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

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Abstract

The development potentials of the Laguna de Bay and its environs and the declining environmental conditions due to the rapidly changing character of the lake watershed, prompted the creation through legislation in 1966 of the Laguna Lake Development Authority (LLDA) to coordinate and facilitate the sustainable development and balanced growth of the Laguna de Bay Region. This move was also intended to facilitate pooling of resources among national government agencies, local governments and the private sector to manage and develop the lake and its resources and control environmental degradation.

The 90,000-hectare Laguna de Bay is the largest inland water body in the Philippines. It is strategically located in the midst of the country's rapidly expanding urban and industrial centers, currently home to over 10 million Filipinos. Over the years, there has been growing concern about increasing environmental stress of the lake and its watershed due to: (i) excessive discharge of pollutants; (ii) rapidly expanding industrialization and urbanization in the region; (iii) conflicts existing among users, uses or the zoning priorities and jurisdictions (among central and local government agencies, government owned corporations, and private sector); (ii) separately formulated and separately implemented policies, mandates, and programs of key players, each striving to meet the relatively narrow and stand-alone goals resulting in fragmentation of the plans and created barriers to the effective management of the Lake and its watershed.

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These concerns necessitated the adoption by the LLDA of an acceptable integrated water resources management and development (IWRMD) approach that serves as a platform for launching programs to meet environmental goals and water resources development objectives. This approach calls for LLDA's implementation of an integrated environmental and developmental policy and coordination and facilitation of protection and remediation measures. In the recent times, it has introduced and advanced a set of institutional, market-based, conflict resolution, technical and engineering measures as well as community-based watershed management interventions to halt the rate of deterioration of the water resources in the region and improve IWRMD implementation in a sustainable way, for example, the Environmental User Fee System, River Rehabilitation Program, Laguna de Bay Zoning and Management Plan, Shoreland Management Program, LLDA Institutional Re-engineering Program, Decision Support System and its applications for the Sustainable Development of the Laguna de Bay Environment.

IWRMD implementation in the Laguna de Bay Region has been challenged by the following problems and issues: (i) inadequate regulation and enforcement; (ii) inefficient institutional arrangements to resolve conflicts; and (iii) lack of mechanisms and capacity constraints particularly in environmental and water-related infrastructure development in the region.

The key lessons learned from the 35-year experience of the LLDA in lake management are in the following areas: legislated actions on lake management and environment support IWRM; political interference in lake governance; modernizing the LLDA; delineation and segregation

of developmental and regulatory functions, the fishpen conflict, financing environmental protection and social development projects, the right way forward in developing and implementing pollution charge systems in a river basin context.

Finally, the following actions for adoption by NARBO are recommended: (i) establishment of mechanisms for proper water allocation among different water quantity and quality dependent uses in a river basin context; (ii) developing alternative conflict resolution mechanisms and corresponding institutional arrangements for balancing supply of and demand for water resources in a river basin context; (iii) market-based instruments for improvement of environmental performance of regulated sources of pollution, and the manner by which LGUs can be engaged in environmental management at the micro-watershed level; (iv) approached to address non-point sources of pollution; (v) legislative measure, administrative and regulatory regime to address pollution from chemical substances; and (vi) creating information tool box on strategies and approaches which have worked successfully with other RBOs on engaging local government units in environmental action planning and investing in micro-watershed improvement; balancing regulatory and development functions and leveraging/facilitating private sector participation in augmenting small, medium and large-scale water-related infrastructure projects, among others.

Key words: IWRMD, micro-watershed, integrated watershed management, co-managed investments, environmental action planning, leverage/facilitate private sector participation.

PART I - Introduction and Background

The development potentials of the Laguna de Bay and its environs and the declining environmental conditions due to the rapidly changing character of the lake watershed, prompted the creation through legislation in 1966 of the Laguna Lake Development Authority (LLDA) to coordinate and facilitate the sustainable development and balanced growth of the Laguna de Bay Region. This move was also intended to facilitate pooling of resources among national government agencies, local government units (LGUs) and the private sector to manage and develop the lake and its resources and control environmental degradation.

Because of the importance of the Lake and its watershed to the economic development of Metro Manila and its environs, hence of the nation, these growing concerns over water scarcity and deterioration have national level implications. These concerns necessitate the formulation of a politically acceptable integrated water resources management and development (IWRMD) framework that could serve as a platform for launching programs to meet the water resources development and environmental challenges in the Region. The LLDA in response to its mandate has taken the necessary steps toward developing and implementing such an integrated policy and institutional framework. To implement the policy, LLDA as a watershed-focused apex body has to coordinate protection and remediation measures and advance a set of institutional, market-based, conflict resolution, and technical and engineering measures as well as community-based watershed management interventions to control the rate of deterioration of the water resources in the region.

This paper comes in two parts. Part I synopsizes the Authority's extensive efforts of the past four years under a IWRMD framework, specifically, the policy and institutional framework adopted by LLDA for effectively managing the water resources of the Laguna de Bay and its watershed, the IWRMD implementation entry points and key challenges. Part II elaborates the experience and lessons learned from the 35-year experience of the LLDA in lake management and its IWRMD implementation, and how the re-engineering of the LLDA fits into the overall integrated institutional framework. Therefore, this paper also discusses how the institutional development benefits from the forthcoming Laguna de Bay Institutional Strengthening and Community Participation (LISCOP) Project will be distributed throughout the whole organization, the LGUs and communities of stakeholders. Finally, drawing from the IWRMD implementation of the LLDA in the Laguna de Bay Region, the paper describes the recommended actions for possible adoption by NARBO.

