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**LUGAD RIVER: A CASE STUDY ON THE DEPLETING WATER SOURCE OF
BRGY. HABAG, HOMONHON, GUIUAN, EASTERN SAMAR**



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ABSTRACT

The Lugad River of Brgy. Habag, Homonhon, Guiuan, Eastern Samar have always been the water supply for the members of its community but with time, this water source have been noticed to be depleting. It is by this reason that the researchers conducted the study. The method used is the Case Study Method, under Qualitative research design. The locale is Brgy. Habag, Homonhon Island, Guiuan, Eastern Samar and 15 community members have been chosen as respondents of the study, the selection was based on their knowledge and availability for interviews and queries. The respondents were asked to answer questionnaires and interviewed at the same time either via phone, messenger or in person, observations of the river as well as daily activities of the community members were also done. The results of the study concluded the following 4 reasons for the water source depletion which includes; (1) irresponsible cutting of trees, (2) *Kaingin System*, (3) mining in the nearby barangays, and (4) climate change. Separate studies on the other barangays, as well as a comparative study of the mined barangays and non –mined barangays are recommended.

Keywords: *Lugad River Study, Resource Depletion, Water Source Depletion*



Chapter I Introduction

*"When the well is dry we will know the worth of water."
-Benjamin Franklin*

Civilizations all over the world can never exist without any water source supplying its citizens. This is a proven fact. Downfall of civilizations does not only come with apocalypses such as volcanic eruptions, earthquakes and tsunamis, and even wars. It is believed that the Akkadian Empire, the Old Kingdom of Ancient Egypt, the Late Bronze Age Civilization (Eastern Mediterranean), the Maya Civilization, the Tang Dynasty, the Tiwanaku Empire, the Ancestral Puebloan, the Khmer Empire, the Ming Dynasty and even modern Syria have fallen because of drought. (Masters, 2016)

The total amount of water available on earth has been estimated at 1.4 billion cubic kilometers, enough to cover the planet with a layer of about 3-km deep. About 95% of the earth's water is in the oceans, which is unfit for human consumption and other use because of its high salt content; about 4% is locked in the polar ice caps; and the remaining 1% constitutes all the fresh water in hydrological cycle including ground water reserves. Only 0.1% is available in as fresh water in rivers, lakes, and streams, which is suitable for human consumption. This highlights the significance of the need to preserve our fresh water resources. (Babu, 2014)

Water resources are under major stress around the world. Rivers, lakes, and underground aquifers supply fresh water for irrigation, drinking, and sanitation, while the oceans provide habitat for a large share of the planet's food supply. Today, however, expansion of agriculture, damming, diversion, over-use, and pollution threaten these irreplaceable resources in many parts of the globe. (The Habitable Planet-Unit 8: Water Resources, p.1)

On a similar note, The Philippines, due to its geographical location, has abundant water resources. It has an average annual rainfall of about 2,500 millimeters. The dependable supply is estimated about 126,000 million cubic meters per year (MCM/year) based on recent assessment. On the other hand, groundwater safe yield of aquifers covering some 50,000 square kilometers found extensively in the plains of the three major islands is estimated at 20,200 MCM/year. However, despite of the abundance, it is becoming one of the critical resources in the Philippines. The assessment in 1995 reveals that only 69% of the total population has access to safe water drinking. The rest still depend largely on water from sources of doubtful quality and quantity. Success in improving access to adequate sanitation has been even more elusive, sanitation coverage is 74.2% in 2000, below its baseline of 74.9% in 1991. Agriculture as a whole is the greatest consumer of water however only 44 percent of the potential irrigable area of 3.16 million hectares are being irrigated. Because of insufficient water for irrigation, the country was not able to meet the rapid increasing food demand. Thus, the people especially the poor are often forced to exploit the environment because of their need for food and water that resulted to environmental deterioration. The Philippine government has gone through a wide range of problems to effectively managing the water resources in the country such as extreme weather events, increasing demand conflicts and environmental degradation. Most of all, there is insufficient planning and data base with which to develop adequate planning framework to guide water resources development, hence the apparent lack of coordination among sectors/agencies and weak institutional capacities to regulate and coordinate the activities across sub-sectors. To address the issues on water resources management, the National Water Forum was conducted and called for the immediate adoption and subsequent implementation of integrated water resources management (IWRM) based on river basin as the direction for future water resources planning and investment. (Barba, 2005)

In all of its history the Lugad River has not only been the supplier of fresh, potable water to the small community of Brgy. Habag, Homonhon., Guiuan, Eastern Samar but has also served as bathing area for people wanting to feel refreshed or feel cool during hotter days or after swimming in Handig beach. More than this, the Lugad River is also a place where the community wash their clothes, bathe their livestock and irrigate nearby farms. But the water supply has depleted since then. But the abundant river has changed; now it can only produce so much water during rainy seasons or right after a heavy rain, the rest of the year specially during the summer, when it's hottest –most parts of the river is dry, while other areas have very minimal water. The community would then resort to buying potable water on mainland Guiuan. More disturbingly, the lower part of the river, where the quiet community is located, is used as defecation site for some of its members –this in turn compromises the health of the rest of the community. Kaingin or burning of some parts of the mountain to be converted to farmland, a common practice not just in Homonhon but other places as well is also practiced –this is considered to be another culprit of the water source depletion.

My father spent his youth on Brgy. Habag as his family has resided there since he could remember and only moved to the mainland when he got married. When I was young, my summer was spent on this beautiful island which I fondly called "my safe vacation haven", my getaway from everything stressful offered

by the mainland. This was my youth. The Barangay Fiesta of Habag is on May 14. And this is why we were around during summer. To meet with relatives living there and relatives who were also from other places, working and living their lives on other places, and we would come home –this small barangay in the island of Homonhon. The day after the fiesta, we would have what is locally known as “*barakasyon*” or eating the fiesta leftovers by the beach –Handig Beach to be exact. The place is like a little Boracay. After which we would remove the salt and heat of Handig on Lugad River. Lugad River refreshed us –never failed. It was so cool and refreshing. And in my personal opinion I loved Lugad more than Handig. As a sun-kissed, tan individual, my skin got darker on Handig Beach while I my skin tone never changed on Lugad. There were many trips to Handig that I ignored but a trip to Lugad was always spearheaded by me. Now, on my 30s, I asked my folks back in Habag, how the place is, and presented my intentions of revisiting the place. But as they told me about the changes of my little haven, I was hurt, disappointed, dismayed and at first –wanted nothing to do with the place anymore. But this is not why I educated myself; this is not why I went to school. I am presenting now my sincerest intentions of trying to fight for Lugad, to know what exactly happened, to look for ways to revive it. To make sure Lugad would go back to its glory days. I want to save my father’s home.

Problem Statement

The Lugad River has been a water source for many generations of Habagnons but has depleted in the past decade. This study was conducted to determine the causes of depletion. Specifically, this study aimed to answer the following questions;

1. How has the River changed in the last 10 years?
 - a. Size
 - b. Flow
 - c. Cleanliness (free of trash and debris/physical foreign objects)
 - d. Presence of Marine Life
 - e. Level of potability
2. Why is the water source depleting?
3. Is there a pattern of the water flow of the river in terms of;
 - a. On what months is the river overflowing?
 - b. On what months is the river dry/ mostly dry?
4. How many people depend on the water source?
5. How much do people depend on the water source?
6. How do you use this water source? Check your answer.
☐ for drinking
☐ for bathing
☐ for washing clothes
☐ for drinking / bathing of livestock
☐ for irrigation
☐ others; Write you answer

-
7. How does this change affect the community members who are beneficiaries of this water source?
 8. What are their alternatives when the water source is not available?

