



**Laguna Lake Development Authority  
Department of Environment and Natural Resources**

**Presentation to**

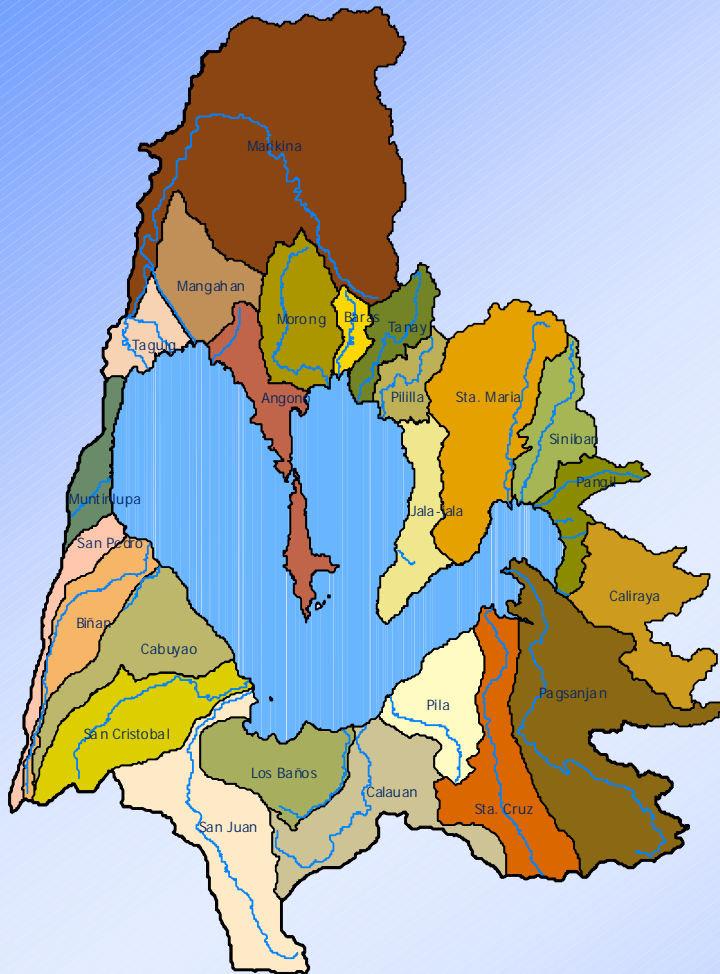
***First General Meeting of the Network of Asian River Basin  
Organizations (NARBO)  
Batu-Malang, East Java, Indonesia  
February 23-27, 2004***

**“IMPLEMENTATION OF INTEGRATED WATER RESOURCES  
MANAGEMENT FRAMEWORK IN THE LAGUNA DE BAY REGION”**

**By:**

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# Laguna de Bay Features



- 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, 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)

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

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



**Industrial cooling water**



**Water supply for domestic use**



**Power generation**



**Water supply for irrigation**

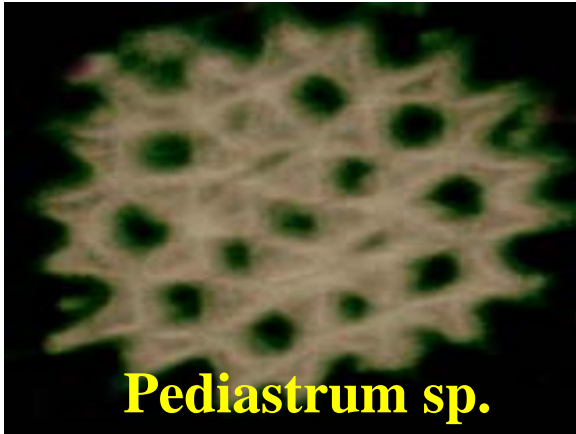


**Transport route**



**Recreation and nature appreciation**





**Pediatrum sp.**



**Eichhornia crassipes**



**Therapon plumbeus**



**Nymphaea**



**Provides genetic resources.**



**Najas graminea**



**Corbicula manillensis**



**Pistia stratiotes**



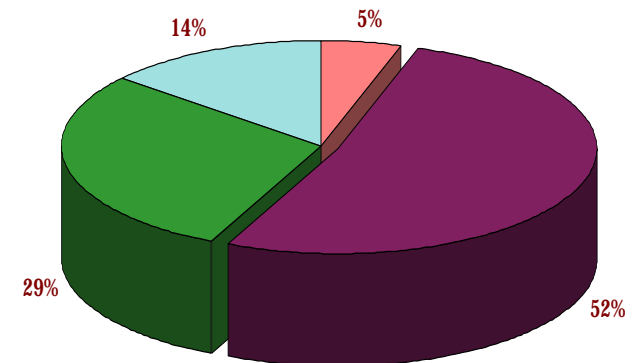
**Bubulcus ibis  
coromandus**

# A THREATENED ECOSYSTEM

Forests receded . . .



Extensive built-up  
agriculture areas. . .



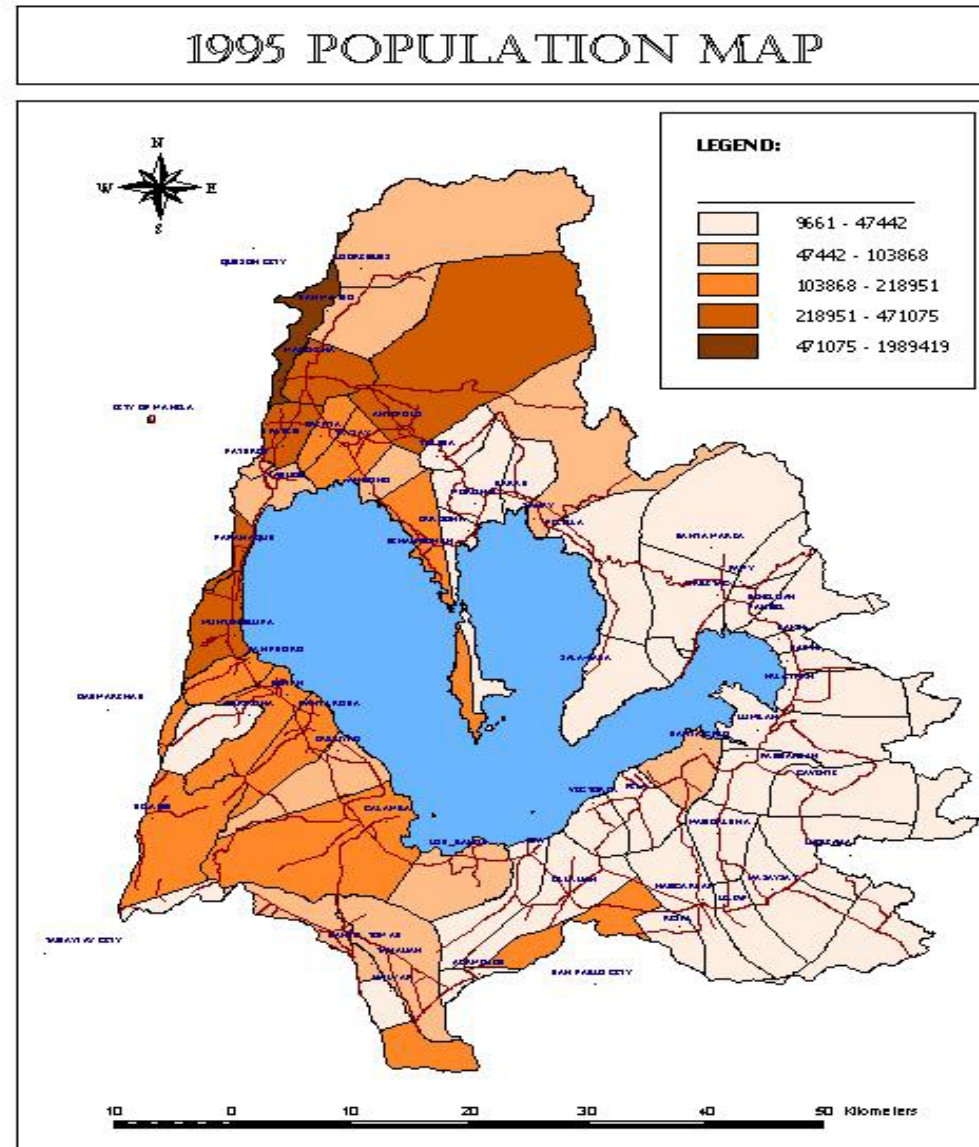
**Forest**  
19,100 has.

