Research Article

Fishing as a Livelihood and Conservation Initiatives: Issues Confronting Pulangi Lake, Mindanao, Philippines

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Abstract

Sound practices should have to be observed as humanity relates to their environment. Thus, this study on fishing as a livelihood and initiatives of conservation among the fishing communities of Pulangi Lake was conducted. It used a triangulation method of Survey, Focus Group Discussion, and Key Informant Interview. The study revealed that the fisher-folks of Pulangi are very dependent on the lake. They believe they co-exist with the river, and they know it is their obligation to care and protect it from destruction. Their low education compels them to engage in fishing. Fisherfolks observe legal fishing technologies, but some fishermen coming from other places are using poisons like Tubli, Malathion or Thiodan, and electro-fishing. Women are seen to tend to exercise restraint from exploiting the lake compared to men who are more aggressive to fish and exploit the lake when necessary. The community wants to conserve the lake; hence initiatives are undertaken like the tree growing, clean-up drive, brick-making, fingerlings dispersal, and provision of alternative livelihood. Likewise, there is a need to address the issues on siltation, pollution, garbage, use of exploitative fishing technology, family size, and dwindling of fish supply. Fishing as a livelihood has remained challenged by a myriad of issues caused by natural phenomenon and anthropogenic activities. Strengthening of fisherman's organizations, employment of sound fishing technology, the conduct of consciousness-raising campaigns, provision of alternative livelihood, and engagement of NGAs, LGUs and industries are recommended to conserve the Pulangi Lake effectively.

Keywords
fishing, livelihood, technologies, conservation, issues

Received 14th March 2018; Accepted 9th October 2018

INTRODUCTION

Natural resources are not inexhaustible. They have a finite quantity (Malayang, 2002). Since the mid-twentieth century, many researchers and scientists have noticed the huge decline in natural resources, and it has been treated a critical issue. Discourses and findings of various studies pointed out many factors like people's unregulated extraction and their use of ruthless technology along with poverty (White, 2005), unemployment and unchecked population increase (Brundtland, 1987), human activities and ecological factors (Macabuac, 2005) and climate change (Fogarty, 2007). All of these factors mentioned contributed to the dwindling of natural resources that threatens the survival of humanity. However, Sutherland (2010) sees available means of recovery and forms of environmental rehabilitation. This somehow depends on humanity's intelligent and moral action. People should do something if they are to survive, make resources available for themselves and future generations.

Sutherland (2000) found fisheries to have collapsed primarily because of insufficient knowledge and exploitative attitude. Natural resources were being exploited, and when people realized it, it was already politically difficult to reduce the level of exploitation to the level, that would have saved the natural resources from crashing. The study of Dadang (2015) revealed that the fisheries of Baliangao, Misamis Occidental largely declined because of indiscriminate extraction. The people of the place expressed nostalgia about the days when sea-shells and fish were still abundant. However, with the passage of time, fisheries massively declined because of dynamite, use of poison and other illegal fishing technologies. These practices gave immediate rewards but were not sustainable. They extract more from their resource-base hoping for a greater yield. On this regard, restraint is seen desirable by some. However, this option may only give others a bigger share in the exploitation. Individuals, pushed with greed, claim exploitation rights (Hardi, 1968).

Nevertheless, according to Sutherland, Hardi's work is only applicable when there is competition. In the real sense, a person exercising restraint will benefit a larger yield in the long term. Thus, Sutherland advocates for humanity to take steps to save the declining biodiversity from extinction. He advised for the setting of priorities, planning, monitoring, detection of problems, diagnosing of problems, and bringing about change through the main techniques of species management, legislation, education, public awareness and integrating development and conservation. He sees effective conservation as a result of qualified research, proper management, and sound policies and legislation.

One potential source of food and livelihood in upland communities is the river. There are an estimated 93-97 million people who are directly engaged in fishing and marketing in small-scale fisheries in developing countries, and 51M are inland fishermen (Martin, 2004). In

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Laos, fishing in the river basin of Mekong is found to be a secondary livelihood. It is not considered as the primary source of living because the income it affords could not sustain a family. Nevertheless, the country finds it equally important to strengthen fishing because it forms a greater proportion of income, employment, and food. It is even the food security of low-income families. (Martin, 2013). The study of Dugan (2006), pointed out the wider role of water in sustaining food production. Water management is very important in sustaining fish production in tropical river basins. Likewise, Allison (2009) revealed that many people (27%) in developing countries take their dietary protein from fish. Developing countries are more reliant on fishing as a source of protein compared to richer countries, the latter's dependency on fish as a source of protein is only 13%. This is because people in richer countries can afford to buy other sources of protein like meat, milk, etc. Nevertheless, Allison revealed that global climate gives challenges to most developing countries because of its adverse effects on fishing as a livelihood.