Significance of the Study

This study sought to study the changes of the Lugad River and how it has become a depleting water source. This further studied the effects of the changes to the community whom of which have benefited from the water source. The researchers have listed the following;

To the community members of Brgy. Habag. For them to be aware of the causes of the depletion of the water source and for them to know what they can do to help improve the conditions that would increase production of the said water source.

To the Local Government Unit of Guiuan. For them to know what measures to take to avoid water source depletion and think of ways to help communities deal with water shortage.

To other communities with depleting water sources. For them to be aware of the causes of the depletion of the water source and for them to know what they can do to help improve the conditions that would increase production of the said water source.

To other communities with water sources. For them to avoid the same fate with those communities whose water sources have depleted.

To future researchers. For this study to help to help them develop further researches regarding depletion of other water resources or the development of any other innovations to fight water shortage.

Scope and Limitation of the Study

This study was conducted on Brgy. Habag, Homonhon, Guiuan, Eastern Samar, the barangay where Lugad River is nearly located. The study was conducted on the mentioned area as the community members are the major beneficiaries of the river.

Definition of Terms

For the purpose of this study, the researchers found it important to give the conceptual and operational definition of the terms to have a clear understanding of the terms used in the study.

Beneficial Use. Is a legal term describing a person's right to enjoy the benefits of specific property, specially a view or access to light, air, or water, even though title to that property is held by another person. (Black's Law Dictionary, Pocket (2nd ed.). 2001).

In this study, the term is used in the same manner.

Freshwater. Water that is considered suitable for consumption. (Merriam-Webster Dictionary)

In this study, the term refers to the fresh water from Lugad River.

Groundwater. Water within the earth especially that supplies wells and springs. (Merriam-Webster Dictionary)

In this study, the term is used in the same manner.

Kaingin System. Means clearing by the cutting down and burning of trees and plant growth in an area for cultivation purposes. (The Manila Times)

Point Source. An identifiable confined source (such as a smokestack or wastewater treatment plant) from which a pollutant is discharged or emitted. (Merriam-Webster Dictionary)

In this study, the term is used in the same manner.

Receiving Water. Is defined as a body of water such as an ocean, stream, river, pond, lake or other such body of water into which treated or untreated wastewater or effluent is discharged. (Trenchless Pedia).

In this study the term is used as Lugad River receives trash, human wastes and other forms of dump.

Renewable Resource. is a substance of economic value that can be replaced or replenished in the same or less amount of time than it takes to draw the supply down. (Investopedia, 2019)

In this study, the term is used in the same manner.

River Basin. is the area of land from which all the water flows into a particular river. (Collins)

In this study, the term is used in the same manner.

Runoff. The portion of precipitation on land that ultimately reaches streams often with dissolved or suspended material. (Merriam-Webster Dictionary)

In this study, the term is used in the same manner.

Surface Water. Natural water that has not penetrated much below the surface of the ground: drainage water. (Merriam-Webster Dictionary)

In this study, the term is used in the same manner.

Water Quality. Is the degree to which water is clean, and whether it is suitable for drinking, for making plants grow, or for fish to live in, etc. (Collins)

Watersheds. Describes an area of land that contains a common set of streams and rivers that all drain into a single larger body of water, such as a larger river, a lake or an ocean. (Missouri Botanical Garden)

In this study, the term is used in the same manner.

Chapter II Methodology

Research Design

The researcher design used in the study was qualitative research design through case study method.

Qualitative research is a process of naturalistic inquiry that seeks in-depth understanding of social phenomena within their natural setting. It focuses on the "why" rather than the "what" of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their everyday lives. Rather than by logical and statistical procedures, qualitative researchers use multiple systems of inquiry for the study of human phenomena including biography, case study, historical analysis, discourse analysis, ethnography, grounded theory and phenomenology. The three major focus areas are individuals, societies and cultures, and language and communication. Although there are many methods of inquiry in qualitative research, the common assumptions are that knowledge is subjective rather than objective and that the researcher learns from the participants in order to understand the meaning of their lives. To ensure rigor and trustworthiness, the researcher attempts to maintain a position of neutrality while engaged in the research process (University of Utah –Nursing Research).

While according to Simply Psychology, Case studies are in-depth investigations of a single person, group, event or community. Typically, data are gathered from a variety of sources and by using several different methods (e.g. observations & interviews). The research may also continue for an extended period of time, so processes and developments can be studied as they happen.

The Case study method, under Qualitative research design was opted as best choice since the study intended to find out the concrete situations and experiences of the members of the community who are benefitting from the freshwater provided by Lugad River and are experiencing the side effects of the depletion of the said water source.

Research Locale

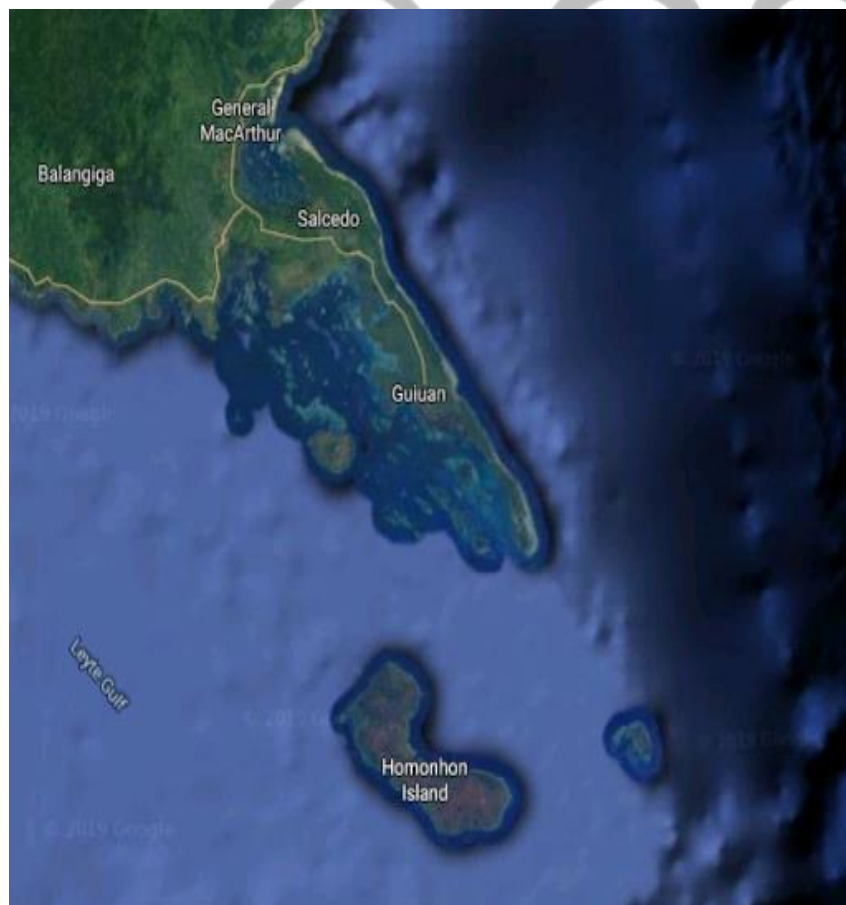


Illustration 1. Map of Guiuan, Eastern Samar, location of Homonhon Island



Illustration 3. Location of Lugad River and Brgy. Habag, Homonhon, Guiuan, Eastern Samar

Participants of the Study

The participants of the study included the community members of Brgy. Habag, Homonhon, Guiuan, Eastern Samar. They are the beneficiaries of the fresh, potable water produced by Lugad River.

