



Republic of the Philippines

Thematic Workshop on Water-Related
Disaster and Its Management in Asian Countries








25-30 November, 2007

Sabo Technical Centre
Yogyakarta, Indonesia

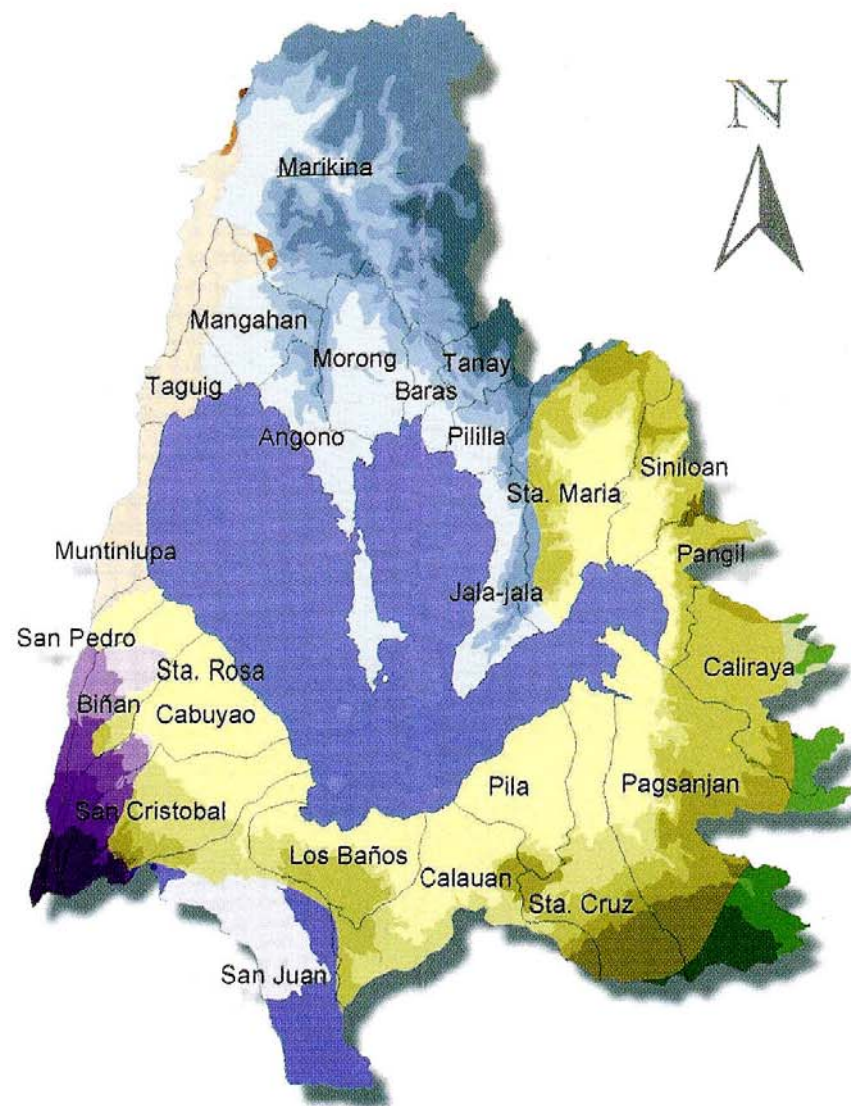
Alicia E. Bongco

Laguna Lake Development Authority

LLDA's Administrative Jurisdiction

| | | |
|---|---------------|-------------------------|
|  | Rizal | = 13 towns and 1 city |
|  | Metro Manila | = 2 towns and 7 cities |
|  | Cavite | = 3 towns and 1 city |
|  | Batangas | = 2 towns and 1 city |
|  | Laguna | = 27 towns and 3 cities |
|  | Quezon | = 1 town |
|  | Laguna de Bay | |

| | |
|-------------------------------------|----------------|
| Total no. of cities | = 14 |
| Lakeshore municipalities | = 25 |
| Non-lakeshore municipalities | = 22 |
| Total no. of barangays | = 2,656 |





Laguna de Bay

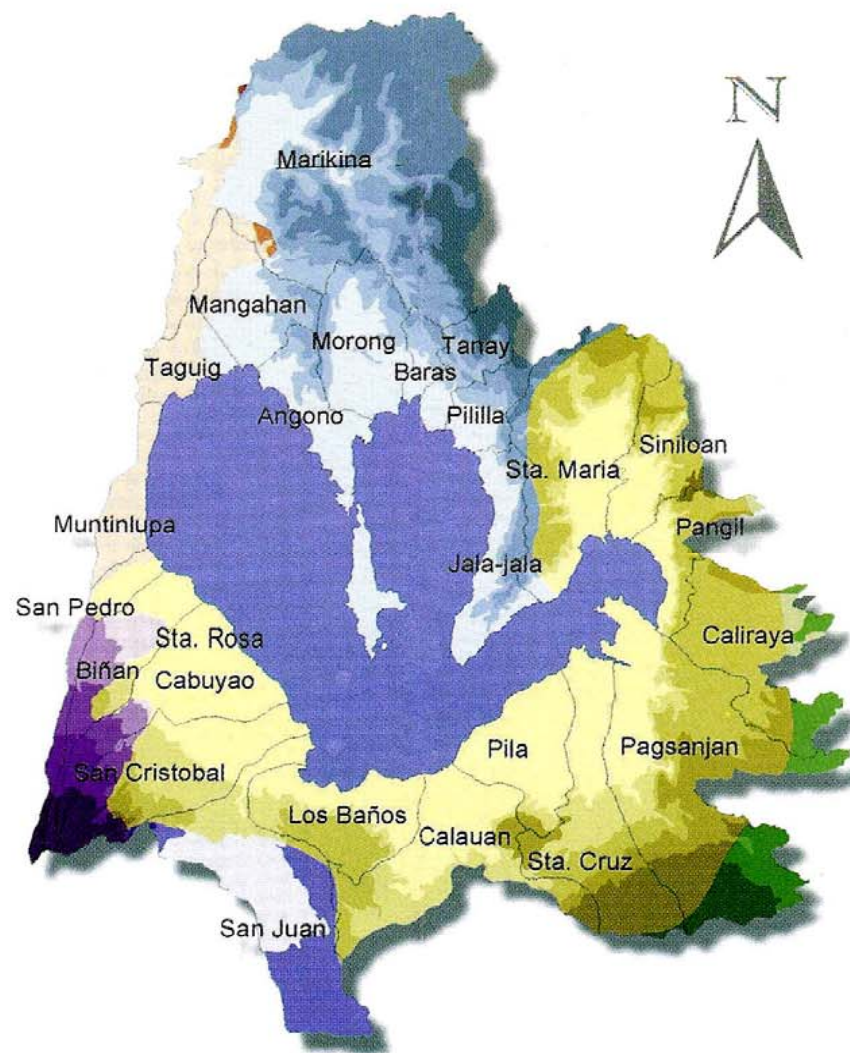
The largest and most
vital inland water body
in the Philippines

18th Member
of the
World's Living Lakes
Network

QUICK FACTS

| | |
|------------------------------|---|
| Surface Area: | * 900 km² |
| Average Depth: | ~ 2.5 m |
| Maximum Depth: | ~ 20m (Diablo Pass) |
| Average Volume: | 2,250,000,000 m³ |
| Watershed Area: | * 2,920 km² |
| Shoreline: | * 285 km |
| Biological Resources: | fish, mollusks, plankton macrophytes |

(* At 10.5m Lake Elevation)