I. Laguna de Bay and Its Watershed

Among the 216 lakes recorded in the Philippines [1], Laguna de Bay is the largest with a surface area of 900 km^2. It is also one of the largest lakes in Southeast Asia and also one of the shallowest with an average depth of 2.5 meters, thus the characteristic turbidity of the lake. It has a water volume of 2.25×10^9 m^3. The retention time is approximately 8 months. Its shoreline of 285 km clearly delineates three distinct bays namely, the West, Central and East Bays that converge towards the south resembling a large bird foot. The South Bay is located along the southwestern towns of Laguna Province. The West and Central Bays are separated by Talim Island, the largest and most populated of the nine islands within the lake (Figure 1).

FIGURE 1. MAP OF LAGUNA DE BAY

The watershed area is 2920 km^2, which is approximately 1.3% of the country's land area of 300,000 km^2. It is composed of the provinces of Rizal and Laguna and partly the National Capital Region, and portions of the provinces of Cavite, Batangas and Quezon. Overall, the lake watershed is host to 66 Local Government Units (LGUs) including 10 cities and 51 municipalities, 29 of which are located along the lakeshore. More than 100 streams flow into its drainage area, which is divided into 24 sub-basins. The Lake's only outlet, Napindan Channel, controls the flow to the 27-km. Pasig River that discharges into the Manila Bay. During conditions when the lake level is lower than Manila Bay and when there is sufficient

tidal fluctuation that could push the entry of saltwater into the lake, Pasig River becomes a tributary. Thus, during backflow of the Pasig River, Laguna de Bay becomes a brackish water lake. The extent of saline water intrusion depends on the duration of the backflow and the prevailing climatic condition. The normal chloride concentration ranges from 250 to 350 mg/L but could reach to 4,000 mg/L at sustained backflow of the Pasig River. The fishermen and aquaculture operators favor this phenomenon because higher salinity improves the transparency of the lake by the flocculating effect of saline water on the suspended colloidal particles in the water column. Subsequently, abundance of phytoplankton followed [2]

Multiplicity of Lake Uses

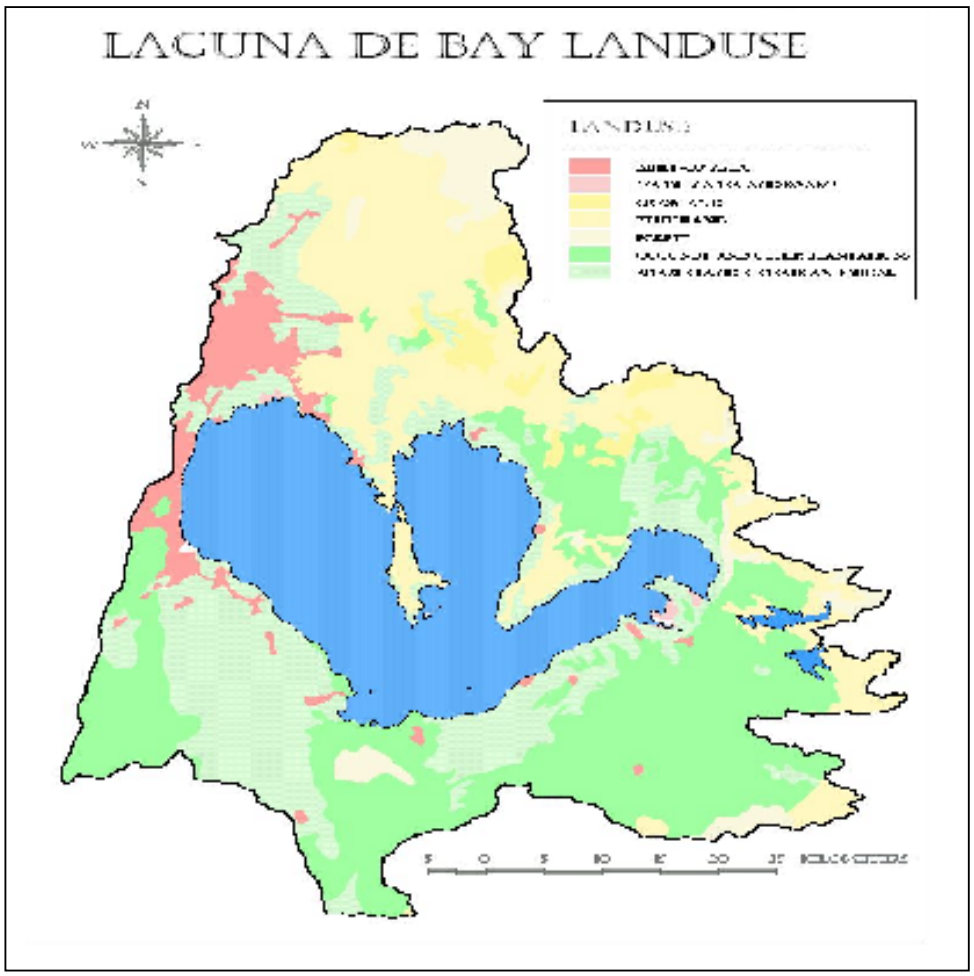
Laguna de Bay is also the most important lake in the Philippines. Over 10 million people are the users of the invaluable resources in the region The lake provides a variety of environmental goods and services to the surrounding communities, which also extend to other stakeholders within and outside the basin. It provides food, water for irrigation, power supply, cooling of industrial equipment and lately, as a source of raw water for domestic supply. Likewise it is a convenient transport route for people and products, a receptacle for floodwaters coming from Metropolitan Manila and a sink for treated and untreated liquid wastes. Unfortunately, some industries, businesses, and nearly all households in the region continue to use the Lake and its tributaries as bodies of water for open extraction and for waste disposal, almost indiscriminately during to lack of sewerage and sanitation systems.

