was also mentioned that funding for maintenance and monitoring in the area is also a challenge for Barangay Pallagao at the moment. It is a challenge to Barangay officials to budget the 40% that they receive. They need funds for maintenance of the infrastructures, salary for the person monitoring the area and the person in charge in collection of entrance fees and registration of visitors. Currently, due to lack of funds, there is no proper management and monitoring in the area.

The rules and regulations are written in English and posted in between the two waiting shades or registration area. 53% of the respondents do not know a single tourism regulation in the area. Only 46% of our community member respondents know a maximum of four (4) implemented regulations in Blue Waters.

We interviewed the only one trained and two untrained tour guides living in *Purok* Blue Waters. The trained tour guide, received 15 days of training provided by Baggao DOT. He had undergone first aid, repelling and tour guiding. During peak season, there are other men from *Purok* Blue Waters guiding the tourists without receiving any training. In this case, they do not have safety knowledge as well as about the conservation of the area.

ACKNOWLEDGEMENT

With our deepest gratitude, we give thanks to the people who, with all they can helped us in making this field research possible. We are grateful to the Municipality of Baggao that welcomed us and gave us ideas. To Barangay Pallagao and its Officials who showed us perpetual hospitality, we are thankful. Our deepest appreciation to our host family who accommodated us lovingly with care and shared some knowledge. And to all participants in this Area Study, we thank you for the friendship and ideas we have shared throughout the duration of this program.

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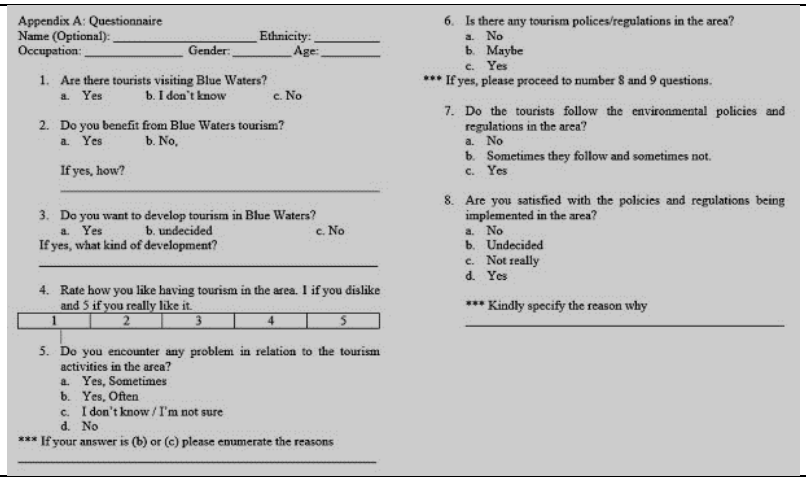
APPENDICES



Appendix A: Questionnaire

Name (Optional): _____ Ethnicity: _____
Occupation: _____ Gender: _____ Age: _____

1. Are there tourists visiting Blue Waters?
   a. Yes b. I don't know c. No
2. Do you benefit from Blue Waters tourism?
   a. Yes b. No,
   If yes, how?
   _____
3. Do you want to develop tourism in Blue Waters?
   a. Yes b. undecided c. No
   If yes, what kind of development?
   _____
4. Rate how you like having tourism in the area. 1 if you dislike and 5 if you really like it.

1	2	3	4	5

5. Do you encounter any problem in relation to the tourism activities in the area?
   a. Yes, Sometimes
   b. Yes, Often
   c. I don't know / I'm not sure
   d. No

*** If your answer is (b) or (c) please enumerate the reasons
_____

6. Is there any tourism polices/regulations in the area?
   a. No
   b. Maybe
   c. Yes

*** If yes, please proceed to number 8 and 9 questions.

7. Do the tourists follow the environmental policies and regulations in the area?
   a. No
   b. Sometimes they follow and sometimes not.
   c. Yes
8. Are you satisfied with the policies and regulations being implemented in the area?
   a. No
   b. Undecided
   c. Not really
   d. Yes

