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Developing Mohicap Lake, San Pablo City, Philippines

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Abstract: This study assesses the development issues of Mohicap Lake. Premised on the lack of development, the inattention from the administrative agencies and the underutilization of the natural resource, the study contends that the Laguna Lake Development Authority (LLDA) and the city government of San Pablo must now take the initiative in fostering development of the lake; specifically by adjusting their model-template approach; by instigating the formulation of a zoning-development plan and by facilitating the promotion of ecotourism. These are basic actionsnecessary for ensuring that development intervention is equitable among the seven crater lakes, for addressing management-conservation issues and precipitating other development actions, for improving the lives of the locals and encouraging community development. Moreover, the study also addresses the gap in Philippine lake studies, particularly the scarcity of scholarly outputs on development studies (as the field is dominated by limnology and aquaculture studies) and on small lakes (as the field is heavily concentrated on big-lake studies).

Key words: Philippine lake, lake development, lake administration, lake studies, small lake, lake and Mohicap Lake (or Muhikap/Mojicap Lake)

INTRODUCTION

Mohicap Lake is the smallest among the seven crater lakes of San Pablo City. As a natural resource, the lake has a high potential for development since it enjoys favourable features such as water conducive to aquaculture, a natural scenic beauty, few illegal settlements and access to the city proper. Normally, these features are enough to serve as impetus for development initiatives to be implemented in the lake; yet, there was none. Mohicap Lake is presently underdeveloped, underutilized and understudied. It is underdeveloped since development actions in the lake have been conspicuously absent over the years. It is underutilized since there are few existing fish farms and ecotourism is virtually non-existent. And it is understudied since there is lack of scholarly materials on the lake, particularly on development aspects.

In general, this study is intended to address the existing scholarly gap in lake studies in the Philippines the scarcity of development studies on small lakes in the country (Brillo, 2015). In particular, this study assesses the lack of development in Mohicap Lake. It contends that the administrative agencies the Laguna Lake Development Authority (LLDA) and the city government must take action and instigate development in the lake. Specifically, the agencies must: reconsider their model-template approach of exclusively prioritizing Sampaloc Lake and Pandin Lake, since all the seven crater lakes are ecologically threatened and equally in need of government interventions; set off the crafting of a zoning-development plan for Mohicap Lake, since it is fundamental in solving problems and precipitating development initiatives in the lake and encourage ecotourism in the lake, since it is key in creating more employment opportunities for the local community. Moreover, since there is no existing definition of small lakes in the Philippines, this study also contributes to literature by providing a definition of small lakes as lakes with an area of only 200 ha or less. This operationalizing definition was subjectively arrived at after surveying the sizes of the "minor" and least-studied lakes in the country. The study proceeds to expound on the following: firstly, the gap in literature and the importance of studying the development aspects of small lakes; secondly, the current situation in Mohicap Lake; thirdly, its administration arrangement and lastly, its development issues.

PHILIPPINE LAKES, DEVELOPMENT STUDIES AND SMALL LAKES

Lakes are integral to human existence and development since over 90% of the liquid freshwater on the earth's surface is found on them (Shiklomanov, 1993; ILEC, 2005). From the dawn of civilizations to

contemporary modern societies, the natural resource has served man's needs from rudimentary uses such as drinking water, source of food and transportation to more complex uses such as agricultural irrigation, fish farming, flood control and hydroelectric power. Natural or artificial (i.e., reservoir) lakes are also essential in the preservation of the world's biodiversity and ecosystem. The water resources serve as habitats for a variety of flora and fauna and play a critical role in natural processes such as climate mediation and nutrient cycling (portions of this section were derived from the previous works of the researcher on Philippine lakes).

Not with standing the indubitable value of lakes, human undertakings over the years such as food production, development activities, settlement, urbanization and industrialization have brought unprecedented degradation on the natural resource. Currently, many lakes around the world continue to be threatened by eutrophication, acidification, toxic contamination, water-level changes, salinization, siltation, overfishing and exotic species/weed infestation (Kira, 1997; ILEC, 2005). This reality was empirically confirmed in the Global Environment Facility-Lake Basin Management Initiative's (GEF-LBMI) study of 28 major lakes around the world from 2003-2005 where the project underscored that overall, the problems affecting lakes are not improving (ILEC, 2005). The GEF-LBMI's finding is mirrored in the Philippines since many lakes in the country are also at risk of ecological deterioration. This situation was formally acknowledged in the First National Congress on Philippine Lakes held in 2003 when the body conceded that lakes in the country are vulnerable to degradation and in the Second National Congress on Philippine Lakes held in 2011 when the body echoed that despite incremental improvements, the condition of lakes in the country remains to be threatened.