Freshwater has to be protected because it affords many benefits to humanity. Aside from being a source of livelihood, freshwater bodies are also used for bathing, washing clothes, irrigating rice-fields, and transporting of crops. However, Vermeersch (2014) found out that freshwater areas are less managed. There are fewer conservation projects in freshwater fishing communities. Likewise, conservation is threatened by harmful practices like overfishing and other factors like pollution and siltation. There are laws and ordinances governing freshwater areas, but enforcement of the existing laws and regulations is weak (Guerero, 2013).

Fishing has to be given attention because for many Filipinos fishing is the primary source of livelihood; for many fathers, it is their primary source of income. They are always confronted with the issue on minimal catch making their concept of a happy family, elusive. Their catch and income cannot support a family (Teleron, 2012). This contention finds support in the study of Vedra (2014). The researcher reveals that in Mandulog, Iligan City, fishing is not considered a main source of income because it really cannot sustain a family. The average catch is only 3 kilograms. He cited the use of destructive fishing methods like cyanide fishing, electric fishing, and use of fine fishnets as the major reason.

The study of Quimpang and Gregorio (2014) on Pulangi lake revealed that 378 fishermen depend on the water resource. It identifies the technologies used and the fishes on the lake. There are already published studies concerning Pulangi Lake, but no study yet has been conducted about fishing as a livelihood that describes the life of fishers, their relationship with the lake, initiatives of conservation and their observation and perceptions about the issues confronting the lake.

It is then necessary to study fishing as a livelihood in the communities of Pulangi lake, hence this study. In particular, this study aimed to assess fishing as a livelihood among the communities in the Pulangi lake, analyze the issues confronting Pulangi lake, and assess the conservation initiatives of the fisher folks of Pulangi lake.

METHODOLOGY

The study was conducted in the barangays of Dologon and Tubigon of Maramag, and barangays Botong and San Jose of Quezon, Bukidnon on January to October 2017. The study dealt on fishing as a livelihood, describing the life of the fisherfolk and the factors contributing to their catch. The issues confronting Pulangi lake were analyzed, and the initiatives of conservation were assessed. A survey and FGD were conducted among fishers and their wives to gather information concerning fishing as a livelihood, initiatives of conservation, and the issues confronting the lake. Also, a KII among the barangay officials of the selected barangays and with BUSCO was facilitated to substantiate and validate the information gathered. The researcher considered 50% of the fishermen and 50% of the wives who were active members of the fishermen organization as respondents on the survey. Purposive sampling was used in determining the respondents. The survey had 66 respondents (35 males, 31 females). Most of the questions were extracted from the study on "Management of Coastal Resource Projects: Issues of Sustainability," a dissertation transformed into an article "Saving Marine Life: An Empirical Assessment of Ecofeminist Thought in Coastal Communities" of Dadang (2015), substantiated by some relevant questions. The questionnaire was peer-reviewed. It had six parts: Biographical Information, Fishing Behavior, Technologies Used, Dependence on Pulangi Lake, Initiatives of Conservation and the Issues Confronting Pulangi lake. To clarify and discuss the issues gathered in the interviews, FGDs were conducted. The FGD had 32 participants (16 males and 16 females). There were four sessions, held in San Jose and Botong of Quezon, and in Dologon and Tubigon of Maramag (Figure 1). Each FGD had eight participants composed of fishers, wives, and the PO Chairman. The respondents were identified by the PO chairmen of the respective barangays. The discussion revolves around the issues confronting the lake, fishing as a livelihood, and the initiatives of conservation initiated by the community.

Quantitative data were analyzed through frequency count and percentages. Qualitative data were analyzed through thematic analysis. The data were categorized in matrix form to identify discernible patterns and later on were revised based on emerging themes. The following themes came out: communities' dependence on the lake is high, decreasing catch, issues on siltation and pollution, the presence of illegal fishing technologies, and conduct of activities concerning conservation. SWOT (Strength, Weak Weaknesses, Opportunities and Threats) method was used to come up with the analysis. The results of the study were presented back to the community for validation, and in the case of Dologon, was even presented during the Barangay Council meeting after it was presented to the community.

The study was conducted observing research ethics. The researcher sought permission from the barangay captains. She and the interviewers also explained to the respondents the nature and purpose of the study conducted and assured them that their identities would be kept anonymous. They were asked to participate, but it was made clear to them that they have the right not to answer questions which they believe are detrimental.