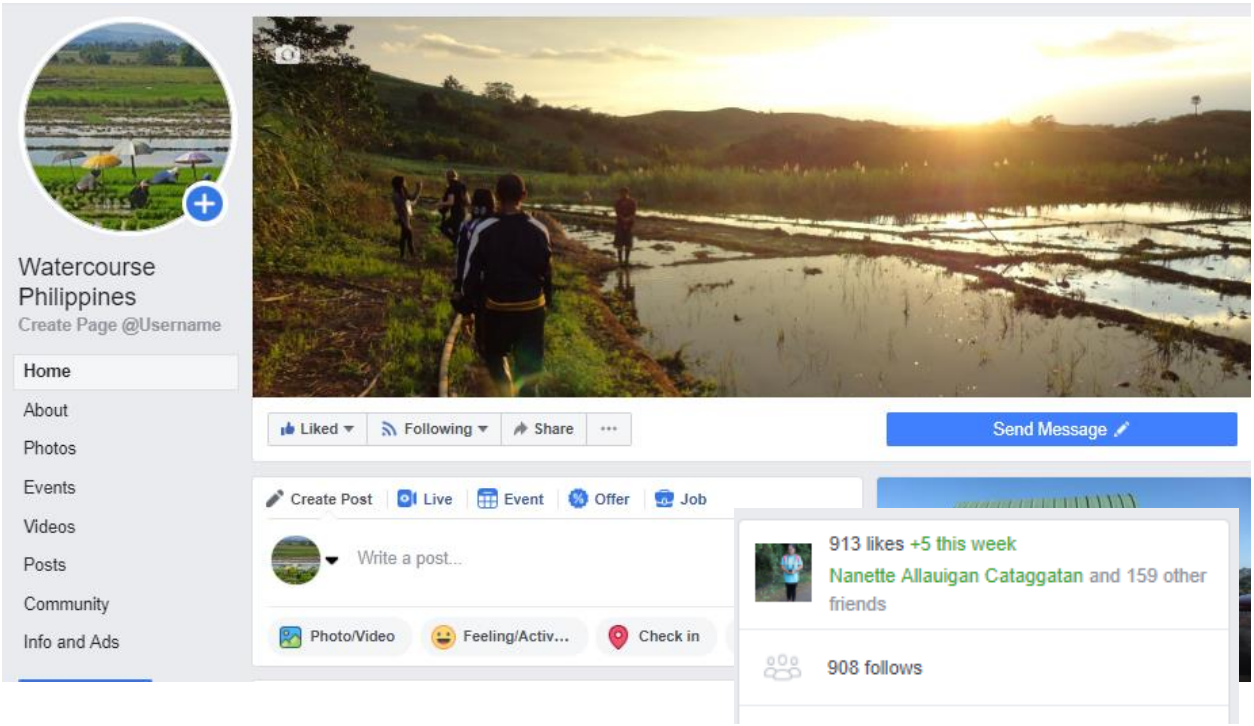
*** Kindly specify the reason why
_____

Figure 7: Appendix A-Questionnaire Guide

1. What are the current tourist activities in the area? What are other potential tourism activities can be done in Blue Waters?
2. Who is currently in charge in the management of Blue Waters?
3. How many visitors are visiting yearly?
4. What is the percentage of local, regional, domestic and international tourists?
5. What time period of the year that tourists visits Blue Waters?
6. Do you have any plan to improve the Blue Water's accessibility for tourism?
7. Are there any adjacent areas to Blue Waterfalls that you're planning to develop for tourism?
8. What are the existing tourism infrastructure in the area?
9. Do you have a plan on building more tourism establishments near blue waters?
   ***If yes, what are those plans, why? And if No, why?
10. Are there any educational tourism programs for the local community? (like trainings for tour guiding)
11. Do you have a plan to regulate the number of tourists visiting Blue waters?
12. Is there any entrance fees for visitors? How much?
    Do you think it's enough?
    Who collect the fees?
    How is the fund managed or used?
13. What are the disadvantages and advantages of tourism development in Blue Waters?
14. How do you conserve the environment in Blue Waters?
15. Complete record of Baggao tourist.