Sources of surface recharge

21 Major Tributaries

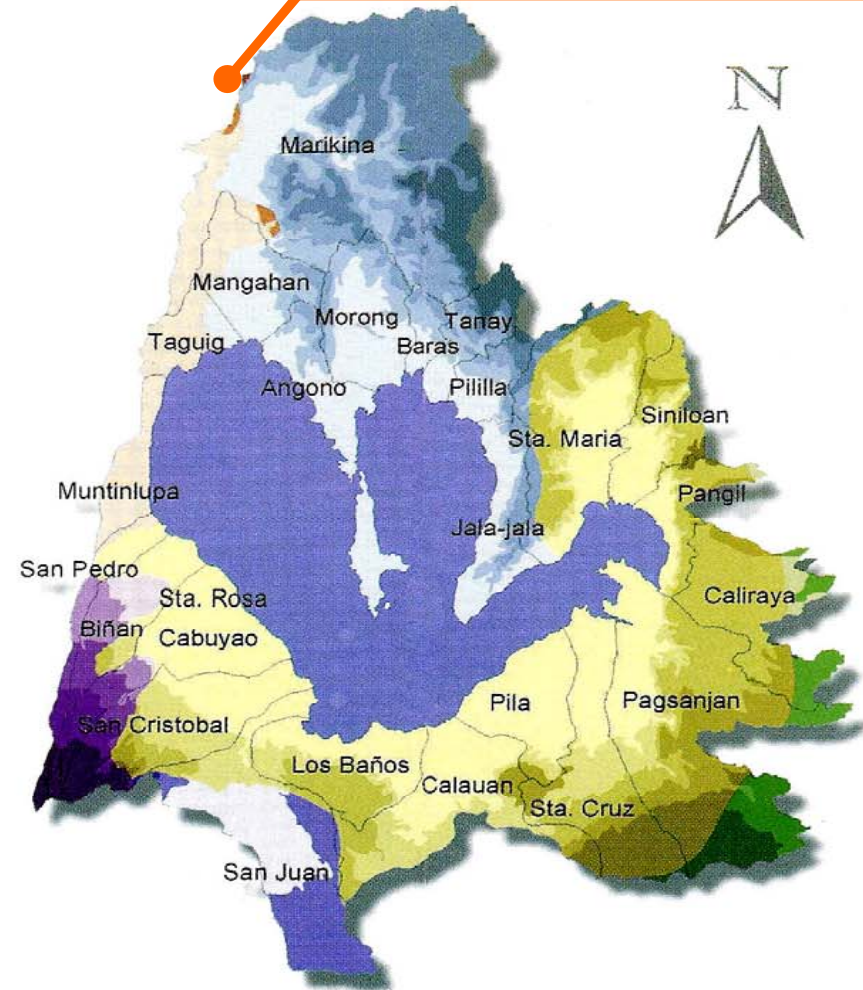
14% *Pagsanjan-Lumban River*

7% *Sta. Cruz River*

79% 19 remaining tributary
rivers

Only Outlet

**Napindan Channel connects
the lake to Manila Bay**



Resource use and pressures of the lake



Laguna de Bay is a multi-use resource . . .



Industrial cooling water



Water supply for irrigation



Water supply for domestic use

Laguna de Bay is a multi-use resource . . .



Power generation



Recipient of Effluents



Transport route



**Recreation and
nature appreciation**

Laguna de Bay`s dominant use is for fishery . . .

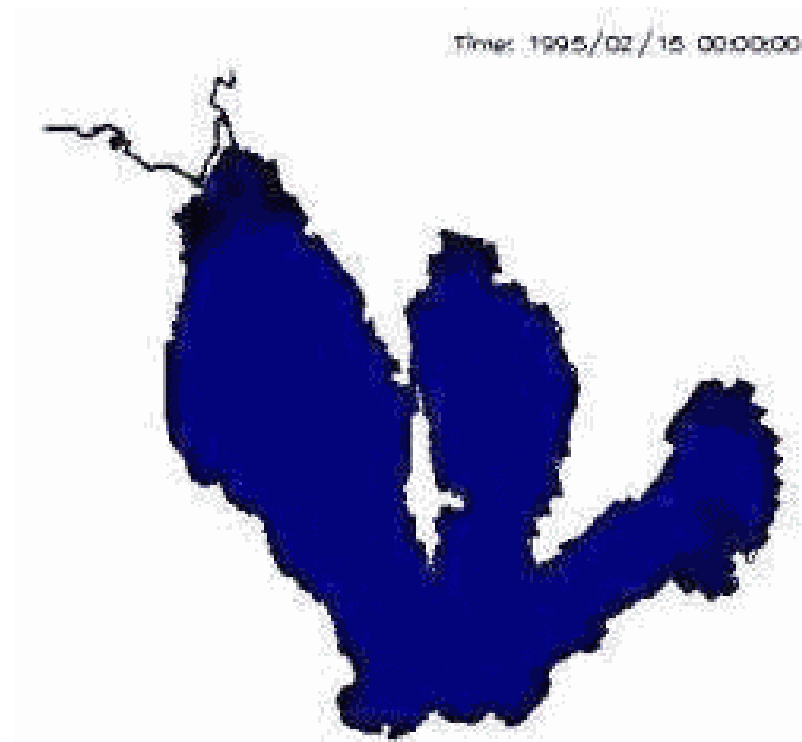


Open water



Aquaculture

Salinity Intrusion



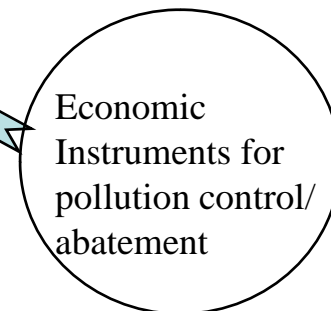
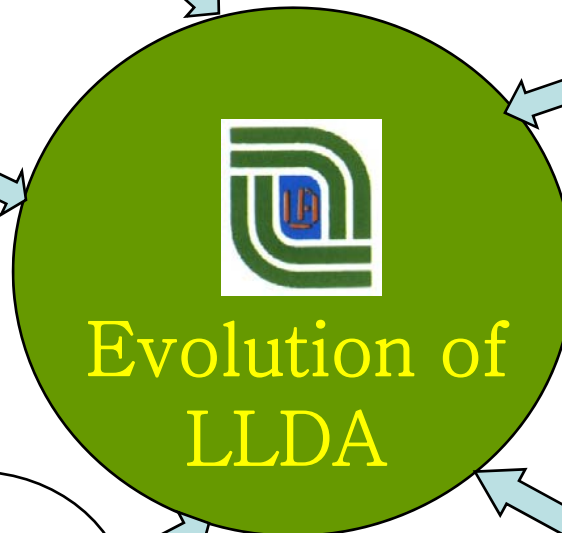
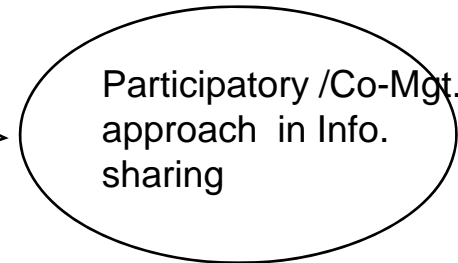
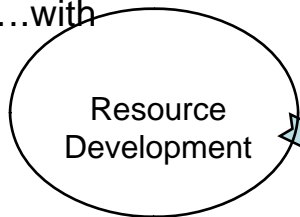
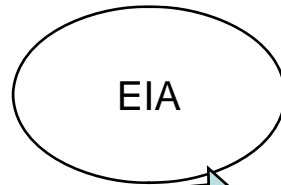
Legend:



DAO 2004-61 transfers
authority to issue
ECC/CNC to LLDA

LIDO / IMOA (2003) provides
longer-term policy & institutional
framework for management of
LDB Region & implementing
arrangement for LISCOP

RA 4850 (1966)
mandates LLDA .to
promote and accelerate
the development and
balanced growth....with
due regard for
environmental
management....)



PD 813 (1975)
Expands the mandate of
LLDA to address
environmental protection
including the power to
issue permit for the use of
surface waters

EO 927 (1983)
Classified LLDA as Class A Corporation
Authorized to modify its organization
Granted water rights over Laguna de Bay and other water
bodies within the region
Granted power to control and abate pollution within the region
Authorized to collect fees for the use of lake water

BR 33 (1996)
Approval of EUFS
& adoption of IRR
implementation started 1997

LLDA Key Functions

POLICY AND PLANNING**

Develop Lake with due regard to **environment and prevention of ecological imbalance**
Conduct comprehensive survey/studies
Prepare comprehensive plan to conserve and utilize resources
Exercise **water rights** within Laguna Lake
Prepare a water quality management program
Coordinate policies with other government agencies and stakeholders

REGULATORY***

Establish and **enforce water quality standards for industrial, agricultural and municipal use**
Issue and revoke **permits** for use of surface waters within the lake region
Approve development plans proposed by LGUs, private persons or enterprises
Collect fees for use of Laguna Lake resources for all beneficial purposes
Compel compliance

INFRASTRUCTURE AND RESOURCES DEVELOPMENT*

Prepares and implement **infrastructure projects such as river works, flood control and sewerage**
Reclaim portions of the Lake
Undertake re-adjustments, relocations or resettlement of populations
Finance Infrastructure projects
Collect reasonable fees and toll charges
Develop water supply from groundwater or Lake water sources
Engage in fish production and other aquaculture projects

