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## ABSTRACT

Lake Apo, an 18-hectare lake situated in Guinoyoran, Valencia City, Philippines is a tourist destination. It was once an ordinary pond, but with the initiatives of the community and some visionary private individuals, it has become a promising tourism site. Hence, the study was conducted to assess the initiatives of conservation undertaken by the stakeholders of Lake Apo, analyze the issues confronting the lake, and describe the tourists' assessment on the lake. The study is descriptive employing quantitative and qualitative approaches. Survey, Focus Group Discussion, and Key Informant Interview were the tools used in data gathering. The residents claimed to be highly dependent on the lake. It gives them livelihood since it was opened to tourism, a source of leisure, and a source of protein. As a tourist spot, the lake receives positive assessment from tourists. Its beauty and serenity appear captivating. Tourism is the lake's most viable utility. The stakeholders are desirous to transform the lake into a vibrant and sustainable ecotourism site. However, young as it is now, tourism in Lake Apo is hounded with controversy on conflicting claim of ownership, and issues on poor resource management, unregulated anthropogenic activities, and poor waste management.

*Keywords:* ecotourism, assessment, perceptions, conflict

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## INTRODUCTION

Tourism is the most rapid growing industry and economic generator to many destinations, towns and regions globally (Yusof et al., 2010). According to Smith (1995) tourism can make important contribution to poverty alleviation, employment, and development of rural areas. Hence, many sites like mountains, beach-fronts, rivers, and lakes have been developed into tourist destinations. These natural settings are aesthetically enhanced to cater public recreation. The conversion is designed mainly for socio-economic development (Tikkanen, 2003). However, tourism may give grave pressures on the environment as more and more visitors come (Bushell, 2006). Much more so that some tourists rarely understand how their gay activities give physical impacts on the environment (Rizvi, 2008). Hence, for many years, experts on environmental protection and water supply like the International Lake Environment Committee (ILEC) try to solve the problems behind the conversion of some sites to tourism, and aimed for sustainable tourism and protection of lake ecosystems (Kurleto, 2013).

Despite the promise of tourism, several reputable lakes have lost its prominence due to apathy, neglect, irresponsible use, and over-exploitation among local residents. Such behaviour may spring from insufficient knowledge and lack of awareness on protection and conservation of lakes (Thomas et al, 1996). This is unfortunate because the natural resource could have been a potent source of income among the locals. Likewise, Drake (1991) stressed that participation of the stakeholders is very important and fundamental in the planning, management, and effectiveness of tourism. More so, according to

Diedrich & Garcia-Buades (2009) understanding and assessing the impacts of tourism development on local communities are important to ensure the sustainability and long-term success of the industry. It is on this regard that Jenkins & Henry (1982) argue that the government has a major role to play, for its responsibility in the protection and conservation of tourism sites is higher than the private sectors' involvement for tourism development. Therefore, the government should get involved in dealing the impacts of tourism on host sites and communities. The study of Guerrero (1999) on 36 major lakes in the Philippines found that only 41.7% are in good condition, while 55.5% are threatened, and 2.7% are in critical condition.

Hence, the study on Lake Apo, an 18 hectare beautiful lake situated at Barangay Guinoyoran, Valencia City was conducted. Some 30 years ago, the lake was just considered a pond where carabaos used to wallow, a place for washing clothes, and a dumping area for household garbage. Some visionary residents, however, saw its potential to become a tourist spot, cleaned and developed it into a tourist area. Now, it is one of the tourist destinations in Bukidnon.

The study is anchored on the principles of ecotourism. Ecotourism is a sub-category of tourism that is seen to be desirable because it gives income to the locals while holding intact the ecosystem. It conserves the status of the natural resources used while affording livelihood. Primarily, it is aimed at improving the lives of

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the locals. Likewise, it is also seen as an effective tool for environmental conservation (Garrod, 2003). Unlike other forms of tourism, ecotourism banks on natural resources and landmarks to attract tourists (Stem, 2003) like forest, lakes, mountains, rivers, etc. More so, ecotourism is seen to be a good example of sustainable development. It supports the locals economically, and it conserves the natural resources used. The Brundtland Commission defined sustainable development as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" (Report of the World Commission on Environment: Our Common Future. N.D.). Henceforth, ecotourism demands conservation, which according to Mondino (2019) is a tough job to do. It demands high quality maintenance of natural resources, training people with local knowledge as guides and interpreters, educating and making people aware on conservation practices, among others. Nevertheless, the author finds ecotourism a promising alternative path to development, especially on areas where extraction livelihood does not warrant. Developing an effective ecotourism business maybe challenging, however Bonilla (2003) has suggested a method which has been proven effective, at least in few tourist destinations where the method was applied. This method is popularized by the Conservation International (CI). Basically it suggests the crafting of a tourism plan that is participatory, where the community, non-government Organizations, local government units, ecotourism specialist, the private sectors, together would craft the vision and mission of the tourism project and strategize its implementation. Being participative, its implementation is feasible, better than consultant-driven plans.