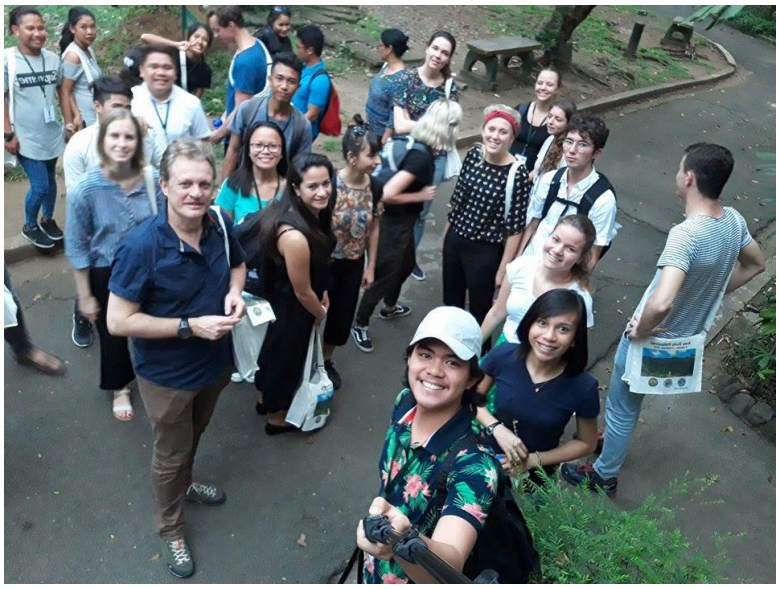
Figure 8: Appendix B-Topic list for Local Government Units and Focus Group Discussion

Facebook blog Water Course Philippines 2018



The Water Course 2018 has started! And the name has changed to "Area Study Philippines". 15 students of Isabela State University and 15 students of Leiden University will participate in the course, In addition, 2 Master students will also join part of the program, including Anna van Delft who was a water course student in 2017. Today, the students met each other at Pension Natividad in Manila and visited the Bioversity Management Bureau where they toured the wildlife rescue center (and met some wildlife up close..) and listened to presentations by conservation specialists and by Dave de Vera about biodiversity conservation and indigenous peoples in the Philippines. Then we had a sumptuous dinner at the Harbour View restaurant.

We are all looking forward to another exciting course full of learning and fun!



How Dilara and Vicson experienced a day of the Area Study Philippines on 5 January, 2018

Most of the students just arrived yesterday, so a very good night sleep was necessary for the busy planning for today! After waking up and we got ourselves a nice breakfast! Nativatad pension serves a wide variety of breakfast options, so we filled our stomachs and got ready for our very first day in Manila! Before we left for our program, we played a name game to try and memorize the names of our fellow Philipino and Dutch students! Everyone was feeling excited and there was a nice atmosphere, not forgetting the excellent hot temperature and sunshine, which doesn't occur in the Netherlands often. The day started of with us visiting the Nino Aquino Parks and Wildlife Center where we saw interesting types of animal species like tigers, birds and especially the Philippine Eagle, which is among the rarest and most powerful birds in the world, it has been declared the Philippine national bird It is critically endangered, mainly due to massive loss of habitat resulting from deforestation in most of its range. This happens to other species too and this wildlife center saves and protects them. After walking around in the park we had lunch and presentations about biodiversity and about the indigenous peoples of the Philippines. It was very interesting, but it was at this moment where the jetlag kicked in for most of the students. After leaving the national park we drove off to harbor view restaurant where we had a nice view and of course we should not forget to mention the excellent and huge amount of food the restaurant has served us; fried rice, oyster soup, crab, fish and even vegan and vegetarian food. Today had been a nice and educational day, with many more to come. It's more fun in the Philippines!




How Eryl Karl and Hanne experienced a day of the Area Study Philippines on 6 January, 2018

Today, we had our second day and also last day in Manila. The day was filled with a lot of touristic things where we learned a lot about Filipino culture.

First stop was at the National Museum of the Philippines. It was the first time for most of the students (both Filipinos and Dutch). In the museum, we saw a lot of cannons and jars that was used in the galleon trade. And also, we saw a miniature ship of the San Diego. Next to that, we learned about the Filipino culture: we saw different handmade baskets, different clothing in different places in the Philippines and musical instruments. Although Filipinos learn about their history in school, the tour was as interesting for them as it was for the Dutch.

Second stop, the "Old City", or more commonly known as Intramuros (derived from the Spanish words "intra" and "muros" meaning the "within the wall". The buildings inside the city gave us the idea on how life was back at the time of the Spanish colonization.