LLDA in Perspective

- Covers well defined area: Ecosystem/watershed-based
- Extensive and encompassing legal authority
 - Reviews/approves development plans/projects
 - Issues permits and charge fees on both intake and discharge of water (and shares these fees to LGUs)
- Self –sustaining agency, plowing back revenues for environmental and water related projects

Composition of the LLDA Board of Directors Under R.A. 4850 as amended



Representative of the Office of the President



Secretary, DENR



Secretary, DTI



Secretary, NEDA



Governor, Province of Laguna



Governor, Province of Rizal



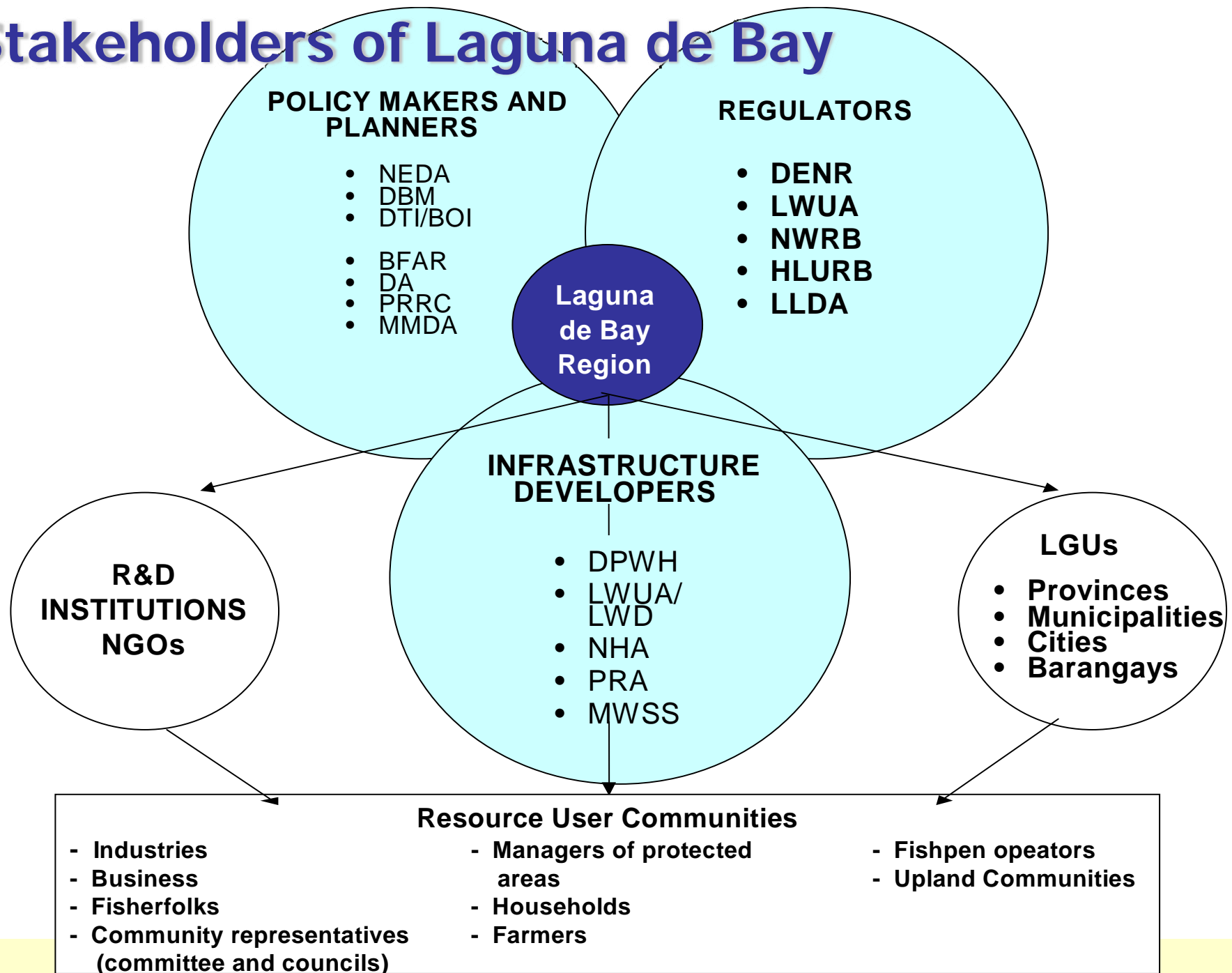
Chairman, MMDA

Presidents, Leagues of Mayors of Rizal and Laguna

Private Investors' Representative

General Manager, LLDA, *ex-Officio member*

Stakeholders of Laguna de Bay



Philippine Clean Water Act

R.A. 9275

- ✓ Recognizes and reinforces the LLDA Mandate
- ✓ Laguna de Bay Region as a watershed-focused Water Quality Management Area (WQMA), under the administration of the LLDA
- ✓ LLDA Board of Directors as the WQMA Governing Board

WATER QUALITY MANAGEMENT SYSTEM

Sec. 5. The areas within the jurisdiction of the Laguna Lake Development Authority (LLDA) shall be designated as **one management area under the administration of LLDA in accordance with R.A. No. 4850**, as amended: Provided, However, That the standards promulgated pursuant to this Act and wastewater charge system established pursuant hereof shall be enforced in said area.

Sec. 7. *The Department of Public Works and Highways (DPWH), through its relevant attached agencies, in **coordination** with the Department, local government units (LGUs) and other concerned agencies, shall, as soon as possible, but in no case exceeding a period of twelve (12) months from the affectivity of this Act, prepare a **national program on sewerage and septage management** in connection with Section 8 hereof.*

*Such program shall include a priority listing of **sewerage, septage and combined sewerage-septage projects for LGUs based on population density and growth, degradation of water resources,** topography, geology, vegetation, program/projects for the rehabilitation of existing facilities and such other factors that the Secretary may deem relevant to the protection of water quality. On the basis of such national listing, the national government may allot, on an annual basis, funds for the construction and rehabilitation of required facilities.*

Each LGU shall appropriate the necessary land, including the required rights-of-way/road access to the land for the construction of the sewage and/or septage treatment facilities. Each LGU may raise funds to subsidize necessary expenses for the operation and maintenance of sewerage treatment or septage facility servicing their area of jurisdiction through local property taxes and enforcement of a service fee system.



State of the Laguna de Bay Region

Industrial pollution

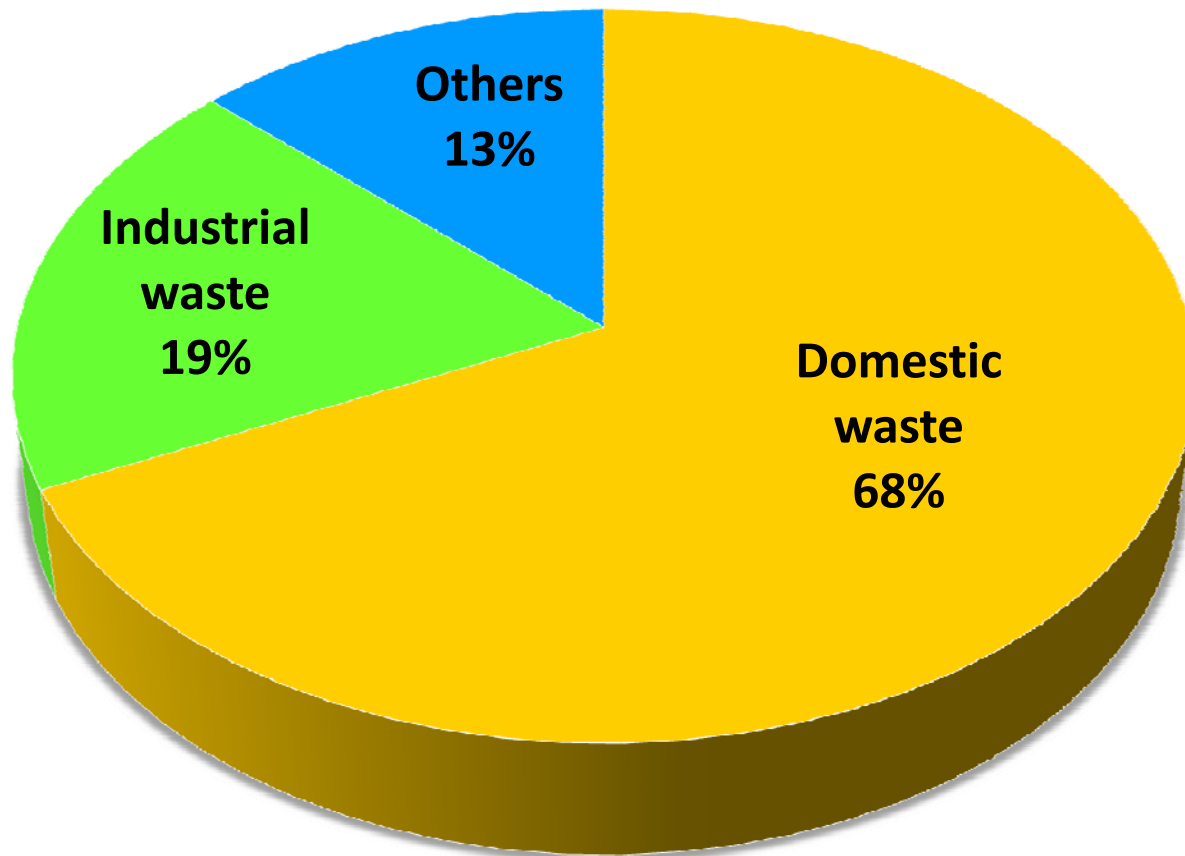
The Lake has become the discharge point for human and industrial wastes from Metro Manila and other surrounding localities.