At present its dominant use is for fishery, both for open water fishing and aquaculture. Rapid urbanization and industrialization have greatly increased the demand for environmental goods and services and mirrors the challenges that the LLDA has to face to sustainably manage the lake basin but most controversial purpose, a recipient of waste.

Regional Land Use

Based on available watershed land use map (Figure 2), there is very minimal forest cover of only 5%, mainly represented by Mt. Makiling. It is considered as the microcosm of the only remaining forested environment in the Laguna de Bay Basin [3] and is one of the 18 centers of plant biodiversity in the Philippines [4]. This may be attributed to its declaration as a Forest Reserve in 1910.

Figure 2. Land Use Map of the Laguna de Bay Watershed



A large portion of approximately 1990 km ^{2} or 52% of the land area, is being used for agricultural purposes, mainly for livestock raising and farming of coconut, fruit trees and rice. Industrial and urban areas account for 29% while defrosted areas consisting of grass and brushland comprise 14 %. There is a need to update the land use map due to rapid land conversion for industrial and residential uses in the past 20 years.

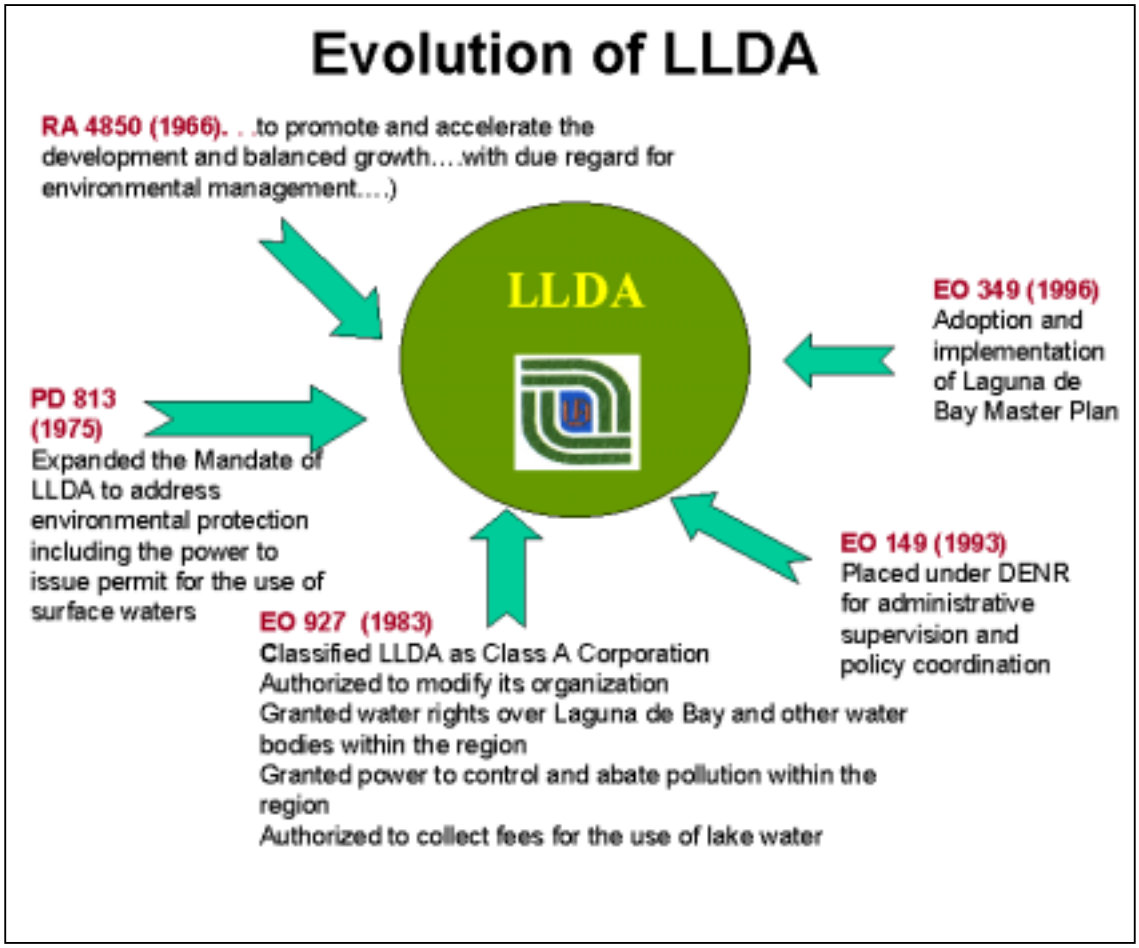
II. The Laguna Lake Development Authority

Its Evolution

The Laguna Lake Development Authority was created on July 18, 1966 through Republic Act 4850: *An Act Creating the Laguna Lake Development Authority, Prescribing Its Powers, Functions, and Duties, Providing Funds Thereof and for Other Purposes.* Its mandate is " to promote and accelerate the development and balanced growth of the Laguna Lake area and the surrounding provinces, cities and towns … with due regard and adequate provisions for environmental management and control, preservation of the quality of human life and ecological systems, and the prevention of undue ecological disturbances, deterioration and pollution." The Authority was formally organized on October ---, 1969. Presidential Decree (P.D.) 813 of 1975 further expanded LLDA's mandate to address environmental protection including the power to issue permits for the use of surface waters. Executive Order (E.O.) 927 of 1983 granted the Authority water rights over Laguna de Bay and other water bodies within its watershed and the power to control and abate pollution. This Order also authorized the LLDA to collect fees for the use of lake water and discharge into the system of wastewater meeting the standards. For the purpose of carrying out its expanded mandate, EO 927

likewise classified LLDA into a Class A Corporation and authorized the agency to modify its organizational structure.

