



# **Aquaculture Development and Management in Laguna de Bay**

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## **First Living Lakes African Regional Conference**

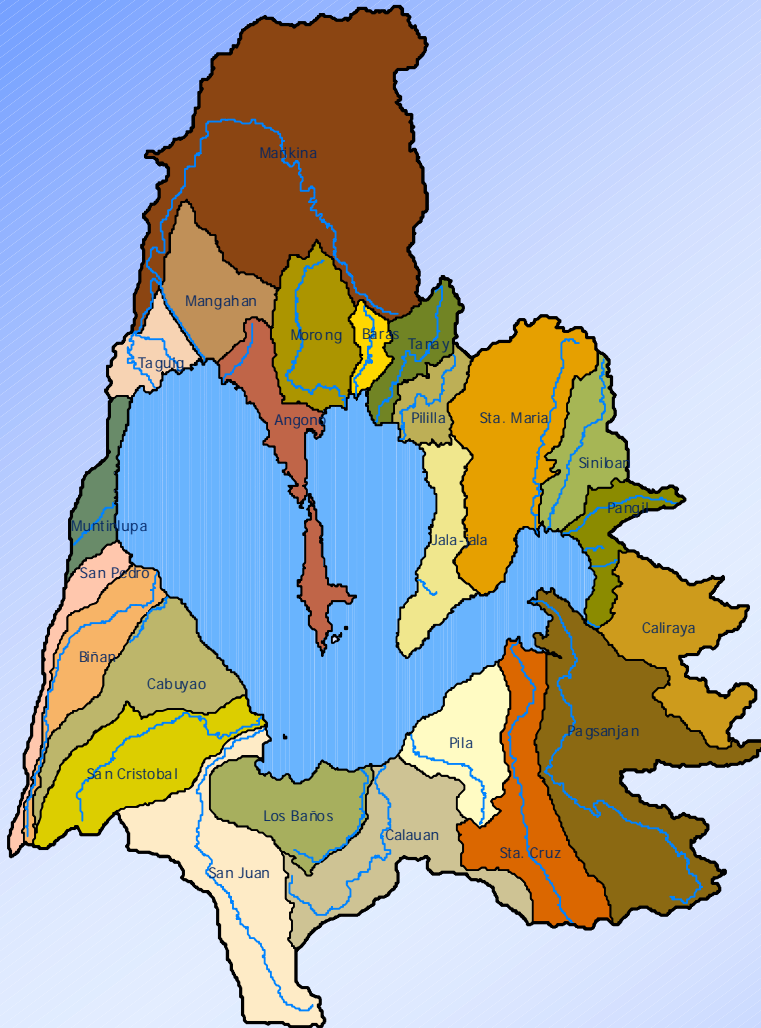
**Kisumu – Mbita, KENYA**  
**27-30 October, 2005**





# Laguna de Bay Features

The Largest lake in the Philippines and one of the largest in Southeast Asia



- Average Depth: ~2.5 m.
- Average Volume: 2.25 MCM
- Shoreline: 285 km.
- Lake surface area: 900 km<sup>2</sup>
- Watershed area: ~2920 km<sup>2</sup>
- (24 sub-basins including many tributaries + a floodway)
- 6 provinces (including Metro Manila), 12 cities, 49 municipalities of which 27 are lakeshore towns and 2 are lakeshore cities
- One outlet: Napindan Channel – Pasig River (serves as inlet of saline water during Pasig River backflow)

**Laguna de Bay is a multi-use resource but its dominant use is for fishery . . .**

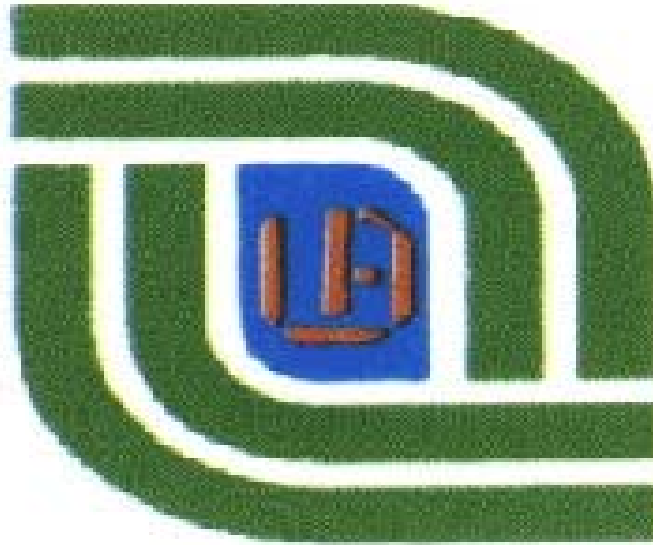
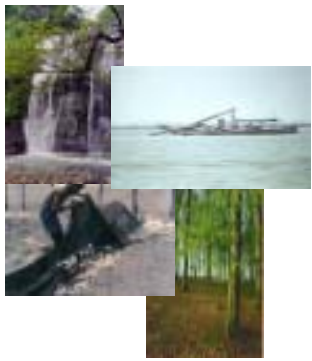


