

Assessment of Local Government's Implementation of Open Access Policy in Taal Lake, Philippines: Effects on Lake Conservation and Management

Ma. Theresa Mercene-Mutia

Bureau of Fisheries and Aquatic Resources (BFAR)
National Fisheries Biological Center
Butong, Taal, Batangas

Mercene-Mutia MT. 2001. Assessment of local government's implementation of open access policy in Taal Lake, Philippines: Effects on lake conservation and management, pp. 123-132. *In* CB Santiago, ML Cuvin-Aralar and ZU Basiao (eds). Conservation and Ecological Management of Philippine Lakes in Relation to Fisheries and Aquaculture. Southeast Asian Fisheries Development Center, Aquaculture Department, Iloilo, Philippines; Philippine Council for Aquatic and Marine Research and Development, Los Baños, Laguna, Philippines; and Bureau of Fisheries and Aquatic Resources, Quezon City, Philippines. 187 pp.

Abstract

The effects of local government's implementation of the current national policy on open access in municipal fisheries are assessed in terms of their impact on the fishery resources of Taal Lake. Local officials and fisherfolk were interviewed and their responses were analyzed for trends in perceptions on how local open access policies affect fishing practices and productivity in the lake. A policy matrix containing certain areas of concern of local governments related to sound decision-making on lake fishery was designed.

The study shows that local government implementation of open access policy in Taal Lake tends to have negative effects on the lake's fisheries. Open access allows for the unregulated entry of fishing practices like fish cage culture which tend to increase the pollution load in the lake. Pollution due to fish farming in cages seems to even exceed loads from domestic wastes and agricultural run-off. While fish cages flourished in the lake, the income of small fisher folk has declined because of dwindling catch from capture fisheries.

It is recommended that national government agencies (e.g., Department of Agriculture, Bureau of Fisheries and Aquatic Resources, Department of Environment and Natural Resources) should forge an agreement with local government units for a continuing assessment of the fishery resources in Taal. This needs to be coupled with technical assistance to undertake sustained efforts to improve the conservation, productivity and management of the lake's aquatic resources. There is also a need to increase the budgetary allocations for new research and extension activities to address problems and issues of the fishery sector in the lake and for upgrading the capability of local and sectoral policy and decision makers on the lake's fisheries.

Introduction

Lakes are important aquatic resources in the Philippines. They cover about 200,000 ha in total area nationwide (Philippine Fisheries Profile 1994). Majority of these lakes provide livelihood

to the surrounding communities. However, because they are considered a common property, they have been overexploited. The existing open access policy of the government provided in Presidential Decree 704 allows no limit on the number of fishing units and types of gears to be used in municipal waters including lakes. As a result of this policy, more and more resource takers crowd in the same resource grounds and social conflicts have arisen among various lake users (Delmendo 1992).

Taal Lake is the third largest lake in the Philippines. Fishing is an important economic activity of the surrounding population in the lake. It is located in the province of Batangas and has a total area of 24,356 ha. There are 11 municipalities surrounding it. The exploitation of the lake has been intensifying while poverty among its lakeshore communities has been increasingly becoming evident. Marginalized lakeshore inhabitants tend to have low educational attainment. Barely 50% had only reached elementary level (UPLB Foundation, Inc. 1996), thus limiting their opportunities to obtain more lucrative employment elsewhere. Likewise, there are limited livelihood opportunities around the lake. At present, fish cage development has been overcrowding the lake bringing about conflicts between municipal fisherfolk and fish cage operators.

In response to the growing problems in the lake, the government (i.e. national, provincial and municipal levels) promulgated policies for protection, management and conservation of the lake and for the improvement of the living condition of its lakeshore inhabitants. However, all these policies are to be implemented by local government units (LGUs), such being prescribed and stipulated in the 1991 Local Government Code (LGC). It is therefore important to define the role of the LGUs in the management of fisheries in Taal Lake. There is a need to understand how the different fishery rules and regulations are being promulgated by LGUs, how they are implemented and what their effects are on Taal's fisheries.