FIGURE 3: EVOLUTION OF THE LLDA



The General Manager is the Chief Executive of the Authority, while the corporate power is vested upon the Board of Directors. An operational subsidy of One Million Philippine Pesos (PhP1,000,000.00) was appropriated annually for five years from the general fund of the National Government. Thereafter, the LLDA became a self-sustaining organization. Its operation is financed through income from regulatory fees and fines, laboratory services,

resource user's fee (aquaculture operation and water abstraction), and from its corporate investments and marketable securities.

In 1993, the LLDA was placed under the administrative supervision of the Department of Environment and Natural Resources (DENR) through Executive Order 149. As such, it maintains its separate policy-making functions through the Board of Directors. The LLDA acts and decides upon policy matters; not all are necessarily elevated to the DENR Secretary for final approval, since the Secretary is a member of the LLDA Board.

Laguna de Bay remains as the only lake in the Philippines that is managed by a special Chartered agency of the Philippine Government. Although LLDA is mandated by law to perform its function as a basin-wide authority, it does not have control over all projects affecting the lake and its region, due to overlapping areas of jurisdiction with other government agencies which exercise their respective mandates in the region on policy and planning, regulation and infrastructure development. By virtue of Republic Act 7160 or the Local Government Code of 1991, the Local Government Units also exercise their mandate on environmental protection and management. The existence of many players, majority of which are government institutions, has led to conflicts among institutional mandates and functions and inconsistent policies, plans and programs for the management of the Laguna de Bay Region (refer to sections IV-4.4, 4.5; Section V-5.2), among others.

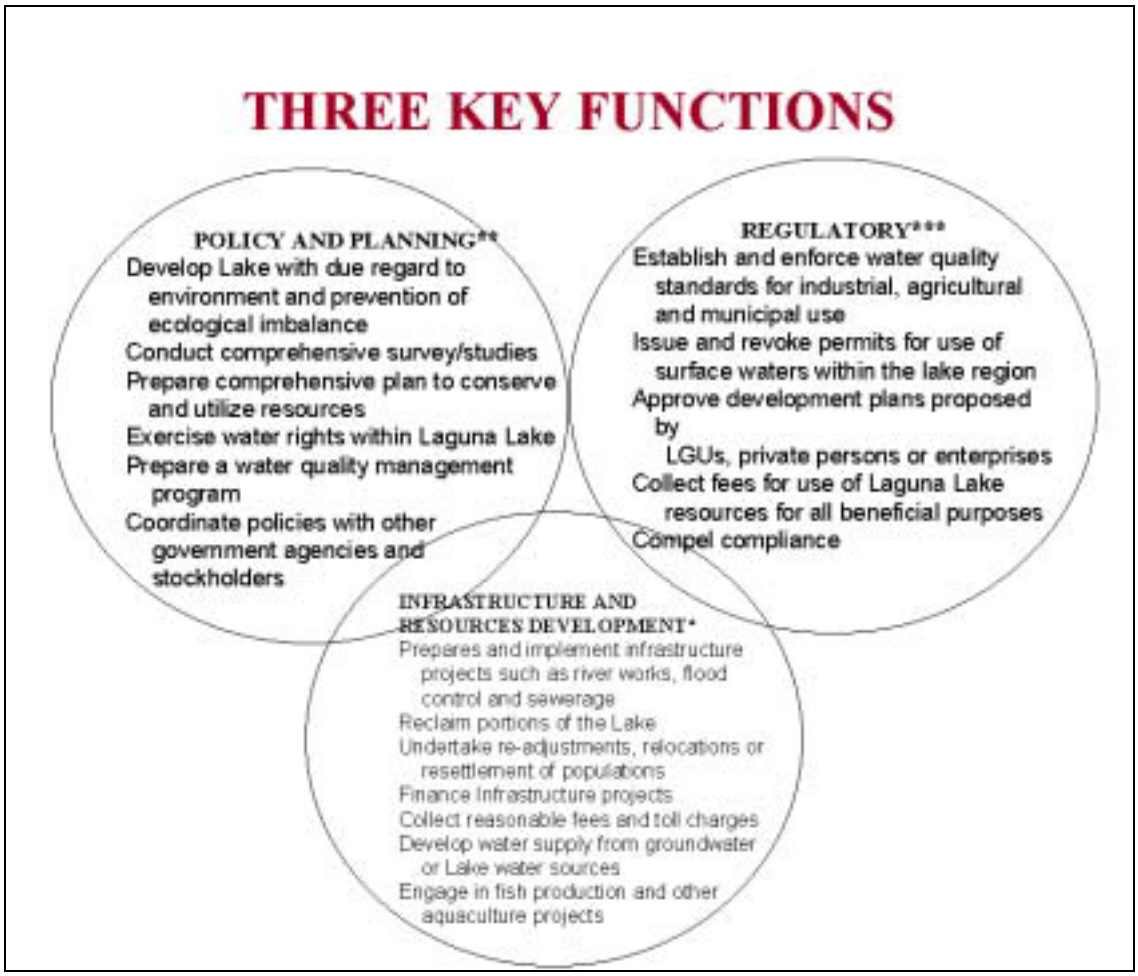
Powers and Functions

Because of its unique legal and institutional framework, the LLDA exercises both regulatory and developmental functions.