Under the threatened-lake scenario, Philippine lake studies have been incrementally increasing through the years. The overwhelming majority of the studies, however, comes from the natural sciences and is heavily concentrated on big lakes (Brillo, 2015). A recent survey on Philippine lake studies revealed that (conducted using the online database of the three leading universities in the country) 77% of the scholarly outputs are classified under the natural science perspective and only 23% under the social science perspective and 80% of the scholarly materials are studies on big lakes and only 8.7% on small lakes (Brillo, 2015). Here, the studies under the natural sciences are spearheaded by limnology and aquaculture research and the studies on big lakes are mainly focused on the largest lakes in the country (e.g., Laguna de Bay, Taal Lake, Lanao Lake and Buhi Lake). This finding implies that scholarly outputs are scarce on two fronts: research on areas of management and development and research on small lakes.

In addressing the scholarly deficit, the management-development studies and the small-lake studies must make significant progress. In the former, concurrently advancing in both is critical: one to have a better understanding of the issues and problems and two to make better headway in improving the conditions of lakes. The two perspectives are interdependent as they complement and supplement each other. A single perspective cannot address the array of challenges confronting lakes today since biophysical-environmental issues and socio-economic-political-management issues are intertwined and cannot be effectively addressed in isolation. So far, the limnology and aquaculture have already made decent progress in Philippine lake studies; thus, the management and development research must now make substantive advances to offset the scholarly imbalance. In this way a more integrative knowledge building can be achieved which translates to better understanding and solutions to the many problems facing lakes in the country.

In the latter, the existence of small lakes and the issues facing them must be documented, in order to expand the knowledge base on Philippine lakes. Small lakes comprise the bulk of existing lakes in the country (around 70-80%) yet little is known or written about them. Small lakes are least studied since they are generally considered to have minimal economic significance (relative to big lakes) which translates to peripheral attention from government agencies, private-funding institutions and scholars. The geographical remoteness of many small lakes in the country is another contributing factor as they require more resources and efforts to study. There are five main reasons why it is urgent to study small lakes: the shorter time span on irreversibility of ecological degradation; the necessity of information needed to save them; the connection to other natural resources; the crucial role in improving lake communities and the need to document the natural resource for posterity.

The first reason is that small lakes are inherently more fragile and vulnerable to environmental deterioration compared to big lakes. Their small size naturally equates to reduced absorptive capacity in neutralizing pollutants/contaminants and shorter time for any ecological damage to be irreversible. The second reason is that critical information is needed to improve the condition of small lakes. Significant knowledge must be gained to properly manage the natural resource. The third reason is that many small lakes are significant

components of the system of other natural resources such as river system and watershed or basin of big lakes. Thus, solving the issues and problems of other systems also demand knowing vital information about small lakes. The fourth reason is that small lakes are abundant in the country and are critical in improving the living conditions of lake residents and their local communities. This is imperative since many communities around small lakes are impoverished. The fifth reason is that small lakes must be recorded for the future generations. Since, it is a truism that all lakes will eventually die, small lakes become extinct at a much faster rate than big lakes. Some small lakes in the country may be lost in just a few decades; just like Manlalayes Lake (the twin lake of Gunao/Gunaw Lake in Dolores, Quezon) which dried out a few years ago before anyone was able to document its existence (Brillo, 2015).

Taking a cue from the preceding discussion, this study directly addresses the identified gap in Philippine lake studies by assessing the development issues of a small lake in San Pablo City Mohicap Lake. Consistent with the lacuna in the literature, there is scarcity of scholarly outputs on Mohicap Lake (Brillo, 2015; Guerrero, 2001; LakeCon2011, 2011). So far, there are no materials obtained under development studies and the only materials found are studies under limnology and aquaculture.