**Open water**



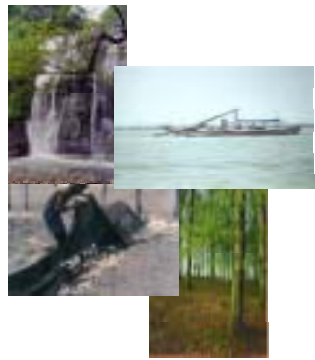
**Aquaculture**





## **The Laguna Lake Development Authority**

***The only lake basin management authority in the Philippines. Created in 1966 through Republic Act 4850.***



# Flagship Programs

**Environmental User Fee System**

**River Rehabilitation Program**

**Sustainable Fisheries Program**

**Shoreland Management Program**

An aerial photograph showing a vast expanse of water with a complex network of dark, rectangular pens or cages. The pens are arranged in a grid-like pattern, with some larger rectangular pens and some smaller, more irregular ones. The water is a deep blue-green color, and the sky is a pale, overcast blue. The overall scene depicts a large-scale aquaculture operation.

# **FISHERIES DEVELOPMENT PROGRAM**

## **AQUACULTURE IN FISHPENS**

# History of Aquaculture operation

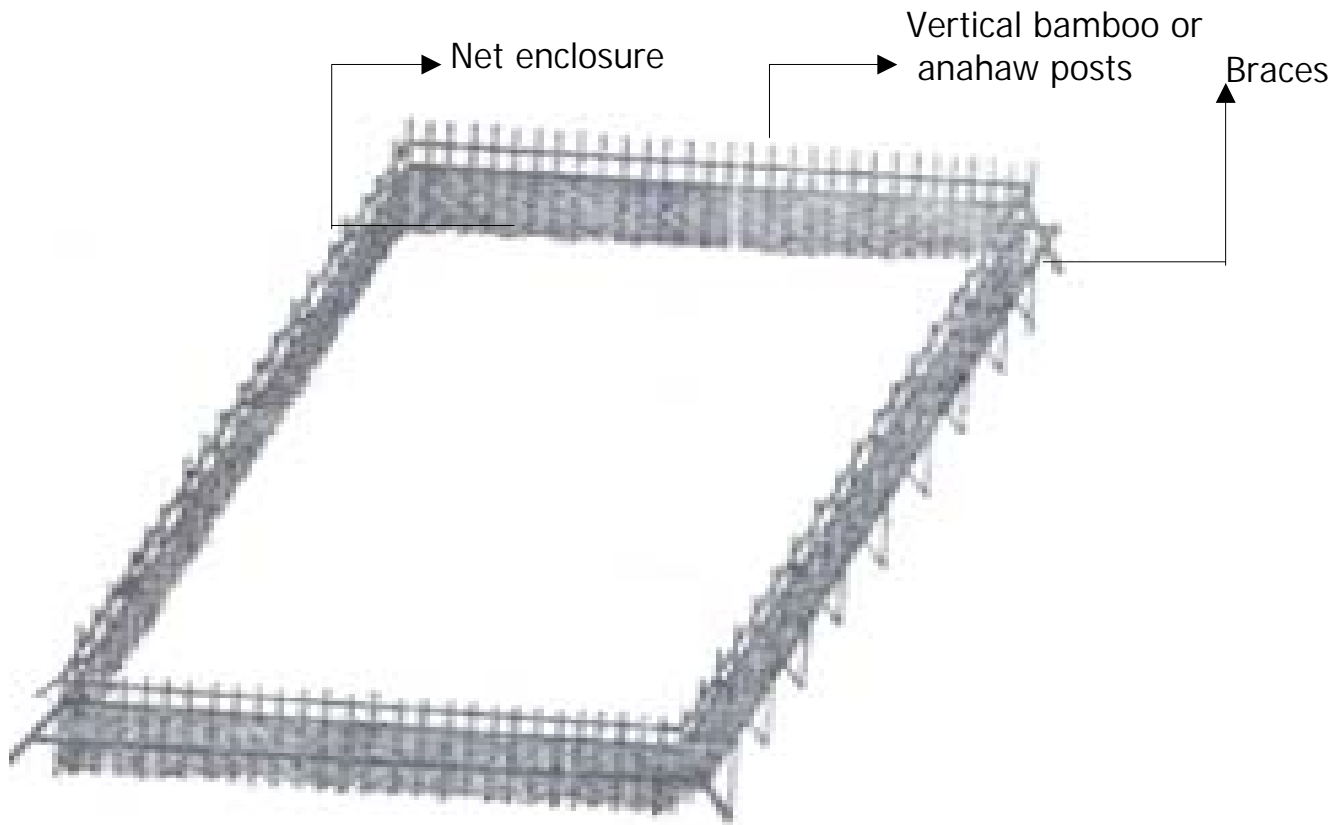
- **Studies done in the late 1960's showed that the primary producers of the lake were not fully utilized by the native fish population.**
- **There was a declining fish catch.**
- **Searched for methods to utilize the natural aquatic biota of the lake to support a more extensive fishery production, taking into consideration high economic return for fishermen as well as maintenance of ecological balance in the lake.**