- **Regulatory Powers and Functions**

The all-encompassing powers of the LLDA are shown in its authority to pass, approve, or disapprove all plans, programs, and projects proposed by all LGUs and public and private corporations. It also has exclusive jurisdiction to issue permits and collect fees for the use of the lake water and discharge of wastewater meeting the standards. The LLDA has the authority to earmark revenues generated for its environmental and developmental projects/ activities.

FIGURE 4: POWERS AND FUNCTIONS OF THE LLDA



The LLDA exercises police powers. In case of violations of the laws, rules and regulations, the violator can be held administratively, civilly and criminally liable. In addition to the criminal liability, LLDA may pursue a separate civil action for damages resulting from the violation of the law. As specifically provided by law, damages recovered by this civil action shall be earmarked for environmental management.

LLDA's mandate allows it to introduce a wide range of innovative policies. It was the first agency in the Philippines to apply concepts of natural resource pricing in the form of fishpen fees and, more recently, the imposition of wastewater discharge fees. The experience of LLDA in resource pricing is setting the stage for a comprehensive national implementation of a similar policy by the Department of Environment and Natural Resources (DENR). LLDA's venture into raw water pricing is set to establish another policy precedent that could have wider national application.

- **Development and Environmental Management Functions/ Services**

As a developmental agency, the LLDA is expected to undertake development-oriented programs, projects and activities. For this reason, the Authority has been engaged in pioneering developmental projects, such as the introduction of the aquaculture industry in the lake in the early 1970s. Now, it has several fishery and aquaculture development activities such as fish sanctuary management and seeding program, among others.

Inclusive in the developmental functions of the LLDA is planning, development and packaging and implementation of environmental infrastructure projects. There are a variety of proposed or envisioned infrastructure development projects necessary for environmental management of the Laguna de Bay Region. These include physical infrastructure such as an

interceptor system to divert wastewater to centralized wastewater treatment facilities, pumping installations that would draw water from the Lake, and river engineering work. Accompanying these are major engineering activities such as dredging of the Lake and construction of protective embankments. Yet another important element in infrastructure support is the availability of technical facilities and environmental management services, such as laboratories and facilities for environmental monitoring.

LLDA currently has limited capability to finance or undertake major infrastructure projects on its own. The Engineering and Construction Division of the Authority is a small unit that currently concentrates on conducting technical surveys to support regulatory activities. It is unlikely, and probably undesirable, for LLDA to directly be involved in staging these various infrastructure projects, otherwise this will unduly jeopardize the regulatory operation of the Authority.

Private sector participation is a preferable approach. Such an approach would set up ways to get the private sector to invest in infrastructure development such as provision of centralized waste treatment facilities operated by a private firm and earning revenues from user fees. Privatized environmental management services could include supply of private laboratory services including testing of industrial emissions and issuance of certification for purposes of securing or renewing annual discharge permits.

IV. Environmental Challenges

The need for an apex body to coordinate the development and sustainable management of the water resources of the Lake and its watershed in relation to the deterioration of environmental conditions in the Laguna de Bay Region have been studied at different scales since early 1990s. Over the years, there has been growing concern about increasing environmental stress of the lake and its watershed due to: (i) excessive discharge of pollutants and rapidly expanding industrialization and urbanization in the region; (ii) increasing conflicts over water use and allocation; (iii) inefficient institutional arrangements to resolve the conflicts; and (iv) capacity constraints particularly in environmental and water-related infrastructure development in the region.

4.1 Water Quality in Surface Waters

The water quality of the lake and its tributaries has been threatened by the discharge of domestic and industrial wastewater, especially from the western part of the lake. Based on the technical findings of the studies under the Netherlands-assisted "Sustainable Development of the Laguna de Bay Environment Project" in 2000-2003, domestic wastewater has been estimated to account for approximately 70% of the organic pollution load into the Laguna de Bay. Industrial pollution contributes about 20% of the total pollution load coming into the lake. The water quality problem is also a factor of solid waste disposal, mainly from households, since garbage dumped into waterways is a major cause of water pollution. Some concentration of heavy metals from toxic and hazardous waste has been observed, but the concentration has not exceeded the level for Class C waters.

4.2 Uncontrolled Expansion of Industrialization and Urbanization

The proper disposal and treatment of domestic wastes in the lake watershed has not yet been fully addressed even within Metro Manila in view of the limited sewerage and sanitation programs. The impact of rapid population growth, urbanization and industrialization, in particular the uncontrolled human settlement along river banks and lakeshore areas, is causing severe stress on the lake environment and the watershed area. Unfortunately, waste segregation and recycling is practiced only in selected places, while indiscriminate open dumping of wastes is still a common practice in spite of the enactment and of the Ecological Solid Waste Management Act (RA 9003).

