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The Governance of the Seven Crater Lakes, San Pablo City, the Philippines

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Abstract: The article assesses the governance of the seven crater lakes (i.e., Sampaloc Lake, Bunot Lake, Palakpakin Lake, Calibato Lake, Mohicap Lake, Pandin Lake and Yambo Lake) using the ILBM framework. In particular, the study elucidates the following: on institutions, the slow-moving and biased actions combined with coordination problems and reactive orientation of the administrative agencies; on policies, the existence of overlapping laws that nurture diverging agenda and emphases; on participation, the presence of organised and actively participating community stakeholders conjoined with a highly centralised decision making; on technology and information, the underuse of technological interventions and the want for critical information; and on finance, the endemic need for funds particularly by the community stakeholders. The administration of the seven crater lakes also exemplifies the lack of long-term commitment and accountability. Overall, the governance praxis illustrates key lessons in contemporary management and development of small lakes in the country.

Key words: Governance, Sampaloc Lake, Bunot Lake, Palakpakin Lake, Calibato Lake, Mohicap Lake, Pandin Lake, Yambo Lake.

Introduction

The seven crater lakes (i.e., Sampaloc Lake, Bunot Lake, Palakpakin Lake, Calibato Lake, Mohicap Lake, Pandin Lake and Yambo Lake) are small freshwater lakes located in San Pablo City, Laguna (see Figure 1). The small lakes are under the administration of the Laguna Lake Development Authority (LLDA), being included in the watershed basin of Laguna de Bay, the country's largest lake, and the City Government of San Pablo, being situated within the local government unit's territorial jurisdiction. The water bodies have long been utilised for aquaculture, but recently, ecotourism has started to take root on the small lakes. Sampaloc Lake and Pandin Lake have even been deemed as possible models for developing ecotourism in a small lake in the country. Despite this, the development and governance of the seven crater lakes, like many other lakes in the country (see Aralar et al., 2005; Fernandez, 2011; Aralar et al., 2013), have been accompanied by issues and problems. The LLDA has long acknowledged that the seven crater lakes are ecologically threatened (see LLDA, 2005a, 2005b, 2005c, 2005d, 2005e, 2005f and 2005g; LLDA, 2008) and that the development of the water resources is arbitrary, as no plans, policies or guidelines have been put in place over the years (see LLDA, 2014). Recently, the seven crater lakes have been proclaimed as the "Threatened Lakes of the Year 2014" by the environmental foundation Global Nature Fund (see GNF, 2014).

Philippine literature is replete with scholarly works dealing with the two encompassing concepts of

governance and development, but little has been said and discussed about lake governance and development, especially on small lakes (see ILEC, 2005; Downing, 2010; Brillo, 2015a). Under this context, the article assesses the governance and development of the seven crater lakes using the most recent framework being promoted globally to manage lakes—the Integrated Lake Basin Management (ILBM) framework. The ILBM takes a holistic perspective and is dedicated to the sustainable management and development of lakes via incremental, continuous and improvement of governance (Nakamura and Rast, 2011). Specifically, the study focuses on six crucial variables—institutions, policies, participation, technology, information and financing—in the governance of Sampaloc Lake, Bunot Lake, Palakpakin Lake, Calibato Lake, Mohicap Lake, Pandin Lake and Yambo Lake. The study also elucidates the key lessons in development based on the experiences of the small lakes. Moreover, this article is the summation of a series of case studies conducted on each of the seven crater lakes. The article proceeds to discuss the following: firstly, the ILBM approach; secondly, the current situation, utilisations and issues of the seven crater lakes; thirdly, the administration and governance challenges; and lastly, the conclusion.

The ILBM Approach

The literature is replete with works proclaiming that lakes are important to humanity (e.g., International Lake Environment Committee [ILEC], 2007; Nakamura and Rast, 2011; World Lake Conference, 2011; Nakamura and Rast, 2012). It is also well established in literature that, contemporarily, the condition of many lakes around the world is not improving (e.g., World Lake Vision Committee, 2003; ILEC, 2005; World Lake Conference, 2009; Global Nature Fund [GNF], 2014). This fact is mirrored in the Philippines, as many lakes in the country are also ecologically threatened. The First National Congress on Philippine Lakes held in 2003 and the Second National Congress on Philippine Lakes held in 2011 have conceded that the condition of many lakes in the country are precarious due to indiscriminate utilisation and increasing demands of development (Aralar et al., 2005; Fernandez, 2011; Aralar et al., 2013; GNF, 2014). Under this backdrop, lake studies in the country have been steadily growing over the years. However, the great majority of scholarly works are classified under the natural sciences (e.g., limnology and aquaculture studies) and on the major lakes of the country (e.g., Laguna de Bay, Taal Lake, Lanao Lake and Buhi Lake) (Brillo, 2015a; see also Guerrero III, 2001; Guerrero III, 2005). On the whole, this situation suggests a literature deficit on the social sciences (e.g., governance, development, socioeconomic and cultural studies) and on small lakes (i.e., lakes with a surface area of 200 hectares or less [Brillo, 2015b; Brillo, 2016b]).