**Open** 53,480  
has

**Built-  
up/Industrial**  
110,780 has.

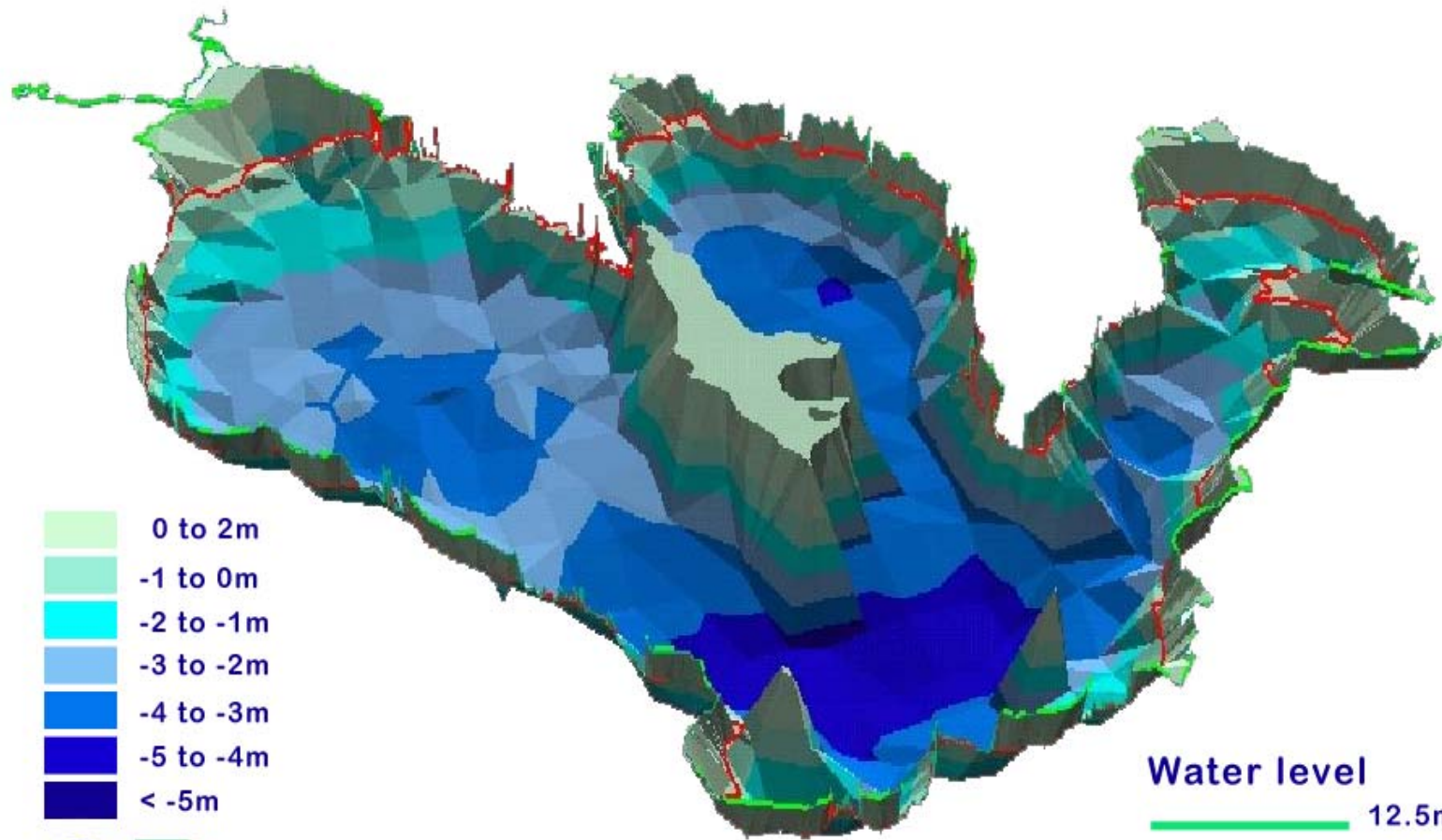
**Agricultural**  
198,640 has.