Rapid denudation of the forested areas and indiscriminate land conversion are aggravating the problem of siltation in the lake and the tributary rivers in the Rizal Province. The lake has become shallower from an average depth of 3 meters in the seventies to the current average of 2.5 meters. Flash floods and mud slides have become frequent in recent times resulting to loss of lives and property. Similarly, a decline in open water fishery was already reported in the early seventies, but the effects were manifested clearly in the 1980's. Control of illegal fishing practices is urgently needed, although it is difficult to convince fishermen that their common fishing practice is causing the decline in their fish catch. In 2002, an alarming population of janitor fish, *Hypostomus plecostomus,* was observed in the lake and the tributary rivers

4.3 Inadequate Regulation and Enforcement

Due to insufficient enforcement capability and a limited scope of the Environmental User Fee System (EUFS) in terms of pollutant parameters and targeted sectors , pollution reduction has been limited. While the LLDA has been improving compliance through a combination of traditional Command-and-Control mechanisms, i.e., pollution control programs and innovative market based instruments, such as the EUFS, there is inadequate incentives that encourage compliance and could lead to the wiser use of the environmental resources. The lack of sanitation and sewerage facilities to collect, treat and dispose of the sewage has greatly undermined the existing and potential benefits from water resource development. While LLDA has been relatively effective in regulating aquaculture structures in the lake in view of the implementation of the Zoning and Management Plan (ZOMAP), its enforcement of shoreland policies and regulations has been ineffective for the purpose of restoration and protection as well as environmental regulation and control.

4.4 Weak Coordination Between Watershed Environmental Planning and Local Development Planning

At present there is insufficient coordination and cooperation between the LLDA and local government units in developing and implementing sound environmental planning. To cite an example, conflicts exist on the zoning priorities and jurisdictions among central and local government agencies, government owned corporations, and private sector. Identified constraints include: (i) lack of institutional structures/capacities through which micro-watershed level environmental issues beyond the political boundaries of single LGU can be fully addressed; and (ii) limiting engagement of the full range of stakeholders at the micro-

watershed level in environmental planning. There is strong need to integrate micro-watershed environmental action planning into local development planning at LGU level.

4.5 LLDA's Lack Institutional Capacity as an Integrated Watershed Management Authority

While the Authority has been effectively operating as an independent lake basin authority for 34 years, it currently lacks the institutional capacity and pragmatic approaches to meet the new demands in its regulatory and management functions. Effective coordination with other government agencies is not always sufficiently explored and institutionalized, and partnerships with, for example, the private sector in leveraging necessary funding for environmental improvement investments has not yet been established.

PART II - IWRMD POLICY DEVELOPMENT AND IMPLEMENTATION

V. DEVELOPMENT OF IWRMD POLICY FRAMEWORK

LLDA has identified three attributes (concerns) as rationale for the development of the integrated water resources management and development policy framework. These concerns include (i) environmental and health risks; (ii) institutional capacity challenges; (iii) and lack of mechanisms and capacities for development of environmental and water-related infrastructure.