Sampling Design

The participants were identified through purposive sampling. This type of sampling can be very useful in situations when you need to reach a targeted sample quickly, and where sampling for proportionality is not the main concern. Fifteen (15) residents from Brgy. Habag were chosen to be respondents of the study.

Research Instrument

The instruments used in the study included (1) a questionnaire that served as primary source of information which can only be given by the participants of the study, (2) photo –documentation which showed the actual situation of the Lugad River, (3) observation notes –which guided the researchers on the changes of the river, and (4) interviews and focus group discussions for data triangulation which helped enhance the credibility of the study.

A diary was also used to put the reflections on the process and the role and influence of the researchers on the study (this is otherwise known as reflexivity).

QUESTIONNAIRE

Name: _____ Age: _____ Date: _____
Address: _____ Occupation: _____

1. How has the River changed in the last 10 years?
 - a. Size
 - b. Flow
 - c. Cleanliness (free of trash and debris/physical foreign objects)
 - d. Presence of Marine Life
 - e. Level of potability
2. Why is the water source depleting?
3. Is there a pattern of the water flow of the river in terms of;
 - a. On what months is the river overflowing?
 - b. On what months is the river dry/ mostly dry?
4. How many people depend on the water source?
5. How much do people depend on the water source?
6. How do you use this water source? Check your answer.
____ for drinking
____ for bathing
____ for washing clothes
____ for drinking / bathing of livestock
____ for irrigation
____ others; Write you answer

-
7. How does this change affect the community members who are beneficiaries of this water source?
 8. What are their alternatives when the water source is not available?

Ethical Considerations

This study, like others is subject to ethical considerations. Though the study was focused on a depleting water source, still the privacy, security of the respondents was taken into consideration. The respondents signed a consent form to assure the researchers of their complete participation on the study. The respondents were also informed of the objectives of the study and were then reassured of the confidentiality of their identity.

Researcher's Reflexivity

The main author of the study has one of her parents as a native of Brgy. Habag, Guiuan, Eastern Samar. This is her story;

When I was young, we used to go to Habag during the summer, to enjoy fully the vacation as Habag is a tropical paradise and to escape the stress given by the mainland, work and school stuff and the people, like my pathetic classmates. More importantly, the barangay fiesta or more commonly known as the Feast Day of San Isidro Labrador, is held every 15th day of May. It is not just about food or even religion, it is also about family reunions as many family members from different parts of the world (Manila, Tacloban, abroad –as we have many relatives who are overseas Filipino workers) comes to meet with loved ones. While on the island, we would go to Handig beach and soak our skins until it turned dark brown and sometimes, as my mom used to say -violet – I don't know why, I guess it was her way of telling my I'm over burnt and yes I think I did because after that day, I'd really get skin burn and put cream on my face just to remove the skin cracks and the burning sensation in my nose. We also went to the mountain, to get some guavas or other fruits, or just see the views of the mountain side. But my best memories were spent swimming in Lugad River, after a long walk to the mountain, lower part of it at least; we would cool ourselves with bathing in Lugad River. It was a great experience, I would dive and open my eyes while just trying to get some dead leaves or pebbles or anything I could see from the bottom. I could open my eyes since the water is fresh, so not so harsh for the eyes and I could drink the water as it is not salty. I would dive a lot and I could see everything as the water is so clear. I did not worry about getting tanned as the river was covered by trees, hidden away from the sun. The place was cool and refreshing. These were my memories with my father's hometown. Sadly, things have changed. I have heard and I have seen that the Lugad River has dried up. The water has depleted. No longer abundant, no longer clean. I want to know what happened. I want to know if I could do something about it –bring it back to its former glory, its former grandeur. This is my goal in conducting the study. I have read of sustainable development, of how to try to save Mother Earth and this is where I want to start.

Data Collection

To gather information, the researchers conducted open –ended surveys, interviews and observations. These were recorded through cellular phones, and recorders. This was done with the approval and consent of all concerned, specially the respondents.

For the depleting water source, photos were taken to document the changes. Locations and season were considered. Pictures of the river were taken on May 2019 –Sunny/Dry Season on three parts of the river; (1) the uppermost part; accessible by people, (2) the middle part of the river, and (3) the mouth of the river –where the Lugad River meets the Casogoran Bay. The barangay council and the residents of Barangay Habag were informed beforehand of this activity.

There was triangulation of data gathered to ensure that the researchers were accurately getting the points of the respondents.

Data Analysis

In this study, the analysis of the collected data was done by transcribing the recorded files, writing down all the things that have been observed on the research locale and by simplifying, summarizing, and interpreting all the collected printed data. The data analysis was divided into parts; depending on the themes that were products of the data gathered.

Chapter IV

Presentation, Analysis and Interpretation of Data

The following chapter contains the photo documentation of the Lugad River as well as the responses/ answers of the respondents on based on the questions on the survey questionnaires and the follow –up in –depth interviews. This chapter further discusses their responses.

The following 15 respondents/community members of Brgy. Habag, Guiuan, Eastern Samar were chosen for the study;

1. COG, 63 yrs. Old –retired teacher,
2. Che, 20 yrs. Old –college fresh graduate, helps in farming
3. LsubL, 36 yrs. Old-housewife/farmer
4. WOG, 67 yrs. Old –Brgy. Secretary, farmer,
5. LOG, 50 yrs. Old –office worker (stays in Habag during summer time and December)
6. GKMGG, 26 yrs. Old-nurse (stays in Habag during summer time and December, votes in Habag)
7. J.P.GP, 24 yrs. Old –HRM grad, works in catering in the mainland but regularly goes home to Habag to help father take care of farm
8. YnGP, 21 yrs.old –HRM grad, works in catering in the mainland but regularly goes home to Habag to help father take care of farm
9. Milo Everyday, 22 yrs. Old –entrepreneur (lives on the mainland but regularly visits grandparents in Habag)
10. GGO, 54 yrs. Old, -housewife, farmer
11. RimG, 50 yrs. Old -teacher (stays in Habag during summer time and December)
12. Ema R., 45 yrs. Old –office worker, farmer
13. DG, 31 yrs old -teacher
14. MelGB, 55 yrs. Old, teacher
15. NOG, 56 yrs. old–office worker (stays in Habag during summer time and December)

1. On the changes of the river on the past 10 years;

Participants	Size	Flow	Cleanliness	Presence of Marine Life	Level of Potability
#1 COG	Smaller, shallower	Stagnant	Not so clean	Not visible, no fish	Not so potable
#2 Che	Same	(Depends on the season) during the summer of dry season the large part of the river, specially the lower region becomes dry and other parts in the mountain part has a small and slow flow of water. During rainy season there is abundant supply of water in the river and a strong	During dry season there are parts of the rive that have been stocked with trash but it is being washed away during and every rainy season.	There is still a presence of marine life in parts where there is a clean supply	The water in the mountain could still be drunk. However during the rainy season it is needed to be “saraan” filtered and boiled before it is safe to drink.