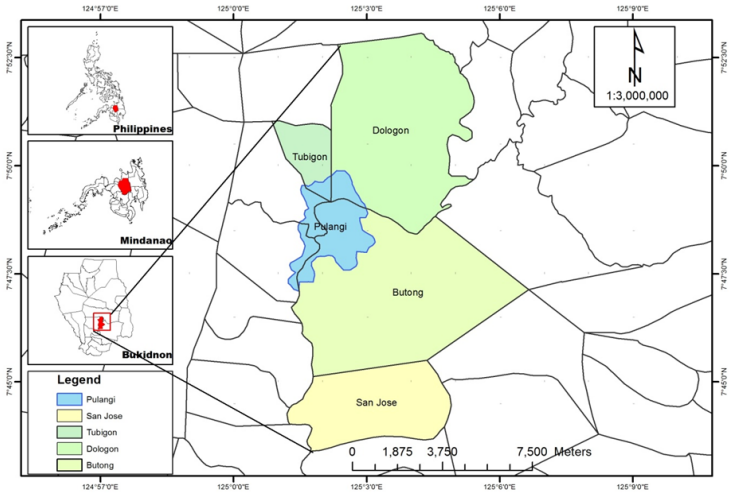

Figure 1. The area of study [digital map]

RESULTS AND DISCUSSION

Pulangi is a vast lake traversing along local communities in Bukidnon. It is a part of Rio Grande de Mindanao, the longest river in Mindanao. Pulangi is also the irrigation source of the National Irrigation Administration (NIA) and the hydroelectric power source of the National Power Corporation (NAPOCOR). Likewise, it serves as a source of living among the many locals who are depending on fishing for livelihood.

Most fishers are on ages 36-50. Most of the respondents (72%) have attended elementary levels only. Only very few were able to finish high school. None have entered college. Most fishermen (90%) are married. Most (53.33%) have 4-7 children. Their low education limits opportunities for employment. This compels them to remain in their places and engage in fishing. Low education

A. Biographical Data

Table 1
Respondents' Biographical Data

Biographical Data	Maramag				Quezon			
	Male		Female		Male		Female	
Age Bracket	F	%	F	%	F	%	F	%
21-35	6	25	4	36.6	3	18.75	6	40
36-50	9	37.5	4	11	8	50	6	40
51-65	8	33.3	2	18	4	25	2	13.3
66-+	1	4.1	1	9	1	6.25	1	6.6
Total	**24**	**100**	**11**	**100**	**16**	**100**	**15**	**100**
Educational Attainment								
Elementary Level	14	58	8	72.73	10	62.50	7	46.67
Elementary Graduate	3	12.5	0	0	3	18.75	3	20
High School Level	4	17	3	27.27	2	12.50	1	6.67
High School Graduate	3	12.5	0	0	1	6.25	3	20
ALS Graduate	0	0	0	0	0	0	1	6.67
Total	**24**	**100**	**11**	**100**	**16**	**100**	**15**	**100**
Civil Status								
Married	24	100	11	100	13	81.25	15	100
Single	0	0	0	0	3	18.75	0	0
Total	**24**	**100**	**11**	**100**	**16**	**100**	**15**	**100**
Number of Children								
0 to 3	14	58.2	4	36.36	8	50	7	46.67
4 to 7	6	25	6	54.55	7	43.75	8	53.33
8 to 11	3	12.5	1	9.09	1	6.250	0	0
12 to 15	1	4.17	0	0	0	0	0	0
Total	**24**	**100**	**11**	**100**	**16**	**100**	**15**	**100**

B. Fishing as Livelihood

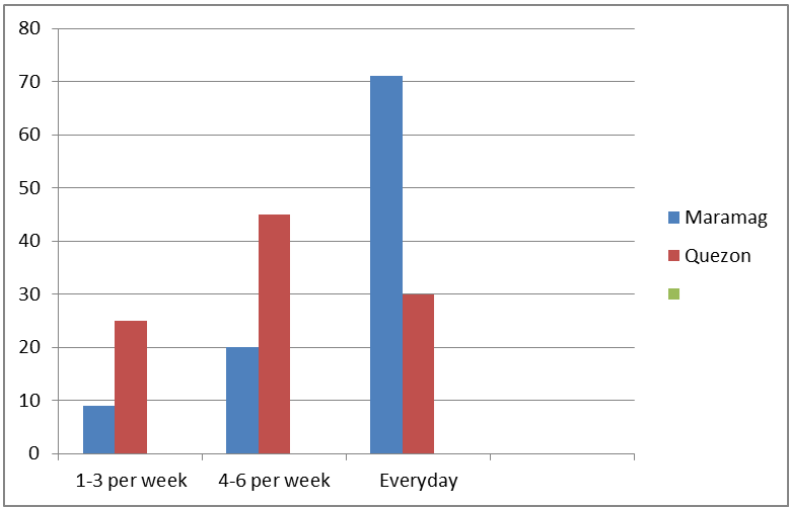

Figure 1. Number of Days of Fishing per Week

is pushing the respondents to be more dependent on the lake.

Except for barangay San Jose of Quezon, Bukidnon that considers fishing as a secondary source of income, the other three barangays of Dologon, Tubigon and Botong are highly dependent on fishing. Fishing is the communities' primary source of livelihood. The study shows that 71% of the fishermen of Maramag fish every day. On the other hand, 45% of the fishermen of Quezon fish at least 4-6 days a week. To most respondents, fishing is their livelihood and the primary source of food and income. From their catch, they derive their food and other necessities of life like the education of their children and clothing. However, the catch is minimal most times, affecting their quality of life. They do not have the intended money for medicines, and not enough money to have better dwellings.