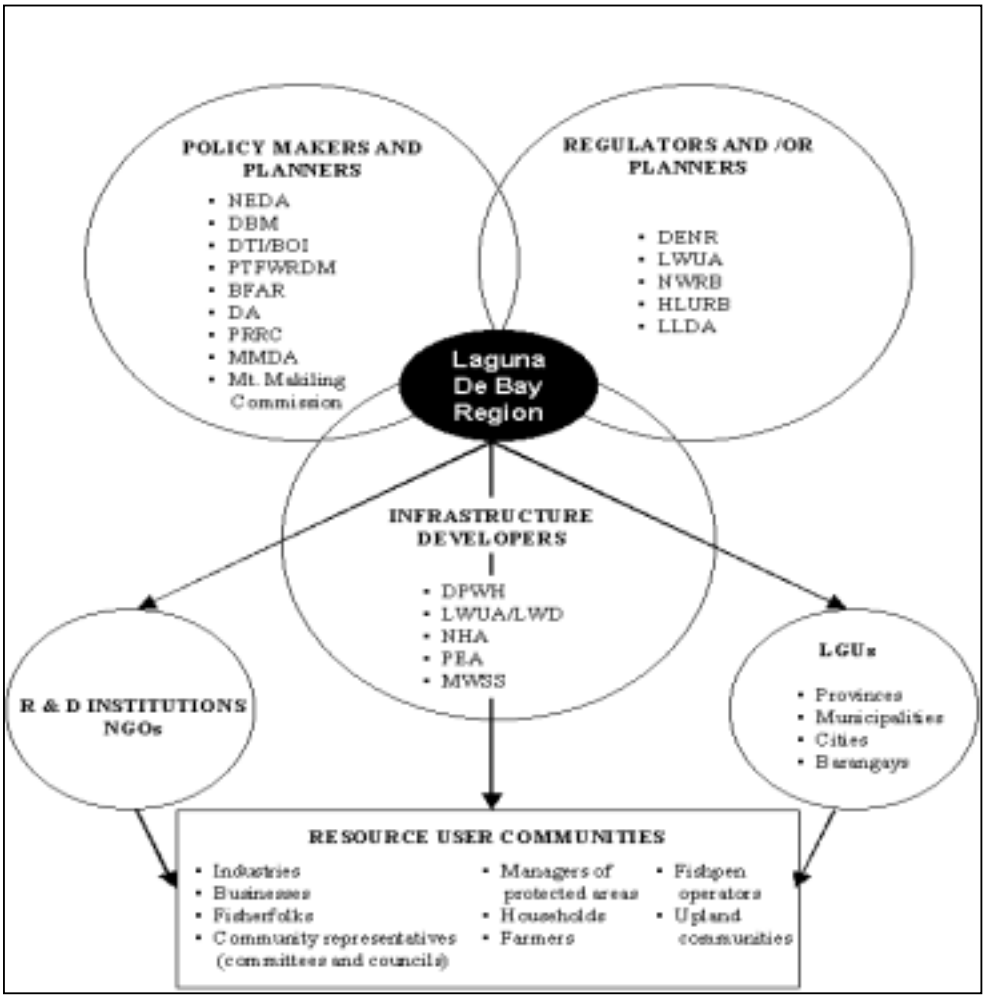
5.1 Environmental and Health Risks

Environmental and health risk posed by scarcity and poor quality of fresh water in the region is a key attribute to any water related policy initiatives in the Philippines. The Laguna de Bay is the main source of freshwater in the Philippine capital and the neighboring areas. Balancing the waste recipient role of the Lake and unplanned development with increasing demand for drinking water supply, fisheries, hydro-electric power and irrigation water poses the greatest challenge to all the policy makers at national and regional levels. **A policy framework for the water resources in the region must be responsive to the serious environmental and health risks that are posed to the citizens living in the region particularly that segment of the population that are highly vulnerable to poor environmental quality.**

5.2 Institutional Context

There are various dynamic and competing demands on water resources of the Lake and its tributaries. The multiple use objectives of the Lake and watershed resources have been recognized as early as the 1960s. In fact, the justification for the creation of LLDA was based on the premise that such institution will balance the different sectoral economic development activities in the Lake and the natural resources carrying capacity of this ecosystem. During the past 34 years, the efforts to create that balance have not been successful as reflected in the increasing deterioration of the environmental parameters in the region.

Figure 5: Stakeholders of Laguna de Bay



Conflicts exist among users (industries, residential developments, infrastructure developers, farmers, and fishers), uses or the zoning priorities (industrial, agricultural, residential, and protected areas), and jurisdictions (among central and local government agencies, government own corporations, and private sector). Most of the current and foreseen problems in the management of the Lake and its watershed are attributed to these conflicts.

Conflict among users: Some Case Studies

A set of case studies exists that clearly reflect the root causes of conflicts among the lake users. Among these cases the following are representatives of the conflict issues:

- Development projects to improve the use of lake water for irrigation is faced with increasing salinity and contamination from the Pasig River that will make the lake water unsuitable for agriculture. Pollution from industries, household waste, and transportation within the lake also threatens the agricultural enterprises. Although LLDA has started to implement strict regulations against effluent discharged by industries, the lake's role as a waste receptacle is not likely to decrease.

- The Napindan Hydraulic Control Structure (NHCS) has been the cause of conflict between the Department of Public Works and Highways (DPWH) and the fishing community. The purpose of the NHCS to regulate backflow from the Pasig River has been ignored in favor of fishermen who need the brackish water for the productivity of the aquatic resources of the Lake. The role of the lake as a buffer against flooding along the Marikina and Pasig Rivers has exacerbated the conflicts by the impact of a flooded lake on farms, fishpens, and lakeshore development.

- Use of the lake by fishpen owners constitutes another level of conflict. From 38 hectares in 1970s, fishpens grew to more than 30,000 hectares in 1983, seriously reducing the areas for open fishing and impeding navigation. To reduce the

adverse impact of fishpen on fish production, LLDA implemented a zoning plan that reduced the fishpen areas to 10,000 hectares and fish cage areas to 5,000 hectares. Still the fishermen, fishpen operators, the Bureau of Fisheries and Aquatic Resources, and LLDA continue to argue the wisdom, size, location, and the benefits of these structures. Compounding the problem is the weak enforcement of fisheries Laws on the fishing boat registration, illegal fishing, and the role of LGUs in the enforcement of these laws.

- The Lake's potential as a key source of drinking water cannot be ignored. The two previous administrations in the Philippines proclaimed this goal for the Laguna de Bay. Increasing emphasis on the role of the lake as a source of drinking water supply will challenge all other uses of the lake.

- Quarry operations around the lake and in its watershed is another resource use that potentially contributes considerably to pollution and sedimentation of the lake. Currently, the Mines and Geosciences Bureau (MGB), an office under the DENR, regulates quarries over 5 hectares while the Provincial Governors control the smaller quarries. The authorities for permitting, clearance, and enforcement among DENR, LGUs, and LLDA have not been streamlined. In addition, there are illegal small-scale mining operations in the region.

- A large portion of the population in the region are informal settlers who typically cluster in the flood and pollution-prone locations such as shorelands, river banks,

embankments, and other areas subject to severe flooding. Most of these areas are in fact the environmentally sensitive areas. The solid waste generated by this large population are carried by the rivers to the lake.

- Attempts to protect the lake as primarily a protected site has long been abandoned in favor of unavoidable demand for water and fish. However, a small-scale tourism industry still struggles to survive amidst the lake traffic. Visitors take historic tours and boat rides to remote pockets where swimming is considered safe.

The existing institutional arrangements for the development and management of water resources in the region are complex. While there is no coherent and integrated environmental or development policy, there is a series of separately formulated and separately implemented policies, mandates, and programs each striving to meet the relatively narrow and stand-alone goals. Lack of a coherent and harmonized institutional arrangement has resulted in fragmentation of the plans and created barriers to the effective management of the Lake and its watershed. It is anticipated that the economic development activities in the form of urbanization and industrialization will accelerate in the future causing deeper land and water use conflicts. Particularly conflict over water will significantly increase in the immediate future. Therefore, the need for establishing mechanisms for proper water allocation in the region is becoming a key policy issue for the national and the local agencies active in the region.