# Rapid urbanization and industrialization. . .





# Bathymetry

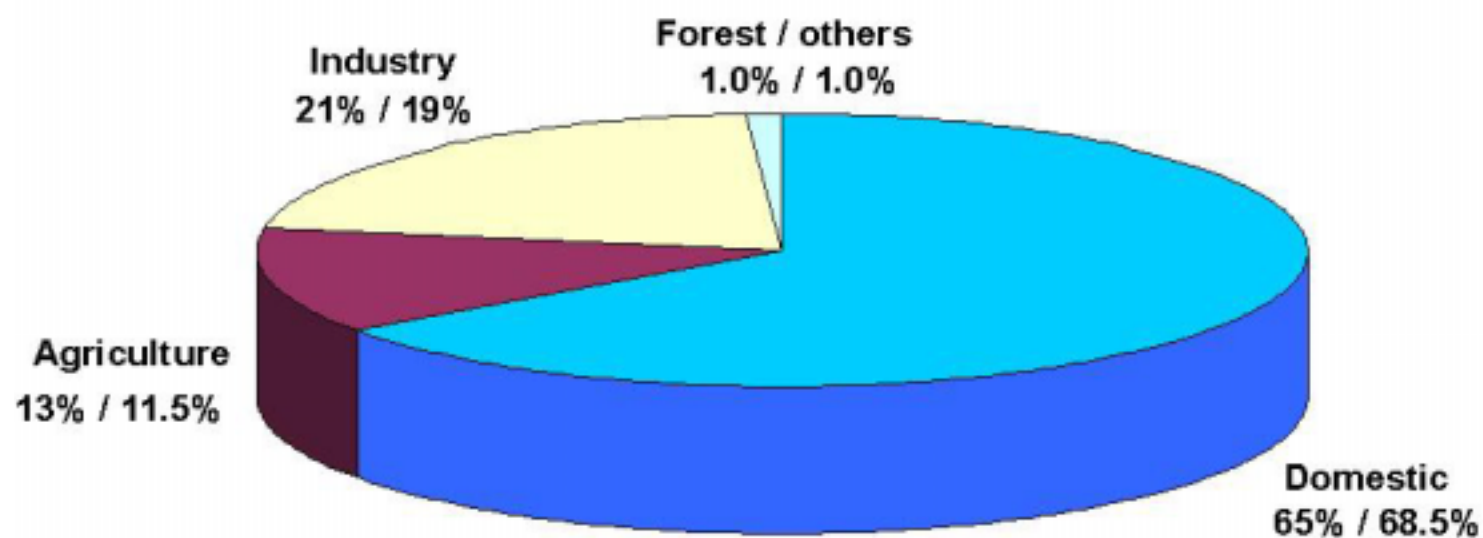


- 0 to 2m
- 1 to 0m
- 2 to -1m
- 3 to -2m
- 4 to -3m
- 5 to -4m
- < -5m



- Water level
- 12.5m
  - 10.5m

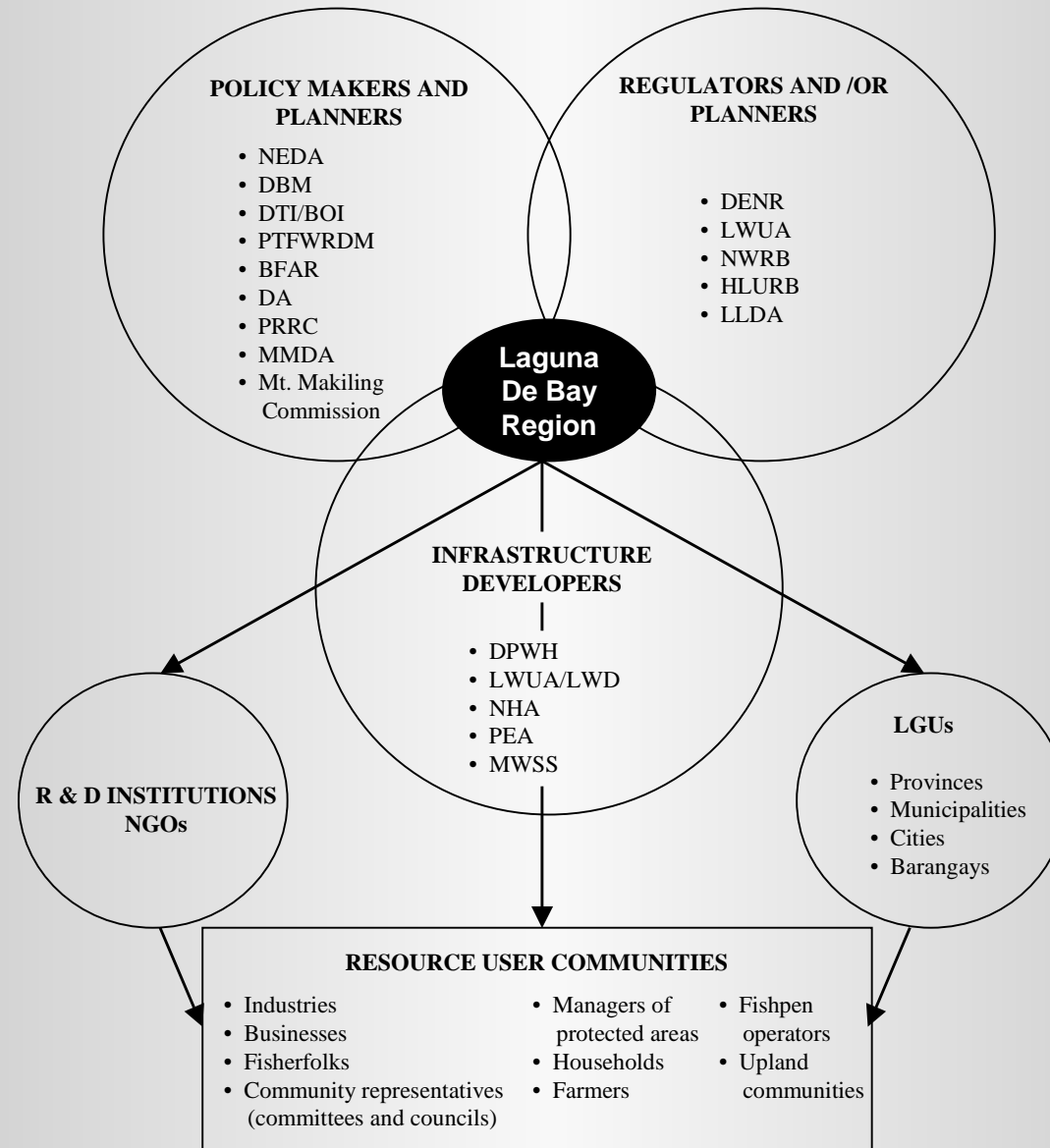
Calculated BOD loading (WLM) as generated within the  
Laguna de Bay catchment  
1995 / 2000



Total load 1995 = 66,305 tons / yr  
Total load 2000 = 74,300 tons / yr



**STAKEHOLDERS IN THE LAGUNA DE BAY REGION**  
(TTEM Inc. and PNB Capital, 2001)





**The Laguna Lake Development Authority**

# Evolution of LLDA

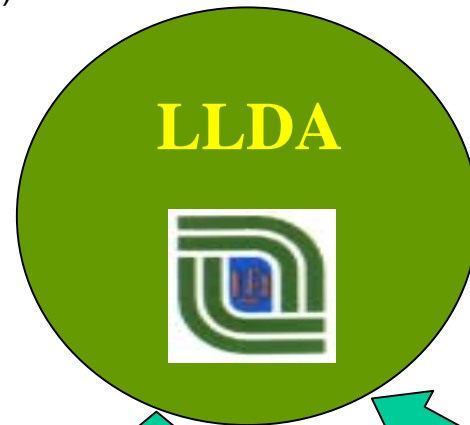
**RA 4850 (1966)**. . .to promote and accelerate the development and balanced growth....with due regard for environmental management....)

**PD 813 (1975)**

Expanded 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



**EO 349 (1996)**

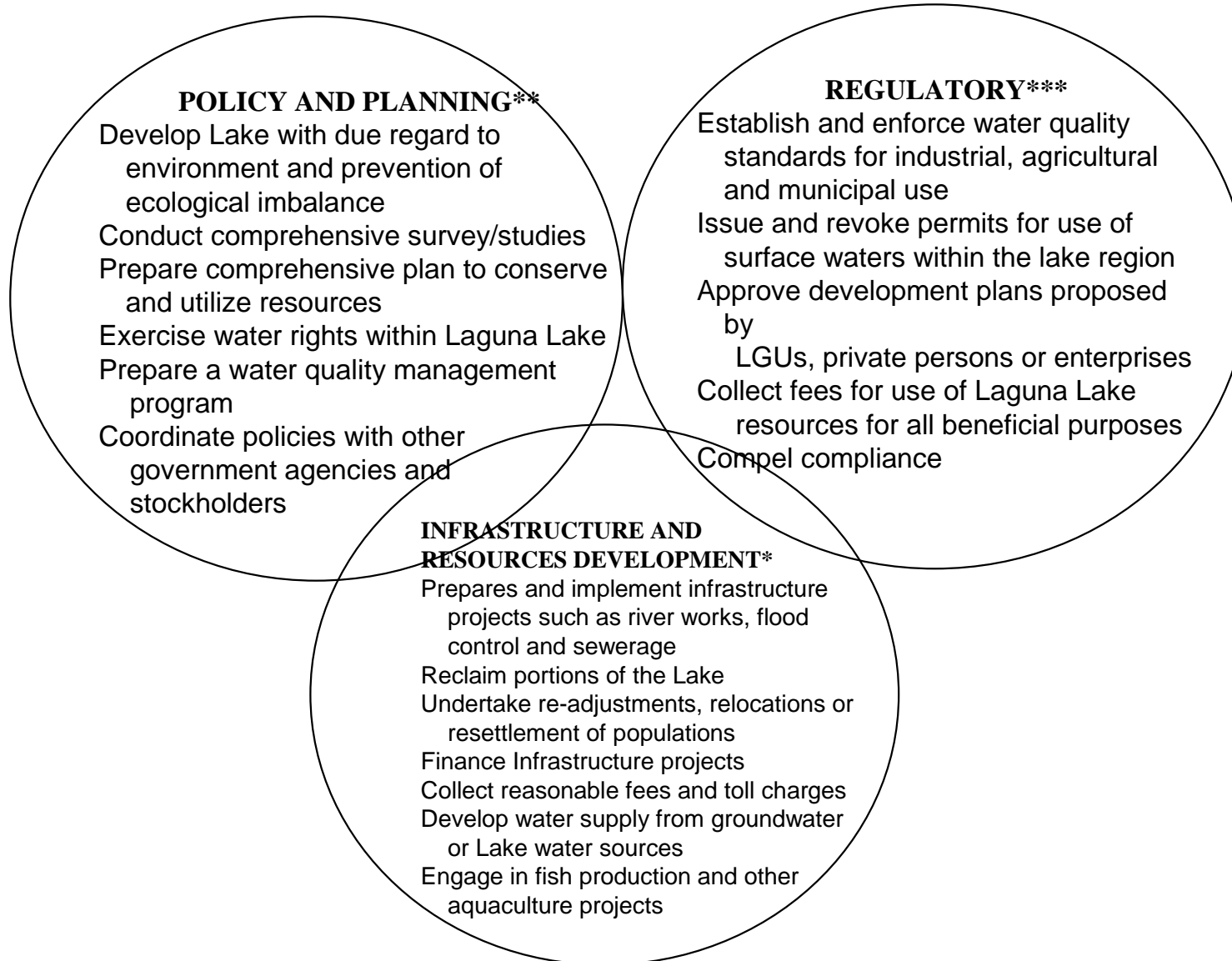
Adoption and implementation of Laguna de Bay Master Plan