Now, having a grip of the past, everyone has a better understanding of the present context the country is in.

We have been to a lot of historically important places and to cap off the night, we enjoyed the beautiful sunset at Manila bay. After this everyone got to enjoy themselves at dinner at a restaurant which offers every food one could think of.

How Regie and Guirliedane experienced a day of the Area Study Philippines on 7 January, 2018

A day that not only the whole group were really excited. After having our last breakfast in Manila, 9am we left Pension Natividad. It took us 6 hours to reach Imugan from Manila. Finally, it was time to move in mountain areas. Where the real adventure of our trip begins. On our way, we had several stops at gasoline stations. However, street vendors are entering buses even in exclusive tourists' bus, they are really determined to sell their products. This

Filipino way of selling surprises our Dutch participants. We even heard them saying “this will never happen in The Netherlands” but in the Philippines, it is just normal to encounter them. They are just working hard Filipino people who are willing to do everything for living. On our way, we had to stop for lunch break, where everybody was free to choose their own Filipino dish. That was quite challenging because vegetarians don’t have a lot of option in Philippine Cuisine. Luckily, rice exist everywhere. It serves as their emergency food. One of the highlight of our lunch was Rik eating “balot” (It’s a cooked egg with few days old infant chick in it). Strange, right? Some of them say: that’s yucky! But it’s not bad at all. You just need to set aside the chick if you want to try it. And Rik had the guts to do it! We even cheered for him.

Moving towards our destination, we stopped at Dalton Pass View Point. We had to trek for few minutes and what awaits us was the spectacular panorama of the mountain area. We were stunned of the view when we reached the peak. Besides it was the boundary of Central Luzon and Nueva Vizcaya, you will also be amazed during bird migrations period because they normally flew above the mountain valleys towards their destinations. This sounds really fascinating for bird watchers, however it also attracts bird hunters in the region. It is unbelievable because people might get diseases carried by migratory birds as well as it can lead to extinction of those species that were caught. We need to realize that every species has the right to live in this world. We don’t own everything, remember that our mother earth is our provider, we can’t exploit everything we see, unless we are willing to supper in the end. We would like to thank Leiden University for letting us this area study in the Philippines possible, this opportunity gives us additional knowledge and awareness about the value of our ecosystem and conserving our biodiversity. Keep following us and our team will keep you posted about this wonderful journey! On behalf of our team Area Study Philippines 2018, we would like to send you our best greetings from Isabela University Cabagan Campus, Regie L. Gabinete, Leiden University and Guirliedane Palapal, Isabela State University

How Chris and Mark experienced a day of the Area Study Philippines on 8 January, 2018

After our first night staying in Imugan, Merlijn gave us a useful wrap-up of the presentations of the previous days. After this wrap-up we got to meet Kuya Sam, representing the Kalahan people that manage the ancestral lands of Imugan. The lands are often serve as an example how well management of an area by indigenous people's can go. Many groups visit the area for an exchange of good customs. After the presentation by Kuya Sam we went to see their high school, where the students are still educated about the customs of the Kalahan people next to their regular education. After this everyone from our group went to visit the Imugan falls. The hiking trail seemed nice and well maintained until we encountered a river crossing it. This required us to jump from rock to rock in order to reach the waterfall. Something that was quite a challenge. However the effort paid off, because the waterfall was among the most beautiful things we had ever seen. It was a beautiful serene sight, which was disturbed shortly by the screams of people getting into the very cold water. It was a very great and inspirational day and I'm excited for the weeks still to come.

