

Environmental User Fee System for Laguna de Bay, Philippines



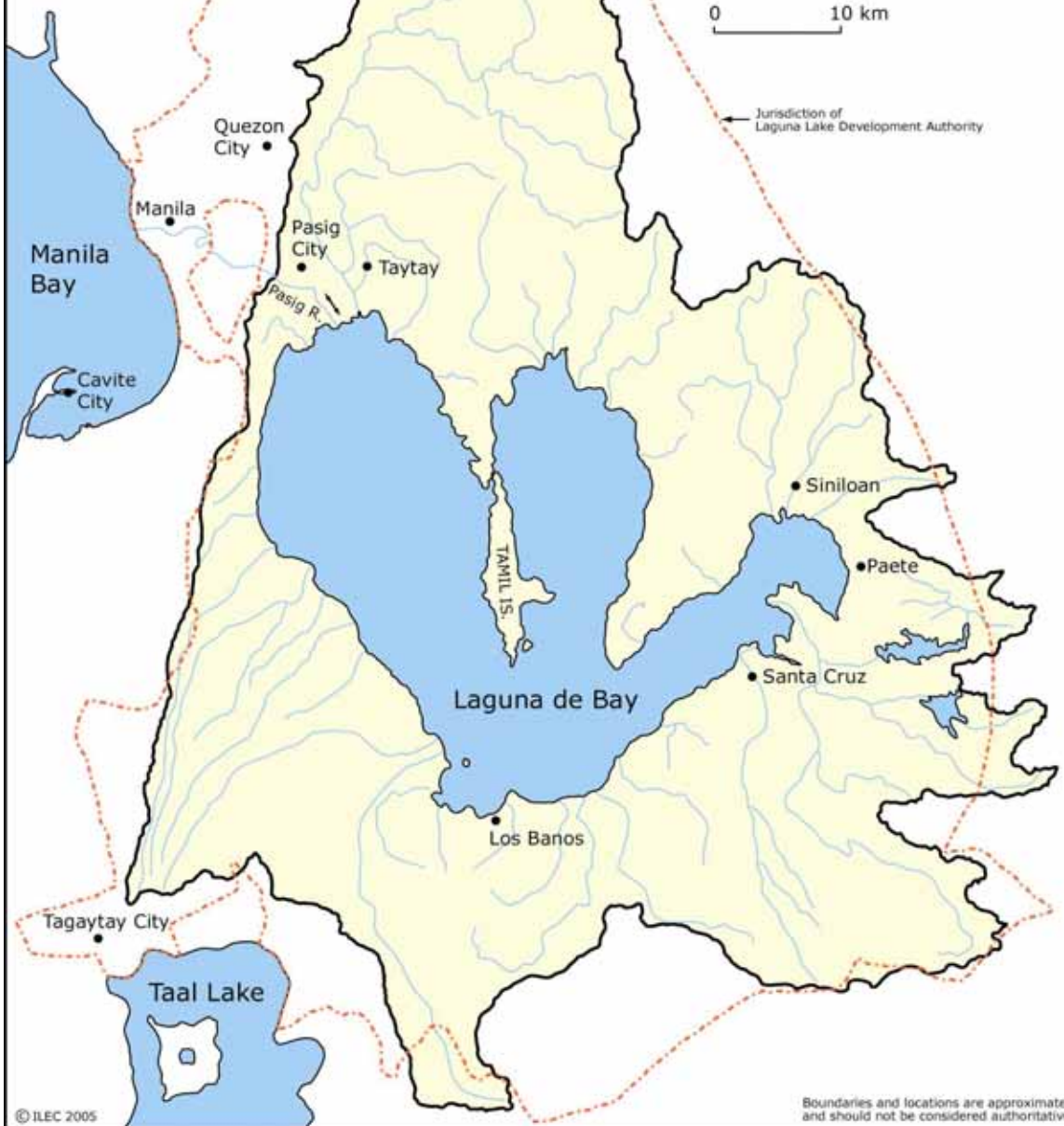
LAGUNA DE BAY BASIN

- Drainage Basin Boundary
- - - Political Boundary
- River
- Lake
- Major city



0 10 km

← Jurisdiction of Laguna Lake Development Authority



Laguna de Bay: Overview

- 2nd largest lake in S.E. Asia
 - Volume = 2.25 km³
 - Area = 900 km²
 - Average depth = 2.8 m
- Freshwater lake but connected to Manila Bay by Pasig River (Flow possible in both directions)
- Population in watershed (including Manila) = 12 million
- Managed by Laguna Lake Development Authority (LLDA)

Laguna de Bay: Uses

- Fisheries (47,000 tons of fish in 2000)
- Irrigation water
- Power supply
- Industrial water supply (cooling, etc.)
- Transportation
- Recreation
- Drinking water
- Ecosystem services (home for birds, etc.)
- Receptacle of wastewater

Laguna de Bay: Problems

- Organic pollution
- Eutrophication
- Overfishing/Exotic Species
- Toxic contamination?