The general objective of the study is to assess how local governments around Taal Lake in the Philippines are implementing the current national policy of open access in municipal fisheries, and how their implementation of the policy has affected the fishery resources of the lake. Specifically the study seeks to: (1) evaluate local government legislations regulating the utilization of fishery resources in Taal Lake and how these legislations improve the management of the resources; and (2) develop a policy matrix of variables for sound decision-making by LGUs in regard to the management of Taal Lake.

Methods

The study was conducted in Taal Lake, Batangas Province, about 60 km south of Manila. The lake has rugged and steep slopes along the western and eastern shore areas, and low plains along the northeast and southern areas. The deepest portion is 180 m but most parts are 65 m deep.

The five towns selected for the study (Fig. 1) are: Agoncillo, Balete, Laurel, San Nicolas and Talisay, with a total land area of 202.7 km² and a total population of 90,331 (Bureau of Agricultural Statistics 1990). These fifth and sixth class towns have an average annual income of P 9,933 (UPLB Foundation, Inc. 1996).

The study used primary and secondary data on local legislations and on fishing and fisheries conditions in Taal Lake. The primary data were gathered through consultation and interviews.

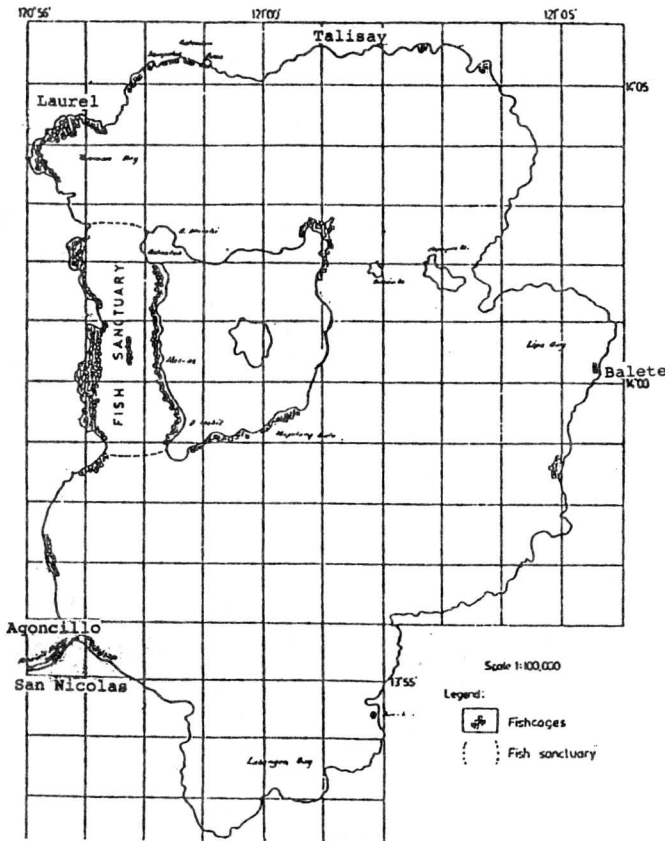


Fig. 1. Map of Taal Lake showing the distribution of cages in 1995

Structured questionnaires were used to interview key informants. Two sets of guide questions were prepared: (1) for local government officials; and (2) for fisher folk. Secondary data were gathered from published literature, socio-economic profiles, development programs, and agriculture, fishery and environmental profiles. Fishery and environment ordinances and resolutions including maps, figures, and tables were sourced from town records. Documentation of legal enactments and direct personal observations were also undertaken. Attendance to the regular sessions of the 'Sangguniang Bayan' (legislative assemblies) allowed the author to witness the proceedings and deliberations related to the fishery concerns of the five towns. Ocular inspection of the entire Taal Lake was done and additional information obtained from local fisher folk and villagers.

Local legislations formulated and implemented in the five selected towns for fishery management of Taal Lake were analyzed descriptively. A policy matrix containing selected areas of concerns of LGUs related to sound decision-making on Taal's fisheries was developed.