THE PRESENT SITUATION OF MOHICAP LAKE

Mohicap Lake is located in Barangay San Buenaventura, San Pablo City. The lake is about 7 km from the city proper and is accessible through the Barangay road which runs along its eastern side. Mohicap Lake is circular shaped and considered a catchment area of Mount San Cristobal; a feature shared by all the seven crater lakes. The lake is widely believed to be volcanic in origin which was formed through a phreatic eruption when shallow lava from Mount San Cristobal made contact with groundwater causing an explosion that resulted in a crater-like depression. As a natural resource, Mohicap Lake is the smallest among the seven crater lakes of San Pablo City. It has an area of only 22.89 ha, maximum water depth of 30.40 m and elevation of more or less 80 m. The water sources of the lake come from rainfall, surface runoff and surrounding/underwater springs and it discharges water through seepage, evaporation and outflow to the town of Calauan via Compuerta Creek.

Mohicap Lake is mainly utilized for aquaculture, specifically, tilapia farming in floating cages. In San Pablo City, aquaculture was first introduced in Bunot Lake in 1976 after the successful introduction of tilapia cage farming in Laguna de Bay by the LLDA in 1974 (Radan, 1977). Eventually, tilapia cage farming spread to Mohicap Lake and the other crater lakes (e.g., Sampaloc Lake, Calibato Lake and Palakpakin Lake). Since, the makeup of Mohicap Lake is suitable for aquaculture, fish farming has expanded over the years, becoming an integral feature of the lake. In 2004, the LLDA has reported that there were 80 fish pen/cage operators on the lake occupying an area of 36,000 m^2. However, fish farming in Mohicap Lake has greatly dwindled since then. In 2013, the Provincial Government of Laguna reported that there areonly 25 registered fish pen/cage operators in the lake. The significant decline in number of fish farms is attributed to the high cost of commercial feeds which makes it hard to start and continue operating a fish farm. The number has declined further due to a recent typhoon that destroyed several fish pens and cages.

Mohicap Lake also has few illegal settlers within its vicinity mainly due to the limited number of fish farms in the lake and the steep slopes in most of the banks which make it unfavourable for building settlements. Ironically, despite the few settlers and fish pen/cages, the water quality of the lake has deteriorated. On the 2006-08 water quality report of the LLDA on the seven crater lakes (the analyses are based on the class C classification of the Department of Environment and Natural Resources (DENR) on fresh surface water (see DENR Administrative Order No. 34 series of 1990, section 68 paragraph A). Class C means that lake waters can be used as: fishery water, recreational water (class 2) and industrial water supply (class 1)) Mohicap Lake registered the following results (footnotes 6-12 are taken from LLDA's 2006-08 water quality report) Dissolved Oxygen (DO) criterion, it exceeds the allowable level and has the lowest DO level in 2007 and 2008 (DO is an important indicator of a water body's ability to support aquatic life) Biochemical Oxygen Demand (BOD), it has consistently taken the second highest concentration (BOD is a measure of how much oxygen is used by microorganism in the aerobic oxidation or breakdown of organic matter in the streams. The higher the BOD, the more polluted the water. Bunot Lake took the highest concentration) Ammonia level, it has consistently failed and has the second highest level (this is based on the criterion set by the Environmental Study Board in 1973. Bunot Lake took the highest level); phosphate concentration, it consistently exceeds the allowable standard (the class "C" water criterion of 0.05 mg L^{-1} for phosphate); Turbidity level, it exhibits the second highest turbidity reading (turbidity is a measure of the amount of particulate matter that is suspended in

water. The measure used was in Nephelometric Turbidity Unit (NTU). Bunot Lake had the highest reading) Total Dissolved Solids (TDS), it has the highest range (High TDS concentrations can produce laxative effect and can give unpleasant mineral taste to water) and Total Suspended Solids (TSS), it ranks second in concentration level (TSS can include silt, decaying plants, animal matter, industrial waste and sewage. High concentration of suspended solids can cause many problems for stream health and aquatic life. Bunot Lake had the highest concentration). Overall, Mohicap Lake took the second worse assessment vis-a-vis the seven crater lakes (Bunot Lake took the first spot as having the worst condition). These results are perplexing considering the Mohicap Lake's "better condition" (in terms of the number of settlers and fish pens/cages) relative to the other crater lakes. The possible explanations are it takes longer for the impact of the decline in fish farm numbers to be felt and the problem of surface run off (due to steep slopes of the lake) (especially agricultural pesticides and fertilizers) and the lack of drainage and sewage systems continue to plague the lake.