Anchored on ecotourism, the study tried to answer the following questions: How do residents of Lake Apo perceive and describe their relationship with the lake? What privileges, opportunities, and benefits has the lake

afforded to them? How do tourists describe and assess the lake? What are some of the tourists' suggestions to better improve the services of the lake? What are the initiatives of conservation undertaken by the LGUs and residents of Lake Apo? And, what are the issues confronting Lake Apo? In general, the study assessed the communities' relationship with the lake and its initiatives of conservation, analyzed the issues confronting the lake, and described the tourists' assessment on Lake Apo.

## METHODOLOGY

### Study Site

Lake Apo is situated in Sitio Lake Apo, Guinoyoran, Valencia City, Philippines (Fig. 1). The lake has been developed into a tourist area, which efforts started in 1990s as initiated by Dr. Almer Alfonso, a member of the Sangguniang Bayan of Valencia City. The lake has an area of 18 hectares with 108 households.

Aside from occasional employment afforded by tourism, most locals engage in farming, while some engage in fishing using gill nets, and banatans (Quimpang, 1991).

The study was conducted on March to July 2019. It assessed the communities' management on Lake Apo as a tourist area. The study is descriptive using a combination of survey among residents and tourists, Focus-Group Discussion (FGD) among local officials, and Key Informant Interview (KII) among lake managers. There are 108 households in Sitio Lake Apo and 60 (55%) were randomly chosen as respondents. They were asked to answer a self-formulated and peer-reviewed questionnaire. The questionnaire had five parts: A. Biographical Information; B. Utilization, Dependence, and inhabitant's Relationship with Lake Apo; C. Initiatives of Conservation; D. Development of