The average daily catch of a fisherman ranges from 3-5 kilos only. However, during peak seasons, about five months after the dispersal of fingerlings, a fisher may have a catch of 28-30 kilograms. According to most respondents, their catch cannot sustain their basic needs. Out of the 3-kg catch, 1 kilo of it is intended for viand. The other 2 kilos are sold so that the family can buy rice and other basic needs. Usually, it is the wife who vends, however, the husbands help in vending when the catch is abundant. This finds support in the study of Quimpang (2014) which revealed that the catch of a fisherman per day is 3-15 kilograms. The author, however, fails to qualify whether the catch was during mean or peak season.

Considering that the fisherfolks of Pulangi have less education (72 % have attended elementary only), job opportunities are limited, compelling them to engage in fishing. This finding finds support in the study of Westway (2009) which found fisherfolks to have low educational attainment, barely 50% only had reached elementary level. This low educational attainment limits their opportunities to grab for employment elsewhere, thus compelling them to stay in their localities.

The FGD and survey revealed that the catch of fishers is more on Tilapia (Tilapia nilotica). Among the fishes in Pulangi lake, Tilapia has the highest value, sold at 30-80 PHP per kilo ($0.6- $1.6). The price depends on the size of the fish, those smaller in size are cheaper than the big ones. To most locals of Bukidnon, Tilapia is a delicacy, best when fried or grilled. The markets in Bukidnon always have a display of Tilapia. For the respondents, this fish is even more palatable than marine fishes. Other fishermen's catch is on Halo-an (Mudfish), Karpa (Carp), Kasili (Freshwater eel), Gono (Tropical silverside), Bunak (Goby), and Puyo (Gourami). These fishes, however, are of lesser market value compared to Tilapia. Shrimps and crabs are also abundant in Pulangi. The same species were identified by Quimpang (2014).

In Pulangi, fishing is a husband and wife team. Most couples go fishing together so that all catch will be solely for the family. According to the respondents of the FGD, if the fisherman would take another person as an assistant or a partner, the catch would be shared. Hence, fishers prefer to make their wives as a fishing partner. Considering that catch is just minimum, couples found it better to go fishing together. Fishing needs at least two people especially if the technology used is a gill net.

The fishermen are using technologies which they believe efficient. Pukot (Gill nets) is the most commonly used technology. 100% of the fishermen use this method. Some fishermen (62.50%) use "pamingwit" (Hook and Line), others use "bobo" (Fish pots) and baling (Purse Seine). These are legal technologies. Gill nets vary in mesh size. Those with very small eyelets are considered illegal. Nets which number is 6 and above have very small eyelets, and its use is illegal. What the Bureau of Fishery and Aquatic Resources (BFAR) and Bukidnon Fisherfolk Association approve for use is number 5 for it has bigger eyelets.

Boats are very important in fishing. One could not go into the fishing ground without a boat, the water is quite deep. Quimpang (2014) claims that each fisher has one non-motorized boat. Contrary to Quimpang's findings, however, some of the respondents said they do not have non- motorized fishing boats. They consider this

B.1. Fishing Technology

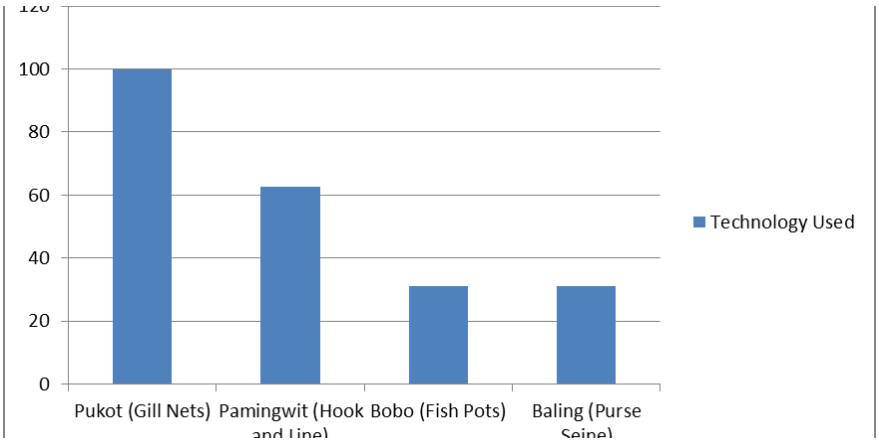

Figure 2. Technologies Used

a problem, and they wished to have one. Hence, they ask support from Bureau of Fishery and Aquatic Resources (BFAR), the Bukidnon Fisherfolk Association (BFA), and from the Local Government Unit of Maramag. During the Pulangi Day Celebration on May 4-5, 2017, 80 non-motorized boats were distributed to the fishermen of Maramag, Bukidnon together with some units of gill nets. BFAR and BFA are trying to be responsive to the needs of the fishermen.