Governance as a concept has been amply discussed in literature of the social sciences since the 1980s. But this trend does not spill over in water resources, as water governance was seriously discussed only in the 2000s (Biwas and Tortajada, 2010). This situation is even worse in lake governance, particularly the governance of small lakes, which are least studied in literature (Downing, 2010; Brillo, 2015a). As a concept, lake governance can be defined (following the well-circulated definition of water governance [see Rogers and Hall, 2003; Nowlan and Bakker, 2007; United Nations Development Programme-Water Governance Facility (UNDP-WGF), 2015]) as the range of political, social, economic and administrative systems that are in place for the utilisation, allocation, management and development of the lake. The essentiality of governance on lakes is heralded by the now universal acknowledgement that many issues on the water bodies are rooted on failure of governance (World Lake Vision Committee, 2003; ILEC, 2005; ILEC, 2007; World Lake Conference, 2009; Nakamura and Rast, 2011; World Lake Conference, 2011; Nakamura and Rast, 2012; GNF, 2014; see also United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2012; World Water Council, 2012; United Nations World Water Assessment Programme [UNWWAP], 2015). Governance is deemed fundamental for better understanding and in offering sound solutions to the multitude of problems facing lakes today.

The most recent approach in lake governance is the Integrated Lake Basin Management (ILBM), a method globally promoted by the ILEC. The ILBM is based on the lessons learned from a study conducted by the Global Environment Facility-Lake Basin Management Initiative's (GEF-LBMI) of 28 major lakes around the world from 2003 to 2005. In principle, the ILBM focuses on the natural watershed system of lakes, following the character of lentic-lotic water linkages (i.e., standing-moving water dynamics such as lake-river system or lake-spring system) and the distinct properties of lake basin system: (a) integrating nature (i.e., various forms of pollutants from diverse sources end up in lakes); (b) long retention time (i.e., pollutants stay on the lake for a long time due to its depth,

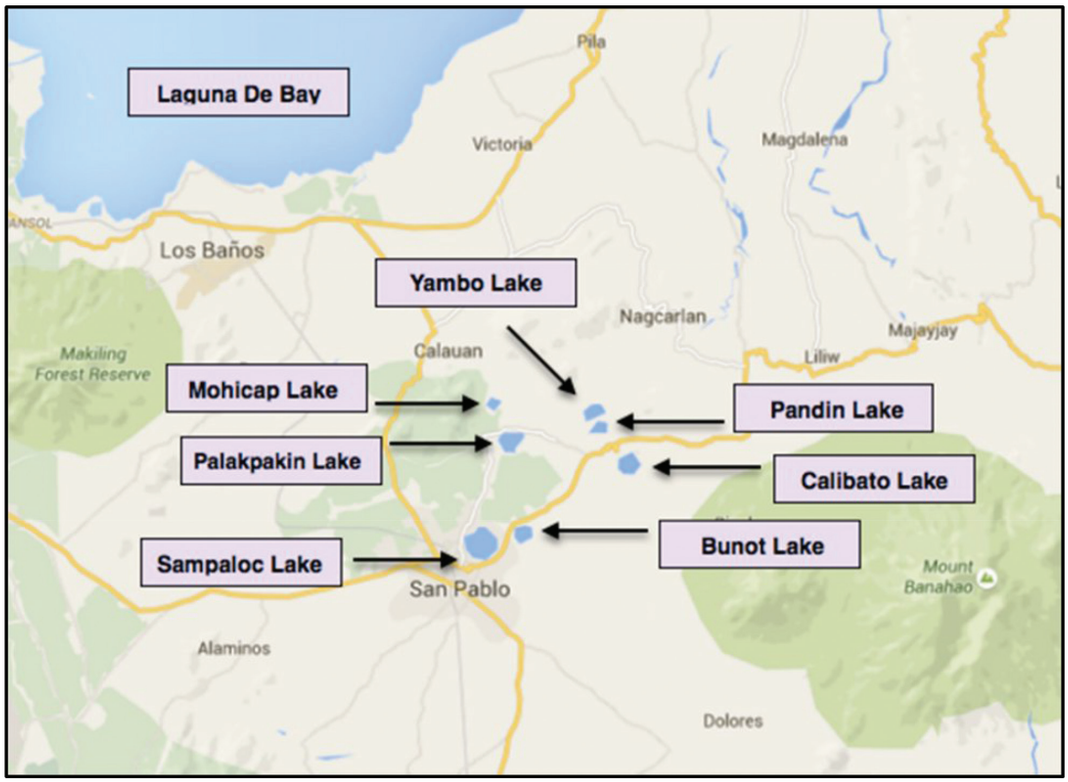

Figure 1: The Laguna de Bay Region: The seven crater lakes and Laguna de Bay (Google Maps, 2015a).

water volume, and stagnant nature); and (c) complex response dynamics (i.e., as the "mixing bowl" of various pollutant inputs, changes and interventions in the lake are intertwined, non-linear and multifaceted) (see ILEC, 2007; Nakamura and Rast, 2011).

The ILBM is also committed to sustainable management of lakes via incremental, continuous and holistic improvement of basin governance (Nakamura and Rast, 2011). To enhance lake governance, the ILBM pays attention to six interconnected areas of intervention: (1) institutions (i.e., developing effective organisations or are there a committed agencies in charge?), (2) policies (i.e., broad directions and specific rules or are there existing policies and a management plan which can be realistically implementable?), (3) participation (i.e., expanding the involvement of people or are mechanisms in place to expand and ensure meaningful participation of the stakeholders?), (4) technology (i.e., technological interventions or are technologies being introduced to improve the management of the water resource?), (5) information (i.e., traditional and scientific knowledge or are information helping the stakeholders to understand issues and protect the lake?) and (6) finance (i.e., sustainability of fundings or are mechanisms in position for generating finance, over the long term, for lake development and conservation) (see ILEC, 2007; Nakamura and Rast, 2012) (see Figure 2).