Similar to the rest of the seven crater lakes, there have been fish kills in Mohicap Lake. This ecological phenomenon is mainly a consequence of the annual stratification or upwelling in the lake where the bottom water which is usually loaded with toxic substances (e.g., hydrogen sulfides and ammonia) is brought up to the surface, resulting in substantial fish kills (Araullo, 2001). Conversely an advantage of Mohicap Lake is that it has a less serious problem of eutrophication the process where dissolved nutrients accumulate, depleting the lake water's oxygen level which then encourages oxygen-depleting plants to thrive. Because eutrophication is not an issue, algal blooms and hyacinth proliferation are also non-issues.

Mohicap Lake is also surrounded by natural springs which feed water on it. In managing lakes, the focus areas are aquaculture and water quality; natural springs are usually overlooked. There is no current program on protecting the natural springs and their watershed. Because the watershed of many natural springs is typically located near or within privately-owned lands, it is crucial to come up with clear directives and regulations such as banning the cutting/clearing of trees and vegetation and the construction establishments near them. Furthermore, it is imperative that studies are conducted to clearly establish the link between the natural springs and the lake, particularly their inflow contribution and ecological effects. This is critical to elevate natural springs in the agenda of the stakeholders and authorities of the lake.

THE ADMINISTRATION OF MOHICAP LAKE

The administration of Mohicap Lake involves two key government agencies the LLDA and the city government of San Pablo and a multitude of overlapping laws. The mandate of the LLDA comes from The Laguna Lake Development Authority Act of 1966 (as amended by Presidential Decree 813, October 1975) or RA 4850 which is the principal law in the administration of Laguna de Bay (the largest lake in the country) and its watershed area (which includes the seven crater lakes of San Pablo City). RA 4850 created the LLDA and made it the main agency in supervising and managing the water bodies in the Laguna de Bay region (see RA 4850, section 1 and section 4) (the Laguna de Bay region includes the Provinces of Rizal and Laguna; the Cities of San Pablo, Pasay, Caloocan, Quezon, Manila and Tagaytay; the Towns of Tanauan. Sto. Tomas and Malvar in Batangas Province, the Towns of Silang and Carmona in Cavite Province; the Town of Lucban in Quezon Province and the Cities of Marikina, Pasig, Taguig, Muntinlupa and Pateros in Metro Manila). Specifically, the LLDA has the primary responsibility to promote the development of the Laguna de Bay region while providing for environmental management and control, preservation of the quality of life and ecological systems and the prevention of undue ecological disturbance, deterioration and pollution. The LLDA's authority was strengthened by Executive Order No. 927 issued by then President F. Marcos in December 1983 which gave the LLDA the exclusive water rights over the lakes in the Laguna de Bay region. In the administrative setup, the LLDA's central concern is Laguna de Bay while its jurisdiction over Mohicap Lake (and the rest of the seven crater lakes) is incidental, it being a part of the watershed of the Laguna de Bay region. In practice, the downside of this administrative arrangement is that the attention and resources of the LLDA (which generally are inadequate as in most government agencies) are concentrated on Laguna de Bay, its principal concern while the small lakes within its region (the seven crater lakes and Tadlac Lake) usually receive peripheral consideration (portions of this section were derived from the previous works of the researcher on Philippine lakes).

The mandate of the city government of San Pablo comes from The Local Government Code of 1991or RA 7160 which gives the local government unit the authority over Mohicap Lake being municipal water. Since, RA 4850 confers the administration of Mohicap Lake to the LLDA while RA 7160 bestows the city government the territorial jurisdiction, this implies "coordinative-supplementary"

arrangement between the two government agencies. The LLDA lays down the comprehensive development framework and approve/disapprove the plans and projects submitted to it by the city government. Conversely, the city government legislate the necessary ordinances in support of the overall development strategy of the LLDA. This arrangement was reiterated in a Memorandum of Agreement (MOA) signed by the LLDA and the City Governments of Laguna in 1997 (MOA was signed by LLDA General Manager Carlos Tomboc, Laguna Governor Jose Lina Jr. and the Mayors of San Pablo City (Vicente Amante), Nagacarlan (Demetrio Comendador) and Rizal (Rolen Urriquia). Nagcarlan and Rizal towns have area jurisdiction over a part of Yambo Lake and Calibato Lake, respectively).