		current of water flow			
#3 LsubL	<i>Lumiit, kumipot</i> (Got smaller, narrower)	<i>Hindi na gaanong dumadaloy, May part na stagnant</i> (Rarely flows and some parts are stagnant)	<i>Marumi na, maraming basura, -Human and animal waste</i> (dirty with a lot of waste-human and animal)	<i>Bihira or wlang mga isda</i> (No fish is present)	Potable but only on the topmost part
#4 WOG	Sunny-naguti (<i>habagat</i>) Nadako (<i>amihan ngan sigidas it uuran</i>) On sunny season –or Habagat (Southwest Monsoon) the river becomes thin and shallow But on rainy season or Amihan (Northeast Monsoon) The river overflows	Mauran-overflowing, blurry-new rain-banika When its fresh from rain, the river is dirty due to mud being washed/eroded but as the rains goes on, the river becomes clearer. Maadlaw-dna nag aaganas ha ubos On very sunny days, the river dries up	Mahamis ha igbaw Ha ubos dre The “ Lidtong ” (daan nga pariguan-dirty) –is the old bathing/swimming area that is no longer used as such because carabaos /livestock are being bathed there	Myda freshwater fish hin taob Freshwater fish are seen when the river is flowing and thick but moves to other places, hidden when the river is dry. Damag, urang (hipon), palo	Acidic (From 2 springs on top of the mountain – watersource that supplies the river, the river being the watersource for the people. The spring is believed to be the source of all freshwater in all barangays of Homonhon island). The 2 springs (burabod) were discovered by PMPI –an international non – government organization that came to Guiuan’s aid after the devastation brought by super typhoon Haiyan (Yolanda) back in 2013
#5 LOG	Different size depending on the weather	When it is raining hard, the water from the river is able to reach the sea	The river is clean	Freshwater fish, Freshwater shrimp	<i>No answer</i>
#6 GKMGG	Smaller and shallower, it only gets bigger during rainy season	Flows fine when raining or after heavy rains. Does not flow when its to hot or sunny	Some people poop on the lower part, their animals also poop. And they also wash clothes so its not	Fish and other marine life is seen but only when	We can drink if the water is from the upper part. Never on the lower part though

			clean on the lower part. Only the upper part is clean	the water is enough	
#7 J.P.GP	Only small and shallow during sunny days but is deep and wider when rainy season	Stagnant on dry seasons but flows faster depending on how heavy the rains are	Not clean at the bottom as it is used for bathing animals	I do not know where the fish go when the water is gone.	We can only drink the water from the upper part as it is cleaner
#8 YnGP	River is smaller now	Almost no water flow specially during dry season but flows rapidly after heavy rains	Its really clean near the springs but becomes dirty at the lower part because of the carabaos staying there and some people defecating in the area	There are fish when the water is high	Drinkable on top of the mountain
#9 Milo everyday	Smaller	Mostly stagnant	Not so clean	There is marine life when the river is flowing	Drinkable but I only drink mineral water
#10 GGO	Smaller, narrower, shallower	Mostly stagnant. It only flows when there is enough rain	Not so clean specially at the lower and middle part	There are fresh water fish, shrimp and other smaller creatures	Drinkable but only on the topmost part of the river
#11 RimG	Narrower and shallower and most areas have no water specially during dry season	It only flows well during rainy season. Its dry during summer.	Not so clean specially at the area where the farmers let their carabaos bathe.	There are still fish and shrimp when the river is deep and wide.	Not potable in most areas.
#12 Ema R	Narrower and shallower	The fine specially when there is rain	Not so clean	I can still see some fish and shrimp	Drinkable but needs to be boiled first
#13 DG	Smaller, Shallower, sometimes none at all	Flows just fine on rainy seasons and almost stagnant to no water during dry seasons	The lower part of the river is dirty because people use it for bathing, washing, sometimes pooping. And also for their carabaos-washing. The upper part is cleaner since it is not easy to access.haha.	I can only see the fish when there is water. But the smaller sea creatures are seen even when there is almost no water.	Drinkable on the upper part but I would rather drink the mineral water bought from mainland because I have amoebiasis and the hospital is in the mainland so its dangerous to get the sickness.

#14 MelGB	Smaller and shallower	The river loses a lot of its water during the dry season	The lower part is dirty	There are still some fish	Needs to be boiled but the fresh water and ready to drink water can be found on the springs or topmost part.
#15 NOG	Same size	Depends on the season (the river flow reaches the sea during rainy season, but during dry season it only reaches a limited area and becomes dry)	The river is with trash mostly leaves and branches of trees that is surrounding the river	Still with marine life like freshwater shrimp, freshwater eel, and freshwater fish	Not potable because some farm owners took a bath, clean root crops, wash clothes in the area near their farm.

2. On the Reason(s) for the water source depletion

Participants	Why is the water source depleting?
#1 COG	This is due to kaingin, irresponsible cutting of trees as the absence of trees means nothing is there to hold the water.
#2 Che	I think because of lack of rain or drought
#3 LsubL	I don't know for sure but since the mining activities started on the other barangays, the river is no longer overflowing easily even after heavy rains. It does overflow when the heavy rains occur for several days though.
#4 WOG	Affected by cutting of trees adjacent to the river, kaingin (there was a rule (agreed by the barangay) to not burn or cut trees near the river but was not followed by the community members) these are long term effects –trees cut long ago (during the times of their parents and grandparents) affects the river now Mining is also a factor since there is only one source of water. Community members of Brgy. Bitagan, Brgy. Inapulangan and Brgy. Habag do not want mining for the reasons stated below; The mining on other barangays (as Brgy. Cagusan, and Brgy. Casuguran has no more water supply –they buy NAWASA and Mineral from the mainland, and Brgy. Canawayon, and Brgy. Culasi respectively has no more to very minimal water supply) deeply affected their water sources. Mining on these places might also affect the water source in Brgy. Habag (as it is believed to be the same water source since the source comes from underground, from a spring)
#5 LOG	Depleting when it does not rain for a long period of time
#6 GKMGG	Because of cutting of trees and absence of roots to hold the soil and water. I think also because of mining.
#7 J.P.GP	Because of irresponsible cutting of trees and mining from other barangays
#8 YnGP	Because of irresponsible cutting of trees and <i>kaingin</i>
#9 Milo everyday	I don't know
#10 GGO	Because of cutting of trees near the river.
#11 RimG	Because of <i>kaingin</i> and cutting of trees next to the river. The area is hotter now so the water evaporates.
#12 Ema R	Because of mining –the river has gotten worse because of that.
#13 DG	I think its because too many trees have been cut and the place is warmer so the water easily evaporates. There are also more farms now than before, so more uses the water.

	The mining from other barangays also affected the water source since before mining occurred; the river was doing just fine.
#14 MelGB	Because of irresponsible cutting of trees and <i>kaingin</i> system and also mining.
#15 NOG	Not really depleting, it only needs proper maintenance like cleaning those leaves and twigs of trees on the river beds by responsible barangay officials and those using it more often.