**EO 149 (1993)**

Placed under DENR for administrative supervision and policy coordination



# THREE KEY FUNCTIONS





## Board of Directors

### **Ex-officio representatives:**

- **National Economic and Development Authority**
- **Department of Trade and Industry**

### **Elective Officials:**

- **Governor of Rizal**
- **Governor of Laguna**
- **President of Rizal Mayors' League**
- **President of Laguna Mayors' League**

### **Presidential appointees:**

- **General Manager of LLDA**
- **Chairman of the Metropolitan Manila Development Authority**
- **Representative of the Office of the President**

**Representative of Private Investors.**

## **Limited Pollution Reduction**

- **Insufficient enforcement capability**
- **Limited scope of EUFS**
- **Inadequate incentives**
- **Lack of sanitation and sewerage facilities**
- **Ineffective enforcement of shoreland policies and regulations**
- **Weak coordination between watershed planning and local planning**
- **Lack of institutional capability and fragmented approaches in regulatory functions**



# Vision

## *Laguna de Bay*

A Lake

... that continuously nourishes life and brings prosperity to the country

... where people work together in harmony to maintain the integrity of the lake ecosystem

... that is sustainably managed and developed for the benefit of the present and future generations

... that is recognized and supported by the global community

## *LLDA*

A self-sufficient and highly dynamic integrated water resources management authority globally known and recognized, with competent and professional personnel who take the lead towards the sustainable development of the Laguna de Bay Basin.

# The Master Plan for the Laguna de Bay Region

## **OBJECTIVES:**

Establish the attributes and potentials of the lake and its watershed, and formulate strategies and measures for their protection, rehabilitation and enhancement.  
Fill the policy gaps and program measures necessary for IWRDM.

## **SPECIFIC CONCERNS:**

Environmental management  
Watershed management  
Fisheries development  
Institutional reform/development

## **IWRMD POLICY CONTEXT**

- **Environmental and Health Risk**
- **Institutional Context**
- **Development Context**



## **POLICY AND INSTITUTIONAL RESPONSES**

- **Pollution reduction and improving water quality**
- **Effective Cooperation in water resources management**
- **Strengthening local capacity and involvement in environmental planning and management**

## Environmental User Fee System

**A** pioneer market based instrument for pollution control and abatement in the Philippines



## ***ENVIRONMENTAL USER FEE SYSTEM***

- **Unique institutional structure, no need for further legislation;**
- **Authorized to collect fee on both intake and discharge of water and issue permit for discharges;**
- **Authorized to retain revenues and utilize the same for environmental and management purposes;**
- **Administratively attached to DENR thereby facilitating expansion of the program nationwide**



# **ENVIRONMENTAL USER FEE SYSTEM**

## **Objectives**

***P*ilot economic-based instrument for pollution control and abatement in the Philippines**

***R*eduction of pollution                      water quality  
improvement**

- **Provide incentives for dischargers**
- **Raise revenue for investment in water quality improvement**

# ENVIRONMENTAL USER FEE SYSTEM

## Coverage

- **Current**
  - Covers all types of establishments with wastewater discharge in the Laguna de Bay Region
- **First 3 years (introductory phase)**
  - **Year I (1997)**

Covered top 5 polluting industries : Food Processing, piggeries/slaughterhouses, Beverages, Dyes and Textiles & Paper and Pulp
  - **Year II (1998)**

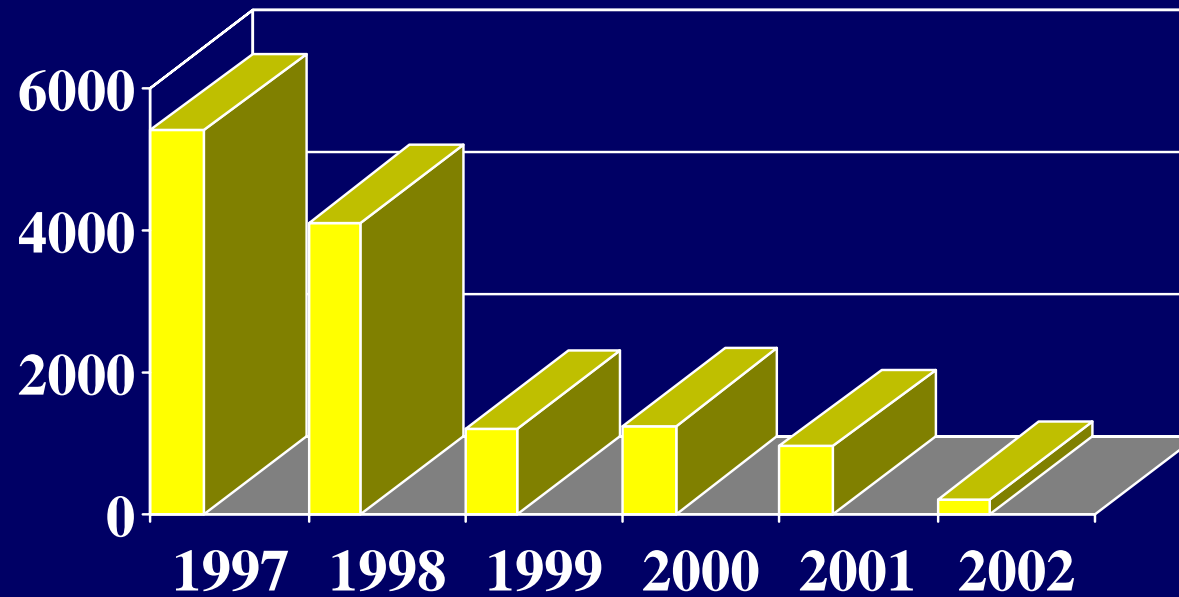
Expanded the coverage to include 100% of all industries w/ wastewater discharges
  - **Year III (1999)**

Expanded the coverage to include foodchains and restaurants

# LAGUNA LAKE DEVELOPMENT AUTHORITY

## BOD LOADING, MT/yr

Firms	1997	1998	1999	2000	2001	2002
222	5402	4102	1200	1241	941	202



## Environmental Management Program PERMIT SYSTEM / REGULATORY ACTIONS

Achieved effective closure of  
point sources of pollution  
through the issuance to  
industrial firms and open  
dumpsites



