

# Sustainable Development of Philippine Lake Resources: An Agenda for Research and Development

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Guerrero III RD. 2001. Sustainable development of Philippine lake resources: An agenda for research and development, pp. 19-23. *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

There are 59-70 lakes in the Philippines. With the exception of Laguna de Bay and Lake Taal, little is known about Philippine lakes although they contribute as much as 15% to the total annual fisheries production of the country. There is need for an integrated basin approach for the sustainable management of Philippine lake resources. Among the research strategies recommended for sustainable management of Philippine lakes are: (1) studies on lake fisheries resources - fish stock assessment, effects of fishing and other human activities on lake productivity, the biology of major aquatic species, and the carrying capacity of lakes; and (2) lake management studies - the rational use of lakes, strengthening management, enforcement and institutional mechanisms, and socio-economics focused on the users of lakes.

## Introduction

Lakes are defined as inland bodies of water with distinct basins or depressions that are formed by the natural sinking and rising of land. There were 59 lakes inventoried in the country according to the Philippine Census Atlas of 1940. Bravo (1970) listed an additional nine lakes in areas of 5-16 ha for a total of 68 lakes. Four more lakes which I am aware of have brought the current total to 72 (Table 1).

Lakes have various uses and benefits to man. Mainly exploited for their fisheries, lakes in the Philippines have contributed an estimated 15% to the annual total fish production of the country (Fellizar 1995). Aside from fisheries, lakes have also served as transport routes and sources of irrigation supply, hydropower and cooling water for industries. Laguna de Bay, the country's largest lake, is now being tapped as source of domestic water supply for Metro Manila.

**Table 1. Philippine lakes and their location**

Region**	Province	Lake	
Region I (6)	Ilocos Norte (1)	Paoay	
	Ilocos Sur (1)	Pinsal*	
	Abra (2)	Quimquimay*	
	Pangasinan (2)	Lumpo*	
		Loloog*	
Region II (1)	Cagayan (1)	Padao*	
		Cabalangan*	
Region III (5)	Tarlac (2)	Ladlaonan*	
	Zambales (2)	Canarin*	
	Nueva Ecija (1)	Alindayot*	
		Looc*	
		Paitan*	
Region IV (17)	Laguna-Rizal (1)	Laguna de Bay	
		Sampaloc	
	Laguna (9)	Palacpaquen	
		Calibato	
		Yambo	
		Bunot	
		Tadlak	
		Pandin	
		Mohicap	
		Caluangan*	
		Taal	
		Ticab*	
		Dagatan	
		Naujan	
		Caluangan*	
	Calapan*		
	Region V (5)	Palawan (1)	Manguao
		Camarines Sur (4)	Bato
			Buhi
			Baao
Manapao			
Region VII (5)	Sorsogon (1)	Bulusan	
	Negros Oriental (4)	Balanan	
		Balinsasayao	
		Mantohod*	
	Cebu (1)	Danao	
			Danao

**Table 1. (continued)**

Region**	Province	Lake
Region VIII (8)	Leyte (8)	Danao Bito Danao* Ibag* Maobog* Lunay* Davo* Cambirag*
Region IX (1)	Zamboanga del Sur (1)	Wood
Region X (6)	Surigao del Norte-Agusan (3)	Mainit Pagusi* Lumao*
	Bukidnon (3)	Lamybyben Pinamaloy Apo*
Autonomous Region in Muslim Mindanao (7)	Lanao del Sur (7)	Lanao Butig* Dapao Putian* Numungan* Talao* Dagianan*
Region XI (10)	Davao del Norte (1) South Cotabato (9)	Leonard Sebu Labas* Blingkong* Lahit* Maughan* Balut* Sultan* Malinao* Buranibua*
Region XII (1)	Cotabato (1)	Buluan

\*Needs verification

\*\*Number in parentheses refers to the number of lakes by region or province.

With the exception of Laguna de Bay and Lake Taal, little is known about Philippine lakes. Of the 72 listed lakes, only 20 have been described to some extent with emphasis on the fishes present in them.

This paper presents an agenda for research and development for the sustainable development of Philippine lake resources.

## Philippine Lake Resources Research and Development

While the fisheries resources of lakes appear to be an important reason for their conservation and management, it should be stressed that the fisheries of any body of water can only be sustained as long as the ecological balance of the ecosystem is maintained. There is need for an integrated basin approach for the rational management of lakes. Not only should the fisheries stocks of a lake be managed but also its watershed and other interacting elements as well including people.

In addition to the research and development priorities identified and recommended for action at the National Symposium-Workshop on Lake Fisheries Management held on October 28-29, 1993 (Edra *et al.* 1995), I would like to endorse the following agenda for lake resources research and development:

### *Update on the Inventory of Philippine Lakes*

We should find out how many lakes we really have or are existing. The lakes listed in our present inventory that need to be verified are marked with an asterisk in Table 1.

### *Limnological Studies*

Limnological studies on other major lakes should be done within the next 2-3 years to assess their present state and potentials. Ten of these lakes are shown in Table 2.

### *Lake Fisheries Assessment*

With the increasing threats of overexploitation and environmental degradation, there is urgent need for an assessment of our lake fisheries with particular attention to endangered species for their sustainability. We are currently conducting studies on the 'tawilis' (*Sardinella tawilis*), 'sinarapan' (*Mistichthys luzonensis*), and the Lake Lanao cyprinids.

### *Lake Use Planning and Management*

Similar to what we are doing for our coastal resources, we should also consider planning for the use of lake resources and come out with integrated management plans for their sustainable development. An example for such strategy is the Laguna de Bay Master Plan.

**Table 2. Major lakes of the Philippines**

Lake	Province
Laguna de Bay	Laguna and Rizal
Lake Lanao	Lanao del Sur
Lake Taal	Batangas
Lake Mainit	Surigao del Norte-Agusan
Lake Naujan	Oriental Mindoro
Lake Buluan	South Cotabato
Lake Bato	Camarines Sur
Lake Pagusi	Agusan
Lake Labas	South Cotabato
Lake Lumao	Agusan

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