Under the above premise, this article examines the governance in the seven crater lakes using the ILBM

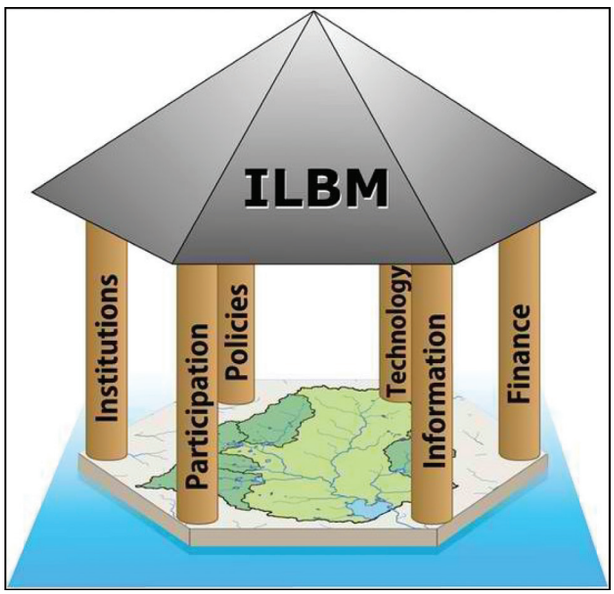

Figure 2: The six pillars of governance of the Integrated Lake Basin Management (Nakamura and Rast, 2012).

approach. Since the ILBM is conceptualised from the experiences of and lessons from managing the largest lakes in the world, using the approach to the seven crater lakes not only systematise the assessment of governance, but more importantly, expands the framework's application to small lakes. Although there are variations in the dynamics of small-lake and large-lake governance and that each lake is unique, this method of working is anchored on the principle that the management, development and conservation of small lakes should be taken from a holistic vantage point, as propagated by the ILBM approach.

The Seven Crater Lakes: Utilisations and Problems

The seven crater lakes are located in San Pablo City and are components of the eight smalls of the Laguna de Bay region under the administration of the LLDA.[1] Sampaloc Lake is the largest lake among the seven crater lakes with a surface area of 104 hectares and is the traditional tourism symbol of San Pablo, being located within the city proper (LLDA, 2005a; LLDA, 2008). Bunot Lake has a surface area of 30.5 hectares, situated in Barangay Concepcion, and is considered the sister lake of Sampaloc Lake (LLDA, 2005b; LLDA, 2008). Palakpakin Lake has a surface area of 47.98 hectares, lies within three Barangays, namely San Buenaventura, San Lorenzo and Dolores, and is the shallowest among the seven crater lakes with an average water depth of only 7.7 metres (LLDA, 2005c; LLDA, 2008). Mohicap Lake has a surface area of only 22.89 hectares, located in Barangay San Buenaventura, and is the smallest among the seven crater lakes (LLDA, 2005d; LLDA, 2008). Pandin Lake has a surface area of 24 hectares, located in Barangay Santo Angel, and is considered the twin of Yambo Lake, as only a narrow ridge separates the two lakes (LLDA, 2005e; LLDA, 2008). Yambo Lake has a surface area of 30.5 hectares, situated in Barangay Sulsugin, Nagcarlan, Barangay Antipolo, Rizal and Barangay San Lorenzo, San Pablo City, and thus, making it is a transboundary lake (approximately two-thirds of the small lake's area is within the jurisdiction of San Pablo City) (LLDA, 2005f; LLDA, 2008). Lastly, Calibato Lake has a surface area of 43 hectares, located in Barangay Sto. Angel, San Pablo City, with a small part in Barangay Tala and Barangay Antipolo, Rizal (making it also a transboundary lake), and is the highest located and the deepest among the seven crater lakes (LLDA, 2005g; LLDA, 2008) (see Figure 3).

The seven crater lakes are oval-shaped freshwater lakes and are part of the watershed of the nearby Mount San Cristobal. The small lakes are considered a mark of the Laguna Volcanic Field which formed through a phreatic eruption when contact between shallow lava and groundwater caused an explosion that resulted in a crater-like depression (LLDA, 2008; PHIVOLCS, 2015). All the crater lakes water sources are rainfall, surface runoff, and surrounding natural springs (except Yambo Lake which has no natural springs, and only Palakpakin Lake with Pagbuga Creek (from Calibato Lake and Pandin Lake), Yambo Lake with "Kali-e" Creek (from Mount Mabilog), and Calibato Lake with Mayton Creek have inlets), and they discharge through seepage, evaporation and water outlets (Sabang Creek for Sampaloc Lake, Sabang Creek for Bunot Lake, Padparan Creek for Palakpakin Lake, Compuerta Creek for Mohicap Lake, Prinsa Creek for Pandin Lake, and Pagbuga Creek for Calibato Lake, while Yambo Lake has no water outlet).[2]

Early on, the seven crater lakes have been utilised mainly for fishing and recreational activities. Although frequented by visitors because of their natural beauty, tourism was not organised back then (e.g., Jose, 2002; LLDA, 2014). Aquaculture, particularly tilapia farming in pens and cages, came into the seven crater lakes in the early 1980s. Tilapia pen/cage farming was first introduced in Bunot Lake in 1976 after the LLDA's successful introduction in Laguna de Bay in 1974 (Radan, 1977; MNR, 1982). By the late 1980s, fish pens and cages have become a common feature among the seven crater lakes. Tilapia farming extensively expanded and reached its peak in the late 1990s to the early 2000s, where the 10 percent area limit for aquaculture structures pursuant to the Fisheries Code of the Philippines (see Republic Act [RA] 8550, section 51) was breached in most lakes. At present, Sampaloc Lake, Bunot Lake, Palakpakin Lake and Calibato Lake continue to have substantial number of fish pens and cages, while in Pandin Lake, Mohicap Lake and Yambo Lake, their presence have greatly dwindled (see Table 1).