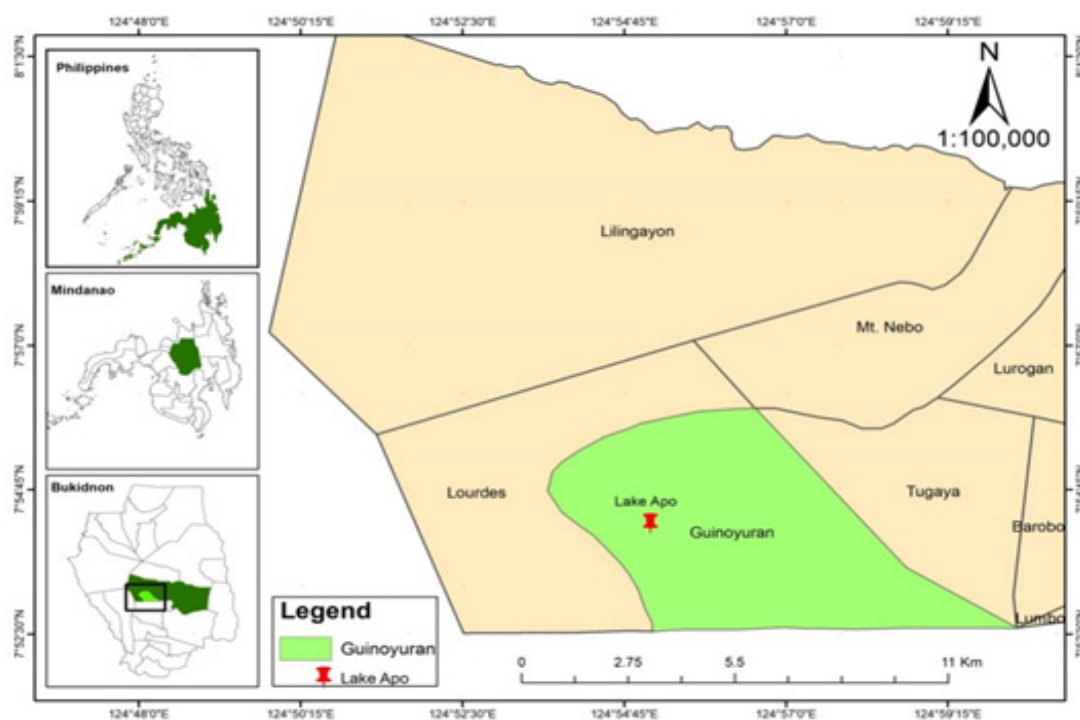


Figure 1. map of the Study Area

Lake Apo into a Tourist Destination E. Issues Confronting Lake Apo. Some of the questions raised to the respondents were: How do you describe your relationship with the lake? How important is Lake Apo to you? What benefits have you gained from the lake? How is the lake managed as a tourist area? Likewise, 60 tourists were interviewed. The questions revolved around their assessment on Lake Apo as a tourist destination, the activities they do in relation to the lake, and the amenities they avail in Lake Apo. Some of the questions raised include: How do you describe and rate Lake Apo as a tourist destination? What can you suggest to help improve the lake? What amenities do you avail? Would you recommend Lake Apo to your friends? The interviews happened in the first week of July 2019 (i.e., July 2-7, 2019) on daily basis for six (6) consecutive days with a quota of 10 respondents per day. The FGD had 6 participants. They were identified by the Barangay Captain based on their functions in relation to the lake. They were the Tourism Officer, SK Chairman, and 4 barangay kagawad. The discussion revolved around LGUs vision, activities, and programs for Lake Apo, and on issues concerning the lake. Some of the questions were raised were: How do you envision Lake Apo years from now? What activities, programs, and strategies are initiated by the LGU to realize the vision? What are the issues confronting the lake and how are these issues dealt with? Likewise, the KII had 6 respondents. They were the stakeholders, managers, and the casual employees of Lake Apo. The discussion revolved around the development, activities, and issues confronting Lake Apo. Some of the questions raised were: Can you describe the appearance of Lake Apo before it was opened to tourism? What benefits has Lake Apo contributed to you and the locals? What is your vision for Lake Apo? Can you describe how you and other stakeholders manage Lake Apo? What issues confront the Lake? How are these issues addressed?

Overall, the research produced quantitative and qualitative data. The former were analyzed through frequency count and percentages while the latter were analyzed through thematic analysis. Qualitative data were categorized in matrix form to identify discernible patterns and were revised based on emerging themes. To come up with an analysis, SWOT (Strength, Weaknesses, Opportunities and Threats) method was used. The questions were imbedded in the FGD and KII.

The research was conducted observing research ethics. A permission to conduct the study was sought from the barangay captain and from the Sitio Leader, and an Institutional Ethics Review Committee (IERC) Permit was secured from CMU before the conduct of the study. Likewise, the interviewers explained to the respondents the nature and purpose of the study conducted and assured them that their identity would be kept anonymous. They were asked to participate, but were also made aware of their right not to answer questions which they believe were offensive or discriminatory, or forego their participation should they feel uncomfortable in the course of the activity. The study was anchored on the principles of ecotourism, a sub-category of tourism that tries to conserve the status of the natural resources used while affording livelihood to the locals. Hence the questions in the study were derived largely on how the locals use and develop the lake to

become a good source of livelihood, and their initiatives of conservation to make the lake still available for their children and for future generations.

## RESULTS AND DISCUSSION

### A. Biographical Data

Most of the respondents (26.67%) are from ages 36-45. Most (61.67%) are male and married (85%). Most of them (46.67%) have attended high school level only and only few (5%) are college graduates. Most of the locals (88.33%) are Seventh-day Adventist (SDA) and most (48.33%) have 3-5 children. Only few (21.67%) claim to have a regular monthly income, which ranges from seven to eight thousand pesos. Other respondents are primarily home-makers who just take turns in serving the lake as guest attendants (53.3%), and others (25%) do farming (Table 1).

Most of the tourists (26.67%) are from ages 21-30. They are mostly male (60%) and single (68.33%). Most of them (68%) are college graduates and are currently working. Most (60%) of the tourists are embracing Roman Catholicism. Most (63.3%) are local tourists outside Bukidnon, they come from Cagayan de Oro City, Cotabato City, and Davao City. There are also "balik-bayan", Filipinos who are permanently staying in the United States of America (5%) and United Kingdom (3.33%) This implies that Lake Apo is not only famous locally, it has as well brought its name internationally. (Table 2).

### B. Utility of the Lake

The respondents consider Lake Apo to be of great importance. If during the past, it only served as a pond to carabaos, a place for washing clothes, and a dumping area for household garbage, it has become a good source of livelihood to many families since it was developed into a tourist area. It came out during the interview that each household near Lake Apo is given the privilege to guard or serve as caretakers of the lake by rotation for three weeks. Others serve as raft-rowers. Likewise, some locals run sari-sari stores, others vend kakanin to tourists. There is an average of 30 tourists a day. During peak seasons like summer, All Souls Day, December and other holidays, visitors reach a number of 180 persons per day. Many occasions like family reunions, class reunions, birthdays, and wedding anniversaries are celebrated in the lake. Likewise, the place is now a favorite destination for pre-nuptial footages and pictorials. This is because the lake is picturesque and has good ambiance. As one tourist puts it "The place is unique and outstanding. The air is refreshing. The landscape gives a foreign feel/aura. The water and the breeze could ease minds. Over-all, this place is amazing".