Aside from fish, Paleomen shrimps and janitor fish are also abundant in Pulangi. According to Quimpang, et al. (2014), the most commonly used technology in catching shrimp is the fish traps baited with dried cassava. These shrimp species could grow at about 6 inches. On the other hand, the janitor fish species is considered invasive and bothersome to most fishers.

All respondents claim they are using legal technologies. However, they observe some fishermen coming from other places to be using illegal fishing technologies like electro-fishing and the use of Tubli (Derris Elliptica Benth). Tubli is a plant that has been identified by respondents as the most popular fish poison used in the locality. Locals pound it and extract the white milky sap and put it into the lake. It indiscriminately kills fishes. Others use pesticides like Malathion and Thiodan. These are pesticides used by farmers to control farm pests like Tamisik (Thripz), Tiyangaw (Rice bugs), Apids (Aphids), etc. Once this is poured into the lake, it will kill fishes and shrimps.

Respondents do not agree that greed is the reason why some fishermen engage in illegal fishing. Instead, it is the need to have enough catch, so that their family can survive. Fishing is their main source of livelihood; hence when the catch is less, income is to a bare minimum.

In general, most fisher-folks of Pulangi abide by the fishing policies stipulated by BFAR. They see the policies to be sound. However, there is a need to control the entrance of fishers coming from other places and

B.2.The locals' Dependency on Pulangi Lake

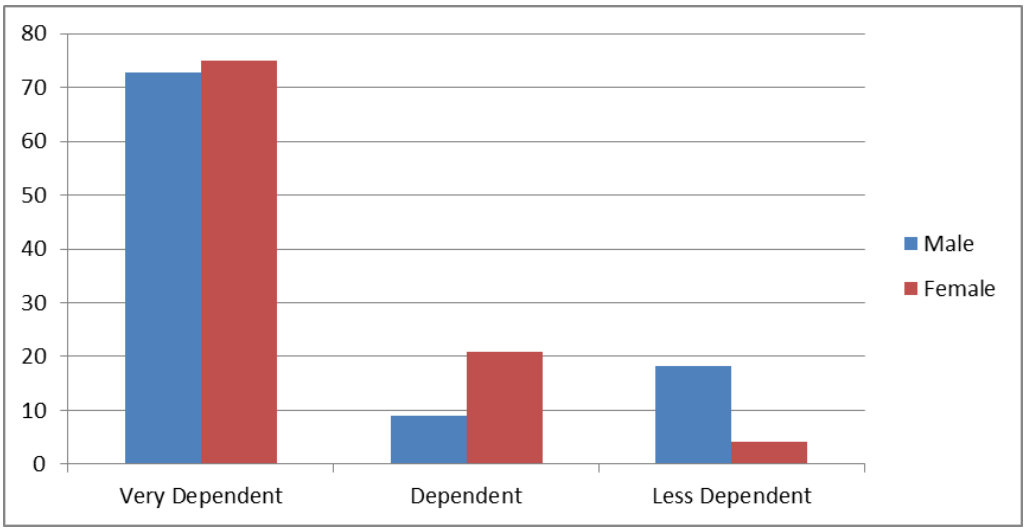

Figure 3. Dependency on Pulangi Lake

educate them on the use of good fishing technologies.

Fishing is the livelihood of most respondents. Data shows that 75% of the women consider themselves very dependent on Pulangi lake, 20.83% consider themselves dependent, while only 4.17 say they are less dependent. None of the women respondents say they are not dependent. Dependency in the context of this study refers to one's main source of livelihood. On the other hand, 72.73% of the men are very dependent on fishing as a livelihood, 9.09% dependent, and 18.18% say they are less dependent. Unavailability of options commensurate with their bare qualifications is compelling the locals to engage in fishing. There may be open jobs in the neighboring locality, but considering that most of the fishermen have low education, they see themselves to be less equipped. "*Walay laing trabaho. Mao ray laing panginabuhian.*" (No other jobs. No other sources of income.) Relative to their livelihood, most female respondents (92%) and 95% of the male respondents believe the lake and other natural resources are created by God for humanity's use. However, it is not to be exploited, but rather to be protected and preserved. The study revealed that 82% of the women and 88% of the men consider stewardship of the lake their role. Their love over the lake tells them to use appropriate fishing techniques, not to throw garbage and feces into the lake, and reprimand those who are using illegal fishing technologies. Respondents in the survey and FGD say none of them are using illegal gears. It came out that fishers who are using electrofishing, Tubli (Derris Elliptica Benth) or pesticides like Malathion and Thiodan are coming from other places which are not a member of the fisherfolk association. According to the respondents, they reprimand these fishermen, telling them it is not good to use illegal fishing gears because these are harmful to the lake and the fishes. But these fishermen do not heed their advice.

The respondents found guarding the lake to be tough, but they said they would continue performing their task. They see it to be their responsibility. To have a more concerted effort, fisherfolks, including women, join in fisherfolk organizations. Women consider themselves as fisherfolk because they also fish. They as well perform the tasks and initiatives relating to conservation. They plant trees, guard the lake, and observe fishing policies.