- **Aquaculture of milkfish (*Chanos chanos*) in fishpens was introduced - considered as a very viable approach to increase fishery production. Being a herbivore, it was believed that milkfish would not compete for the natural food source of the native species.**



- **Likewise, under this condition, an extensive aquaculture can be supported by the lake.**



**Fishpen structure in Laguna de Bay**



Harvest of milkfish in a fishpen

## The culture of other species followed:

- **Mid 1970's - tilapia culture through fish cages using the "inverted mosquito net" and floating fish cage technique.**



- **1980's - bighead carp culture in fishpens**





## **Aquaculture:**

- **intended to improve the livelihood of fishermen**
- **capital intensive**
- **no accompanying program for fishermen to finance the operation**
- **rich businessmen took over**
- **very profitable in the early years of operation**

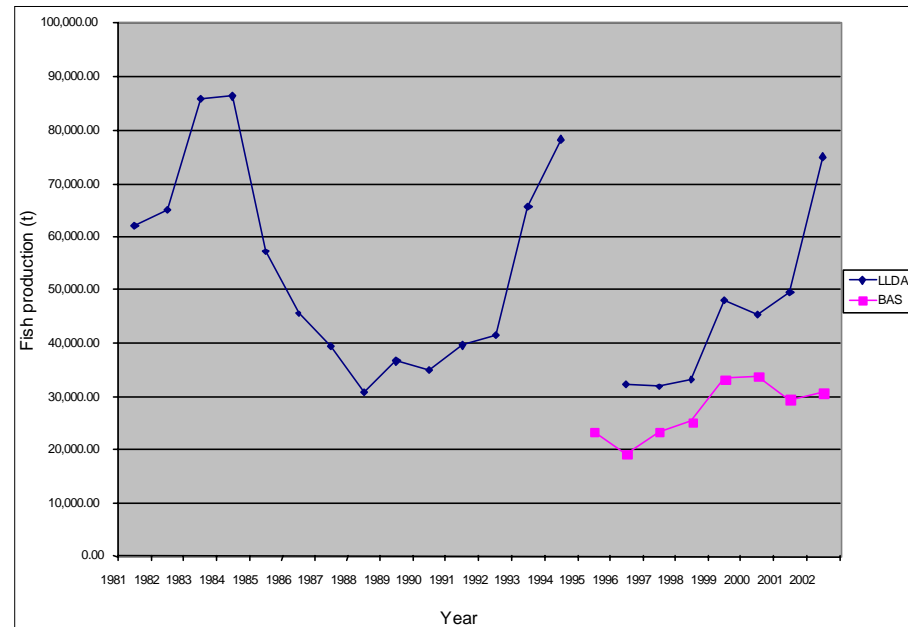


**From a pilot area of 38 hectares in 1970, fish pens swelled to about 35,000 hectares in 1983.**

**Fishermen asserted their rights on the use of traditional fishing grounds.**

**Resulted to serious conflict between fishermen and the fishpen operators on access to fishing grounds which led to the death of some fishermen.**

**The proliferation and overcrowding of fishpens affected the fish yield. From a culture period of six months, it became one year or more to harvest milkfish in their marketable size.**