# River Rehabilitation Program

**A** model in multi-sectoral/multi-agency river basin approach

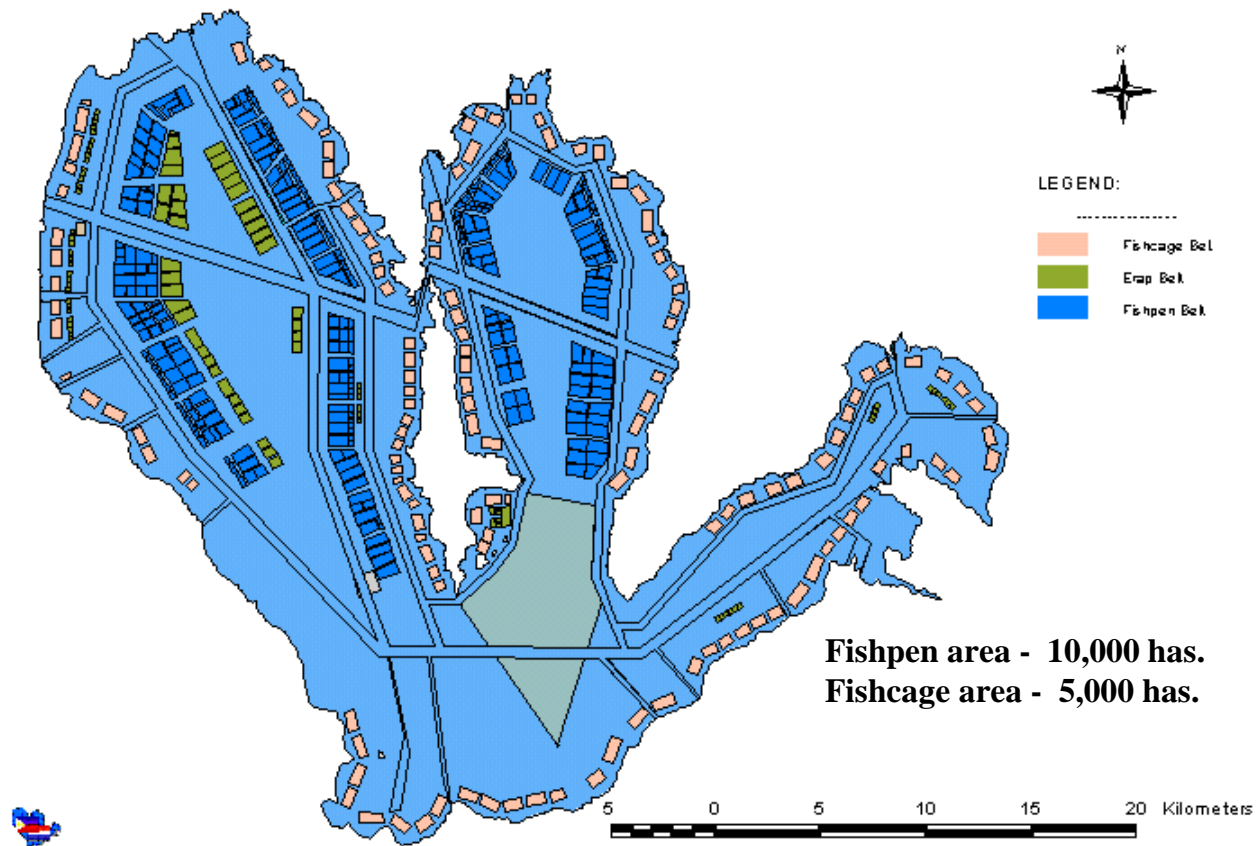
**With the RRP:**

Fully intensified river rehabilitation efforts by covering all 21 major tributary river systems

Formed the first ever Environmental Army in the world with **400** members, **39** of whom are women

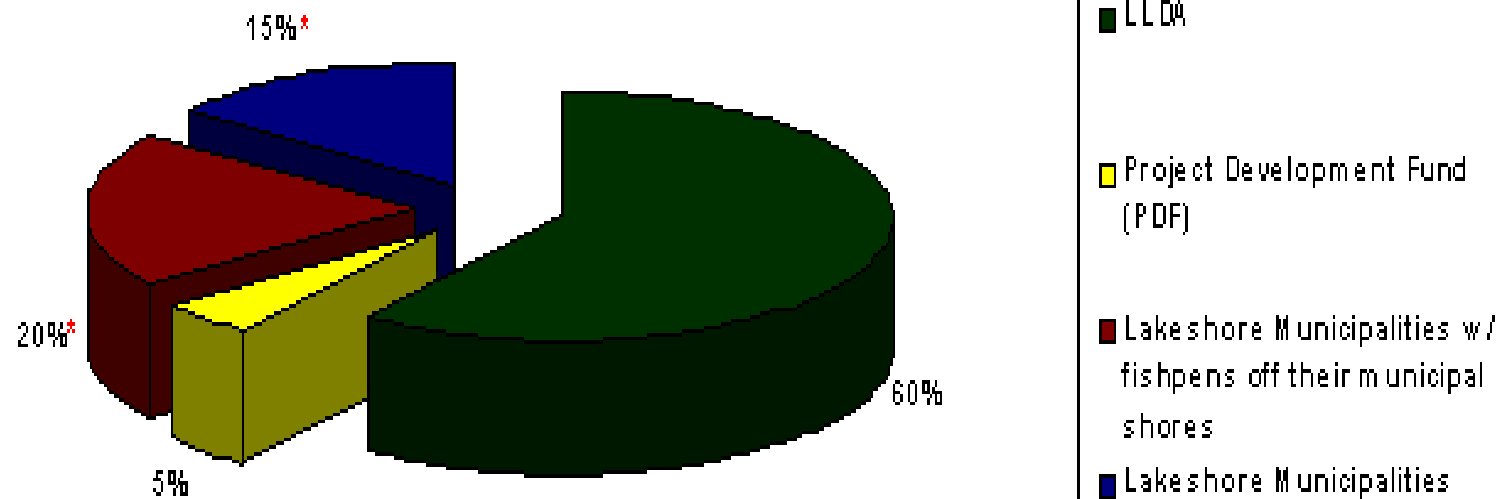


# ZONING and MANAGEMENT PLAN 1999





### Sharing scheme for fishpen and fishcage fee share for Laguna de Bay



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

## Environmental Management Program WATER QUALITY MONITORING

Maintained water quality  
conforming to **Class "C"**  
standard  
(suitable for fishery)



**1999**  
**Annual Water Quality Report**  
**on the Laguna de Bay**  
**and its Tributary Rivers**

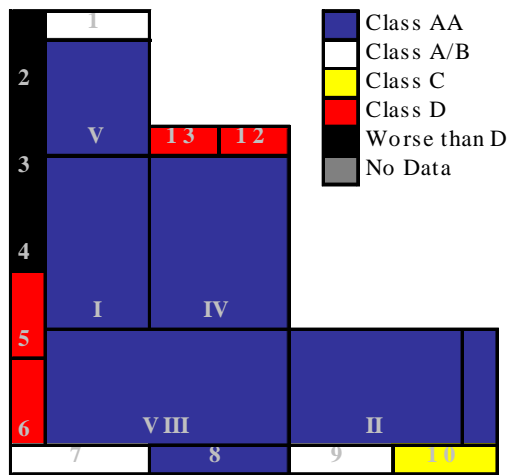


**DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**LAGUNA LAKE DEVELOPMENT AUTHORITY**  
Rizal Provincial Capitol Compound, Pasig City

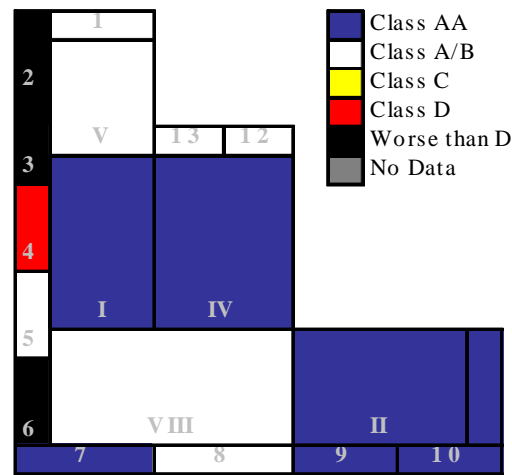


# Operationalized the “Laguna de Bay Water Mondriaan”, an on-line water quality monitor

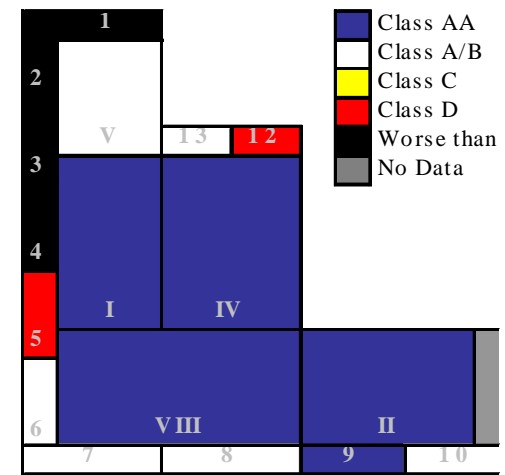
January 2002



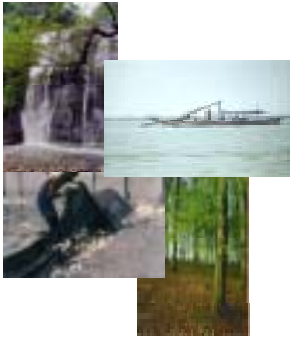
February 2002



March 2002



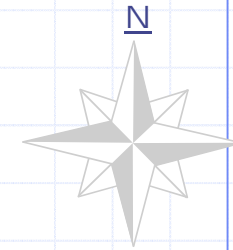
**Water Mondriaan for BOD<sub>5</sub> (mg/l)**