The Laguna de Bay region has more than 10,000 small, medium, and large business establishments producing wastes that ultimately settle in the lake

Organic waste input in the lake



**Fishkill due to
pollutions**







Water related disasters in Laguna de Bay Region

Deforestation and resource extraction



Water run-off from open spaces as a result of quarrying

Subdivision / housing development

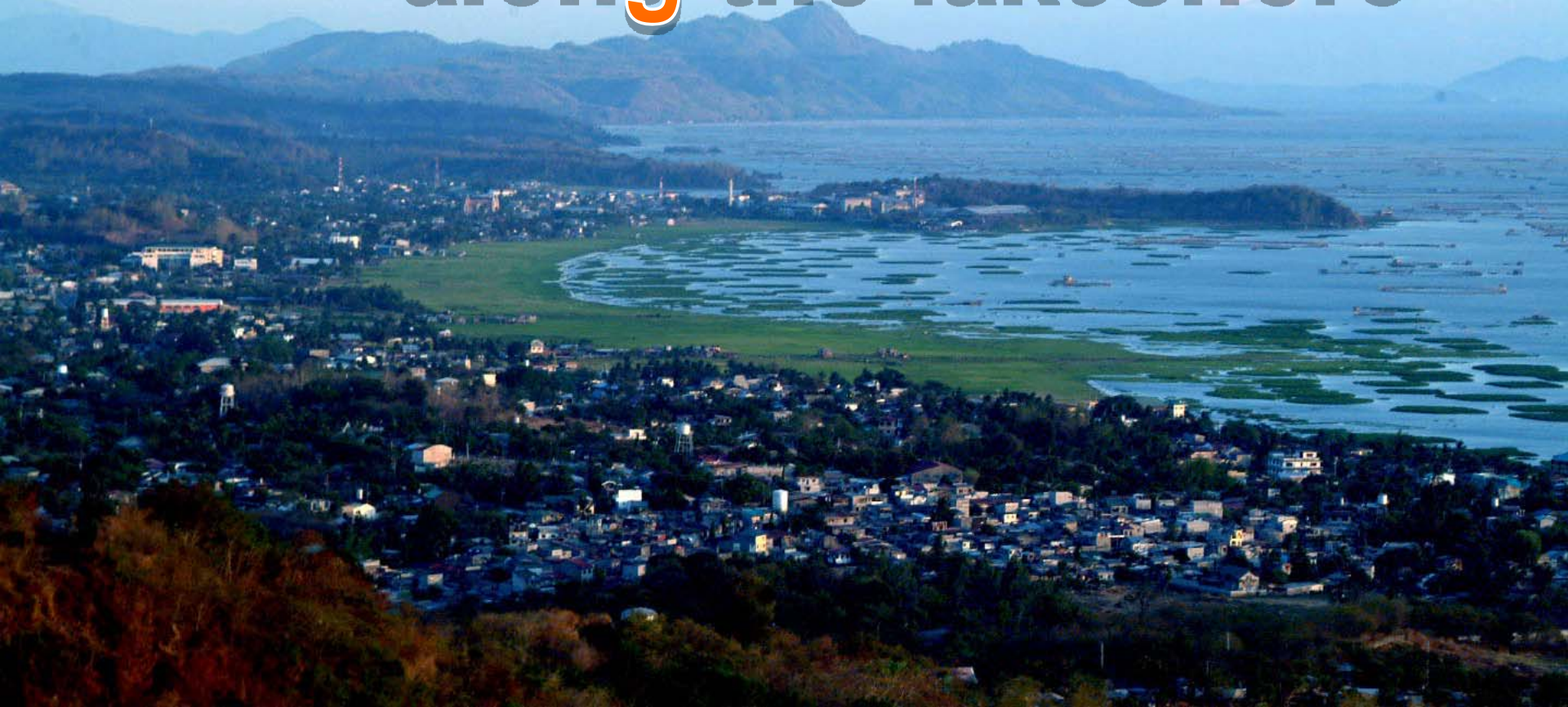


Shoreland encroachment and illegal settlers

ENCROACHMENT IN THE LAKE IS PREVALENT
CAUSING INTRUSION OF POLLUTANTS INTO THE
LAKE WATER



3.05 M people live directly
along the lakeshore











... from communities



Threats to Tributaries
...which could lead to economic loss

Manggahan Floodway





Napindan Channel



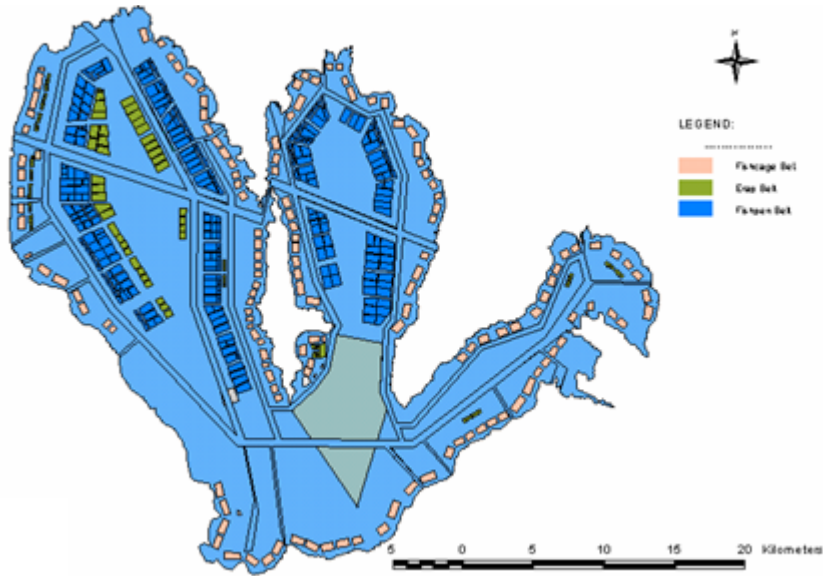
Laguna de Bay Zoning and Management Plan (ZOMAP)

Laguna de Bay ZOMAP

Fishpen area - 10,000 has.

Fishcage area - 5,000 has.