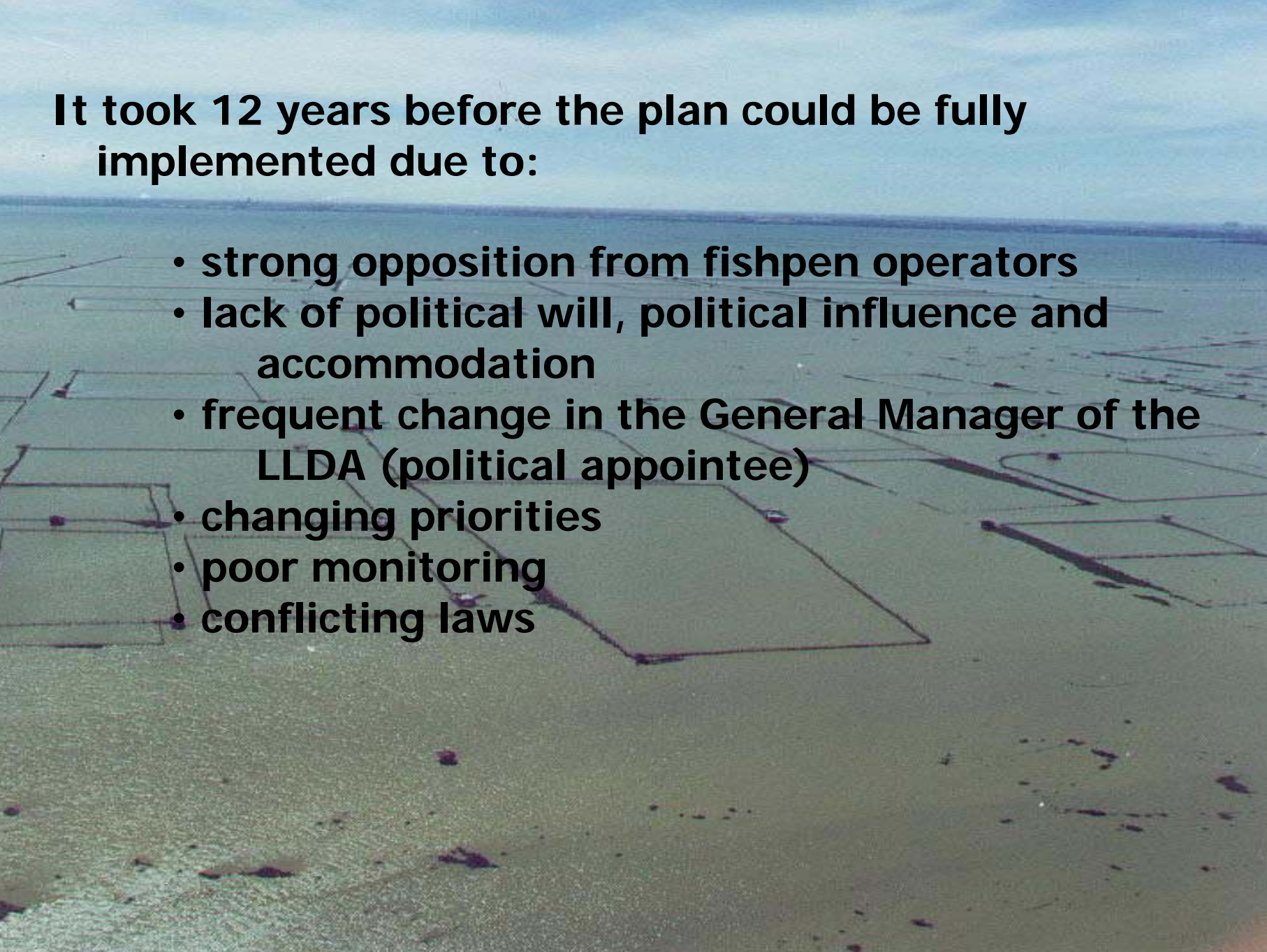


## **MANAGEMENT CHALLENGE:**

**High economic return for fishermen as well as maintenance of ecological balance in the lake.**

**A zoning and management plan (ZOMAP) was implemented in 1983 – considered by far as the most feasible management system for equitable allocation of the fishery resource.**