3. On the pattern of the water flow of the river in terms of;

Participants	a. On what months is the river overflowing?	b. On what months is the river dry/ mostly dry?
#1 COG	November – February	March - September
#2 Che	October – February	March – September
#3 LsubL	November – February	March - September
#4 WOG	Rainy months Habagat (Southwest Monsoon) April - July	Amihan (Northeast Monsoon) <i>Tag 6 months 6 months iton pero ngiiniba na yana agi hiton nga climate change</i> It's usually 6 months dry and 6 months wet but changed because of effects of climate change. April –June
#5 LOG	October – January	April –June
#6 GKMGG	-ber months September, October, November, December and March	April, May, June, July, August ...but sometimes there are heavy rains
#7 J.P.GP	-ber months	Other months
#8 YnGP	Usually from October to March	The rest of the months
#9 Milo everyday	-ber months	Very hot months
#10 GGO	Habagat	Amihan
#11 RimG	November – March	Other months
#12 Ema R	September –March	Other months
#13 DG	I don't know exactly what months but it overflows every time there is heavy rains. I think December.	I don't know either because there are no fixed months now because of climate change, but it gets really dry during summer or very hot seasons. I think May –but sometimes it rains hard in May
#14 MelGB #15 NOG	November – February December –February (not sure) Or when there is typhoon with heavy rains	March - September April –June (not sure) During El Niño

4. On the number of people depending on the water source

Participants	How many people depend on the water source?
#1 COG	All people
#2 Che	All of the people living in the barangay depends on the water source
#3 LsubL	"All of the people in our barangay depend (on this water source)"
#4 WOG	<i>Kay tanan man iton nagamit it mga taga barangay. Tana gad it ada.</i> All members of the barangay. Everyone
#5 LOG	All people in the community depends on the water source
#6 GKMGG	All of us who lives in the barangay. Everyone drinks water so everyone depends on it
#7 J.P.GP	All of the community members get water from the river.
#8 YnGP	All members of the barangay

#9 Milo everyday	All people of course since all needs water to survive. They use it either directly getting from the river or getting water from the pipes –the pipes lead to the river <i>kasi</i>
#10 GGO	All residents of the barangay
#11 RimG	All
#12 Ema R	All Bgy. Habag community members
#13 DG	All the community members use it for water source, for washing and drinking. Years ago, we would swim in the river because its so cool and refreshing, especially during summer but now, we cannot because there is almost no water.
#14 MelGB	All Bgy. Habag community members
#15 NOG	To date, since almost all houses now in Habag are installed with faucet, only those with nipa huts in their farm depend on the river as their water source.

5. On the level of dependency of the community members on the water source

Participants	How much do you depend on the water source?
#1 COG	"We use it for everyday activities."
#2 Che	We depend on the water source in a way that is vital part of our day to day living.
#3 LsubL	<i>"Sobrang nakadepende kami dahil diyan kami kumukuha para sa aming pang araw –araw .. dahil sa tubig. Very useful"</i>
#4 WOG	<i>Tanan kinahanglan hin tubig ha Lugad kay gingagamit nga irinmun hiton kadam-an pro danay makuri pag-alog asya maupai kun diri naruruba it mga (water) pipe.</i> Very much since it is the drinking water And all uses The pipes are very useful because they don't need to fetch the water themselves – the source is very far.
#5 LOG	All daily activities are dependent on the water source
#6 GKMGG	It gets very hard when there is very little water in the river, or when the pipes get broken. So I guess we depend on the river so much. We do get our drinking water and water for bath and washing there.
#7 J.P.GP	Very much dependent on the water source
#8 YnGP	We depend on it very much since we get the water for drinking
#9 Milo everyday	I take a bath there when the weather is too hot. Also use the faucet for washing my clothes, washing dishes and our motorbike
#10 GGO	Very dependent since all drink water, wash clothes, take a bath, cook and other tasks.
#11 RimG	We depend on it very much, its hard when the pipes are broken because we need to fetch the water from its very source.
#12 Ema R	Very dependent
#13 DG	I depend on it 90% because I drink only mineral water, but I think it would be nice to be able to enjoy the river totally like before. When we did not need to buy the water –because its hard during rainy seasons or when there are storms as going to the mainland is a 4 hour boat trip and is never easy.
#14 MelGB	The Brgy. Habag community will not become what it is now without the water source. All lives are dependent on that river.
#15 NOG	<i>No answer</i>

6. On how they use their water source

Participants	for drinking	for bathing	for washing clothes	for drinking / bathing of livestock	for irrigation	others; Write you answer

#1 COG	/	/	/	/	/	We also catch fish on the river
#2 Che	/	/	/	/	/	For cooking
#3 LsubL	/	/	/	/	/	For cooking
#4 WOG	/	/	/	/	/	For catching fish – very rarely
#5 LOG	/	/	/			<i>No answer</i>
#6 GKMGG	/	/	/	/	/	<i>No answer</i>
#7 J.P.GP	/	/	/	/	/	For cooling by swimming specially on hot days
#8 YnGP	/	/	/	/	/	For cooling by swimming specially on hot days
#9 Milo everyday	/	/	/	/	/	Swimming, having fun, cooling off
#10 GGO	/	/	/	/	/	For cooking
#11 RimG	/	/	/	/	/	For cooking
#12 Ema R	/	/	/	/	/	For cooking
#13 DG		/	/	/		For swimming during hot days
#14 MelGB						
#15 NOG		/	/			<i>No answer</i>

7. On the effects of the changes of the water source on its beneficiaries

Participants	How does this change affect the community members who are beneficiaries of this water source?
#1 COG	“The change affects the people so much as so much life depends on it. Without the water source, most of us would be forced to live somewhere.” Its hard to get the water from the source but there are men assigned to fix the pipes or see the problem whenever the water is running low. We also need to boil the water for drinking when the rain just ended because the water gets mixed with soil and mud and not safe to drink. <i>“Mahirap, nagiimbak kami ng tubig pero hindi sapat, kealangan paring bumili ng tubig o mgimbak kapag umuulan.”</i> It's hard for us, we save the water during rainy days but its still not enough, we still need to buy from the mainland.” Big effects especially when pipes are broken, they sometimes use seawater to wash dishes. People have no choice but to store water.
#2 Che	
#3 LsubL	
#4 WOG	
#5 LOG	When the water flow is very minimal, the water flowing through the houses is also limited. The water flow is very minimal when it does not rain for a long period of time but it does not run out of water.
#6 GKMGG	We started from having the non-stop water faucet before Yolanda/Haiyan but now we have faucets at home. When they get broken, we need to put waters on pails and walk kilometres higher to the mountains to get the water. Its hard. We have to get mineral water from the mainland when the river is dry and when its raining to hard –since we cannot go to the mainland as travelling in the sea is very dangerous –we collect as many rain water as we can. Getting fresh and drinking water is harder now
#7 J.P.GP	
#8 YnGP	
#9 Milo everyday	
#10 GGO	
#11 RimG	We buy water from the mainland or fetch for free from the mainland when water is scarce. We get buckets and fetch the water ourselves when there is very little water but sometimes someone is tasked to fix the pipes so the water is easy to access again

#12 Ema R	We store the rain water and buy mineral water from the mainland.
#13 DG	We collect rain water on rainy days, we have faucets and pipes leading to the river but years ago we used to have an infinity faucet, no switch off as there was abundance of water. We do not have that now-there is very little water from the river now.
#14 MelGB	We need to know when the water is coming and when it is scarce so that we can prepare for it in advance
#15 NOG	Not much effect due to the installation of faucet in almost every household from a different source of water.