Results and Discussion

Ordinances and resolutions enacted

The town of Talisay has not passed any ordinance. The ordinances are mainly of the towns of San Nicolas, Agoncillo and Laurel. From 1990 to 1995, 20 ordinances and four resolutions were passed by the Sangguniang Bayan of the towns to address fisheries and related concerns: management (6 ordinances), regulation (13 ordinances, 3 resolutions), lake utilization (1 resolution) and other related concerns (1 ordinance). Most of the ordinances now being implemented in the four towns relate to fish cage operations. There are 16 ordinances or regulations which include licensing, imposition of tax mostly on fish cage operation, and prohibition of the use of fine-meshed nets in 'suro', fish corral and 'basnig'. Two of the ordinances concern open water fishing activities: prohibition of the operation of 'suro' and 'basnig' and imposition of taxes (1/3 of the gross sale from fishing). One ordinance from Balete concerns the prohibition of collecting sand from the shores of Taal Lake.

Fisheries legislations of the four towns began to be formulated only in 1990 when fish cages started in Taal. Most ordinances passed in 1993 pertained to the imposition of taxes on fish cage operation, waste and pollution control, and prohibition of illegal fishing. Ordinances on fish cages increased even more in 1995 to impose additional prohibitions and taxes on fish cage construction.

Policy matrix of local legislations

Table 1 shows a matrix of local legislations on fisheries in Taal Lake.

1. Control of fish cage construction

- Majority of ordinances and resolutions passed by municipal governments prohibit and regulate construction of fish cages and related facilities in specific areas of Taal Lake.
- Taxes of P0.60 to P6.00/m² are often used to control the proliferation of fish cages in different areas of the lake.
- One ordinance prohibits construction of fish cages in Taal Lake, but since the lake is a common property, the prohibition cannot be implemented. There is no coherence in the passage of legislative enactments among neighboring towns.

2. Control of pollution in Taal Lake

- Several resolutions and ordinances prohibit dumping of waste pollution materials and garbage into the lake.
- An ordinance was passed for the cleaning of a municipal park and the shorelines of Taal Lake.
- An ordinance prohibits collection of sand from the lake that would pollute water and change the topography of shore areas.

3. Beach resorts

- Resorts seem to have higher priority in the utilization of the lake.
- A mayor's permit raised the fee on beach resorts presumably to increase income of municipality. This seems to indicate that, in Taal, regulations may be tied to the revenue objectives of local governments.

On the other hand, the matrix also shows the negative impacts of local legislations on the productivity, sustainability and equitability of the fishery resources of Taal. There were no ordinances nor resolutions passed by the LGUs to address the following concerns:

Lake's productivity

- Appropriate aquaculture practices have not been defined in terms of proper zoning of cages, stocking density, feeding rate and size of cages.
- Measures are lacking to protect, conserve and manage the fish sanctuary area, now being used for fish cages.
- The towns belong to the lower income class, thus, LGUs cannot provide the fisherfolk financial support nor technical assistance.

Sustainability of the lake's productivity

- There are no measures to arrest the depletion of indigenous fishery resources, particularly the 'tawilis' *Sardinella tawilis*, 'maliputo' *Caranx ignobilis* and other migratory fish species.
- Fish wardens or 'Bantay Lawa' groups have still to be created and empowered.
- The need of Philippine National Police (PNP) officials to acquire a pumpboat for regular

Table 1. Matrix of local legislations and areas of concern of the five (5) municipalities in Taal Lake