The study found out that men have higher tendencies to exploit the lake when necessary than women. Perhaps this is because the burden and the responsibility to provide the family are on their shoulders. The survey shows that 66% of the fishermen and 33% only of the wives said they might be compelled to use illegal fishing technologies like the use of fine fish nets when necessary. Most wives (67%) say they will never resort to the use of illegal fishing gears. They will just find some other available means of living rather than use illegal gears. Turgo (2010) however pointed out that in places with declining fisheries women face a greater burden than men, as this doubles up wife's efforts to make up for their husbands' minimal income and at the same time attend to family problems and concerns.

In general, fishing as a livelihood in Pulangi cannot sustain a family. Pulangi is a potent source of fish, but the catch has become scarce. Hence, there have to be some other sources of income commensurate to the locals' bare qualifications. A catch of 3 kilos per day, sold at 30-80 PhP per kilo is not enough to answer a family's basic needs. An income of 90 -240.00 Php (1.8-4.8 USD) a day is not enough. In the interview conducted, the respondents were open to other sources of income. They would like to venture on vending of "kakanin" in schools and offices, backyard gardening, hog raising, running a "sari-sari" store or pedicure and manicure services. They believe these "sidelines" (alternative livelihood) are feasible.

C. Issues Confronting Pulangi Lake

Pulangi lake is confronted with a lot of issues. "Hugaw ug baho" (Dirty and smelly); "Lahi na kayo karun, dili na maintain ang tubig" (It is different now, water is no longer stable); "Mabaw na ang tubig" (the lake has become shallow). These are how the respondents describe Pulangi Lake.

The respondents identified siltation, pollution, natural calamities, garbage, use of inappropriate technologies as the issues confronting the lake. They see siltation a result of erosion of soil particles from the mountains that are carried by floods. The respondents observed that during floods Pulangui lake turned brownish as particles coming from the mountains are eroded. They have also observed that as compared in the 1990s, the lake has become shallow. Likewise, they see garbage and pollution caused by companies and industries to be an issue. These adverse conditions of the lake, are believed to have caused the dwindling of fish supply.

The respondents suspected the Bukidnon Sugar Milling Company (BUSCO) as the primary pollutant of the lake. They believe the industry's waste and molasses are thrown into the lake. Nevertheless, in an interview with the manager of BUSCO, the company claims it has proper waste disposal, that has improved a lot from the previous years. The company has huge collecting ponds where wastes like mud cake and domestic wastes are stored. It does not throw its wastes to the lake. Likewise, molasses is an important by-product, not considered as wastes, hence are not thrown away. The company has a freshwater treatment facility. The plant is regularly monitored by the LGU, and it has an ISO (International Organization Standards) certification, which means it has passed the standards to operate. Likewise, Quimpang (1989) in the study "Effects of Bukidnon Sugar Mill Wastes in Pulangi Lake" concluded that sugar mills do not pollute the Pulangi Lake.

The respondents also observed the presence of trashes and garbage like cellophane, cans, diapers, and other urbanization-related garbage in Pulangi lake. For them, these wastes have as well polluted the lake. The study of Mercene-Mutia (2011) identified water pollution due to lack of proper waste disposal as one of the issues confronting Philippine rivers. Hallare, et. Al (2009) found Philippine lakes to be constantly threatened with stressors like heavy metal pollution, and agricultural and domestic pollution among others.

Further, Quimpang (2014) stressed that water quality in Pulangi is affected by the increasing land cultivation in Bukidnon, like the venture of the multinationals on pineapple and banana, local farmers' cultivation on sugarcane, corn, and rice crops, and the synergistic effects of the growing industrial development, and economic activities. Likewise, according to Sumbalan (2010), some unsustainable agricultural practices like modern farming that involves extensive use of inorganic fertilizers and chemical pesticides have been proven to pollute land and water resources, and are hazardous to people's health. Nevertheless, the issue of river contamination is not something new. In 1975, the National Environment Protection Council (NEPC) declared more lakes and rivers to have become contaminated every year due to improving industry despite the number of environmental laws, regulations and conservation programs.

On the other hand, Montalvan (2014) found Bukidnon's Pulangi Lake to be heavily silted. He stressed that siltation, even without forest denudation, is a natural process. River floods washing down silt is an age-old phenomenon.

As identified by the respondents, the factors mentioned above contributed to the dwindling fish supply in Pulangi lake. This observation finds support from the report of the National Economic Development Authority (NEDA) in 2017. The department pronounced region 10's fish production to have decreased by 11.6% including the rivers and lakes of Bukidnon.

This information from the respondents implies their concern on Pulangi lake. They are worried about the status of the lake because it is their primary source of livelihood. Their observation and knowledge have found support from scientific findings and researches. However, their suspicion that BUSCO has polluted the lake may have grown only because it is the most visible company in the locality. BUSCO has observed the standards set by the Philippine government for sugar mill companies. The pollution of the lake is a result of unchecked rapid urbanization of neighboring towns along with the intensive land cultivation in Bukidnon both my local farmers and multi-national companies.