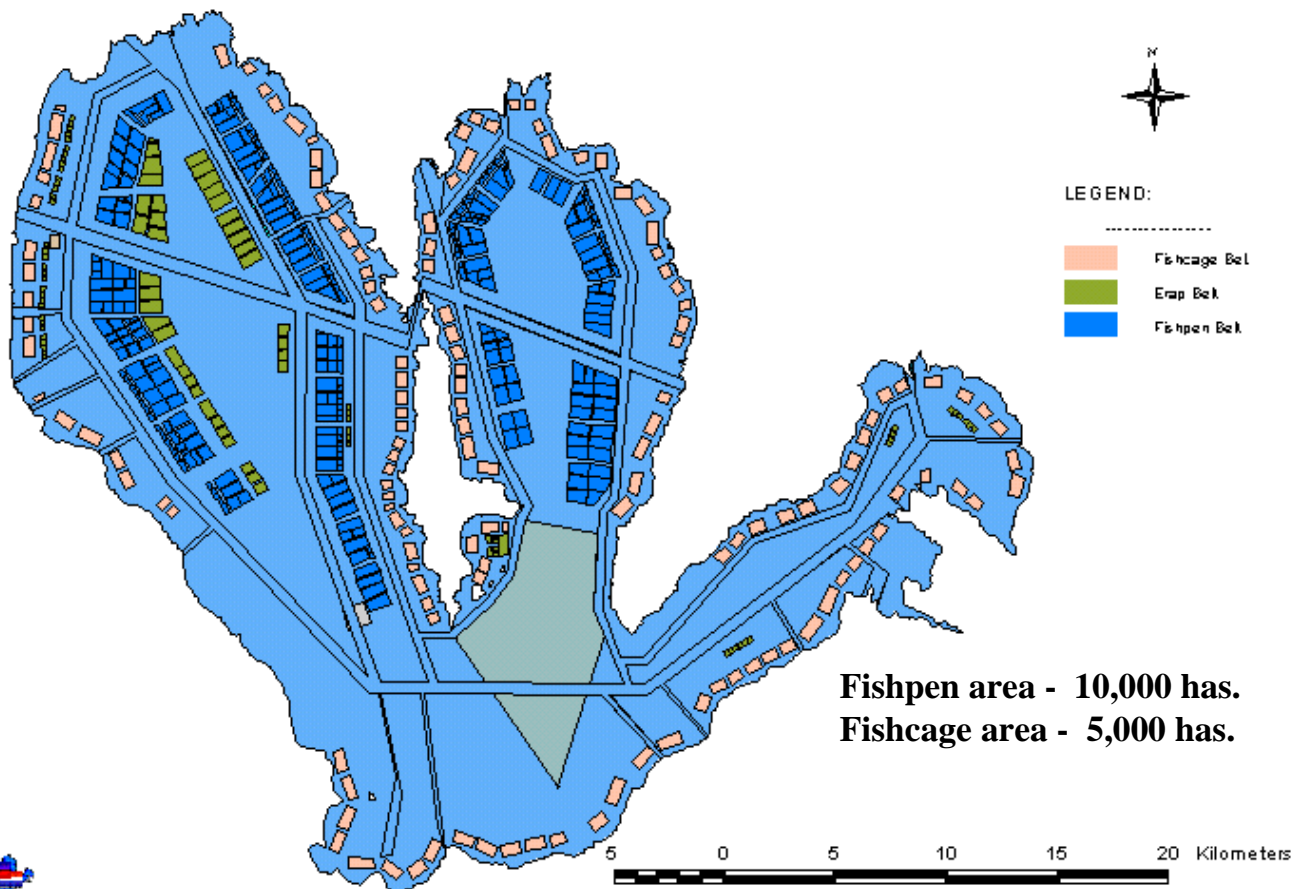




**It took 12 years before the plan could be fully implemented due to:**

- **strong opposition from fishpen operators**
- **lack of political will, political influence and accommodation**
- **frequent change in the General Manager of the LLDA (political appointee)**
- **changing priorities**
- **poor monitoring**
- **conflicting laws**

# ZONING and MANAGEMENT PLAN 1999



## **Salient Features:**

**Fishpen belt from 500 to 1000m from the shore with a total area allocation of 10,000 has. for fishpens**

**Fishcage belt with total area allocation of 5,000.**

**Navigational lanes for easy access of open water fishermen to their traditional fishing grounds.**



# Area Allocation

## Fishpen

- a. Corporations - 50 has.
  - b. Individuals - 5 has.
  - c. Cooperatives - 25 has.
- 40 m distance between fishpens