ORDINANCE AND RESOLUTION	AREAS OF CONCERN											REMARKS						
	P r o d u c t i v i t y			S u s t a i n a b i l i t y				E q u i t a b i l i t y										
Illegal Fishing practice	Aqua-culture practice	Fish Sanctuary	Prot. of Fish	Credit/Tech. Support	Fishery Depletion	Waste Mgt.	Fish Warden	Sanitation & Beautification	Prot. of water- shed & Env't Grnds.	Off- shore Beaches	Request for Pump Boat	Reg. fishage & Fish-coral	Lic. Iss. of permit/ Tax	Zoning Plan	Orgn. of Fish Asso. & Coop.	Increase Income of Fishermen	Participatory Fish. Mgt.	
MO No. 5 S-93	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	priority for beach leases
MO No. 10 S-93	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	regulate aquaculture practice
MO No. 5 S-93	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	regulate aquaculture practice
MO No. 9 S-93	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	measure to protect env't
MO No. 20 S-93	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	regulate aquaculture practice
MO No. 5 S-95	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	regulate aquaculture practice
MO No. 5 S-90	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	income generation
MO No. 6 S-91	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	income generation
MO No. 6 S-93	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	Regulate open fishing
MO No. 7 S-93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	income generation
MO No. 21 S-93	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	control pollution
MO No. 2 S-93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	income generation
MO No. 5 S-93	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	control pollution
MO No. 7 S-93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	income generation
MO No. 2 S-94	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	income generation
MO No. 3 S-94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	income generation
R. No. 34 S-94	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	control pollution
R. No. 23 S-95	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	income generation
MO No. 19 S-95	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	control pollution
R. No. 11 S-95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Regulate fishage
MO No. 4 S-95	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	Regulate fishage
MO No. 4 S-95	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	income generation
MO No. 24 S-95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Regulate fishage
MO No. 6 S-93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	Livelihood to fishermen
									+								-	protect environment

Legend: + positive effect/impact
- negative effect/impact

monitoring and surveillance in the lake has not been considered.

Equitable resource use in Taal Lake

- There are no guidelines to be followed regarding proper zoning of fish cages in the aquaculture sites. This resulted to overcrowding and pollution in the areas.
- The LGUs have programs for cooperatives and fisherfolk associations but they do not include training and group strengthening to allow groups to manage their own fishing grounds.
- The LGUs lack the initiative to include the fisher folk in decision making for proper management of Taal fisheries.

Fisher folk's awareness and perception of the management of Taal Lake

Most fisher folk in the four towns were familiar with only five of the 20 ordinances. The five are: a) prohibition of 'suro' and 'basnig' operation; b) registration of fish cages; c) registration of boats; d) prohibition of waste disposal in Taal Lake; and e) regulation of fish cage construction

Apparently, when these ordinances were deliberated, the fisher folk's views were not sought. After the passage of the ordinances, there was no information dissemination by the local governments to inform the affected fisher folk.

Knowledge of the Implementation of Local Fishery Ordinances

Table 2 shows that 64% of the respondents think that local fishery ordinances were not strictly implemented. Most ordinances are ignored, there are no fish wardens to enforce the ordinances, information dissemination is insufficient, and local fisher folk lack unity and cooperation.

Table 2. Respondents' knowledge on the implementation of the local fishery ordinances in Taal Lake

Categories	Number n=50	Percent (%)
<i>Fishery Ordinances:</i>		
Strictly implemented	18	36
Not strictly implemented	32	64
TOTAL	50	100
<i>Problems Related to Implementation:</i>		
Laws and ordinances are ignored	19	38
No fish warden	12	24
Not informed	8	16
Political interference	4	8
Lack of unity and cooperation	1	2
Others (no existing fishery laws, presence of fish cages, lack of good leaders)	6	12
TOTAL	50	100
<i>Solutions:</i>		
Create a 'Bantay Lawa' group	17	34
Strict implementation of laws	10	20
Regular monitoring and rigid surveillance	7	14
Information dissemination	4	8
Cooperation between LGU's and fisher folks	4	8
Others (penalty to violators, good leaders, set limit to fish cages)	8	16
TOTAL	50	100

A number of solutions to weak implementation were suggested (Table 2). About 34% of the respondents suggested the creation of a task force to protect the lake from illegal activities and 20% wanted the government to implement the ordinances strictly.

Fishing problems in Taal Lake

There are a number of problems related to fishing operations in the lake. These include bad weather, water pollution, lack of capital among fisher folk, occurrence of fish diseases, overcrowding of fish cages and illegal fishing.

Several solutions were suggested by the respondents: proper waste disposal, credit and technical support from the government, proper zoning and the involvement of and cooperation among the fisher folk and the LGUs.