Lake Apo, primarily serves as a tourist destination. Its operation has provided livelihood to the locals. Likewise, the lake also serves as sources of protein. Fishing does not appear vibrant, but the catch is enough to supplement the family's need for protein. The average catch for a fisherman fishing for 4 hours is 2 kilos. The catch is just enough for food. However, there are cases when a couple of fishermen is able to have a catch of 10 kilos. But this rarely happens.

Table 2. Biographical Data of Tourists Visiting Lake Apo, July 2019.

Variable	Frequency	Percentage
<b>Age</b>		
26-35	11	18.33
36-45	15	25
46-55	16	26.67
55-65	10	16.67
66+	8	13.33
<b>Sex</b>		
Male	37	61.67
Female	23	38.33
<b>Civil Status</b>		
Single	2	3.33
Married	51	85
Widow	7	11.67
<b>Educational Attainment</b>		
Elementary Level	10	16.67
Elementary Graduate	6	10
High School Level	28	46.67
High School Graduate	5	8.33
College Level	8	13.33
College Graduate	3	5
<b>Religion</b>		
Seventh-day Adventist	53	88.33
Roman Catholic	7	11.67
<b>Number of Children</b>		
0-2	26	43.33
3-5	29	48.33
6-8+	5	8.33
<b>Monthly Income</b>		
7-8k	13	21.67
<b>Sources of Income</b>		
Guest attendants	32	53.33
Farming	15	25

Nevertheless, the locals acknowledge the significance of fishing for their daily survival. "Maka-abag-abag pud sa inadlawng panginahanglanon" (It helps us answer our basic daily needs). Using hook and line (pamingwit), the catch of fishermen are more on Tilapia (*Tilapia nilotica*), Karpa (*Cyprinus Carpio*), and Kasili (*Anguilla australalis australalis*).

Fishing in Lake Apo however does not appear attractive to most locals, hence there are no full-time fishermen in the area. In-fact, only 5% of the locals claim to be part-time fishermen. Other than tourism and fishing, the lake also serves as a laundry place to some locals. Though with the development of tourism, washing of dirty clothes in the lake is prohibited, there are still some locals practicing it. Though, they do it only at the water-exit portion of the lake.

Above everything, the lake is a place for leisure

among the locals. It gives them the privilege to go rafting, angling, swimming or boating. This is for them the greatest contribution of the lake to their lives. They are thankful that they are blessed with a beautiful lake where they can celebrate their special occasions without spending a penny for the venue. The locals are free to use the place. This is one of their privileges.

### B.1. Residents' Relationship with Lake Apo

The residents' relationship with Lake Apo is best described with their dependency on the Lake. The graph below presents respondents' perception on the degree of their dependency on the lake (Fig. 3).

The lake has contributed to the income of the locals, primarily because of tourism. It is also their main source of protein. It is where they fish. Likewise, it is their venue for recreation. Hence, data reveal that 65% of the

Table 2. Biographical Data of Tourists Visiting Lake Apo, July 2019.

Variable	Frequency	Percentage
<b>Age</b>		
21-30	32	53.33
31-40	11	18
41-50	7	12
51-60	6	10
61+	4	6.67
<b>Sex</b>		
Male	36	60
Female	24	40
<b>Civil Status</b>		
Single	41	68.33
Married	17	28.33
Widow	2	3.33
<b>Educational Attainment</b>		
Student	18	30
College Graduate	41	68
Post Graduate (PHD)	1	2
<b>Religion</b>		
Baptist	9	15
Seventh-day Adventist	15	25
Roman Catholic	36	60
<b>Number of Children</b>		
Bukidnon	3	28.33
Non-Bukidnons	2	63.3