# **SHORELAND MANAGEMENT**

**Presidential Decree 813 (1975)**

**Shoreland Policy and Implementing Rules and Regulations (1996)**



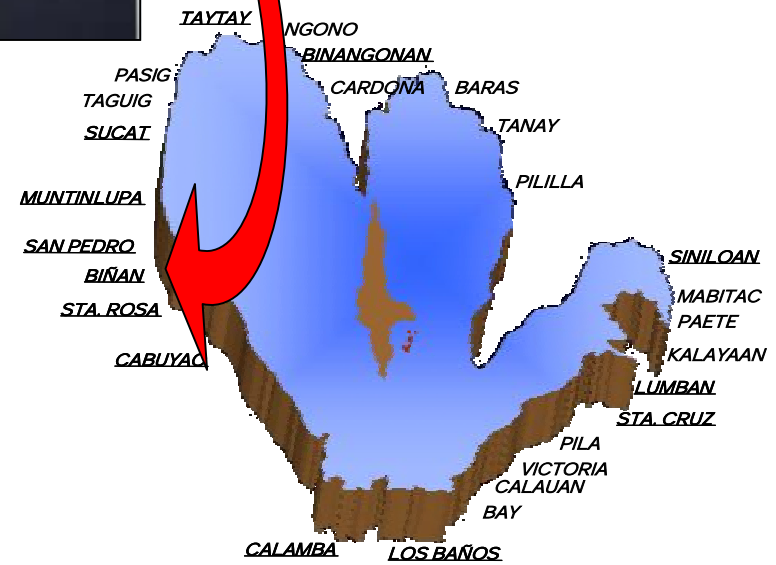
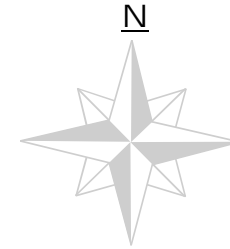
## LUPANG ARENDA TAYTAY, RIZAL