[1] Seven crater lakes of San Pablo City and Tadlac Lake of Los Baños, Laguna.

[2] The creeks are locally known by the mentioned names.

Table 1: Number of registered operators of fish pens/ cages in the seven crater lakes in 2012 (Provincial Government of Laguna 2013)[3]

Seven crater lakes	*Number of registered operators of fish pens/cages*
Sampaloc Lake	163
Palakpakin Lake	85
Bunot Lake	75
Calibato Lake	49
Mohicap Lake	25
Pandin Lake	14
Yambo Lake	3

A direct consequence of the expansion of aquaculture is the proliferation of structures and settlements in the seven crater lakes. Following the pattern of existence of fish pens/cages, Sampaloc Lake, Bunot Lake, Palakpakin Lake and Calibato Lake have significant presence of illegal establishments (especially, along and near the banks), while Pandin Lake, Mohicap Lake and Yambo Lake have nominal. The overcrowding of fish farms and the presence of settlements have led to problems, such as water quality degradation, excessive algal blooms, and exacerbated fish kills during the natural upwelling or overturning of the lakes. Consequently, the LLDA has concluded that the seven crater lakes are extremely threatened by pollution (LLDA, 2008) and the GNF has tagged the seven crater lakes as threatened lake of the year in 2014 (GNF, 2014). Among the seven crater lakes, Bunot Lake is considered the most problematic since around 2/3 of its shoreline is occupied by illegal structures and its water is congested by fish pens and cages (Brillo, 2015b), and the lake has posted the worse reading of water quality analyses (LLDA, 2008) (see Figure 4); while Palakpakin Lake is deemed the most endangered of infilling due to heavy flow of silt from its inlet, Pagbuga Stream, and due to being the shallowest with an average water depth of only 7.7 metres (Brillo, 2016a).

In the light of the many problems associated with the over expansion of aquaculture, ecotourism has recently become more attractive development alternative for the seven crater lakes. Since the seven small lakes have high potential as tourist destinations, ecotourism is deemed as the most viable option in expanding the livelihood opportunities of the many poor residents of the lakes and in ensuring the conservation of the water resource. So far, only Sampaloc Lake, Pandin Lake and Yambo Lake have made some progress in developing and organising ecotourism. This headway was shown in the move to have a Master Development Plan (MDP) for each lake, which have been pending for more than a decade already. An MDP is fundamental for the effective management of the lake (e.g., it facilitates the regulation of fish pens/cages) and is the basic enabler of ecotourism development (e.g., it designates specific area, including extent and arrangement, for aquaculture and ecotourism). Sampaloc Lake was able to have an MDP in 2015; the lake was prioritised by the City Government since it is the traditional tourism emblem of San Pablo City. Pandin Lake was able to have an MDP also in 2015; the lake was a pilot project of the LLDA due to the well publicised success of its local initiated ecotourism enterprise. Yambo Lake is poised to have one in 2016; the lake is next in line in the agenda of the LLDA mainly for having the least problems, as it is the most well-preserved and least ecologically threatened lake. At present, the rest of the seven crater lakes continue to wait for the LLDA and the City Government to make serious move to formulate an MDP and to organise ecotourism in them.

Another aspect of the seven crater lakes that have often been overlooked by the administrative agencies is the conservation of the many natural springs surrounding the lakes. But for Yambo Lake, the seven crater lakes are fed water by a number of natural springs around them. The management of the natural resources has been mainly focused on aquaculture and water quality issues and have not factored in the natural springs. By far, there has been no serious discussions/ research conducted on the natural springs, such as establishing their inflow contribution, ecological effect and sustainability, or concrete programmes/directives being implemented to protect them (in which a number of natural springs are located in privately-owned lands).

In the past, the seven crater lakes were also thought of as reservoir for domestic water supply (e.g., Banzuela, 2005; Jose, 2005; City of San Pablo Tourism Council, 2008). In particular, Sampaloc Lake, being the largest and located within the city proper, and Calibato Lake, being the deepest (an average water depth of 156 metres) and having the biggest volume of water in

[3] Unregistered/illegal operators of fish pens/cages are not reflected in the Table. For instance, in the consultative meeting for the Tourism Master Plan of Sampaloc Lake held in 2014, the stakeholders mentioned that there are 192 fish pens/cages operators in the lake (compared to the 163 operators cited by the Provincial Government of Laguna, see Table 1).