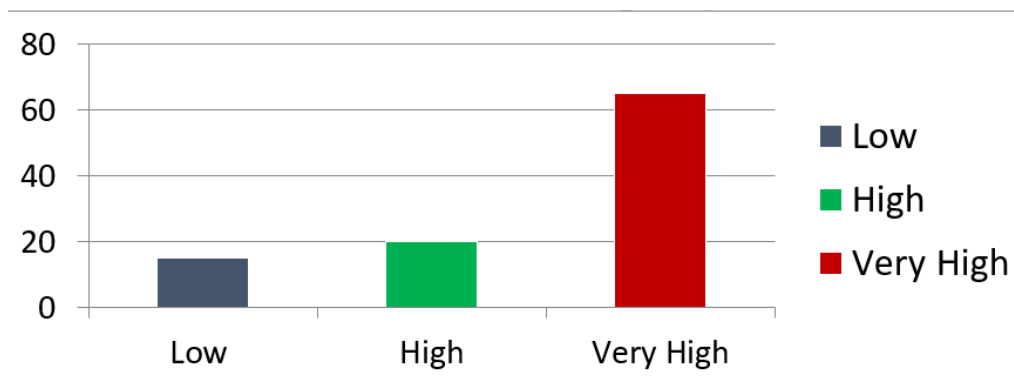


Figure 3. Perceived Dependency of the Respondents on Lake Apo

local residents claim they are very dependent on the lake; 20% consider themselves dependent, while only 15% say that they are less dependent. None among the respondents say they are not dependent. Thus, feeling blessed, all of the respondents believe that Lake Apo is created by God, not only for themselves but for all humanity, and they consider stewardship of the lake as their role. Likewise, all of the residents consider themselves as part of the lake and believe that if they harm it, the lake will harm them back. "Gatinabangay gayud ang mga tao diri (babae o lalaki) sa pagbantay ug pag-implement sa mga polisiya diha sa Lake Apo kay para raman sad na sa amoa" (Both men

and women help each other in maintaining and guarding the Lake because it is for our own good). In general, the residents are concerned of the lake. They strongly believe that it is their obligation to protect and conserve it. Hence, they actively participate in tree planting, clean-up drive, and in guarding the lake. They do this to preserve the beauty and the serenity of the place not only for them but also for their children, the future generations.

### C. Tourists' Assessment on Lake Apo

Crompton (1979) described the push and

pull factors of tourism. Like some authors before him, he primarily operates on a foundation of the socio-psychological characteristics of tourists, and the culture and attractiveness of the actual destinations. He stressed that individuals travel because they are pushed to do so by factors related to themselves, but at the same time they are pulled by tangible factors such as natural and cultural resources, and the benefits that they may get from the place of destination. In the case of Lake Apo, 86.67% of the tourists visited the lake for relaxation. The lake is a good break from their hectic everyday life, while 55% of the tourists choose the place because of its natural beauty and climatic conditions.

Despite the inadequacy of the services of Lake Apo as presented earlier, the tourists are more than satisfied with what the lake offers. Generally, tourists express with awe over Lake Apo and consider their experiences and stay in the lake truly worthwhile. They describe it to be "enchanting, too perfect, and beyond compare". They see it to be a good place for "relaxation", and "meditation". It is a beautiful escape from the hassles and annoyances of the busy cities. "It is a place where every soul can freely move without limits", said one tourist. "It is a lovely place that one feels like a bit of heaven", says another. "When it comes to the real beauty of nature, nothing beats the shining aura of this beautiful place", says one Balik-bayan. "Philippines never ceases to amaze me. Lake Apo is a natural world God created for us", says another Balik-bayan. Indeed, Lake Apo appears to be relaxing, consoling, and meditative to many tourists.

For most tourists (53.33%), the beauty of the lake is excellent, while it appears good to others (46.67%). None rated it poor nor terrible. Likewise, 30% of the tourists

rated Lake Apo as excellent in terms of personal safety and security while most of them (70%) rated it as good. In terms of cleanliness of the surroundings, 13.33% rated it with excellent while 75% rated it as good and 11.67% as poor. For the cleanliness of the water in the lake, 16.67% of the residents rated as "excellent" and most of them (78.33%) as "good" while there is 5% as "poor". Most (83.33%) rate their over-all experience in Lake Apo with "good", while 11.67% of the tourists' rate "excellent", and 5% rate their experience as "poor".

However, most of the tourists (82%) are not aware of any policies established by the management of the lake. They said, no one orients them about it. Some tourists (18%) say they know some basic policies such as "Don't throw your garbage in the lake" and "Alcoholic drinks are prohibited", but these rules are based on their own perspectives only. According to them, there are no personnel/staff in the area that guide or instruct them on the prescriptive and proscriptive norms when in the lake. Likewise, the tourists offer some suggestions for the improvement of tourism in Lake Apo such as establishment of food and beverage stalls, renovation of the cottage rafts, improvement of comfort rooms, proper waste disposal (trash bins) and improvement of the Dologon route road. Nevertheless, most of the tourists would like to recommend the lake to their friends and family. They find it to be a good place for relaxation with its serene environment and amusing ambiance. For them, its beauty is relieving.

#### D. Initiatives of Conservation

The LGU of Barangay Guinoyoran envisions for a more beautiful and captivating lake that would attract more tourists while conserving it at the same time. Hence,

Table 3. Lake Apo Development Plan for 2019-2022.

Project	Total Projected Cost	Funding Source
Construction of Information/Pasalubong Center	300,000.00	City, National, Province
Construction of Floating Cottages	200,000.00	City/Province
Landscaping/Beautification of the Lake	100,000.00	Brgy, City, Province
Tree Growing	10,000.00	Brgy/City
Purchase Life Jacket	100,000.00	Brgy/City
Zip Line	500,000.00	Brgy, City, Province
Total	1,210,000.00	

As of October 2019, what has been realized from the plan is Tree Growing (Fig. 3).