8. On their alternatives

Participants	What are their alternatives when the water source is not available?
#1 COG	<i>No answer</i>
#2 Che	Mineral water and rain water
#3 LsubL	Mineral water or water from the mainland.
#4 WOG	Stocks water while the river is overflowing or raining And buy mineral water from the mainland
#5 LOG	<i>No answer</i>
#6 GKMGG	Buy mineral from the mainland and store water during rainy seasons or when it rains.
#7 J.P.GP	Mineral water and rain water
#8 YnGP	Mineral water bought from the mainland and rain water collected during rainy days
#9 Milo everyday	Mineral water and rain water
#10 GGO	Mineral water and rain water
#11 RimG	Mineral water and rain water
#12 Ema R	Mineral water and rain water
#13 DG	Mineral water from the mainland and collected rainwater.
#14 MelGB	Mineral water and rain water
#15 NOG	<i>No answer</i>

Additional Notes:

Given by Respondent #4: The old water source near the Barangay Plaza, (faucet with no off button) was ruined by Super Typhoon Haiyan (Yolanda) back in 2013 but was replaced by water pipes donated by PMPI (international non –government organization). The water pipes start from the upper part of the water source and leads to the houses of the barangay, three (3) houses share one (1) faucet.

Given by Respondent #4: The 3 barangays of Homonhon island namely; of Brgy. Bitaugan, Brgy. Inapulungan and Brgy. Habag fiercely fights mining industries and stop them from entering their places. Boats coming in are not allowed to enter as the community members believe that mining activities would not do any good to their communities. They have asked for the help of the church and priests have been supportive of them –only 1 priest is not supportive of this and is a matter of fact deeply supportive of the mining activities specially in Manicani Island. They strongly believe that mining will not do them any good as this activity would only deplete their resources, not just their water supply. And they do not want to leave their home. They have seen the effects of mining in Manicani Island and do not want the same fate to happen to their little island paradise.

Given by Respondent #1. The farmers of the community had irresponsibly cut the trees near the river, and other areas and practiced *kaingin* to have more crops and improve crop produce but they have ignored the importance of the river, they abused the river and now the entire community is suffering from the lack of water supply.

Observation Notes /Photo Documentation

The Philippines, being located very near the equator (with Manila City, its capital being located at 14° 35' N, 120° 59' E) has two climates –Sunny/Warm Season and Rainy/Wet Seasons. Even though the Philippines have a hot tropical monsoon climate type, the country is mostly wet from May to November and dries from November to April. But the weather has been unpredictable due to climate change, and as a matter of fact, Super Typhoon Haiyan, locally known as Yolanda hit the archipelago on November 8, 2013, on a month with supposedly dry climate.

The following are current photos of the Lugad River, taken on June 2019. During this month, the climate is still warm due the ending of the Summer Season. It has been observed that the Lugad River has very minimal to no water on some parts.

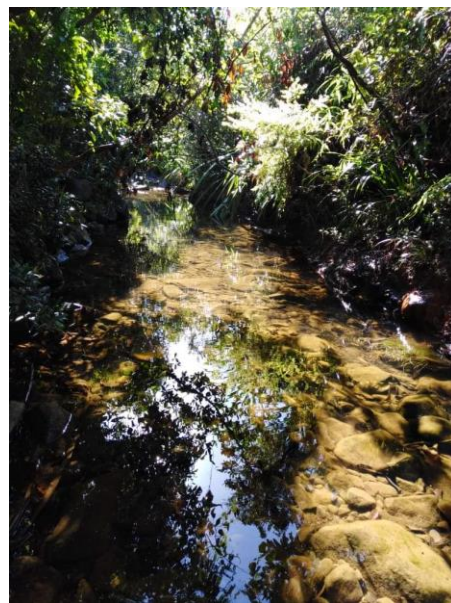
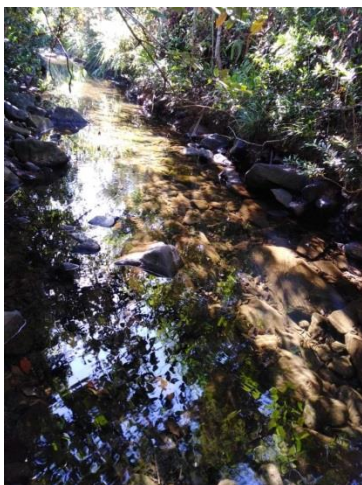
Downstream Photos/ Where the Lugad River meets the Casogoran Bay



The lowest part of the river, the part nearest to the Brgy. Habag community is not potable since it is used by the community members as bathing site for their livestock, specifically carabaos. It is also used as defecation site for some of the community members. During very hot days or sunny season, the river

losses almost all of its water and the river is all dried up. The entrance of the river is filled with rocks, some plastic bags and wastes and on very hot days has no water. The river and the Casuguran Bay does not meet during very hot weather.

Photos of the Middle Part of the River



The middle part of the river is filled with moss as people from the community do not come to this area since it is not as clean as the upper part. It is also not so wide, not more than 1 meter wide during the summer since water is very minimal. There are some areas on this place where community members wash their clothes. As it has clean water; not cleaner than the upper part but cleaner than the lower part where the carabaos lay.

The Middle part of the river is where the *Lidtong* was once located. This is the old swimming / bathing place of the people. Those who want to swim in the river nowadays need to walk further up the river if they want cleaner, safer water.

Upstream Photos of the Lugad River and the water pipes



The upstream part of the river is the cleanest and nearest the source. The source is composed of two (2) streams or locally known as *burabud* which is an underground water source. The pipes coming from the houses lead to this place as the community members and the PMPI (international non –government

organization) decided to place the start of the pipes here since it is the cleanest part and there is presence of water all year long.

Photos of the water pipes that connects the river (part near the spring) to the homes of the community



Photo 1: Ground Pipe (from upper of the river leading to the houses.



Photo 2: pipe entering the houses. Faucet are put to regulate flow.

The pipes lead from the water source of the river down to the homes of the community members of Brgy. Habag. The pipes were installed by members of PMPI, an international non –government organization who helped the community rebuild itself after the devastation of Super Typhoon Haiyan / Yolanda back in November 2013. It is a big help to the community as with these pipes, people no longer need to carry heavy buckets and pails and walk kilometres to get the water.

CHAPTER V

Results, Discussions, Conclusions and Recommendations

This chapter contains the results and discussion of the results of the study, followed by the conclusions and the recommendations as given by the respondents themselves.

RESULTS AND DISCUSSION

Theme 1. Changes of the River and Pattern of Flow

The changes of the river has been felt the by community members of Brgy. Habag community. The past 10 years have had significant changes.

Back in November 2013, super typhoon Haiyan, locally known as Yolanda devastated the Philippines, specifically Region VIII. Homonhon, being part of Guiuan, Eastern Samar is just one of the hardly hit areas. Not only did the super typhoon destroy all of the houses, but the river as well. It moved all the large river rocks, some of it blocking the rest of the area. The residents needed to move the river rocks because it was blocking the water from going downstream and the people no longer have enough water supplies. Even though some of the stones were moved, the landscape, like most places, has been changed for good.