On the regulation side, the LLDA oversees while the city government executes the rules. The city government enforces the regulations of the LLDA since it controls the local police and the barangay units. This role was evident when the city government demolished the illegal structures in Sampaloc Lake in the early 2000s. This capacity gives the city government some leverage over the "upper" authority of the LLDA as the latter's regulatory actions on the seven crater lakes are almost always anchored on the former's cooperation and assistance. In practice, the downside of administrative arrangement happens: on the LLDA's part when it procrastinates in deciding on plans or projects submitted by the city government (e.g., zoning-development plan) and on the city government's part when it becomes reluctant in enforcing the directives of the LLDA (e.g., demolition of illegal settlers).

In administering to Mohicap Lake, the LLDA and the City government utilize the Fisheries and Aquatic Resources Management Council (FARMC) (this institutional arrangement is the standard among the rest of the seven crater lakes). The FARMC is principal organization mandated by law, specifically the Philippine Fisheries Code of 1998 or RA 8550 (The precursor law of the Philippine Fisheries Code is Executive Order (EO) 240 issued in 1995 which instigated the formation of the Fisheries and Aquatic Resources Management Committees (FARMCs) nationwide) to assist government agencies in the management, utilization and conservation of the water resources throughout the country (the functions of the local FARMC (RA 8550 section 74) assist in the preparation of the Municipal Fishery Development Plan and submit such plan to the Municipal Development Council; recommend the enactment of municipal fishery ordinances to the sangguniang bayan/sangguniang panlungsod through its Committee on Fisheries; assist in the enforcement of fishery laws, rules and regulations in municipal waters; advise the sangguniang bayan/panlungsod on fishery matters through its Committee on Fisheries, if such has been organized and perform such otherr functions which may be assigned by the sangguniang bayan/panlungsod). The FARMCs are established from the national level to cities and municipalities and formed locally by fisherfolk organizations/cooperatives and NGOs in the locality with the assistance of the government agencies. In the Laguna de Bay region, FARMCs' formation, sustenance and supervision which by the Philippine Fisheries Code is under the Department of Agriculture was devolved to the LLDA in recognition of its exclusive jurisdiction. The Philippine Fisheries Code also mandates that the FARMC be multi-representative in its composition (section 75) and guarantees the organization's funding (section 79). In practice, however, the FARMC lacks diversity as the organization is mainly led and comprised by fisherfolks and lake residents, particularly members of the Samahang Mangingisda ng Lawa ng Mohicap (SMLM). The FARMC also lacks funding as its leaders have often complained that the funds allocated to them is insufficient to effectively function, sustain and carry out the responsibilities of the organization.

Beyond the Philippine Fisheries Code, the two other laws that have direct bearing on the administration of Mohicap Lake are the Philippine Clean Water Act of 2004 or RA 9275 and the Tourism Act of 2009 or RA 9593. In principle, the laws complement and supplement each other, particularly in the development of the lake. On the ground, however, the laws are also a source of divergence since each statute pushes distinct agendas over the utilization of the water resource. In particular, the Philippine Clean Water Act underscores the preservation of the water resource; the Tourism Act promotes ecotourism for socio-economic development and the Philippine Fisheries Code primarily advances the interest of the fisherfolks and the fishing industry. All together, the proponents of each law compete and negotiate over the utilization of the lake. Consequently, the actions, plans and programs in Mohicap Lake will have to be framed within the orbit of these laws andthe intertwined interests they represent.

DEVELOPMENT ISSUES IN MOHICAP LAKE

The most obvious issue in Mohicap Lake is the absence of development. Despite having many attributes

conducive for it, the lake has long been wanting of development initiatives from its key administrative agencies. On one hand, the LLDA's involvement is mainly confined to its routine tasks of conducting water quality monitoring (which the agency has been doing in Mohicap Lake since the 1980s), seeding of fingerlings and clearing of water lilies. On the otherhand, the city government's undertaking in the seven crater lakes is mainly confined to Sampaloc Lake, the premier lake and commercial symbol of the city (Lately, the LLDA and the city government has also focused on Padin Lake due to its ecotourism success (Brillo, 2015)). In the past, the LLDA and the city government's lack of actions have been ascribed to limited resources and prevailing internal political dynamics. On the part of the LLDA, it has often alluded to inadequate manpower (since managing its principal concern Laguna de Bay demands enormous resources) and to the frequent change in its leadership which usually results in varying priorities; for instance, from 2005-2013, the LLDA had four different General Managers: Casimiro Ynares (2005-7), Edgardo Manda (2008-10), Rodrigo Cabrera (2010-11) and Nereus Acosta (2012 to present). On the part of the city government, it has often cited insufficient funds (due the lingering budgetary deficit) and the penchant of local politicians to accommodate pleas (usually from fish farm operators and fisherfolks organizations) against taking drastic actions on the lake.