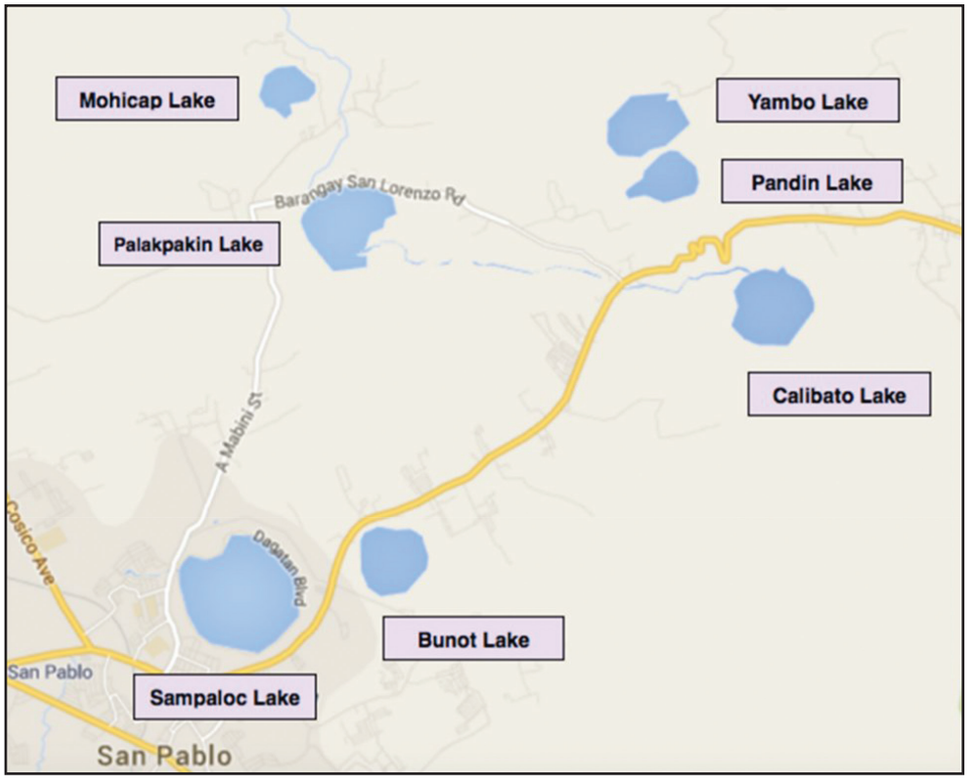

Figure 3: The seven crater lakes of San Pablo City (Google Maps, 2015b).

Figure 4: Fish pens/cages of Bunot Lake (Google Maps, 2015c).

storage (approximately 29,600 cubic metres) (LLDA, 2005a; LLDA 2005g), were proposed by the City Planning and Development Office and the San Pablo City Water District, respectively, as possible sources of potable water for the city. Both proposals did not make headway, as there was significant opposition which raised the possibility of adverse effects and the lack of definitive study on the ecological effects of siphoning off large amount of water from the lakes.

The Six Pillars of ILBM: Governance Challenges in the Seven Crater Lakes

The LLDA is the principal administrative agency of the seven crater lakes by virtue of Republic Act (RA) 4850 or The Laguna Lake Development Authority Act of 1966 (as amended by Presidential Decree 813, October 1975), which is the main law governing Laguna de Bay and its watershed area. RA 4850 created the LLDA and designated it as the agency in administering the water bodies in the Laguna de Bay region, including the seven crater lakes of San Pablo City. In particular, the LLDA's task is 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 (LLDA, 2005a). This function was strengthened by Executive Order no. 927 issued by then President F. Marcos in December 1983, which conveyed the LLDA the exclusive rights over the water bodies in the Laguna de Bay region.

The City Government of San Pablo is the other administrative agency that has authority over the seven crater lakes (a small part of Yambo Lake and Calibato Lake are under the jurisdiction of the local government units of Nagcarlan and Rizal, respectively, being transboundary lakes). The mandate of the City Government comes from RA 7160 or The Local Government Code of 1991, which gives it territorial jurisdiction over the seven crater lakes being municipal bodies of water. Since RA 4850 makes the LLDA the principal administrative agency, the local government unit serves as the supplementary administrative agency. In principle, the LLDA draws up the overall development framework and approves/rejects the plans/projects submitted to it by the City Government and the community stakeholders; while the City Government executes programmes/initiatives and legislates regulations in support of the LLDA's development agenda. In application, the LLDA usually initiates and the City Government implements, having the authority over the enforcement units such as the local police force and the Barangay officials.

On the ground, the LLDA and the City Government of San Pablo utilises the local Fisheries and Aquatic Resources Management Council (FARMC) in administering and organising the inhabitants of the seven crater lakes. FARMC is an organisation created under RA 8550 or the Philippine Fisheries Code of 1998 to assist government agencies in the management, development and conservation of the water resources in the country. In the Laguna de Bay region, FARMC was devolved from the Department of Agriculture to the LLDA in recognition of its exclusive jurisdiction via RA 4850. FARMCs are established from the national level to municipalities and are mandated to be multi-representative in its composition, including community stakeholders and non-governmental organisations operating in the area of the water bodies. In the seven crater lakes, the local FARMC is formed mostly by fisherfolk organisations and lake residents. In securing the lakes, FARMC is usually assisted by the Barangay unit and the Bantay Lawa (lake watchmen) of the locality. The Barangay unit, under RA 7160, is the smallest and lowest administrative-legislative unit under the local government unit in the country; while the Bantay Lawa is a local volunteer organisation funded by the Provincial Government of Laguna.

On tourism development, the orchestration in the seven crater lakes is guided by RA 9593 or Tourism Act of 2009. RA 9593 recognises tourism as a key engine of the national economy in promoting socio-economic development, particularly in the countryside. Following this, the law encourages developing ecotourism among the many lakes in the country. The seven crater lakes have long been identified by the community stakeholders and the administrative agencies as ideal for ecotourism development. Ecotourism is seen an effective means of magnifying the livelihood opportunities, enhancing the economic stature of the locality and preserving the water resource (LLDA, 2014).