Subtheme A. Size and Flow

In the past 10 years, the river has become thinner, narrower and mostly stagnant especially during the summer season. Even when it rains, if it just rains for a short period of time, the river will not flow immediately as the water sinks directly into the ground. The respondents have dealt with the thinning and narrowing of the river as this naturally occurs with the changing of the seasons. It overflows when it rains, and is stagnant when the weather is too hot. The significant change is that instead of still having a significant amount of water in the river even on hot months, like 10 years ago and beyond, anyone can go swimming in the lower part of the river and not have any problems with the size and flow –but now, during the summer, if someone wants to go swimming in the river, the person needs to go to the topmost part of the river, or even near the source to be able to fully enjoy it because during summer or during very hot days, most parts of the river only have knee –height depth of water.

Key Informant(s)	<i>“(Rainy weather) Mauran-overflowing, blurry-new rain-banika (red, loam, clay like soil)” – Respondent #4</i> When its fresh from rain, the river is dirty due to mud being washed/eroded but as the rains goes on, the river becomes clearer. <i>Maadlaw-dna nag aaganas ha ubos</i> On very sunny days, the river dries up and no longer flows downstream. –Respondent #4
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Subtheme B. Cleanliness and Potability

The cleanliness of the river has also been compromised. The upper part of the river, or the part nearest the springs (it is believed that there are 2 springs that serve as the source of water for the river and it comes from underground; note that this is also the reason why the mining on the nearby barangay also affects the cleanliness, potability and flow of the river –as the respondents assume that these springs or underground water feeds the big river that flows on all of the barangays of the island; One water source for the entire island).

After super typhoon Haiyan/Yolanda, and international non –government organization came to aid Brgy. Habag, they tested the potability of the spring water as they wanted to promote it as a product and give livelihood to the people, but results came and it was found out that the water is acidic. Even with these result, the community members still drink from it as they have been drinking from it as their ancestors have been drinking from it. Some of the residents though, boil the water first before drinking.

Key Informant(s)	The water in the mountain could still be drunk. However during the rainy season it is needed to be “saraan” filtered and boiled before it is safe to drink. –Respondent #2 Acidic (From 2 springs on top of the mountain –water source that supplies the river, the river
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	being the water source for the people. The spring is believed to be the source of all fresh water in all barangays of Homonhon island). The 2 springs (burabod) were discovered by PMPI –an international non –government organization that came to Guiuan’s aid after the devastation brought by super typhoon Haiyan (Yolanda) back in 2013 –Respondent #4
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Subtheme C. Pattern of Flow

The pattern of flow has always been and perhaps will always be, stagnant and dry on hot season but overflowing and deeper on the rainy seasons. The difference is WHEN exactly is it going to be raining or when it is exactly going to get hot. Some of the respondents believe that this is because of climate change.

It is easy to ignore patterns of river flows when you have a different water source, but never when you are too dependent of a single water source. The community members really need to be aware of the cycle as their lives and daily activities highly depend on the said water source. The respondents could not identify exactly when the rainy season starts or when the hotter days begin.

Key Informant(s)	Amihan (Northeast Monsoon) Tag 6 months 6 months iton pero ngiiniba na yana agi hiton nga climate change It’s usually 6 months dry and 6 months wet but changed because of effects of climate change. –Respondent #4
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Theme 2: Reasons for the Water Source Depletion

The following have been identified by the respondents to be the reason for the water source depletion, though not scientists or experts in the field of environmental education and environmental issues, the respondents can only base their judgement from previous experience, identifying causes and effects, observation of events and its influence on the surroundings and comparison with the situations of nearby barangays to their own barangay. The respondents have been in Brgy. Habag all their lives and have witnessed first-hand the changes of the river. The following three (3) events have been identified by the respondents to be the cause of the depletion of their water source.

Subtheme A. Irresponsible cutting of trees especially near the river

The irresponsible cutting of trees especially near the river has caused the river to dry up faster. Reasons as to why the cutting of trees affected the river are mentioned; (1) The roots of the trees served as filters and at the same time, held the water close to the river, (2) the trees shaded the river from the sun, keeping it cool even when the weather was too hot and (3) covered the trees from the sun avoiding the water to evaporate easily. The absence of trees therefore meant that the river could no longer hold its water, keeping it dry most of the time. Even when it rains hard, if it only rains for a day, the river still is not able to hold the water.

Key Informant(s)	This is due to kaingin, irresponsible cutting of trees as the absence of trees means nothing is there to hold the water. –Respondent #1 Because of cutting of trees and absence of roots to hold the soil and water. I think also because of mining. –Respondent #6 I think its because too many trees have been cut and the place is warmer so the water easily evaporates. There are also more farms now than before, so more uses the water. –Respondent #13
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Subtheme B. Kaingin System

The *Kaingin System* is the burning of trees to convert the area into tillable land to be used for farming. The burning of trees is believed to cause the soil to become more healthy, and conducive for vegetation. The problem though is that this system adds to global warming and increases the carbon emission of the planet. The system, if not properly executed could also lead to forest fires. This practice is already deemed illegal by the not only the government of the Republic of the Philippines but all nations as well. The problem is, probably because of its location or poor implementation of rules and laws, or poor monitoring from the government, very little action is done to avoid the total eradication of the said practice.

The *Kaingin System* therefore increases the heat level of the area surrounding the river, which in turn disables it ability to keep its waters.

Key Informant(s)	Affected by cutting of trees adjacent to the river, kaingin (there was a rule (agreed by the barangay) to not burn or cut trees near the river but was not followed by the community members) these are long term effects –trees cut long ago (during the times of their parents and grandparents)... affects the river now. –Respondent #4
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Subtheme C. Mining in the Nearby Barangays

The mining in the nearby barangays are already considered to be another factor for the water source depletion. Even though the patterns of overflowing and Dry River have been observed for a long period of time by the residents, it is noted that the intense drying up of the river has only been observed after the mining has started in the nearby Barangays of Cagusuan and Casuguran.

As seen from the google map pictures, there is a large river covering the entire Homonhon island and with this one river, there seems to be only on source –which seems to be coming from underground. And with this, it can be assumed why the mining in other barangays would affect the other barangays as well.

Key Informant(s)	...Mining is also a factor since there is only one source or water. Community members of Brgy. Bitaugan, Brgy. Inapulangan and Brgy. Habag do not want mining for the reasons stated below; The mining on other barangays (as Brgy. Cagusuan, and Brgy. Casuguran has no more watersupply –they buy NAWASA and Mineral from the mainland, and Brgy. Canawayon, and Brgy. Culasi respectively has no more to very minimal water supply) deeply affected their water sources. Mining on these places might also affect the water source in Brgy. Habag (as it is believed to be the same water source since the source comes from underground, from a spring). –Respondent #4
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Theme 3. Dependence to the Water Source

The entire communities of Homonhon Island have thrived because of its water supply, with its distance from the mainland of Guiuan, Eastern Samar, it could have been and is difficult to be dependent from the mainland's water supply. Travelling by sea is already difficult and people need to wait on for finer weather to safely cross the sea, with this being said it would be impractical to have an abundant and thriving society on the island without having its own water supply.

The community members of Brgy. Habag has depended on Lugad River as its water source ever since its establishment. All of its activities, day to day activities, like any other civilization depend on the water source.

Subtheme A. Number of People Dependent on the River

As stated by the respondents, all of the community members depend on the water source.