How Kyrvie and Laura experienced a day of the Area Study Philippines on 9 January, 2018
It was last day at Imugan and it feels really sad to leave a place as majestic as Imugan. Breakfast was planned at 7:00, early alarm in a misty atmosphere. With a few others we organized a basketball at 6 A.M. but we woke up in a pouring rain so we went up to bed for another hour. The water was really cold and we could hear Jaylord and Vicson shouting while taking their bath in the morning. Everyone packed their bags and excitedly climbed on the top of the jeeps. While getting up the mountain we could feel the climate changing and the temperature cooling down. The jeeps stopped where the construction of the road was altered. Then Merlijn explained things about the divisions regarding the climate, vegetation and ecosystems between the mountains and the valley were impressive. On the way down we all had the chance to listen to Vicson's interpretation of Lady Gaga's "Bad Romance" wherein he uses all our names as lyrics of the song. Once we were all back to our bus we started to count again; none was missing; we were good to go! Later on, we had lunch in a nice local Ecorestaurant and enjoyed the food. After a few hours we already reached the province of Isabela wherein we had a chance to visit the Magat Dam at Ramon, Isabela and Merlijn shared to us some information about the dam. After a whole day in the bus, which included a lot of singing and sleeping we finally arrived at the Isabela State University-Cabagan Campus. We were welcomed by the students who cooked for us and the food was amazing!

How Alec and DG experienced a day of the Area Study Philippines on 10 January, 2018

This morning our program was officially launched! The ceremony started right on [Filipino] time: 9 o'clock sharp + one-hour delay. The director, the vice-president and other faculty members were all present to welcome us and officially start this year's Area Study Philippines.

Two of the student participants—one Dutch, one Filipino— also gave a short speech about their experience during these first few days. Added to that we got some extra background information about the course and the longstanding relationship between our two universities.
After another delicious Filipino lunch, we had a full afternoon of lectures about the Sierra Madre in general and more specifically about Baggao, the area where we will conduct our fieldwork next week but also about the people, different traditions and ethnic minorities of the region.
We finished the day with a tricycle-ride in and around Cabagan. First stop, the Cabagan market where the Dutch students enjoyed some banana cue, hopia and buko juice. Second, a quick stop at the internet café which will provide us an access to World Wide Web during our stay at ISU. Finaly we paid a visit to Cabagan Xentro Mall. After dinner, students fought for their lives in a boys-versus-girls dance battle. The boys won!

How Manilyn and Kirsten experienced a day of the Area Study Philippines on 11 January, 2018

It is the 8th day of the Area Study Philippines and it now feels like we have known each other for so long, the group is starting to become really close. Today we were starting at 10 am, which is a couple of hours later than the usual mornings. Most students had a longer rest and a relaxed morning. (Which was needed after a night of dance battles…) The relaxed morning was a good start to an interesting, but long morning with two lectures. One by Ma'am Cecile about governance in the Philippines and one by Sir Ruben Bastero, the Regional Director of the National Commission on Indigenous People. After lunch we were told more about the fieldwork in Baggao and our proposals, which we will start working on in the coming days. Our designated areas got assigned and our possible topics became more specific. All students are really excited to go into the field, now they know more about their topics and the places they will be staying.

How Spencer and Daan experienced a day of the Area Study Philippines on 12 January, 2018

Today was a busy day. In the morning we had a lecture about the development plans (Ambisyon2040, PDP, SGD2030 and Cagayan Valley Development Plan). The interesting presentation was conducted by the representative of NEDA in Region 2. After the presentation Sir. Merlijn taught us about how to take photographs and conduct interviews for our research. Most of the teams worked till late and are almost finished with their research proposals by now. Sir. Merlijn also gave an overview about the program for the upcoming days especially the trip and visitation to San. Mariano to get to know more about the Philippine Crocodile.

How Alvin and Laura experienced a day of the Area Study Philippines on 13 January, 2018

We had a free day today, since most people finished their research proposal yesterday. Some Filipino students went home together with Dutch friends and make fun visiting some places in Cabagan. Today is also called 'haircut Day' for the Filipinos because a few of them got haircuts. Many of the students also went to the markets to buy snacks and other supplies for the trip to San Mariano the coming days. For the Dutch students the markets can have some weird and funny stuff like edible chicken-paws and coconuts. Some of the vegetarians also weren't pleased with the view of 3 big pigs crammed into a small cage (probably to sell their meat at the market tomorrow). There is also a mall located in the village including a game hall. An intense and hilarious game of Just Dance followed and afterwards the students were really exhausted because of their commitment, it was really funny. Some of the students also went to the city of Cauayan to visit family and show some Dutch students around. Others also went to their parents with their Dutch friends, It was really interesting to see how their friends living place are and to meet their parents. In the evening most people packed their packs for the trip tomorrow and went to bed early