1996 as amended in 1999

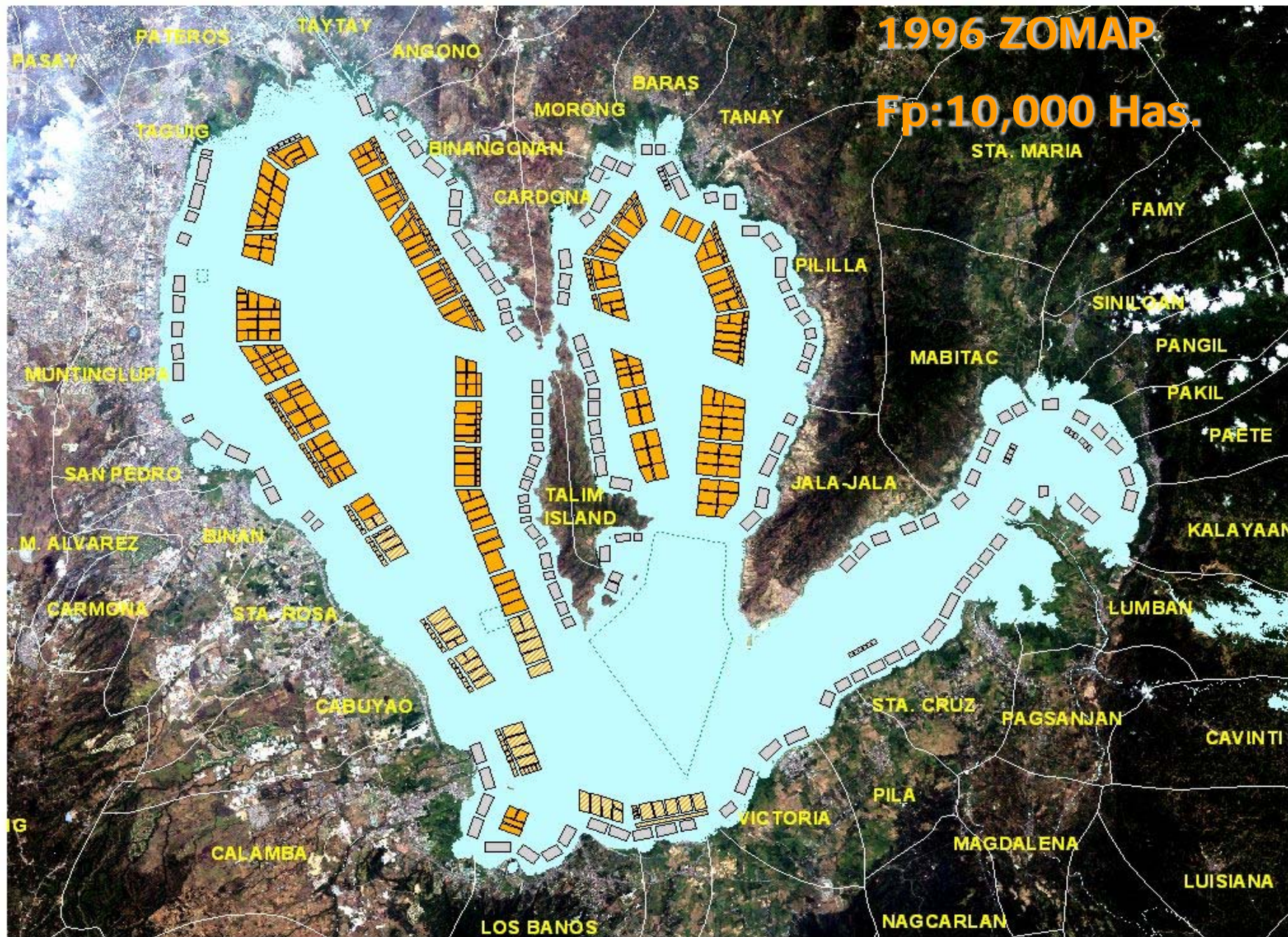


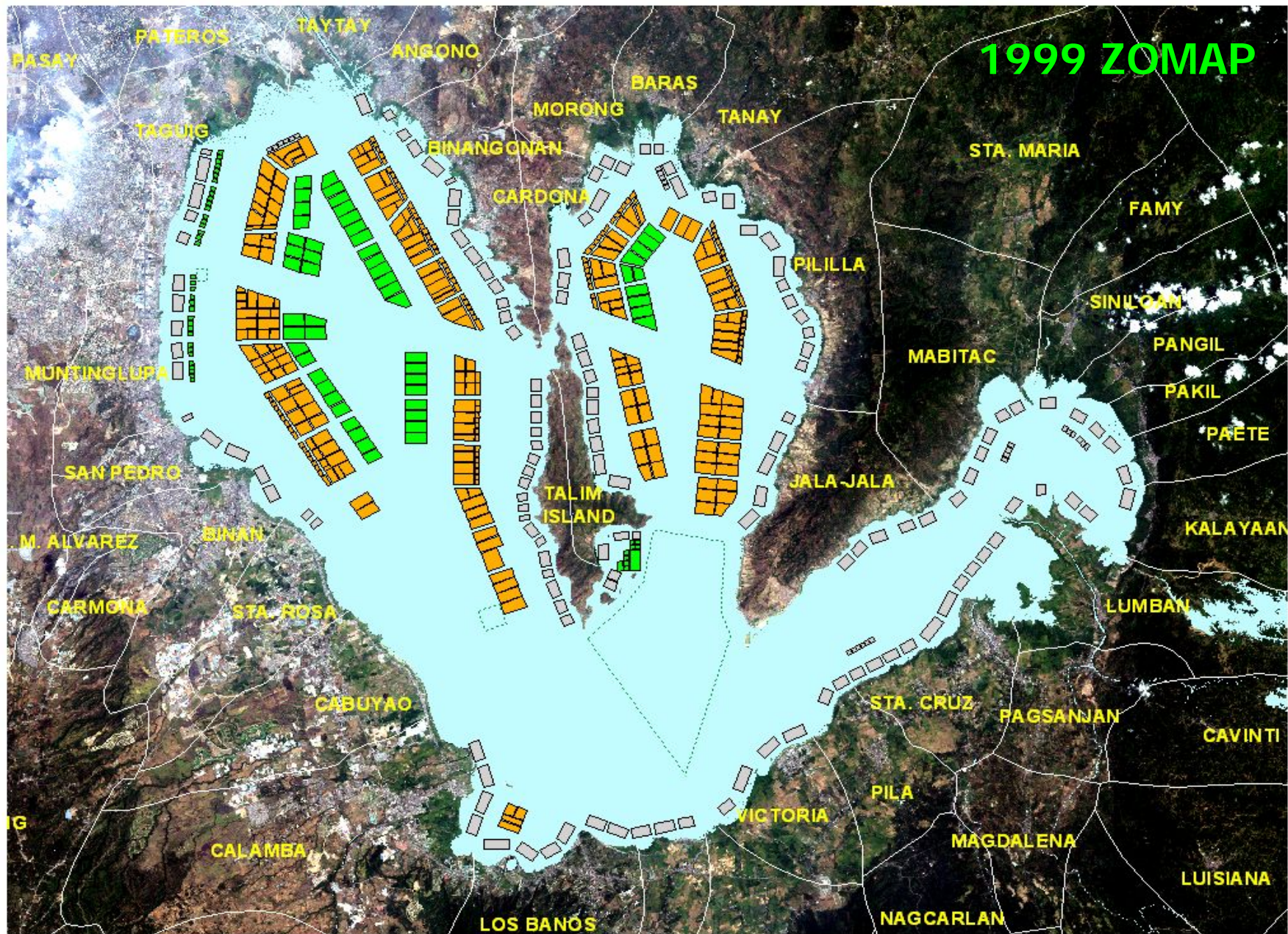
1994 AQUA STRUCTURE MAP

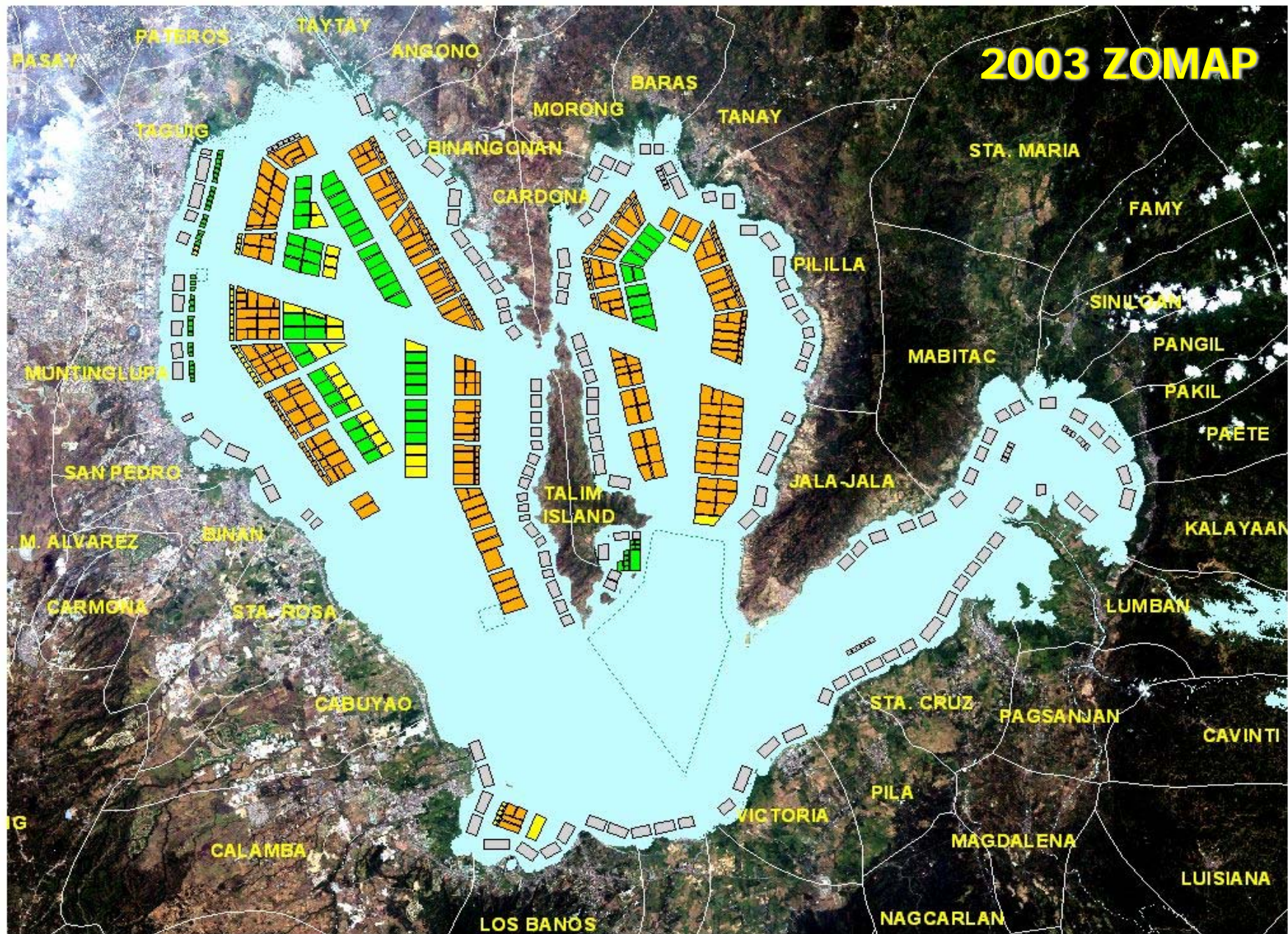


LEGAL BASIS

- Executive Order No. 349 - June 18, 1996
- Implementing Rules and Regulations of the ZOMAP for fishpens and fishcages were issued by virtue of Board Resolution No. 5, Series of 1996.





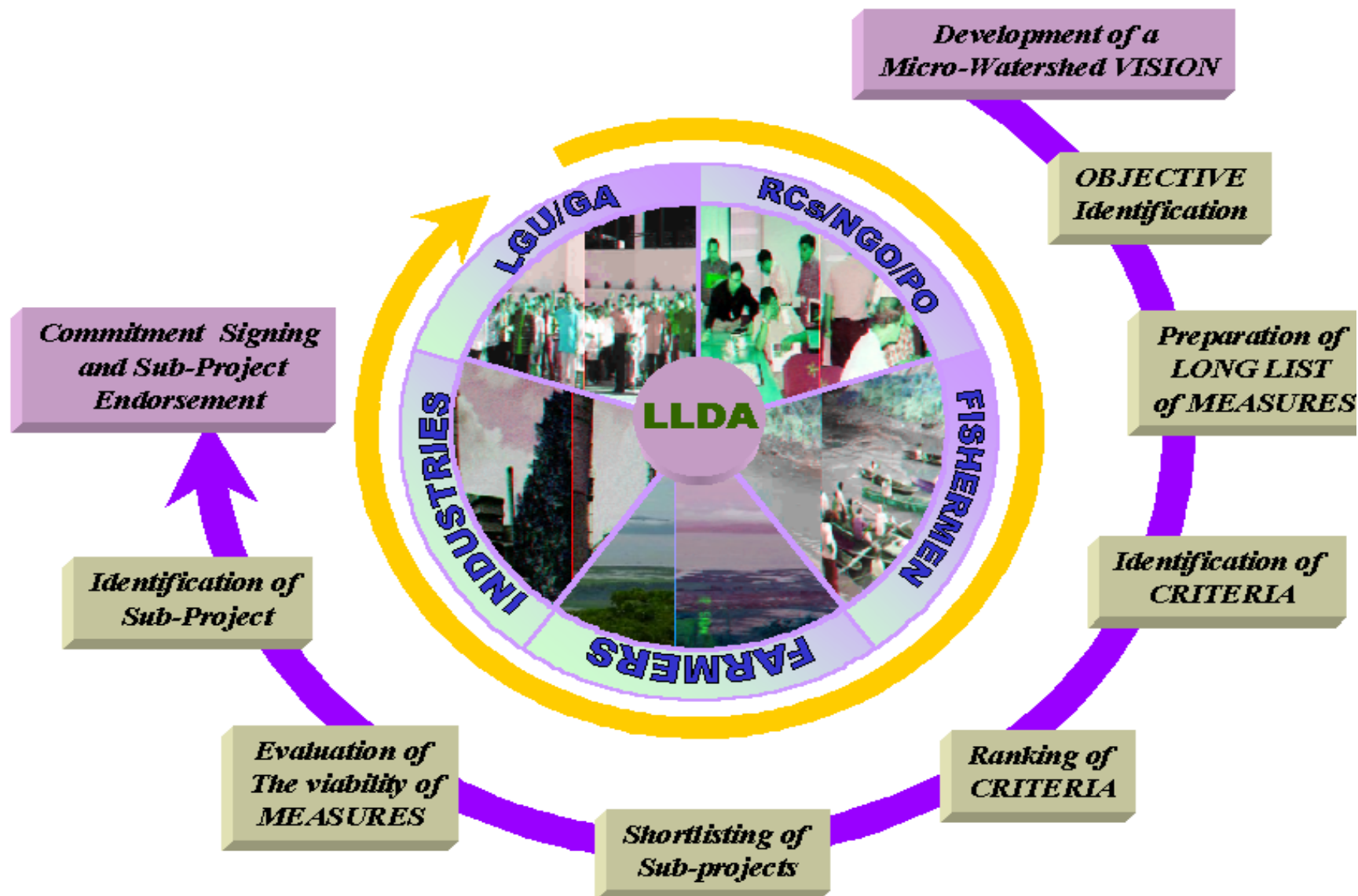






Involvement of stakeholders

The LEAP Process



Stakeholders Analysis



The following steps have been included:

1. Organization of local workshops attended by all relevant stakeholders
2. Determining the relative priority (weights) of important independent 'criteria', reflecting the personal view on issues in their area (blueprint of important issues).
3. Present the case study (incl. pros and cons)
4. Collect feed-back (positive vs. negative, suggestions, etc.)
5. Use the results to fine-tune project components, determine alternatives or for instance to stop the project!