Figure 4. Tree Planting Activities

it crafted a 3-year Development Plan for the lake (Table 3). The following are the components of the plan:

Last June 26, 2019, the LGU of Barangay Guinoyoran conducted tree planting activity. The local officials in partnership with City Environment & Natural Resources Office (CENRO) and Provincial Environment and Natural Resources Office (PENRO) planted 200 seedlings of Golden Trumpet Tree (*Handroanthus chrysanthus*) around the 20-meter easement of the lake. The LGU chose Golden Tree for it appears very attractive to most people's eyes. Likewise, the barangay also conducts clean-up Drive. This is facilitated every first Tuesday of the month, participated by the locals, Barangay Tanod, Barangay Health Workers, Bantay-bayan, and the business sector.

Likewise, there are private individuals who are taking initiatives to help conserve Lake Apo. As recalled by the respondents, in 1980s, the lake was just a pond where carabaos used to wallow. It was dirty, with tons of garbage. In 1990s, some visionary locals initiated the cleaning of the lake. Then, one entrepreneur started building rafts, floating cottages, and rest-houses. The place became attractive and it drew tourists to visit the place. Since then, Lake Apo gained prominence.

Indeed, the LGU and some private individuals have initiated necessary steps to promote and help conserve Lake Apo. Its endeavors however are seen insufficient. The management on lake Apo is loose and below satisfactory. It needs improvement. Some inadequacies mentioned by the respondents include the absence of a unified ticketing booth and the absence of proper entrance-exit routes. There are two gates leading to the lake, one collects 50Php (\$1) for entrance, while the other collects only 25 Php (\$.50). But no tickets are issued upon entrance. Likewise, some tourists complain about toilets that are not presentable, life jackets that are already worn-out, the absence of trash bins, and the absence of tourist guides orienting tourists about proscriptive and prescriptive norms while in the lake. Some resident-respondents also complain about garbage that are not regularly collected. They are junked near the toilets.

The situation of the opposite bank however presents a different scenario. The lawns are well-manicured, and no garbage could be seen around. The proprietor of

the rest-houses is able to maintain the cleanliness of the place.

## E. Issues Confronting Lake Apo

Lake Apo is a good tourist destination. Despite its inadequacies in terms of facilities and regulations, most tourists (83.3%) rate their visit in the lake to be good, and most (53.3%) rate its beauty to be excellent. Most tourists are appreciative of the place. They describe it to be enchanting, a perfect place for relaxation and meditation. Hence, it is important to identify and analyze the issues confronting it, so that each could be properly addressed.

### 1. Water Quality

One resident-respondent said "Hinlo man kaau ni ang tubig diri ug pwede gani mainom ang tubig sa tunga sa lake" (The water here is very clean and the water in middle portion of the lake is potable). In contrast to the claim, an agroforestry project conducted by the CMU College of Forestry and Environmental Science (April 2016) revealed that the lake's water is not healthy for human consumption. It contains bacteria and substances that can harm human's health and may cause diseases to the person who drinks on it. The result of their study is presented below.

*The bacteria named above are harmful. Citrobacter may cause meningitis to adults or older children; Proteus mirabilis can cause urinary tract infection (UTI), intra-abdominal, and bloodstream infections; Enterobacter aerogenes, Enterobacter agglomerans may cause urinary tract infections (UTI) and bacteremia. Likewise, Serratia are widespread in the environment. They are capable of thriving in diverse environments, including water, soil, and the digestive tracts of various animals. They can cause infections in the bloodstream, lower respiratory tract, urinary tract, surgical wounds, and skin and soft tissues in adults. Whereas, Proteus usually infects urinary tract, blood and abdominal wound, groin, neck and ankle (Eichhoff et al., 1966).*

DAO-34 series of 1990 set the standard of nitrate of about 10mg/L and the nitrate level in the lake Apo is higher than the standard, while in the spring is lower than the standard. Nitrates are a form of nitrogen and essential plant nutrients, but in excess amounts they can cause

Table 6. Bacteria Analysis Result, Lake Apo, April 2016.