Respondents' perception of ways to help manage Taal Lake

Respondents think they can help in managing the lake by: 1) improving unity among themselves and their level of cooperation with the government (58% of the respondents); 2) avoiding disposing wastes to the lake by digging garbage pits in their backyard (22%); 3) observing local ordinances (10%); 4) information dissemination (6%) and others like joining associations and stop illegal fishing (4%).

Consequences of local ordinances

The intended and unintended effects of policies may modify certain conditions of affected sectors. The socio-economic effects of local fishery policies may translate into modifying any or either of the following conditions in Taal Lake: 1) number of fish cages; 2) productivity of fish cages and of open water fisheries and 3) incomes of fisherfolk.

1. Number of fish cages

In 1993, there were 1,271 fish cages in Taal and ordinances were passed prohibiting the construction of additional fish cages in the lake (Mun. Ord. Nos. 5-S-93, 10-S-93, 5-S-93). The number of cages increased to 3,101 in 1995 (Table 3). Among the five towns, Agoncillo and Laurel had the most fish cages, mostly located in the protected area of the sanctuary portion of the lake (Fig. 1).

Table 3. Number of fish cages operating in Taal Lake (1993-1995)

Municipality	Number of Cages		Total
	1993 ^a	1995 ^b	
Agoncillo	469	1,143	1,612
Balete	0	50	50
Laurel	548	1,269	1,817
San Nicolas	159	115	274
Talisay	95	524	619
Total	1,217	3,101	4,372

^a PCTT 1993

^b Municipal Agriculture Profile (MAP) 1995

From 1990 to 1993, ordinances on fish cage management and regulation increased ten times in number but did not stop the proliferation of fish cages in 1995. This shows non-compliance to the above ordinances, or weak implementation of laws and regulations in Taal.

The effects of local ordinances on the lake ecosystem can be both positive and negative. UP-FSP (personal communication) measured the physico-chemical variables in Taal Lake, in the open waters, in a fish cage area and in Pansipit River. It was found that DO (dissolved oxygen) levels were lower in the fish cage area (3.57 ± 1.25 mg/l) than in the open waters and river (7-8 mg/l). DO levels vary by time of day, temperature, fish stock density and other factors, but must be maintained near 5 mg/l or higher for optimum fish growth.

2. Production from fish cages and open waters

The use of modern technology, more cages and more input (e.g., feeds) in the culture of tilapia in Taal have resulted in a 5-fold increase in fish production between 1993 and 1995 (Table 4). However, the open water fisheries catch has been reduced to 1/3 over the same period, so that the total fish production in the lake has only doubled despite the existence of 3,000 fish cages.

Table 4. Estimated total fish production in Taal Lake (1993-1995)

Year	Open Water (mt)	Fishcage Production (mt)	Total (mt)
1993 ^a	8,792	4,984	13,776
1994 ^b	2,446	12,097	14,543
1995 ^c	2,767	26,376	29,143

^a PCTT 1993

^b Bureau of Agricultural Statistics 1994

^c MAP 1995

The open water fisheries is now dominated by an introduced species, Nile tilapia *Oreochromis niloticus*, which constitutes 43% of the total volume of the catches. 'Tawilis' *Sardinella tawilis* makes up 30% and 'maliputo' *Caranx ignobilis*, 21%. Minor fishery resources which make up only 6.4% include 'ayungin' *Therapon plumbeus*, 'dalag' *Ophicephalus striatus*, common carp *Cyprinus carpio*, eel *Anguilla mauritiana* and goby *Glossogobius giurus*. The species composition of the lake has changed from dominance of migratory marine species to dominance of tilapia (UP-FSP 1995). The catch from the open waters dwindled from 8,792 mt in 1993 to 2,767 mt in 1995. This was probably due to increased fish cage area and consequent reduction of the area for open water fishing.

3. Reduced income for the fisher folk

The decrease in open fisheries production has resulted in substantial reduction in the family incomes of small fisherfolk in Taal (Table 5). An average of P 14 per month during the 5-year period should have been added to the base earnings assuming no earning capacity of fisher folk is reflected in a negative difference between nominal and real incomes, on average -P336.00 for the five towns.