## Fishcage

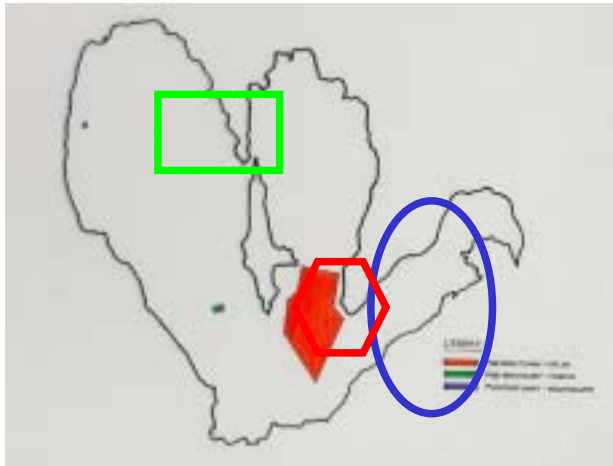
Maximum area of 1.0 hectare

20 m distance on all  
sides

A one hectare fishcage area is  
allocated for every municipal  
Fisheries and Aquatic Resource  
Management Council



# **Establishment/Maintenance of Sanctuaries in Laguna de Bay ( in has.)**



**Talim Sanctuary - 5,000.00 has.**

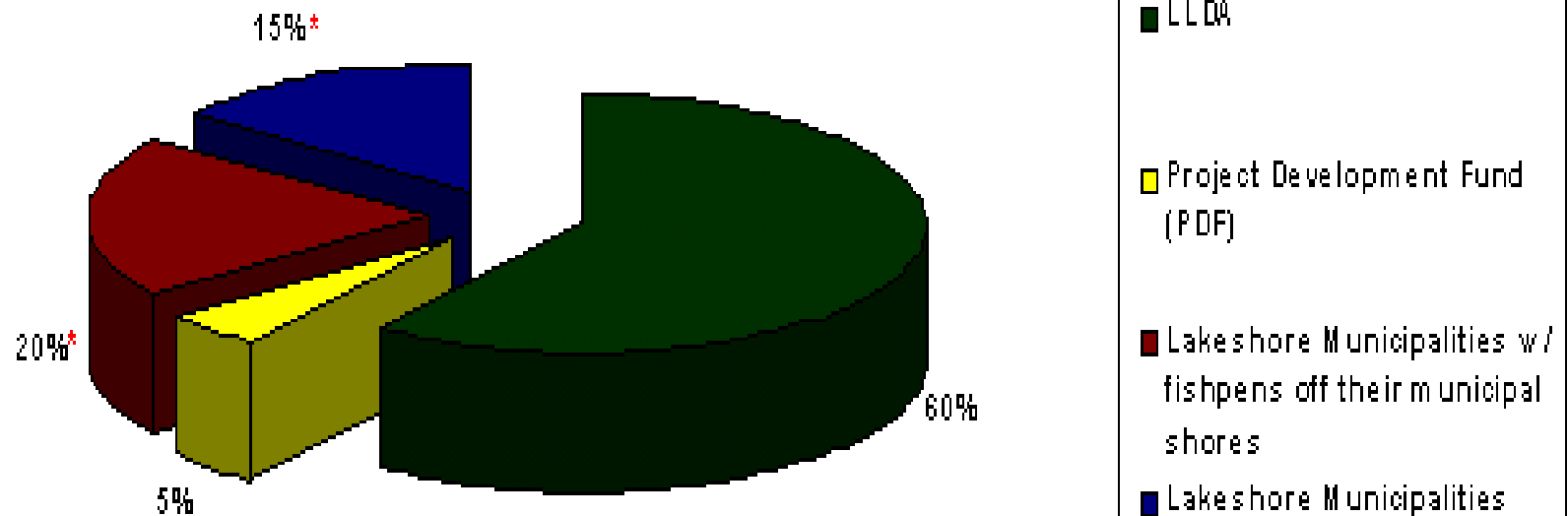
**Tabon Sanctuary - 126.27 has.**

**Muntinlupa Sanctuary - 30.00 has.**

# Sharing scheme for annual fishpen and fishcage fee

Fishpen fee - P 6,000.00 (US \$110.00)

Fishcage fee – P 4,000.00 (US \$ 72.00)



\*Thus, lakeshore municipalities with fishpen structures off their shores receive a total of 35% share



**“Maraming Salamat Po!”**

**Asante Sana !**

**THANK YOU VERY MUCH!**