SAMPLE AREA	RESULTS OF ANALYSIS			REMARKS	ISOLATED BACTERIA
	Total Caliform (MPN /100ml)	Fecal Caliform (MPN /100 ml)	HPC (CFU/ ml)		
Shoreline	>8.0	>8.0	281	FAILED	<i>Enterobacter aerogenes;</i> <i>Serratia sp.;</i> <i>Proteus mirabilis</i>
Middle	>8.0		228	FAILED	<i>Proteus mirabilis</i>
Spring	>8.0	>8.0	678	FAILED	<i>Enterobacter aerogenes;</i> <i>Enterobacter agglomerans;</i> <i>Citrobacter diversus;</i> and <i>Proteus morganii</i>
PNSDW 2007 AO 2006-0024	<1.1	<1.1	<500		

Table 7. Water Analysis Result, Lake Apo, April 216

PARAMETER	LAKE	SPRING	DAO-90-34 STANDARD
Nitrate	12.8	7.8	10mg/L
Phosphate	0.25	0.01	Not to exceed 0.05 nor maximum 0.1 mg/L

significant water quality problems. If you drink water that is high in nitrates, it can interfere with the ability of your red blood cells to transport oxygen and have difficulty in breathing since their bodies are not receiving enough oxygen. Sources of nitrates include wastewater treatment plants, runoff from fertilized lawns and cropland, failing on-site septic systems, runoff from animal manure.

Likewise, DAO-34 series of 1990 set the standard of phosphate not exceeding an average of 0.05 mg/L nor is a maximum of 0.1 mg/L. The level of phosphate both in the lake and in the spring is within the standard. Phosphates are chemicals containing the element phosphorous, and they affect water quality by causing excessive growth of algae. Phosphates enter water systems naturally by dissolving out of rock, but phosphates are also mined and made into chemical fertilizers to grow crops. Applying chemical fertilizers to soil already saturated with phosphates and spreading excessive amounts of manure on land causes phosphates to run off during heavy rainfall and pollute nearby water sources.

### E.1. Farming Activities

The farming activities around Lake Apo may have contributed to its water quality. Among the respondents, 25% are farmers. Most of the farmers (21.67%) only own less than a hectare of farmland and most (23.33%) plant corn crop. They use fertilizers like urea (46-0-0) and complete (16-16-16) and only few (13.33%) used ammonium phosphate (16-20). They also use herbicide such as Triple 8 (25%), Ground Plus (15%), and Tower (8%). Synthetic fertilizers and herbicides are generally classified as persistent organic pollutants (POP's) both have common properties such as persistence in the environment, and since they are not biodegradable they have the ability to bio-magnify and bio-accumulate in ecosystems, and once integrated to the food chain will create significant negative impact to human health as well as the environment.

## 2. Carrying Capacity

Carrying capacity refers to the number of individuals who can be supported in a given area within natural resource limits, and without degrading the natural, social, cultural and economic environment for present and future generations (<http://www.gdrc.org/uem/footprints/carrying-capacity.html>). In the case of Lake Apo, the LGU and stakeholders have no idea on the carrying capacity of the lake. The office will still determine it, since they lack manpower and knowledge to do it. Carrying capacity maybe computed using the given formula.

$$\text{Carrying Capacity} = \frac{\text{Area used by tourists}}{\text{Average individual standard}}$$

$$\text{Rotation Coefficient} = \frac{\text{Number of daily hours area is open to tourists}}{\text{Average time visit}}$$

$$\text{Total Daily Visit} = \text{carrying capacity} \times \text{rotation coefficient}$$

## 3. Solid Waste Management

Republic Act 9003, also known as "Ecological Solid Waste Management Act of 2000", describes solid waste management as a discipline associated with the control of generation, storage, collection, transfer and transport, processing, and disposal of solid wastes. It also states that there should be a separate container required for each type of waste for on-site collection properly marked as "compostable", "non-recyclable", "recyclable" or "special waste". The residents of Lake Apo claim they practice waste segregation. The problem however is on waste collection. "Usahay ra naay gakuha ug basura diri" (Garbage collector comes here very seldom) and "Usahay maabtan ug bulan ug masobra-an pa jud ayha ma-kolekta ang mga basura" (Sometimes, collecting of garbage would reach a month or more before the collector comes). One of the respondents say that "Kung dugay maka anhi ang mga ga-kolekta, usahay amo nalang ginalabay sa suok-suok layo diri kay gatam-ok naman gud siya" (If the garbage collector does not come, we sometimes just throw our garbage in the sides. This is a huge problem because the presence of garbage may adversely affect the environment and may give health hazards to the residents.

## 4. Inadequate Operation Management

Tourism in Lake Apo is still very young hence its management is still loose and inadequate. As mentioned by the respondents earlier, the lake has no ticket booth and no proper entrance-exit routes. There are two gates leading to the lake, but no tickets are issued upon entrance. The place is also devoid with presentable toilets. Garbage are not regularly collected. The roofs of the cottage-rafts are rotten and life-jackets are already worn-out. There are no trash-bins in the rafts. Likewise, there are no trained tourist guides. Hence, the crew know less about the standards of tourism.