Institutions

The foremost issue in the seven crater lakes is slowness of development actions. This problem is exemplified in the MDP issue, where the administrative agencies and the community stakeholders, since the early 2000s, have unanimously acknowledged the urgency of having an MDP for each lake (e.g., LLDA, 2005a, 2005b, 2005c, 2005d, 2005e, 2005f, 2005g; LLDA, 2008; City of San Pablo Tourism Council, 2008; City Government

of San Pablo, 2015). The rationale is that the MDP is the basic instrument in addressing extant issues, such as regulating fish farm operations and promoting ecotourism. In spite of the across-the-board clamour, the LLDA and the City Government of San Pablo took more than a decade in taking (partial) actions on the concern. As mentioned, Sampaloc Lake (through the effort of the City Government of San Pablo) and Pandin Lake (through the lead of the LLDA) were able to have MDPs only in 2015, while Yambo Lake in 2016 (under the stewardship of the LLDA, the Local Government of Nagcarlan, and the City Government of San Pablo, being a transboundary lake). These achievements are noteworthy, but it also means that the majority of the crater lakes continue to be without a basic plan. Worse, the lakes without an MDP—Bunot Lake, Palakpakin Lake and Calibato Lake (with the exception of Mohicap Lake) are the ones in dire conditions (in terms of water quality, number of fish pens/cages and presence of informal settlements).

In a way, the governance praxis exhibited by the administrative agencies is hierarchical— some lakes are prioritised at the expense of the others, where all the seven crater lakes are ecologically threatened and equally need immediate intervention. In general terms, the actions of the City Government is mainly confined to Sampaloc Lake (being the premier lake among the seven crater lakes) and the actions of the LLDA is heavily favoured on Pandin Lake (being promoted as a model of ecotourism development for a small lake). Here, the customary response by the administrative agencies is that Sampaloc Lake and Pandin Lake will serve as model for the development of the other crater lakes and that it is costly to simultaneously cover all. This contention is only partially valid if one is to consider that the overall financial cost of procuring an MDP is minimal (compared to the other grandiose initiatives/projects that have been proposed in the seven crater lakes in the past) but its impact is substantive. From the experience in Sampaloc Lake and Pandin Lake, crafting an MDP is more labour-intensive (requiring mainly consultations and technical expertise) rather than capital-intensive, and what is costly is the implementation of such a plan. Under this premise, the seven crater lakes must each have an MDP and only in the implementation phase should the prioritisation apply.

Another major issue in the seven crater lakes is administrative dereliction and lack of accountability. The LLDA is often blamed for failure to enforce the rudimentary regulations in the 1990s which led to the excessive expansion of fish farming and illegal settlements, and the violation of the 20-metre shore easement in most of the seven crater lakes. In addition, the agency is also noted for its refusal to act on the three submitted MDP proposals in the Sampaloc Lake in the 2000s which led to more than a decade of managing the water body without a basic plan. Inexplicably, the administrative agency has never been held accountable for its non-performance. Furthermore, the LLDA has also suffered from discontinuity of programmes due to frequent turnover of leadership which result in varying priorities (for instance, the agency had four different General Managers from 2005 to 2012), and from inadequate personnel to cover the small lakes of the Laguna de Bay region since the bulk of the agency's workforce is concentrated on Laguna de Bay, its main responsibility (for instance, the LLDA's surveillance and monitoring officer usually conducts quarterly visits/inspections in a year on each of the seven crater lakes).

On the part of the City Government of San Pablo, the past administrations' actions on the seven crater lakes have been hampered by the lack of vision in developing the tourism sector of the City (particularly the seven crater lakes), by the three-year electoral cycle of the local government officials, and by the sensitivity of local politicians to the pleas from vested interest or their constituents. The first two concerns are interrelated since the short term horizon of the public officials contributes to the absence of long term vision among many local politicians. The latter was evident in the move to demolish the illegal settlements/establishments in Bunot Lake in the mid-2000s, which did not materialise due to the intercession of local politicians, petitioning the LLDA to defer taking action. In addition, the City Government is remiss in "infrastructurally" developing the traditional access entry as well as legally fortifying the right of way of the seven crater lakes (with exception of Sampaloc Lake which has a well-developed circumferential road). The local government unit must guarantee access and the right of way to the water resources, either by negotiating with owner of land (used as means of entry to the small lakes), encumbering the title of the land (via a legal proceeding) or outright purchasing of the private land.

Moreover, the mentioned issues are exacerbated by coordination problems and by the conventional reactive (rather than proactive) stance of the administrative agencies. For instance, in the former, the construction of the boardwalk in Sampaloc Lake in the late-2000s was carried out by the Third District Congressional Office in cooperation with the City Government of San Pablo but without coordination with the LLDA. In

the latter, the move to formulate an MDP for Pandin Lake was a response to the success of the ecotourism enterprise in the lake and the action to partially clear the illegal establishments/structures in Sampaloc Lake (in the early 2000s) was a response to the multi-sectoral protest, instead of the administrative agencies taking the initiative by themselves.