How Jerry and Orleans experienced a day of the Area Study Philippines on 14 January 2018

The day started bright and early as we left our new home at ISU and headed to Dunoy. At first, we made a stop at the crocodile rearing station, where we had an interesting lecture from Merlijn and Mom Tes, regarding endemic species and how to work with local communities. Afterwards, all of us got a chance to hold a juvenile crocodile. The highlight of this experience definitely was 1 of the juvies peeing on Eva & Jer 😁 we then continued our journey to San Mariano in a large truck, in which we crossed unpaved and rocky roads, wide rivers and had amazing views all the way. This in itself was an incredible experience, but then the real challenge started. The road was too muddy to continue, so we had to hike the last part. It was quite the strenuous hike due to the muddiness and steepness of some slopes, but we all made it, eventually. Our reward was arriving in Dunoy, having some amazing pork adobo and a wonderful swim in the river (yes crocodiles resided here too!!). Dunoy brought excitement to all of us upon arrival, and thus most of us went to sleep early to rest from a long day of traveling, recharging our bodies for guaranteed adventures in the following days.

How Richelle and Rik experienced a day of the Area Study Philippines on 16 January 2018

Yesterday evening some participants joined Joni, Merlijn, Bernard and Amante on a crocodile spotting session. We went to several placed and looked for crocs. By shining on them with flashlights you could see red eyes because their eyes reflect red light. We saw 9 crocs, we think one of them was Muddy. We even had the privilege that Bernhard could catch one of them and we took a selfie with it. That was an amazing experience. At night everyone was tired and went quite early to bed.

Such a refreshing day to wake up. We are still in Sitio, Dunoy, San Mariano, Isabela. We woke up hearing the sounds of insects and chirping of the birds and the pleasant sound of the river flowing. And it is also the big day for Chris, one of the participants this course, before eating our breakfast we cheerfully greet him and sing him happy birthday songs. We have not yet recovered from the hiking that we did the day before yesterday and today we are going to hike back again to the rearing station. Even though we are all tired you can still see the faces of the participants happy and laughing together and enjoying the view of this peaceful community. We first hiked to a reforestation area and each of us planted the national tree, the endemic Narra. The hike was not as muddy as the day before yesterday so we got to the place where the trucks picked us up really fast. The ride with the truck was again a lot of fun. At one sloop we had to be pulled up by the other truck because we were stuck. On our way to Cabagan we went via the Mall in Ilagan to buy supplies for the field-trip. Back in Cabagan we could finally shower and everyone went to bed soon after.

How Jessa and Eva experienced a day of the Area Study Philippines on 17 January 2018

We woke up with semi-sore muscles and blisters on our feet after the muddy hike we had the past day. However, it felt so good to wake up in our own bed at Isabela campus! We all had a calm morning and worked on our research proposals and presentations. We all seemed a bit nervous but also excited for the upcoming party that was planned for the evening to celebrate Chris' birthday, our achievements and our friendships. Our presentations went really well and Merlijn was proud of our ideas and presentation skills. It is exciting to be able to conduct our research in the field in Baggao in the upcoming days! After our yummy dinner, we had a mix of Dutch and Filipino snacks and drinks served outside. Most of the Filipinos were big fans of our stroopwaffles but not so much of the stuffed eggs and the 'drop' candy. The Dutch loved most of the Filipino food (we think). The highlight of the night was the videoke party- we all gathered together and became superstars until midnight. We hope we didn't crack any glass windows at the campus with our "wonderful" singing voices!

How Dilara experienced a day of the Area Study Philippines on 20 January 2018

Yesterday we arrived at our research area Malisi, together with my counterpart Jaylord and 2 other groups who will conduct their research in this place. Malisi is a village that has been made into the main settlement of the Agta tribe and is located in a very remote area in Baggao. To get here we had to hike for 3 hours through the mud, so we took a nice rest after we arrived. Today we conducted several interviews with Agta-respondents about their migration history and current cultural practices. Malisi is a nice place to be because the community is constantly smiley and everybody is so friendly towards us and each other. It may be interesting to mention that we don't have any form of connection or signal with the outside world (like internet), no clean water (we have to boil water before drinking and cook on self-made fires), no electricity (so the nights are very dark, but the thousands of stars we see at night are so beautiful to look at) and there no CR's (we have nature right.....?). It is good to be here because it makes me appreciate everything around me and in my life more. I am so thankful for being here and conducting my research here with my counterpart.