The relationship between the LLDA and the city government has also been hampered by coordination problems, diverse priorities and weakness in accepting responsibilities. For instance: the Third District Congressional Office and the city government's project of constructing a concrete boardwalk along the main entrance of Sampaloc Lake was not properly coordinated with the LLDA; the LLDA's priority for the creation of a zoning-development plan is Pandin Lake (as the agency has acted motu propio) while the city government's priority is Sampaloc Lake (as the local government unit intends to come up with a Master Tourism Plan for the city, a component of which is the zoning-development plan of Sampaloc Lake) and recently when the city government released its draft zoning-development plan for Sampaloc Lake, the LLDA responded by asking the former to also craft a "technical study plan." One that the City Government is unable to provide because they do not have the subject matter experts The LLDA who has the mandate to provide technical basis for the management, policies and programs for the seven crater lakes and has the pool of experts on lakes is in a better position to do a technical study plan. Hence, the LLDA should have conducted the scientific study or at least help the city government develop one instead of simply asking the City Government for it. Moreover, these factors are aggravated by lake residents grown cynical of politicians and administrative agencies' efforts and capability to develop Mohicap Lake as their actions are seen to lack long term commitment and political will.

The lack of a zoning-development plan is another major issue in Mohicap Lake. The formulation of the zoning-development plan has been a principal item on the agenda in forumson the seven crater lakes since the early 2000s. The LLDA and the city government have recognized the need for it; for instance, the former had acknowledged this in its 2005 water quality report in Mohicap Lake and the latter in its 2014 citizen's charter report. A zoning-development plan is considered a basic need since it is critical for the management, exploitation and protection of Mohicap Lake. The plan furnishes the overall map in which the development initiatives and projects in the lake must conform to be systematic, coherent and effective. In particular, the zoning-development plan is the first step in the administration of the water resource as it gives guidance to succeeding plans and precipitates subsequent actions. For instance, a zoning-development plan may partition the lake and designate the specific area (including the extent and arrangement) for aquaculture and ecotourism which may then facilitate the regulation on fish farms and the promotion of tourism.

The efforts of the LLDA and the City Government in formulating a zoning-development plan are currently concentrated on Pandin Lake and Sampaloc Lake, respectively; the former, being aprospective model for ecotourism development of the seven crater lakes and other small lakes in the country (Brillo, 2015) and the latter being the central emblem of the tourism program of San Pablo City. The LLDA had publicly announced that the agency will come up with a zoning-development plan for Pandin Lake by December 2014 and the city government had intended to do the same for Sampaloc Lake by October 2014 (As of the writing of this paper, a zoning-development plan for Padin Lake and Sampaloc Lake still has to materialize (that is officially promulgated and implemented)). Both the LLDA and the city government are working following the so-called "model-template" framework (Brillo 2015) where the development of Sampaloc Lake (as primus inter pares) takes precedence and would serve as the pattern for the other crater lakes. But when the success of the ecotourism enterprise in Pandin Lake became widely known (which in effect, challenged the "hegemonic status" of Sampaloc Lake), the model-template framework

was modified with the accommodation of Pandin Lake; thus, making both lakes the center of attention in the agenda of the administrative agencies.

The emphasis on Sampaloc Lake and Pandin Lake and the neglect of the other crater lakes including Mohicap Lake is another issue. As a rule, the seven crater lakes are all ecologically threatened and hence, each equally needs immediate administrative intervention. In many development initiatives Sampaloc Lake and Padin Lake may take precedence but not in the drafting of a zoning-development plan since it is basic for the development of all the crater lakes. Creating a zoning-development plan largely entails minimal capital as it is more labor-intensive (requiring mainly consultations and technical expertise). What is usually costly is the implementation of such a plan. Under this premise, the model-template framework should be further modified all the seven crater lakes must have a zoning-development plan and the prioritization of Sampaloc Lake and Pandin Lake should only be applied on the implementation phase.

Concomitantly having a zoning-development plan to all the seven crater lakes would bestow the following advantages: better accounting of the similarities, diversities and unique features of each lake; ensuring that the development and management are supplementary and complementary as the lakes are proximate and customarily interconnected to one another and guaranteeing that no lake is isolated and left behind. Beyond this, the crafting of a plan will is empowering to the stakeholders since the process provides opportunity for the lake residents and fisherfolks to have direct access to decision makers as well as a platform to share their views and perspectives. Furthermore, the move to develop a zoning-development plan entails significant goodwill since, on one hand, it signals that the administrative agencies are doing something important for the lake and on the other hand, it instils in the minds of the people (as they participate) that they are a part of the process.