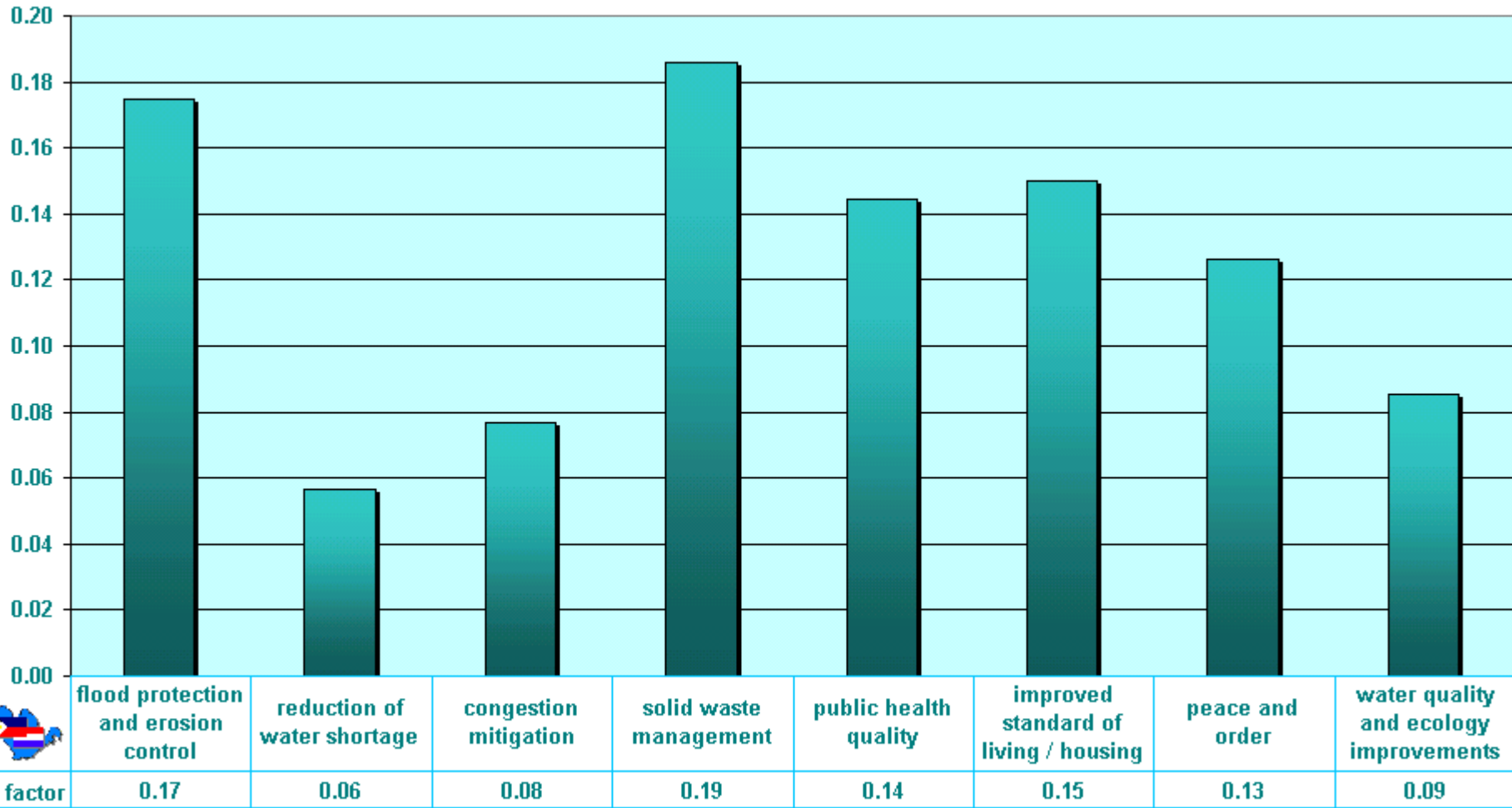
Issues

Proposed selection of (independent) sustainable development issues for Laguna de Bay.

- Flood protection and erosion control
- Reduction of water shortage
- Congestion mitigation
- Solid waste management
- Public health quality
- Peace and order
- Improvement of standards of living and housing
- Water quality and ecology improvement



Ranking



Criterion

Overall



Laguna Lake Development Authority

**Laguna de Bay Institutional Strengthening and
Community Participation (LISCOP) Project**

LISCOP Component 1:

Co-Managed Investments in Watershed Development

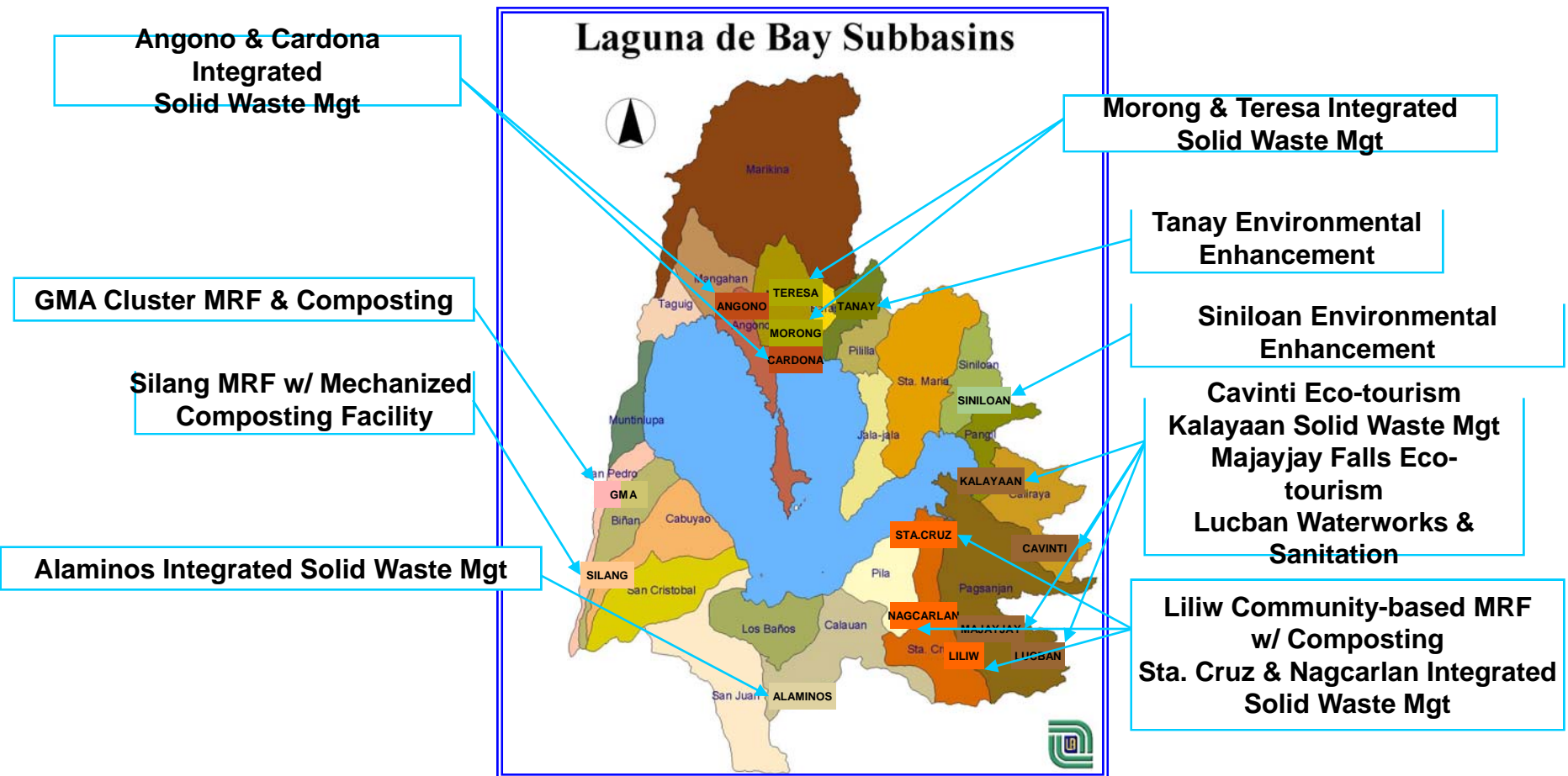
- Aims to address priority environmental problems through LGUs, RCs and communities;
- Building partnership with various users of the resources and encourage voluntary action in improving environmental quality.