Subtheme B. How the dependents use the water source

The members of the Brgy. Habag communities lives revolve around their water source. Most of them are aware of the significance of the river to their lives and its impact on them. This water sources is used for drinking, bathing, washing clothes, drinking and bathing of livestock, irrigation as well as, catching freshwater fish and shrimp on the river, for cooking and for cooling down and swimming on during hot weather.

Subtheme C. How the dependents of the river cope up with the changes

The community members have installed the pipes that connected them with the river, it gave them easy access to their water source as the pipes started at the main source; the springs or locally known as *burabud* and leads to their houses via faucets. It's a little bit noticeable once the rest of the river dries up as the pipes are far enough to get water, but for other tasks like bathing and drinking of livestock, swimming and other activities need to be moved to higher places where there is enough water supplies. When times get really tough though, people buy water both potable and tap from the mainland in order for their activities to continue on.

Key Informant(s)	The changes of the river affects our lives, livelihood and everyday activities in a way that when there is an abundant water supply we can do our daily routines that needs water such as bathing, cleaning, cooking, watering the plants, washing clothes and dishes, and bathing of livestock. But during the scarcity of water supply we have to look for a part where we can fetch water and continue our daily activities–Respondent #2
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CONCLUSION

The study was about the depletion of the water source of Brgy. Habag, Homonhon, Guiuan, Eastern Samar. The respondents chosen where all from the aforementioned barangay. Though there are more or less than two hundred (200) community members of the barangay, only 15 were to participate in the study. They were chosen based on their availability, as there were some identified respondents but were not able to be met or contacted by the researchers due to conflict of schedules. Some of the respondents had no idea of the situation; most of them only became aware when they were already asked. Their justification was because they have been living in the island for too long that they have not noticed the difference, as it happened gradually. But there were some respondents who were aware of the situation and they had a lot to say. In consideration with their rights to privacy and self –incrimination, the respondents were given aliases.

This study was conducted for several reasons and these are as follows; (1) to know the cause of the water depletion, (2) to raise awareness on the water source depletion and the consequences of losing the water source, and (3) to stay away from activities that causes this depletion. The aim of the study was and is to stop human activities that causes environmental destruction that leads to resources being depleted and that again leads to humanity being at risk of displacement or even worst.

RECOMMENDATIONS

Recommendations of the study were given by the respondents. These are as follows, (1) for the members of the barangay, spearheaded by the barangay officials to think of alternatives to avoid the water source depletion, e.g. moving of livestock to other areas so that the river will not get dirty, (2) for the members of the barangay to avoid cutting trees near the river and stop practicing the *Kaingin System*, (3) for the barangay members to be certain that their decisions are not done in consideration with their day to day needs but as well as in consideration of the future generation – to make sure that the resources they are enjoying now will still be enjoyed by their children, the children of their children, and so on.

This study further recommends the following; (1) to know deeper the causes of the water source depletion, (2) to know if there is really a connection between the mining activities of the nearby barangays to the water source of other barangays on the island, and (3) to think of alternatives that can help humanity move on with their day to day activities without compromising the health of the environment.

REFERENCES

Electronic Data File

- Babu, B.V. (1999). **Fresh Water Depletion - A Crisis: Causes & Remedies**. Graphic Era University. Retrieved from the website https://www.researchgate.net/publication/237610803_FRESH_WATER_DEPLETION_-_A_CRISIS_CAUSES_REMEDIES on June 16, 2019
- Barba, P. () **The Philippines: Challenges in Water Resources Management**. Retrieved from the website <http://rwes.dpri.kyoto-u.ac.jp/~tanaka/APHW/APHW2004/proceedings/JSE/56-JSE-A519/56-JSE-A519.pdf> on June 16, 2019
- Black's Law Dictionary*. Pocket (2nd ed.). 2001. p. 236.
- Collins. Definition of River Basin. Retrieved from the website <https://www.collinsdictionary.com/dictionary/english/river-basin> on June 26, 2019
- Collins. Definition of Watersheds. Retrieved from the website <https://www.collinsdictionary.com/dictionary/english/water-quality> on June 26, 2019
- Environmental Biology. **Chapter 7: Water Availability and Use, 7.2. Water Supply Problems and Solutions, Water Supply Problems: Resource Depletion**. Retrieved from the website <https://courses.lumenlearning.com/suny-environmentalbiology/chapter/7-2-water-supply-problems-and-solutions/> on June 26, 2019
- Hinrichsen, D. and Tacio, H. **The Coming Freshwater Crisis is Already Here**. Retrieved from the website <https://www.wilsoncenter.org/sites/default/files/popwawa2.pdf> on June 26, 2019
- Hokuma, K. (2012) **Rural Development: Freshwater Depletion**. Retrieved from the website <https://www.eoi.es/blogs/hokumakarimova/2012/02/08/rural-development-freshwater-depletion/> on June 26, 2019
- Investopedia. Definition of Renewable Resource. Retrieved from the website https://www.investopedia.com/terms/r/renewable_resource.asp on June 26, 2019
- Jeff Masters. (March 21, 2016). **Ten Civilizations or Nations That Collapsed from Drought**. Retrieved from the website <https://www.wunderground.com> on July 6, 2019
- Manila Times. 2016. Meaning of Kaingin System. Retrieved from the website <https://www.manilatimes.net> on June 16, 2019
- Merriam –Webster. Fresh water definition. Retrieved on the website <https://www.merriam-webster.com/dictionary/freshwater> on June 16, 2019
- Merriam –Webster. Fresh water definition. Retrieved on the website <https://www.merriam-webster.com/dictionary/groundwater> on June 16, 2019
- Merriam –Webster. Definition of Point Source. Retrieved on the website <https://www.merriam-webster.com/dictionary/point%20source> on June 16, 2019
- Merriam –Webster. Definition of Run Off. Retrieved on the website <https://www.merriam-webster.com/dictionary/runoff> on June 16, 2019
- Merriam –Webster. Definition of Run Off. Retrieved on the website <https://www.merriam-webster.com/dictionary/surface%20water> on June 16, 2019
- Pimentel, D., et.al. (October 2004). **Water Resources: Agricultural and Environmental Issues**. Retrieved from the website <https://watermark.silverchair.com/54-10-909.pdf?token=AQECAHi208BE49Ooan9kKh> <https://www.merriam-webster.com/dictionary/point%20source> , on June 2019
- Raymundo, R. (2015). **Challenges to Water Source Management: Ensuring Adequate Supply and Better Water Quality for the Present and Future Generations**. Retrieved from the website <https://www.scribd.com/document/389259093/434373-Ch-12> , on June 2019
- Smedley, T. (April 12, 2017). **Is the World Running Out of Fresh Water?** Futurenw. Retrieved from the website <http://www.bbc.com/future/story/20170412-is-the-world-running-out-of-fresh-water> , on June 2019
- The Habitable Planet. 2017. Annenberg Learner. Retrieved from the website <https://www.learner.org/courses/envsci/unit/text.php?unit=8&secNum=1> , on June 2019
- The Habitable Planet. **Unit 8: Water Resources**. Retrieved from the website www.learner.org , on June 2019
- Trenchlesspedia. Definition of Receiving Water. Retrieved from the website <https://www.trenchlesspedia.com/definition/3108/receiving-water> on June 26, 2019
- University of Utah College of Nursing. **What is Qualitative Research?** Retrieved from the website <https://nursing.utah.edu/research/qualitative-research/what-is-qualitative-research.php> on June 26