Policies

There are four major laws—RA 4850 (i.e., the Laguna Lake Development Authority Act, RA 7160 (i.e., the Local Government Code), RA 8550 (i.e., the Philippine Fisheries Code), and RA 9593 (i.e., the Tourism Act)—directly related to the management and development of the seven crater lakes. All plans, programmes and projects in the small lakes have to be framed within the scope of these overlapping laws. In principle, these laws complement and supplement each other in the administration of the water resource. In practice, these laws are also a source of divergence since each statute pushes distinct agendas and interests. The constituents of each law compete and negotiate over the administration and utilisation of the small lakes. For instance (in administration), the LLDA via RA 4850 is the principal agency over the seven crater lakes, but the City Government of San Pablo via RA 7160 has territorial jurisdiction (over the small lakes and the surrounding lands as well as on their water inlets/outlets) and has monopoly control of the enforcement of regulations (being in command of the local police and the Barangay units). In this arrangement, the inaction in one administrative agency or the lack of cooperation/coordination between the two administrative agencies is crippling to the management and development of the seven crater lakes. This instance was demonstrated in Sampaloc Lake in the 2000s. On one hand, the move to have an MDP stalled due to the inaction of the LLDA over the three plans submitted by the FARMC, the Seven Crater Lakes and Watershed Management Council (SCLWMC), and the City Government, and on the other hand, the move to partially remove the illegal settlements and establishments succeeded with the cooperation between the LLDA and the City Government of San Pablo. Another instance (in utilisation), RA 8550, being the Philippine Fisheries Code advances the interest of the fisherfolks and the fishing industry, and RA 9593, being the Tourism Act, promotes ecotourism for socio-economic development, which, on the ground, ramifies into the perennial aquaculture and ecotourism conflict over the utilisation of the seven crater lakes. This issue is evident in the "battle"of the MDP proposals in Sampaloc Lake; where in the partitioning of the lake, the FARMC Plan favours giving more space for fish farming while the SCLWMC Plan is skewed towards allocating more grounds for tourism development.

Moreover, the LLDA needs to refine its policy of overwhelmingly focusing on the Laguna de Bay and guarantee equitable attention and resources to the seven crater lakes. As the principal concern, the Laguna de Bay is expected to get the lion share of the attention and resources of the LLDA, but this should not be at the expense or neglect of the small lakes of the Laguna de Bay region; in other words, the seven crater lakes should get their fair share. This problem is discernible in the LLDA's annual reports from 2009-2013 where not a single section was devoted to the seven crater lakes (see LLDA, 2009; LLDA, 2010; LLDA, 2011; LLDA, 2012; LLDA, 2013). Only in "democratizing" the attention and resources can the small lakes be ensured that they are developmentally not left behind and that they move with the progress in Laguna de Bay.

Participation

One favourable feature in the seven crater lakes is the presence of organised and actively participating community stakeholders, as each lake has its own functioning local FARMC and lake residents organisation. In principle, participatory approach is the administrative practice in the seven crater lakes. The LLDA and the City Government of San Pablo embraces participatory proceedings where the community stakeholders are provided the platform for consultations and discussions on tackling issues in the small lakes. With this platform for involvement, the community stakeholders have consistently participated on dialogues and meetings with administrative agencies; this is evident in the many meetings and fora assembled for discussing problems and plans (such as in the formulation of an MDP for Sampaloc Lake, Pandin Lake and Yambo Lake) in the lakes over the years. However, the downside of this administrative arrangement is that, notwithstanding the active involvement/participation of the community stakeholders, the decision making continues to be highly centralised. In practice, the outcome of plans or programmes are solely determined by the administrative agencies since the LLDA and the City Government completely control the agenda setting (decides to tackle or not an initiative), the timing (decides when to tackle an initiative), the funding (decides over allocation and release of funds) and decision making (ultimately approves/rejects the

initiative). Under this setup, the action or inaction of the administrative agencies, regardless of the participation of the community stakeholders, has been the critical factor in the success of the many initiatives in the developmental history of the seven crater lakes. For instance, despite the willingness of many of the remaining informal settlers in Sampaloc Lake to be relocated (in Unityville, Barangay San Lucas II), the completion of the resettlement programme has been stalled for more than a decade in the absence of support and funding from the administrative agencies. In a way, this inaction has bred cynicism among many stakeholders, as the administrative agencies are seen as lacking long-term commitment.

In the past, there was an instance where the "participation" of the community stakeholders went beyond the formal process and into the streets, so to speak. In the late 1990s in Sampaloc Lake, for instance, when the ecological problems of the urban lake became conspicuous (e.g., water lilies covering a substantial portion of the lake surface, emitting foul smell, experiencing multiple fish kills, proliferation of illegal establishments, and overcrowding of fish pens/cages), a multi-sectoral coalition (led by the Save the Lakes Movement [later becoming the Friends of the Seven Lakes Foundation, Inc (FSLF), civic groups and religious groups] launch "Yakap sa Lawa" [Embrace the Lake] prayer rally and protest. This protest prompted the administrative agencies to take notice of the lake and the convening of the first seven lakes summit.

Distrust leading to fragmentation is a major issue among the community stakeholders of the seven crater lakes. This problem is evident among the lakes with substantial presence of commercial fish farming (i.e., Sampaloc Lake, Bunot Lake, Palakpakin Lake and Calibato Lake) in the form of divide between proponents of fish farming and ecotourism. In Sampaloc Lake, for instance, in the move to develop an MDP in the lake, this divergence has evolved into a serious distrust between the FARMC (wanting more space for fish farming) and the SCLWMC (wanting more area for ecotourism) which, consequently, made it difficult to come up with a compromise. In turn, this fragmentation between the two key stakeholders of Sampaloc Lake became a handy excuse of the LLDA and the City Government for not taking action over the MDP issue which lasted for more than a decade.

In absence of assistance from the administrative agencies, the experience in Pandin Lake showed that the community stakeholders with support from a non-governmental organisation (NGO) can be successful in developing the lake. In particular, the local community organisations of Pandin Lake—Samahang Mangingisda ng Lawa ng Pandin (SMLP) and the local FARMC—were assisted by a local environmental group—the Pundasyon ng Kalikasan (PK)—in initiating, organising and promoting the Pandin Lake Tour which eventually became a successful ecotourism enterprise in the lake. With this achievement, the LLDA was compelled to come into the picture and take action by prioritising the crafting of the MDP for Pandin Lake in 2014. Moreover, the experience in Pandin Lake also illustrated the importance of women participation. In particular, the women residents of the lake play a crucial role in the formation and management of the ecotourism enterprise. A group of mostly women residents took the initiative to seek the help of PK and together established the Pandin Lake Tour in 2003, and at present, the local women continue to dominate the operations of the ecotourism enterprise in Pandin Lake.