The absence of ecotourism development is also a critical problem in Mohicap Lake since it ramifies the lack of alternative source of livelihood for the locals. Ecotourism offers a viable opportunity for employment among the locals as well as a possible source of funds for the operational activities and projects of the FARMC-SMLM. At present, only fish farming and related activities are the principal sources of livelihood in the lake since no ecotourism initiatives or projects have been introduced. Although, the city government has floated the idea of Mohicap Lake as an ecotourism hub (specifically, an eco-adventure tourist destination which offers activities such as cave exploration, boating, diving and swimming), it is still on the drawing board, so to speak.

Mohicap Lake has high potential as a tourist destination as beyond its natural beauty, the lake offers other attractions such as a cave (I suggested that the locals designate a name for the cave) a peninsula and surrounding natural springs. In addition, Mohicap Lake also has the advantages of being accessible (i.e., proximate to the city proper and has an existing barangay road adjacent to it) and having a nearby hotel (Starlake Hotel and Resort) (which may accommodate visitors staying overnight). Moreover, developing Mohicap Lake is consistent with the vision and development strategy of the City Government of San Pablo City (i.e., to make the city a premier eco-adventure tourist hub in the Calabarzon region (Comprising the provinces of Cavite, Laguna, Batangas and Quezon) and to make tourism a key instrument for the sustainable growth of the city). All in all, these favourable elements are buoyed up by the fact that many locals are open to the notion of developing ecotourism in the Mohicap Lake. The locals' support is very important since it eliminates a possible major obstacle in fostering ecotourism in the lake.

For the time being while waiting for a zoning-development plan to be crafted in Mohicap Lake, the following are the immediate steps that can be taken by the administrative agencies to promote ecotourism in Mohicap Lake: installing directional signage from the city proper to the lake (especially near the traditional entry point); restoring the steps to main entrance going to the lake; establishing a permanent trail or path way around the lake and going to the cave; building stopover stations and washrooms; organizingand promoting tour and rafting trips and training locals on the ins and outs of tourism and supplying them with theneeded things and safety gadgets such as life vest and first aid kits.

CONCLUSION

Over the years, no substantive development activities were initiated by its two administrative agencies. The LLDA and the city government have not brought or cause the instigation of developmental actions on Mohicap Lake, nor is there a definite time table on when initiatives will be introduced in the future. So far, the administrative agencies are fixated on Sampaloc Lake and Pandin Lake and have not taken notice of the other crater lakes. With limited fish farming and virtually non-existent ecotourism, Mohicap Lake's economic potential is underutilized. Under this context, development must come

into the lake. The LLDA and the city government must elevate Mohicap Lake on their agenda and take the necessary actions. In particular, the administrative agencies must modify their approach the model-template framework to include Mohicap Lake and ensure that all the seven crater lakes would be in equal footing in terms of development intercessions; they must prioritize the basic the formulation of the zoning-development plan to facilitate resolving management-conservation issues and to prepare for subsequent development initiatives on the lake and they must promote the alternative source of livelihood the promotion of ecotourism to expand the work opportunities of the locals in particular and enhance community development in general.

This study directly addressed the identified gap in literature by conducting a case study on a small lake in the country. Specifically, the study assessed the current issues necessary in the development, management and preservation of Mohicap Lake. Overall, this study advances two key agendas in Philippine lake studies. One, development studies (including governance, socio-economic, history and cultural studies) must even out and complement the advances in limnology and aquaculture studies. Two, studying small lakes is imperative because of their pervasive presence throughout the country. The two agendas are related and intertwined. To make consequential gains in alleviating the condition of lakes in the country, the development studies must advance side by side with limnology and aquaculture studies and to completely capture the plight of the water resource in the country, small lakes must be accounted for. Correspondingly, this study underscores the importance of obtaining primary information as starting point for future studies on lakes and accumulating knowledge necessary for guiding lake management and conservation. In ending, since there are still a great number of small lakes in the country, this article makes a small contribution in Philippine Lake studies as it hopes to instigate more studies on small lakes in the country in general and on Mohicap Lake in particular.

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