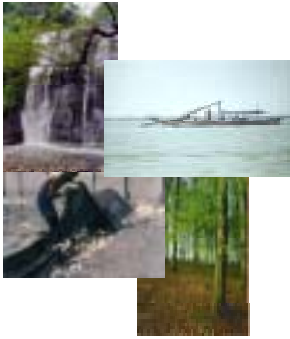






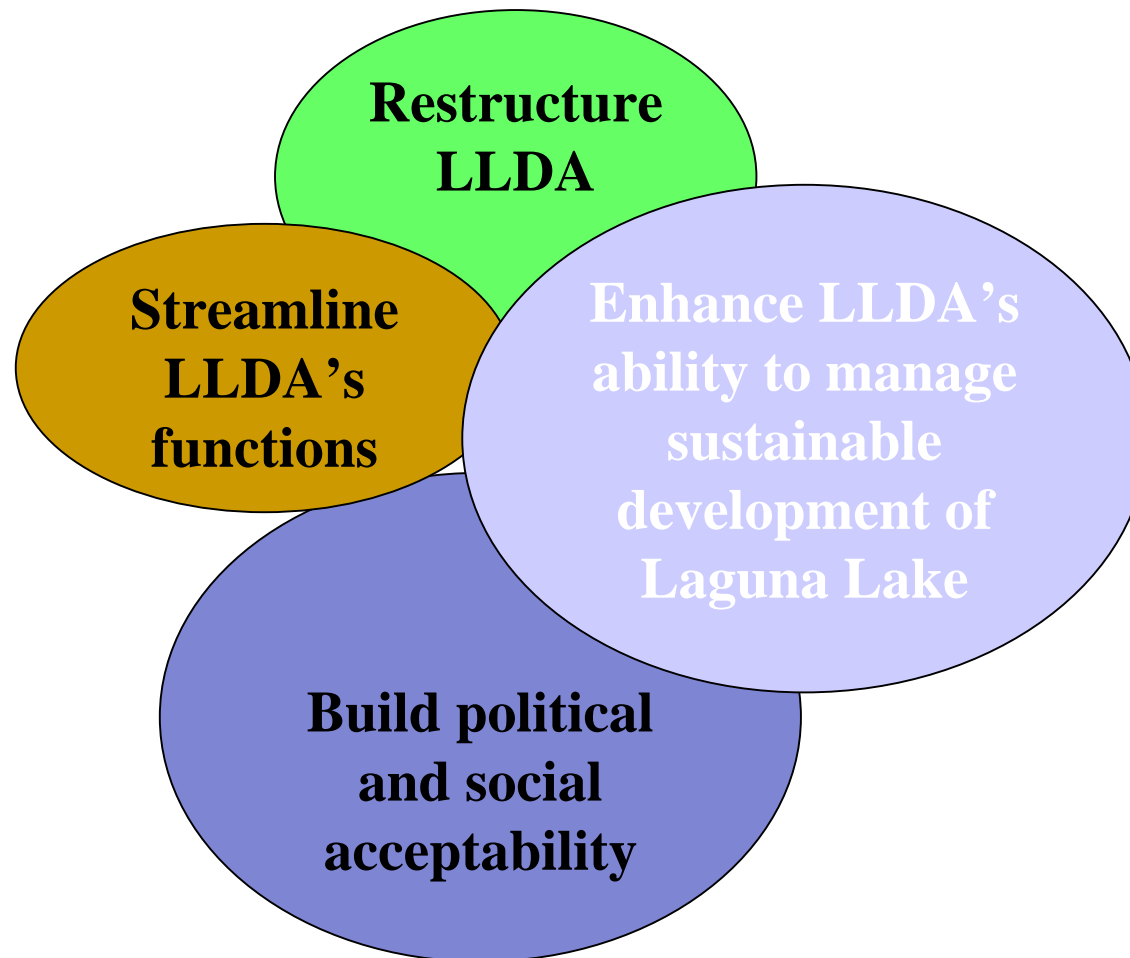
BIÑAN,  
LAGUNA





## RE-ENGINEERING OF LLDA

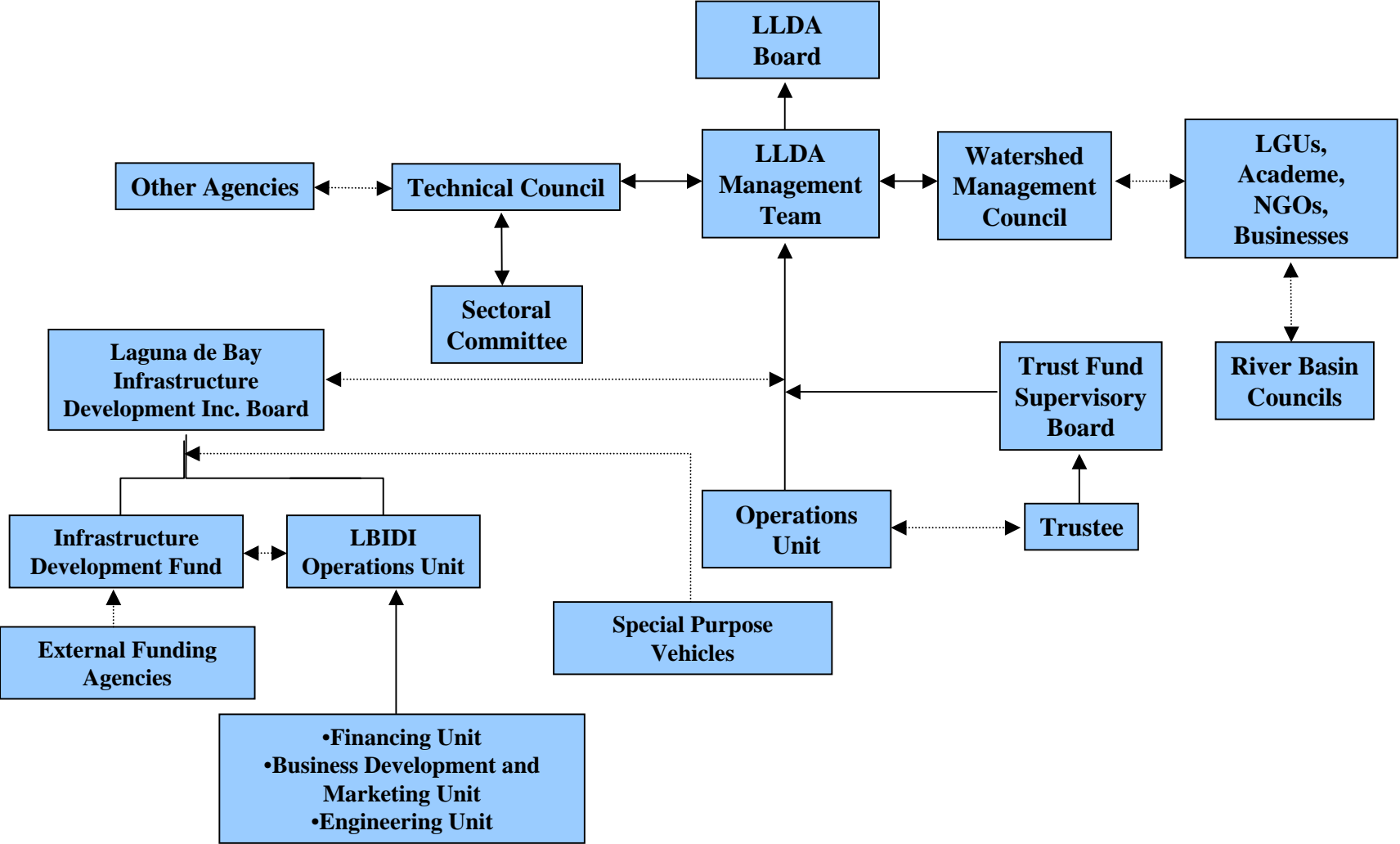
## Re-engineering Objectives



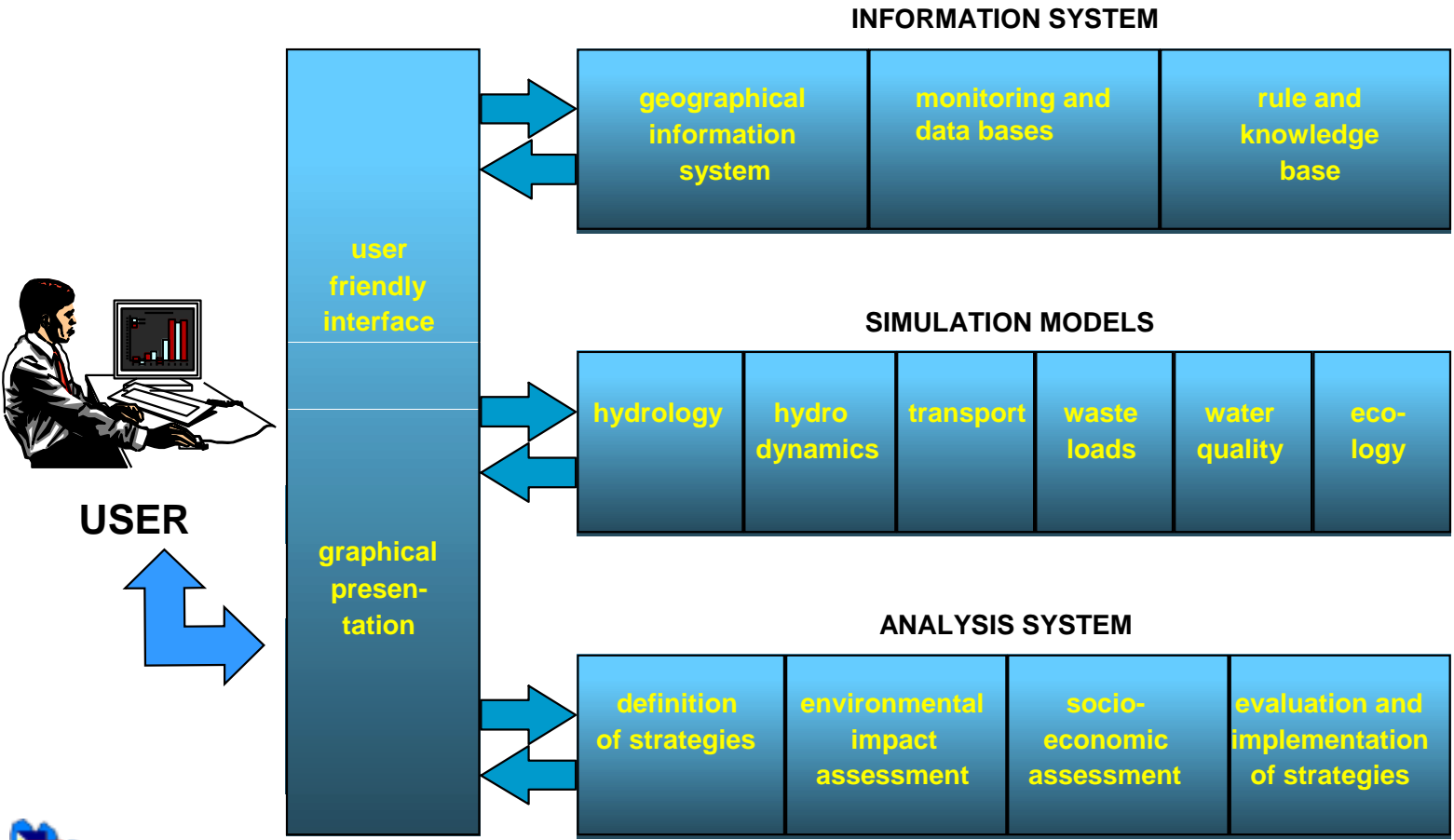
# **Strategic Objectives for the** **Re-engineered LLDA**

- 1. Ecosystem based planning and management**
- 2. Participatory and partnership approach in planning and implementation**
- 3. Broadening market based instruments**
- 4. Restoring the water quality of the Lake**
- 5. Developing and sharing knowledge**