How Regie and Karl experienced a day of the Area Study Philippines on 21 January 2018

Another wonderful day in Blue waters. Waking up to the sound of nature, birds were singing and water in the river was splashing. I had to wake up early, pitch water from the spring and prepare myself because my partner and I had to conduct focused group discussion (FGD) with the barangay officials of Pallagao. We prepared ourselves and around 10 in the morning one of the Barangay Kagawad pick us up and took us in the center of Baranagy Pallagao. We had the chance to meet his family. They are really typical Filipino. Very warm and welcoming. They prepared lunch for us and we were invited to join them in Karaoke before the discussion begins. Meeting the Barangay Officials was really interesting because we are lucky enough that all of them really exert effort to attend our FGD. During the discussion, we were able to gather all the important data that we need. Everybody was willing to contribute to our discussion. This is one of the best experience I had. They are willing to help and support us in our field study. But not only the Barangay officials of Pallagao, but also all community members and Baggao Local Government Unit were all friendly and welcoming. Aside from the beauty of Blue waters Lagoon and cave, I want to share that people there are all amazing!

How Chris experienced a day of the Area Study Philippines on 22 January 2018

Today we woke up early to leave for Mansarong. After having stayed in Remus with our great host-family it was time to say goodbye and leave for a much more remote place in Baggao. We got to experience the amazing driving skills of Merlijn who brought us safely there, sliding through the mud and crossing multiple rivers with his car. Finally arrived in Mansarong we got to experience a way nicer place in Baggao then Remus. There endless train of tricycles and tractors passing, it was peaceful and quiet. During our lunch, I got to experience the most amazing fruit I have ever encountered. The Gujabano, also known as soursop. It looked like it was from another world and it tasted like it as well. It was heavenly. I'm already sad that I won't be able to buy this once I return to the Netherlands. We also got to meet the community of Mansarong, which were super nice and helpful people that helped us with our research. We also got to meet a lot of young piglets and a pet monkey. After the long day, sleeping in the middle of a church was still surprisingly comfortable.

How Spencer and Laura experienced a day of the Area Study Philippines on 27 January 2018

The 27th of January is a quite long busy day since all the student were finishing and preparing all paper works and presentations. This is the second day of writing so most pairs had a lot of papers to do (fortunately there are teams who were already finished). For all students, it is interesting to notice what the work attitude of the Dutch/Philippine students, sometimes it can be quite a challenge to work with someone who has a different way of doing things. But due to this, we learn a lot from each other like how to work with people from different cultures and ways of working. Joint effort or the initiative or every team are very noticeable which means everyone is participating very well to finish the workload, thus, resulted in a wonderful outcome. A day of spending much of our time and all were looking forward to seeing a positive outcome of their research which gave them the opportunity to work together. At the end of the day, all our hardships are not wasted, everybody is happy for we know that we're at ease now, because we give our best. "Don't lose hope if you stumbled once, try and try until good becomes better and better becomes best" good day everyone.

How Jerry and Alvin experienced a day of the Area Study Philippines on 28 January 2018

The 28th of January was our last full day of report writing. Many teams were still working hard to include the feedback received from Janneke and Merlijn. As the day progressed, reports were being finalized and teams started working on their presentations. The overall vibe was good, everybody seemed content and confident with their research, but nervousness started to kick-in when thinking about the official ending of the course. In the evening we enjoyed dinner at the ISU campus, and most went to sleep early, in order to get some rest for the final presentations of the day after.

How Anne-Marie experienced a day of the Area Study Philippines on 2 February 2018

It is our last day of the course. We woke up in Batad and hiked back to the roads were the jeepneys were waiting for us. Some people sat inside and others enjoyed sitting on top of the jeepney for the last time. We then transferred to the bus to get to a really nice restaurant for our goodbye lunch. The lunch was great but also strange as everybody realized we had to separate afterward. We reflected on all the good times we had during this amazing course and hugged each other a lot.After doing the count with everybody for the last time, the Dutch students left in the bus to Manila and the Filipino students got into vans that brought them back home.







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