Laguna de Bay: Root Causes

- Urbanization
- Industrialization
- Excessive Resource Use

Sources of Organic Pollution (mid-1990s)

- Agriculture (40%)
- Domestic (30%)
- Industry (30%)
 - Food processing
 - Pig farming/Slaughterhouses
 - Beverages
 - Textiles
 - Pulp and Paper

Pre-1997 Industrial Regulation

- Direct Regulation: Industries had to apply for Discharge Permits
- Often rejected by LLDA
- Burden was on LLDA to know the appropriate technologies for treatment
- Cheaper to pay a fine than to treat waste
- Polluters were not responsible for damage done

Environmental User Fee System

- LLDA implemented a EUFS in 1997 to deal with these problems
- Discussed below are:
 - Structure of the fee
 - Phases of system
 - Results
 - Implementation Issues
 - Lessons Learned

Structure of EUFS

Total Annual User Fee =

Fixed Fee + (Variable Fee x Total Annual BOD
Load)

Structure of EUFS

- Fixed fee is based on volumetric flow rate, as follows:
 - $Q < 30\text{m}^3/\text{day} = \text{P}5,000$
 - $30 < Q < 150\text{m}^3/\text{day} = \text{P}10,000$
 - $Q > 150\text{m}^3/\text{day} = \text{P}15,000$
- Variable fee is based on BOD_5 loading, as follows:
 - $[\text{BOD}_5] < 50 = \text{P}5/\text{kg BOD}_5$
 - $[\text{BOD}_5] > 50 = \text{P}30/\text{kg BOD}_5$

Structure of EUFS

- Total Annual BOD Load = $\text{BOD}_5 \times Q \times d \times 10^{-3}$
 - Where:
 - BOD_5 is the average concentration of BOD_5 measured over the year in mg/L
 - Q is the flow rate in m^3/day
 - d is the number of days discharging per year
 - 10^{-3} is a conversion factor

Structure of EUFS: Example 1

- Assume you are owner of a company that:
 - Operated 300 days per year
 - Flow rate = 100 m³/day
 - Average BOD₅ = 70 mg/L
- What is your annual EUFS?

Structure of EUFS: Example 2

- Assume you treat your waste so that your new:
 - Average $\text{BOD}_5 = 35 \text{ mg/L}$
- What is your new annual EUFS?

Phases of EUFS: Phase 1

- In 1997, the EUFS was introduced, but only covered:
 - BOD
 - 5 groups of industry
 - Polluters with BOD loads of 4,000 kg/yr or more

Phases of EUFS: Phase 2

- In 1998, the EUFS was expanded to include:
 - All industries
 - Polluters with BOD loads of 0 kg/yr or more!

Phases of EUFS: Phase 3

- In 1999, the EUFS was expanded to include:
 - Other polluters such as
 - Housing subdivisions
 - Commercial Establishments
 - Restaurants

Phases of EUFS: Phase 4

- LLDA plans to expand the EUFS to include
 - all polluters, including agriculture
 - more pollutants
- This has not been implemented yet.

Results of EUFS

- The fee has led to
 - Increased treatment of organic waste
 - Adoption of cleaner production
 - Voluntary closure
 - Plant relocation

Results of EUFS

- BOD load from industries to the lake has dramatically fallen
 - 1993 = 12.142 million kg BOD
 - 1997 = 5.402 million kg BOD
 - 1998 = 4.102 million kg BOD
 - 1999 = 1.082 million kg/BOD

Implementation Issues

- The EUFS does not replace the previous regulations.
- Polluters must still pay a fine if they are not in compliance with their Discharge Permit.
- Industries must still have a Pollution Control Officer.
- The Public Disclosure system is still used.

Implementation Issues

- A special national act was passed to allow LLDA to administer and collect the fee.
- The revenue is used for
 - Water quality management programs
 - Infrastructure
 - Technical assistance centers
 - Training, etc.
- 20% of the revenue is shared with local governments, especially for sewerage construction.

Lessons Learned

- “Ready, Fire, Aim!”
 - Simple, modest approach
 - Pilot program
 - Pick one of two parameters
 - Revise charges based on monitoring
 - Engage stakeholders
 - Charge all polluters
- The EUFS is not a pure tax but mixed with direct regulation and other policies.