# INTEGRATED WATER RESOURCES MANAGEMENT AND DEVELOPMENT AUTHORITY

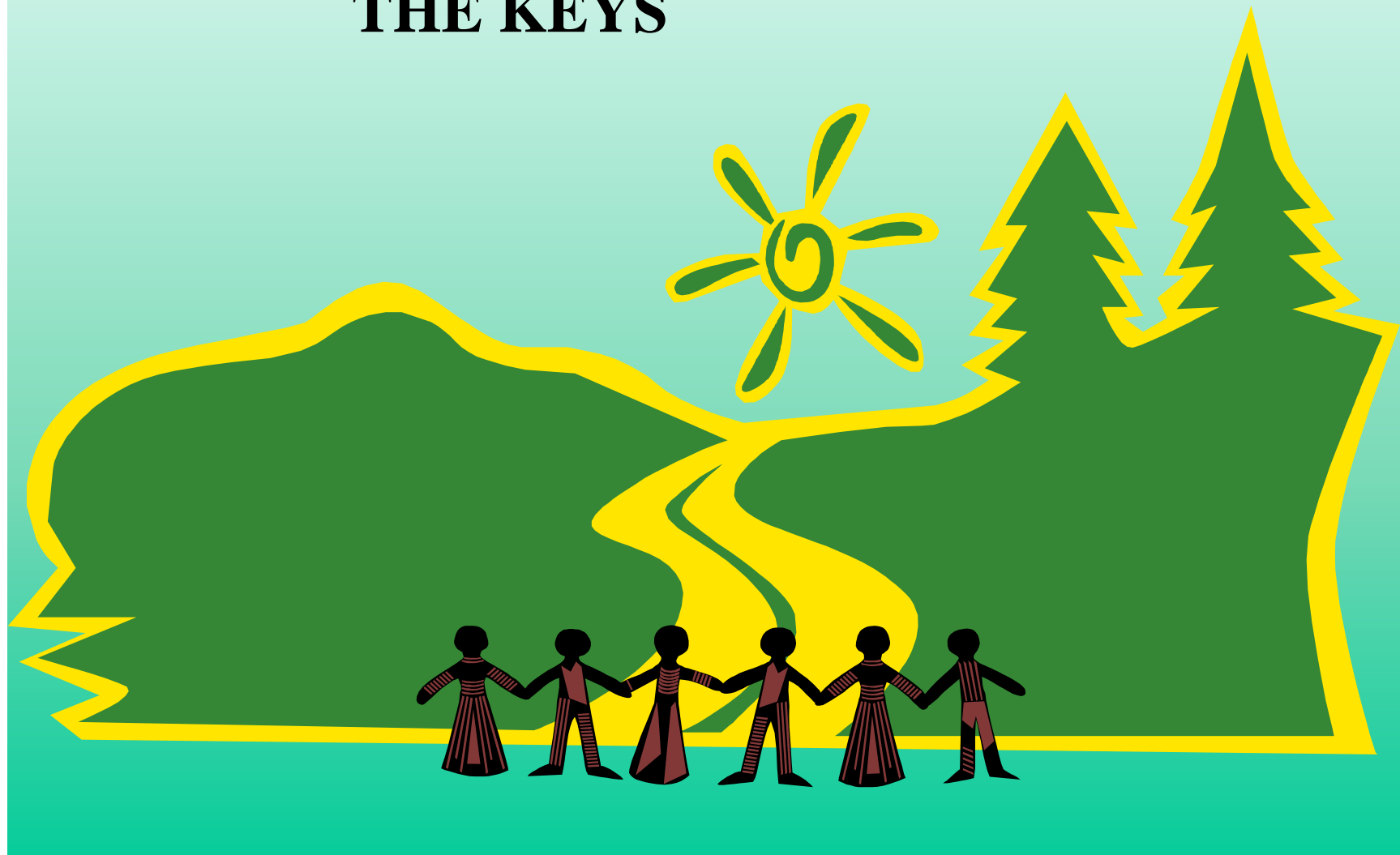


# Sustainable Development of the Laguna de Bay Environment Decision Support Systems





# **PARTNERSHIP IS ONE OF THE KEYS**





## A TRIPARTITE PARTNERSHIP



Conservation of  
Laguna de Bay's  
Environment  
And  
Resources





## **Partnership with U.S. Agencies, Chesapeake Bay and Tha Chin River (Thailand)**



## LESSONS LEARNED

***“Efforts of LLDA is an effort. But what is it achieving? What’s being learned? LLDA must not only be a model for the country, but for the lessons that can be learned.”***

**CODE NGO, 2003**

## **LESSON NO. 1**

### **Legislated actions for sustainable lake management**

- **creation of an apex body - single lake management authority**
- **unique legal and institutional framework**
- **Institutionalization of environmental planning and management**

## **SUPREME COURT DECISION**

(LLDA vs. CA and City of Caloocan December 8, 1995)

***“Laguna de Bay therefore cannot be subjected to fragmented concepts of management policies where lakeshore local government units exercise dominion over specific portions of the lake water. The garbage thrown or sewage discharged into the lake, abstraction of water therefrom or construction of fishpens by enclosing its certain area, affect not only the specific portion but the entire 900 km<sup>2</sup> of lakewater. The implementation of a cohesive and integrated lake water resource management policy, therefore, is necessary to conserve, protect and sustainably develop Laguna de Bay.”***



## **LESSON NO. 2**

### **Politics in lake governance**

- **Manner of appointment to top management positions**
- **Frequent shifts in Board composition**
- **Political interference in policy decision making and enforcement**

## **LESSON NO. 3**

### **Community Networking and Co-management for Lake Watershed Development**

- **Partnership with stakeholders: a key element in managing lake resources**
  - **strategic alliance for program/project implementation and enforcement action**
- **Building a common ownership and vision**

## **LESSON NO. 4**

### **Financing environmental protection and social development projects**

- **Corporate structure: fiscal autonomy and revenue-generating capacities**
- **Sharing of revenues with LGUs**

## **LESSON NO. 5**

**Importance of scientific data and availability of management and technical tools in lake management**

- **Establishment of DSS**
- **Set up of Hydrological Database System and Hydrological Monitoring Network**
- **Development and Installation of Geo-Information Database System**
- **Environmental Action Planning and Use of Multi-Criteria Analysis Tools**

## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Environmental User Fee**

- **Application in well-defined area**
- **Start simple and build experience**
- **“Ready, Fire, Aim” rather than “Ready, Aim, Fire”**
  - **Sector-based pilot run**
  - **1 to 2 controllable parameters**
  - **Pollution charge at all levels from zero discharges but progressive above the effluent standards**

## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Environmental User Fee**

- **Stakeholders Consultation**
- **Coupling market-based features with regulatory elements into one instrument could result in perverse reactions of discharges, i.e. dilution of wastewater**
- **Actual water quality of receiving body not taken into account**
- **Strong and credible regulatory body as implementor of MBI**

## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Environmental User Fee: *The Way Forward***

- **Expansion using the following strategies:**
  - **Modifying the existing user fee structure to address dilution and water quality of receiving water**
  - **Introduce other pollutants in addition to BOD**
  - **Feasibility of Household EUFS**
  - **Adoption of resource fee for raw water abstraction**
- **Public Disclosure Program**

## LESSONS FROM PROGRAM IMPLEMENTATION

A license to pollute?

- **No, because the system does not replace the existing regulatory system**
- **Firms that are unable to comply with standard not only pay higher user fees, but are still subject to fines and closure procedures**



## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Shoreland Management**

- **Development has overtaken regulation**
- **Lack of common understanding of**
  - **technical basis**
  - **environmental significance**
- **Conflict in jurisdiction over shoreland areas between LLDA and lakeshore LGUs**
- **Lack of coordination with LLDA on titling of lands on or abutting shoreland areas**

## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Fishpen Controversy**

- **The fascination that was the fishpen technology!**
- **Preparedness of targeted beneficiaries (small fishermen) to use technology and adopt it on commercial scale**
- **Lack of financial assistance program**
- **Underestimation of required capacity and control mechanisms to implement the program**

## LESSONS FROM PROGRAM IMPLEMENTATION

- **Lack of clearly defined roles among LLDA, LGUs and other concerned agencies (DA-BFAR, etc) prior to Supreme Court Decision**
- **Over proliferation of fishpens and its social, economic and environmental impacts....**

*thus the issues of efficiency and equity*

## **LESSONS FROM PROGRAM IMPLEMENTATION**

### **Zoning and Management Plan (ZOMAP)**

- **Sound technical grounding**
- **Consultation process that includes all relevant stakeholders**
- **Evolution over time of physical plan and implementation scheme**
- **Unilateral modifications of physical plan and implementation scheme – a new fishpen belt for every new President**

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

**... geared towards improving the environmental quality in the region and ensuring that effective development and environmental governance mechanisms to sustainably manage Laguna de Bay and its watershed are in place.**

# LISCOP CONTRIBUTIONS TO INSTITUTIONALIZING RE-ENGINEERED LLDA

- **Strengthening of institutions and instruments**
  - **Regulatory Strengthening and Economic Instruments**
  - **Policy, Planning and Support Services**
  - **Developing Strategies for Watershed Development**
  - **Support to LLDA/LGUs/River Councils**

## **LISCOP CONTRIBUTIONS TO INSTITUTIONALIZING RE-ENGINEERED LLDA**

- **Deepening co-management for watershed development**
  - **Micro-watershed improvement projects**
  - **Capacity building of LGUs, RCs, communities**
- **Financing environment protection and social development projects**
  - **Environmental Trust Fund**
  - **Laguna de Bay Development Corporation (LBDC)**

## **PRIORITIES FOR IWRMD IMPLEMENTATION 2004 and Beyond**

- **Institutionalization on a Re-engineered LLDA**
- **Expanded community networking**
- **Improving compliance and expanding MBIs**
- **Environmental and water infrastructure development**



## **Recommended Actions for NARBO**

- **Water allocation and pricing among different quantity and quality dependent uses/users**
- **Developing and handling alternative conflict resolution mechanisms and institutional arrangements**
- **MBIs for**
  - **Improving environmental performance**
  - **Incentives mechanisms**
- **Engaging LGUs in environmental improvement**
- **Approaches to address non-point sources of pollution**
- **Addressing pollution from chemical substances**

## Managing a Lake Basin needs....

- **Common Vision**
- **Sustainable Commitment**
- **Resources**
- **Political will**
- **International Support**

Managing a lake basin is....

**A WORK IN PROGRESS !**

*Thank You  
& Good Day*

**Laguna Lake Development Authority  
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Provincial Capitol Compound,  
Pasig City, Philippines**

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