Technology and Information

Overall, the technological interventions to help improve the management of the seven crater lakes is minimal, and the key information to help better understand the problems and protect the water resources is wanting. In the former, the periodical interventions performed by the LLDA in the small lakes are basic—conducting water quality analysis and seeding of fingerlings; and in the latter, scientific studies are needed in many areas in the seven crater lakes. For instance, scientific studies need to be conducted on the many natural springs that feed the small lakes in order to definitively establish their link with the water resources, specifically their inflow contribution, ecological ramifications, and sustainability. These studies can also enhance the understanding of other related issues (such as the past proposal to make Sampaloc Lake and Calibato Lake as a source of domestic water supply), and problems (such as in the case of Palakpakin Lake, being the shallowest among the seven crater lakes, in resolving the heavy siltation-infilling problem that can lead to the extinction of the water body in the long term). Furthermore, on the regulation of commercial fish farms in the seven crater lakes, the key provision in RA 8550 pertaining to the regulation of fish pens and cages must be clarified; specifically, Section 51 which states: "That not over ten percent (10%) of the suitable water surface area of all lakes and rivers shall be allotted for aquaculture purpose like fish pens, fish cages and fish traps; and the stocking density and feeding requirement which shall be controlled and determined by its carrying capacity."

The provision imposes two limits to fish farming: the 10 percent limit and the carrying capacity limit. Both limits need clarifications; in the former, a scientific study needs to establish the accuracy of the measure (i.e., science must validate the regulation), and in the latter, a study needs to scientifically quantify the measure as well as clarify its possible divergence with 10 percent limit.

Information is critical on two key aspects in the seven crater lakes: on the part of the community stakeholders—in convincing them to accept change and to soothe the distrust among them; and on the side of the administrative agencies—in pressuring them to take actions. For instance, in the former, the members of the local FARMC were vehemently against developing tourism in Sampaloc Lake at the onset primarily because of their misconception that fish farming would be driven out; and only when they learned that ecotourism can significantly expand the livelihood opportunities in the lake and that they would not be displaced did they embrace the development idea. In the latter, the publication of the ecotourism success in Pandin Lake locally and nationwide (via mass and social media) was critical in compelling the LLDA to take notice, and in turn, to take motu propio action in initiating the efforts to have an MDP for the lake.

On local knowledge, its utilisation is demonstrated in the case of the upwelling or overturning phenomenon in the seven crater lakes, where the locals through observation and experience have established its usual occurrences in the cold months ahead of scientific studies. Local knowledge can supplement the administration as well as help resolve issues in the seven crater lakes, such as in designing a suitable MDP for each water body. For instance, in partitioning Palakpakin Lake between fish farm and ecotourism areas, it is valuable to consider the suggestions of the locals to assign the southern part of the lake (near the inlet of Pagbuga Stream) for ecotourism development since the water there is not ideal for fish farming, as it is shallow, has strong currents (especially during storms) and has few illegal settlements.

Finance

The lack of funds is an omnipresent issue in the seven crater lakes. Past to present, the insufficiency of funds is the often cited problem from the administrative agencies to the community stakeholders. On the side of the administrative agencies, the immediate concerns are the financing of the resettlement projects for informal settlers of the seven crater lakes (especially the more than a decade-long stalled housing project in Sampaloc Lake as well as the deferred relocation in Bunot Lake), and the construction of infrastructure (such as the development of the main entry points of Pandin Lake, Mohicap Lake and Calibato Lake and the setting up of basic facilities needed in establishing ecotourism). On the part of the community stakeholders, the main concerns are obtaining a budget sufficient to sustain their organisation as well as their efforts in safeguarding the water resource, and securing the capitalisation needed on each small lake for ecotourism to take root. On the whole, the finance problem in the seven crater lakes underscore the importance of, on one hand, facilitation of fund generation by the administrative agencies, and on the other hand, institutionalisation of a sustainable funding mechanism for the community stakeholders.

Conclusion

Despite recent improvements in the overall condition of the water bodies, the governance of the seven crater lakes has been and is fraught of challenges. The key issues are: on the institutional front, the slow-moving and biased actions conjoined with coordination problems and reactive orientation of the administrative agencies; on the policy side, the existence of overlapping laws that nurture diverging interests and focuses; on the participation aspect, the presence organised and actively participating community stakeholders coupled with a highly centralised decision making; on the technology and information dimension, the underutilisation of technological interventions and the yearning for critical information; and on the financial side, the pervasive need for funds particularly by the community stakeholders. These facts also point to the need for the administrative agencies to exemplify long-term commitment (for consistency of actions) and accountability (to ensure proper implementation of regulations) in the seven crater lakes. The LLDA must dedicate a unit (with guaranteed funds) solely for the management of the seven crater lakes to, on one hand, enhance accountability by pinpointing the responsible people, and on the other hand, insulate the small lakes from neglect by ensuring adequate personnel and resources are supplied to them. Identifying champions (that continually fight for the causes of the seven crater lakes) among the politicians and the community stakeholders would also help significantly in the long-term development of the water bodies. On the whole, the article illustrated the contemporary status as well as the basic areas of improvement in governance of the seven crater lakes. In closing, the article hopes to

inspire more studies in small lake governance as they are abundant in the country and the fundamental starting point in improving the socio-economic well-being of lake communities.

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