D. Initiatives on Conservation in Pulangi Lake

There are initiatives of fishery resource rehabilitation in the Philippines. Lakes, reservoirs, river sanctuaries have been rehabilitated in the Cordillera Administrative Region and CALABARZON Region among others. The major activities included water quality monitoring, promotion of sustainable culture management, restocking and stock enhancement, repopulation of indigenous fish species, habitat restoration, control of invasive and introduced species, and establishment and/or maintenance of fish refuge, among others. (Palma et al., 2016). The inclusion of the locals and indigenous peoples in conservation initiatives is also seen important in conservation projects initiated by researchers, development workers, and scientists. This will help the locals clearly understand specific physical and social linkages between land and downstream areas. The locals and the Indigenous Peoples have their perspectives and explanations about their environment, but many of them are also open to modern and scientific methods. On July 1994, the local citizens, including Talaandig and immigrant farmers of Impasug-ong, Bukidnon, volunteered to receive training in water quality monitoring and on principles of watershed management. The workshop included techniques for simple physicochemical and biological tests of water, and systematic monitoring program for subwatersheds, which included collecting data on water chemistry, bacteria, total suspended solids, stream discharge and soil export (Deutsch et al., 2011).

Likewise, there are initiatives of conservation initiated by the communities along Pulangi lake because the locals want the lake to sustain. Most of the respondents are saying that Pulangi is a good source of livelihood and can provide their basic needs if only the lake has remained productive. For years the 1990s to 2000, Pulangi has plenty of fishes according to the respondents. However, its abundance vastly declined starting 2011. The respondents consider the lake to be their life. They perceive it to be their provider. That is why they want to conserve it. Some of the initiatives of conservation include tree growing, clean-up drive, brick-making, fingerlings dispersal, and provision of alternative livelihood.

The National Power Corporation (NAPOCOR), Bureau of Fishery and Aquatic Resources (BFAR) together with the Municipal Agriculture Office (MAO) and the Bukidnon Fisherfolks Association (BFA) facilitate tree growing. Seedlings of fruit-bearing and non-fruit-bearing trees were distributed to the locals. The non-fruit-bearing trees are planted on the lake coast, while the fruit-bearing trees are planted at the fishermen's farms. On May 4-5, 2017 and October 17, 2017, the barangays of Tubigon and Dologon respectively conducted tree planting. Tree planting among the POs started in 2005.

Likewise, clean-up activities are undertaken by the fisherfolks association. Fisherfolks collect garbage from the coasts. Most are pieces of cellophane, tins, cans, diapers, etc. In barangay Botong, Dologon and Tubigon, clean-up, which the respondents call as bayanihan, is done at least once a month. San Jose, however, does not have this kind of activity.

In response to siltation, barangay Tubigon is initiating brick-making. Bricks are made from mud which the locals get from the coasts of Pulangi lake. These bricks are a potential material for house construction. Hence, brick-making may help deal the issue on siltation and absence of decent dwellings among fishers. Barangay Tubigon has started the initiative. However, the fisherfolk's leader says they need more training and assistance to come up with high-quality bricks. In response to this, Central Mindanao University, through the College of Engineering has just made brick-making as its extension program. The team trains the locals to come up with quality bricks.

BFAR, MAO together with the LGUs initiated dispersal of fingerlings. On May 4-5, 2017 and October 17, 2017, fingerlings of Tilapia were dispersed in Tubigon and Dologon respectively. This will help improve the catch

of fishers. Fingerlings dispersal is done at least once a year.

Provision of alternative livelihood is also seen as a conservation tool. For people to be not very dependent on fishing, fisher-folks are given alternative livelihood. Henceforth, the Municipal Agriculture Office (MAO) is giving assistance like entrepreneurial skills training like cooking, hog raising, and gardening. The office also distributes seedlings of fruit trees and vegetable seeds for the locals to grow in their farms.

All of these initiatives of conservation are commendable. If these are sustained and consistently done, fishing as a livelihood in Pulangi will improve and the lives of the locals would become better. However, as of the conduct of this study, it has been found out that the initiatives are still insufficient, there are some issues. Tree Growing is a good practice. The agencies like DENR, NAPOCOR, LGU, and MAO are willing to extend seedlings for free. The locals are also willing to plant. Issues, however, include the presence of stray animals and the emergence of typhoon and floods, destroying the plants. According to the PO chairman, the survival rate is only 60-70%.

The conduct of clean-up drive is a good practice. Out of the four barangays covered in the study, only one barangay (San Jose) does not engage in the clean-up drive. Tubigon, Dologon, and Botong conduct at least once a month. Though this has become a culture and a routine for the locals, they also complain. Sometimes, they feel like scavengers. "Magbaton sab unta ug kaikog ug ubang tawo. Kami maoy nahimo tigpunit sa ilang hugaw" (People should observe discipline/sensitivity. We clean after their wastes). Nevertheless, they are much willing to do the job.