Laguna Lake Development Authority

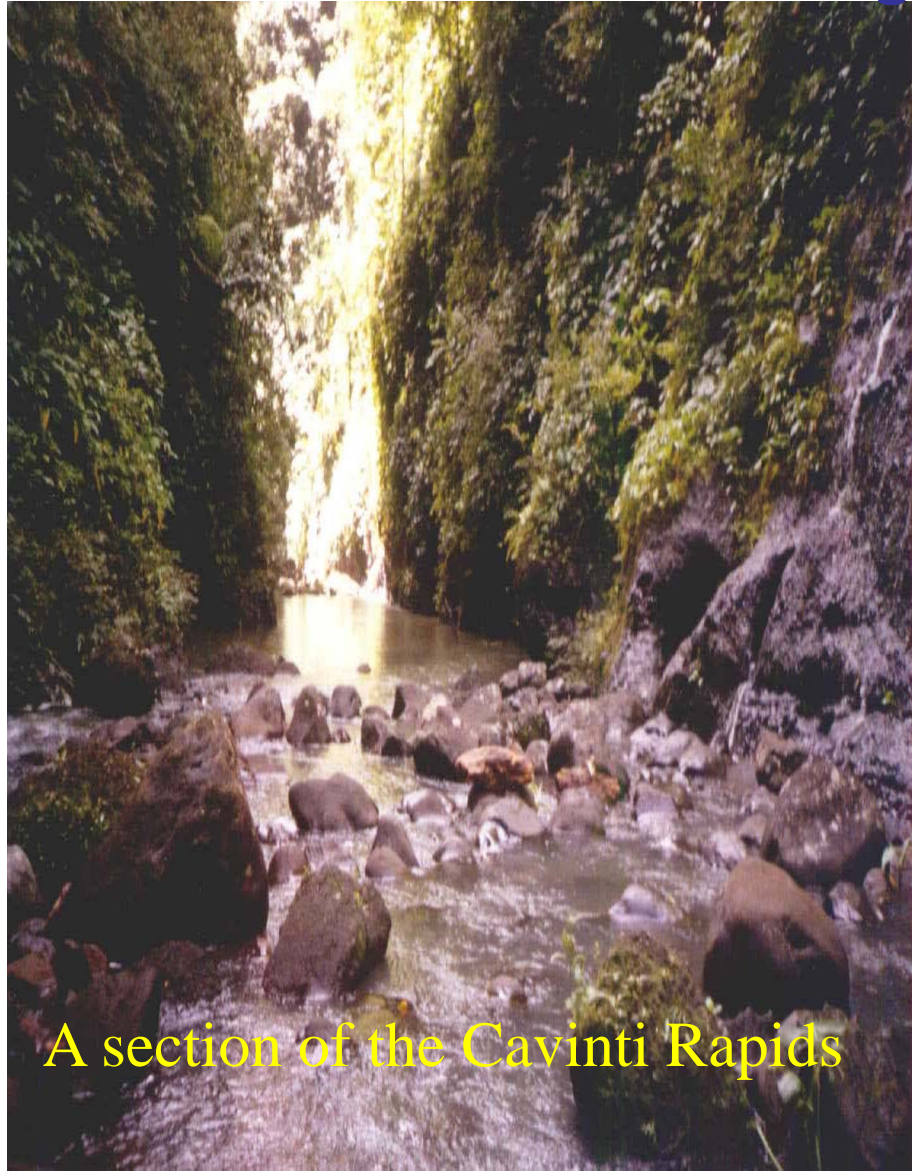
Laguna de Bay Institutional Strengthening and Community Participation (LISCOP) Project

From 2005 to 2006, there are 16 Pipeline Sub-Projects generated from 9 micro-watersheds (16 LGUs) as a result of Laguna De Bay Environmental Action Planning involving all stakeholders in the specific LGU:

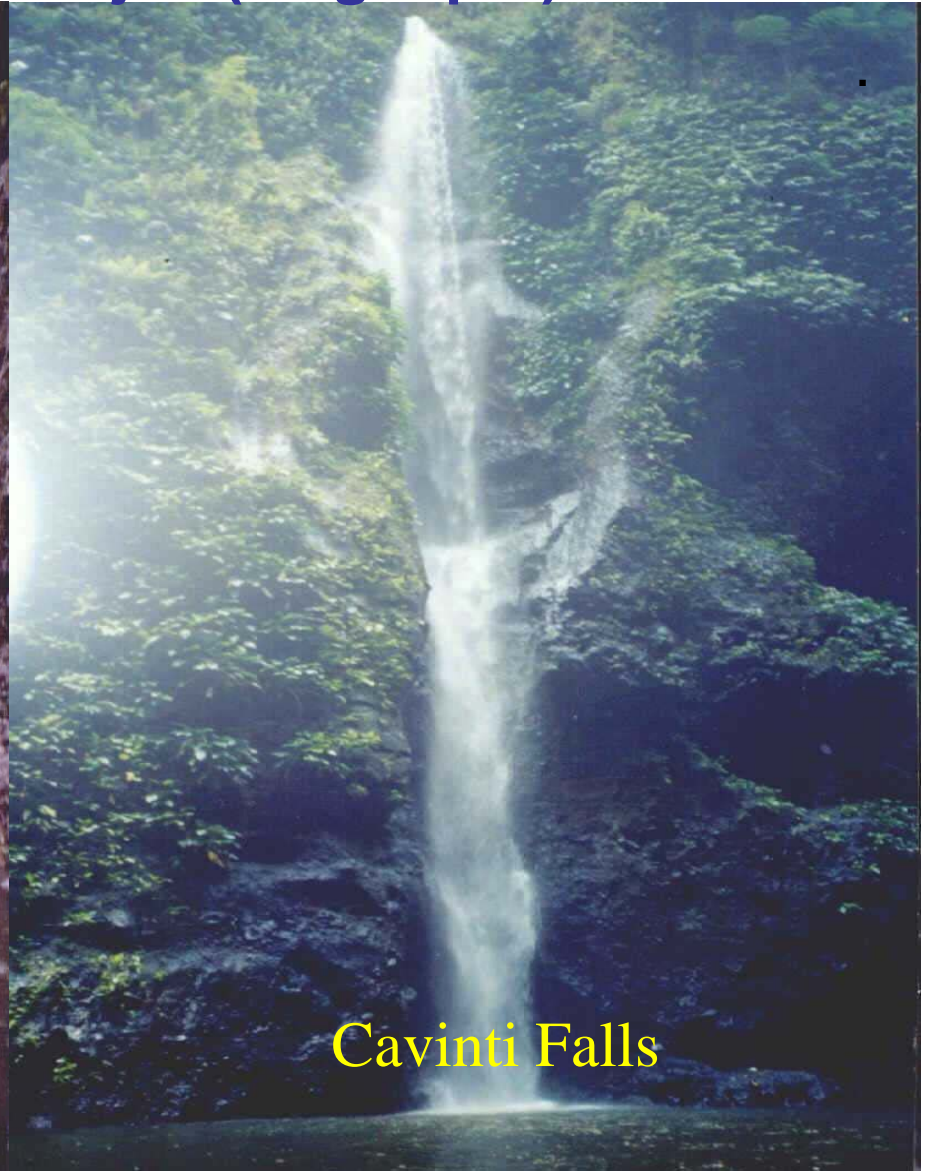


Cavinti Eco-tourism Sub-Project

...addressing environmental degradation and providing alternative route to Pagsanjan (Magdapio) Falls



A section of the Cavinti Rapids



Cavinti Falls

TANAY MICROWATERSHED ENHANCEMENT SUBPROJECT



Twin goals:

- **Poverty reduction and**
- **Rehabilitation of degraded resources in the micro-watershed**

Three key components:

- **streambank stabilization,**
- **ecological enhancement**
- **pollution management loading.**

Public Disclosure Program for the *Laguna de Bay Region*

Features

- Employs “carrot-and-stick” approach
- Participatory and multi-sectoral.
- Combines “hard” and “soft” criteria.
- Includes public performance accounting of the regulating agency (i.e., LLDA)





Laguna Lake Development Authority



Federation of River Basin Councils

Laguna de Bay Environment Monitor

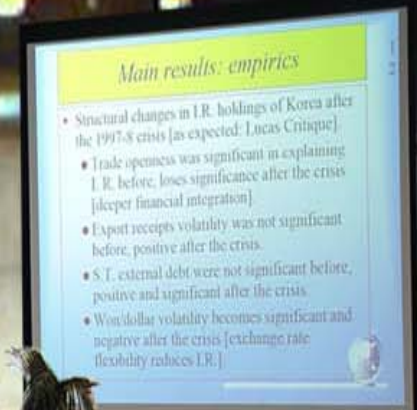
2005



Laguna de Bay Institutional Strengthening
and Community Participation (LISCOP) Project



Laguna de Bay Learning Forum



- Main results: empirics*
- Structural changes in I.R. holdings of Korea after the 1997-8 crisis [as expected: Lucas Critique]
 - Trade openness was significant in explaining I.R. before, loses significance after the crisis [deeper financial integration]
 - Export receipts volatility was not significant before, positive after the crisis.
 - S.T. external debt were not significant before, positive and significant after the crisis.
 - Won/dollar volatility becomes significant and negative after the crisis [exchange rate flexibility reduces I.R.]

Conclusion

- national government capacity to provide the resources and services during disasters;
- people at all levels should have their own forms of interventions for disaster incidents;
- Involve the community in disaster management;

Conclusion

- create awareness and invest on disaster management communication programs;
- cascade the national government/ NDCC's skills
- NGOs and/or the private sector are also indispensable in providing training at the community level
- early warning schemes at the community level

Thank you for your attention!