Table 5. Annual family income (in Philippine pesos, P) of five municipalities in Batangas (1990-1995)

Municipality	1990 ^a	1995 ^b	(P 14/mo) ^c	Difference
Agoncillo	11,200	11,750	12,040	(-290)
Balete	9,000	9,600	9,840	(-340)
Laurel	9,000	9,500	9,840	(-340)
San Nicolas	14,000	15,000	14,840	(-160)
Talisay	14,200	14,750	15,040	(-550)
Average	11,480	12,320		(-336)

^a National Statistics Office 1990

^b MAP 1995

^c P14/mo estimated increase in monthly income over a 5-year period with the same number of members, Bureau of Labor Statistics, DOLE.

Summary and Conclusion

It appears that:

- Municipal ordinances and resolutions prohibiting the construction of fish cages and levying taxes on fish cage construction and operations, seem to favor open fisheries. However, the proliferation of fish cages belie the prohibition. This is a direct result of open access policy, i.e., anybody with a capital can invest on fish cages.
- Fish cages increase overall fish production (particularly tilapia) but they threaten the indigenous species, 'tawilis' and 'maliputo' which are dwindling.
- There are limited inputs to local government decision-making process. Ordinances suffer various technical deficiencies with respect to the management and utilization of lake fisheries in Taal.
- The fisher folk have little knowledge of ordinances and these have little impact on their behavior as lake users. This seems to be brought about by their low educational status and lack of communication with government development and regulatory personnel.
- Open access is worsening the pressure on the lake ecosystem and lowering the income of marginalized fisher folk due to decreased fishing grounds in open waters and the enlarged areas for fish cages.
- Management inputs like participatory planning and implementation, common visioning and implementation of resource management programs and projects, are quite limited; these shortfalls may worsen the declining quality of water and resources in the lake.
- There is low compliance with local ordinances. Legislations seem ineffective.
- Although, there are other sources of pollutants like domestic wastes and agricultural residues, lake in the very near future, the pollution load from fish cages is likely to have an even greater impact on water quality in the

Recommendations

Certain measures may be undertaken by local governments in Taal to address the aforementioned problems. In light of the weaknesses and threats arising from the open access policy and the lake being

common property resource, these measures will improve the sustainability of fish production.

- Results of comprehensive studies done in the lake (like the Tagaytay-Taal Integrated Master Plan done by the Presidential Commission on Tagaytay-Taal) must be widely disseminated to concerned sectors.
- Non-formal education and training should be given to fisherfolk and families so that livelihood alternatives and their perceptions and knowledge of the lake's limits can be expanded.
- Integrated capability programs may be undertaken by LGUs to ensure regular coordination among them so that there will be coherence among local legislations.
- Fisherfolk associations or cooperatives must be represented in the deliberations of the local development council so that they can participate in tackling local issues and problems related to the utilization of the lake.
- DA, BFAR and DENR should forge an agreement with LGUs for a continuing assessment of fishery resources in the lake; technical assistance in conservation, production and management projects and programs of Taal Lake fishery resources, as proposed in the Master Plan ZONMAP, need to be expanded.
- The Sangguniang Panlalawigan should review and carefully scrutinize ordinances and development plans of component municipalities to see whether or not they agree with the growth and welfare objectives for Taal's marginalized fisher folk and other poor people.
- Budgetary allocations should be increased for new research and extension to address problems and issues of the fishery sector in Taal
- Policy formulation and implementation are formidable tasks, hence, the capability of local and sectoral policy and decision makers must be continuously upgraded.

Although broad, these measures may be undertaken collaboratively and cooperatively by LGUs and national agencies in Taal, with the participation of different user sectors of the lake, by way of specific project and policy interventions that will enhance government-fisherfolk cooperation in managing the lake's fishery resource. Details need to be laid down in further dialogues and collaborative planning exercises. If the interventions will fall within these general measures, it is likely that fisheries in Taal Lake will become sustainable, productive and equitable in the very near future.

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