Brick-making is seen to be a promising endeavor in barangay Tubigon. With the assistance extended by the College of Engineering of Central Mindanao University, brick-making has the chance to prosper. However, according to the PO chairman, more machines and structures are needed, which may be provided by other agencies. As of this time, the PO chairman is looking for the expansion of markets. Bricks are sold at 14.00Php/ piece.

Provision of alternative livelihood is seen insufficient. Entrepreneurial skills training like cooking, hog raising, and gardening are not enough. The fishermen and the wives need financial assistance. During the interview and FGD, this was one of the concerns raised by the respondents.

CONCLUSIONS

This study concludes that the fisher-folks of Pulangi are very dependent on the lake. Fishing is their main source of livelihood thus water is their life. They believe they co-exist with the lake, and they know it is their obligation to care and protect it from destruction. Low education compels them to engage in fishing. Their catch is minimal, thus affecting their quality of life. Among the fishes in the lake, Tilapia has the greatest value. Fisherfolks observe legal fishing technologies, but some fishermen coming from other places are using poisons like Thiodan, and electro-fishing. Women are seen to tend to exercise restraint from exploiting the lake compared to men who are more aggressive to fish and exploit when necessary. The fishermen see the need to conserve the lake, hence initiatives are undertaken like a tree growing, clean-up drive, brick-making, fingerlings dispersal and provision of alternative livelihood. These are a concerted effort between the fishermen and the BFAR, BFA, NAPOCOR, DENR, MAO, and the LGUs. Likewise, Pulangi lake has issues on siltation, pollution, garbage, use of exploitative fishing technology and dwindling of fish supply. Fishing as a livelihood has remained challenged by a myriad of issues caused by natural phenomenon and anthropogenic activities.

RECOMMENDATION

The fisher-folks of Pulangi believe that the lake can sustain their basic needs if only it has remained productive. They perceive it to be their provider. That is why they want to take efforts to rehabilitate and conserve it, hence the following recommendations:

Strengthening of Bukidnon Fisherfolk Association

The Bukidnon Fisherfolk Association (BFA) is an organization of fishermen. It is considered the voice of the fisher-folks. It connects them to other agencies. Likewise, it translates fishermen's activities into collective action. BFA has been the LGUs' and fisherman's partner in conservation initiatives. However, some fishermen are not members of BFA, and some members are inactive. In some barangays, BFA is not even existing. There is a need to widen the membership of BFA, inviting more fishermen in Bukidnon. Likewise, the organization has to be more receptive to the concerns of fisherman and conduct more activities.

Conduct of Consciousness-raising Campaigns

Insufficient knowledge is a factor behind the exploitative behavior. The use of Tubli (Derris Eliptica Benth) and chemicals like Malathion and Thiodan must have to be stopped. It is then expedient to conduct consciousness-raising campaigns regarding humanity's reciprocity with nature. This endeavor may be facilitated by the Bureau of Fishery and Aquatic Resources (BFAR), Municipal Agriculture Office (MAO). the Local Government Unit together with Bukidnon Fisherfolk Association (BFA);

Provision of more Alternative Livelihood

The need to provide food for the family has made fishers more aggressive in exploiting the lake. Thus, the availability of alternative livelihood may help reduce one's dependency on a water resource. Alternative livelihood may include backyard gardening, vending of native food, cottage industries, brick-making, etc.

More Assistance from BFAR, MAO, and other agencies

The Bureau of Fishery and Aquatic Resources (BFAR) together with the Municipal Agriculture Office (MAO) has been assisting the fisher-folks. This receives appreciation from the locals. However, the locals are

expecting for more livelihood training, "banca" units, and fishing gears;

Better involvement of LGUs

The municipal and barangay officials have been found by fisher-folks to be less receptive to the issues and concerns on fishing. The former is hoping the latter to exercise political will. They have to impose sanctions on those who are using illegal fishing technologies. Likewise, the locals are asking the LGUs to police and address the dumping of garbage on Pulangi lake.

Representation of BFA in Barangay Council

Likewise, the fisher-folk associations want to be invited or be represented during barangay sessions. They have issues to bring to the council, and they want to mainstream their programs as well;

Formulation of an Integrated Area Development Plan

The activities in the upland like farming, to the construction of roads, the presence of industries, fishing technologies, and even household activities contribute to the state and quality of lakes. Hence, there has to be an integrated development plan that has to be participated by the various stakeholders.

ACKNOWLEDGMENT

The researcher would like to extend her sincerest appreciation to Central Mindanao University for giving her the privilege to conduct this study. The financial and moral support afforded by the institution to the researcher made this paper a reality;

Likewise, due appreciation is afforded to the LGUs of Maramag and Quezon Bukidnon, and to the barangay captains of Tubigon, Dologon, San Jose, and Botong for their positive response on the conduct of this research;

Most profound gratitude is accorded to the respondents for their honest and most valuable answers to the interview and Focus Group Discussion.

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