## 5. Issue on Easement

The problem on easement is the biggest issue tearing apart Lake Apo. This controversy is between a prominent stakeholder versus the Local Government Unit of Guinoyoran, Valencia City. Allegedly, a part of the titled lots of one stakeholder belongs to "easement", which means the lands cannot be privatized because they belong to the state. This is a very big issue because the LGU wants to develop this portion of the lake, but it cannot take action because it is privately owned. The situation provokes



heated arguments between the two camps. Hence, the plans of the LGU cannot be implemented. This issue came out during FGD and KII.

The LGUs claim is based on Article 51 of PD 1067 otherwise known as "The Water Code of the Philippines which stated that "The banks of rivers and streams and the shores of the seas and lakes throughout their entire length and within a zone of three (3) meters in urban areas, twenty (20) meters in agricultural areas and forty (40) meters in forest areas, along their margins are subject to the easement of public use in the interest of recreation, navigation, floatage, fishing and salvage. No person shall be allowed to stay in this zone longer than what is necessary for recreation, navigation, floatage, fishing or salvage or to build structures of any kind". Moreover, explanation of the "Easement Rule" under the revised implementing rules and regulation (IRR) further stated that: "For purposes of Article 51 of the Code, all easements of public use prescribed for the banks or rivers and the shores of seas and lakes shall be reckoned from the line reached by the highest flood which does not cause inundation or the highest equinoctial tide whichever is higher. Any construction or structure that encroaches into such easement shall be ordered removed or cause to be removed by the Board in coordination with DPWH, LGU or appropriate government agency or "local government unit".

On the other hand, the owner/stakeholder based his ownership claim on "Riparian Rights". Riparian rights are awarded to landowners whose property is located along flowing bodies of water such as rivers or streams. Landowners typically have the right to use the water as long as such use does not harm upstream or downstream neighbors (Investopedia.com). The landowners have access to "reasonable use" of the water that abuts, or flows through or over their properties (Legal Dictionary). Examples of riparian rights includes swimming, boating, or fishing in the area.

Water rights in the Philippines were founded based on two major water laws during the Spanish regime: the Spanish Law of Waters (August 3, 1866) and the Spanish Civil Code. These two laws recognized the duality of water ownership- that waters are owned publicly and privately. Hence, the said laws are consolidated on the Water Code of the Philippines, Article 51 of PD 1067 (Kho and Saño,2005).

## CONCLUSION AND RECOMMENDATIONS

Lake Apo is a promising tourist destination. With its beauty and serenity, it receives positive assessment from tourists. Local residents are highly dependent on the lake. It gives them casual employment, and it is their source of leisure and protein. Transforming the lake into a vibrant ecotourism site is viable. The local-residents and the LGU are desirous to achieve a sustainable ecotourism industry. However, young as it is, tourism in Lake Apo is beset with issues like poor and inadequate operation management, poor natural-resource management, adverse anthropogenic activities that affect the lake, and ownership controversy. However, the stakeholders are open for negotiation and appropriate action.

For Lake Apo to successfully rise as an ecotourism site, the efforts and dedication of the various stakeholders are vital and necessary. Hence, the following recommendations are addressed to the following institutions and individuals:

### 1. Local Government of Guinoyoran

Based on the principles of ecotourism, the Local Government is encouraged to craft a tourism plan that is participatory, with the community, non-government Organizations, local government units, national government agencies (i.e. academe. DOT, etc.) ecotourism specialists, and the private sectors. This may be undertaken aside from the on-going 3-year Development Plan. Likewise, the "Lake Apo Sustainable Agroforestry and Natural Growing" (LASANG) proposed project of a particular stakeholder in Lake Apo is seen to be holistic, culture-sensitive, resident-responsive, and eco-friendly. It is suggested for the LGU to work out its coordination with this stakeholder. Likewise, the LGU has to continue its Clean-up Drive, establish a unified or uniform ticket booth, improve the toilets, monitor water quality, check farming activities, determine the carrying capacity, and improve solid-waste management.

### 2. Academe

The local officials of Barangay Guinoyoran acknowledge that they need the assistance of the academic institutions. They need scientific knowledge and empirical findings to support their tourism program.

### 3. Residents

The residents are the ultimate recipients and end users of Lake Apo. Hence, they are encouraged to be active and participative in the programs concerning the lake. The state of Lake Apo affects themselves.

### 4. Tourists

Tourists are encouraged to visit Lake Apo and enjoy the beauty of the place. But they should follow the basic principles of tourism like "Take nothing but pictures, leave nothing but footprints, bring nothing but memories". Likewise, they are encouraged to invite their friends to visit the lake, and to give suggestions and feedbacks, as these may help guide the management and the LGU in improving Lake Apo.

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