Balancing the supply of and demand on water resources in the region through conflict resolution mechanisms and institutional arrangements is another challenge posed to the national and regional policy makers. **A policy framework for the water resources in the region must encompass the institutional arrangements for balancing the wide range of demanding interests and the supplying capacities.**

5.3 Development Context

Inherent in the LLDA Charter is the creation of an authority for water resources development purposes. This overarching mandate of LLDA has not been met because of lack of capacity and appropriate mechanisms to enable the Authority to initiate and involve the private sector in capital intensive infrastructure development projects in the region. Further, the financial flexibility of LLDA and other government owned corporations, in terms of sourcing finances and utilization, has largely been constrained by the multi-layered approval process for fund solicitation.

In the absence of any organization with specific mandate for the development of water resources of the Lake and its watershed, LLDA, because of its charter, is recognized as the only organization that could fulfill this role. However, undertaking so many diverse functions over the past forty years have over-stretched LLDA. Today, this focus of the Authority on regulatory function to the exclusion of its planning and development roles is evident in the existing business and financial profile of LLDA.

It is clear that the regulatory function of the Authority should be segregated from development activities to enable a more effective implementation of its intended mandate. LLDA will need to develop the capability to leverage and facilitate private sector participation for augmenting large-scale water-related infrastructure projects. **Building institutional capacities for undertaking large-scale infrastructure project in the region requires that the regulatory and policy-making function of LLDA is balanced with a strong, but segregated, development function.**

The LLDA re-engineering study also came out with the observation that limited overlapping of mandates and responsibilities are often not a hindrance. The conflict arises when the objectives of the policies and laws creating those mandates contradict. Further, the conflicts become deeper when the resource base in question is delicate and has limited carrying capacity to satisfy all the mandates.

VI. IWRMD Policy Goals and Objectives

Building upon the policy, institutional and technical outputs of the World Bank-funded Institutional Re-engineering Studies and the Netherlands SDLBEP, the common vision for the sustainable management of the Laguna de Bay which LLDA has formulated in a participative fashion with its stakeholders in 2002 is articulated in the following statement:

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 generation; and***
- ***That is recognized and supported by the global community.***

To attain this common vision, the LLDA therefore believes that the purpose of an integrated water resources management and development policy for the Laguna de Bay region is to focus the planning and management activities on the protection of the Lake and its watershed. This implies that LLDA as well as other governmental organizations will need to coordinate the planning and management activities in the region around an ecosystem and watershed based approach. Inclusive in this policy statement are five key objectives: participatory ecosystem-based planning and management, partnership with stakeholders, improve compliance and broadened market-based instruments (MBIs) and measures to restore water quality of the Lake, and developing and sharing knowledge.

The Laguna de Bay Master Plan

Implementation of an integrated environmental and developmental policy calls for coordination and facilitation of protection and remediation measures. Thus, a Laguna de Bay Master Plan was formulated in 1995 and approved by the President of the Philippines in 1996. The Laguna de Bay Master Plan the Master Plan represents the most explicit action towards the strengthening of the integrated lake basin management approach. It addresses the need to fill the policy gaps and program measures as necessary for integrated water resources management after a comprehensive assessment of the present conditions of the lake, establish the attributes and potentials of the lake and the watershed and formulate strategies and measures for the protection, rehabilitation and enhancement of the lake environment and

natural resources in order to attain sustainability as a vital ecosystem, by recognizing interacting relationship between and among the various uses of land and water resources and the conflicts among alternative production activities as well as uses of the lake water and surrounding related land resources particularly those dictated by urbanization and industrialization.

Thus, the Master Plan focuses on the following specific concerns: environmental management, watershed management, fisheries development and institutional arrangements. The plan sets the priority policies and measures to address these specific concerns and calls for the LLDA to transform its fundamental role as well as its management approaches and strategies as a basin resource management institution. From its heavy regulatory orientation, it has now become critical to transform the Authority as a market/client driven developmental agency. This role necessitates a shift towards a more result-oriented, client-focused and market-driven initiatives.

VII. Policy and Institutional Responses

The LLDA has established the following policy and institutional responses to meet IWRMD goals and objectives which are set out in the Letter of Institutional Development Objectives (LIDO) dated November 04, 2003. This document which was submitted by the Philippine Government to the World Bank, confirms the longer-term strategy for the institutional arrangement in the management of the Laguna de Bay watershed and to provide the policy and institutional underpinning for the Bank and Netherlands funded institutional strengthening project for LLDA.

7.1 Pollution Reduction and Improving Water Quality

With the recently enacted Clean Water Act of 2004, the LLDA has, in cooperation with the member LGUs, a renewed obligation to implement measures to improve compliance with pollution regulations and to further develop the effectiveness of its pollution charges, such as the user fee, and other market-based instruments. The Clean Water Act advocates area-based water quality management and action planning, improved water quality compliance scheme at the LGU level, improved coverage of domestic wastewater collection, treatment and disposal and expanded financing mechanisms through the setting up of the water quality management fund and user fee. This legislation recognizes LLDA mandate over Laguna de Bay Region as a Water Management Unit.

7.2 Effective Cooperation and Management of Water Resources in the Laguna de Bay Watershed

The Government's strategy for water resources, as formalized in the MTPDP 2001-2004, focuses on an integrated water resources management approach centering on rivers or lake basins. Government will pursue institutional strengthening of efficiently and effectively operating river basin organizations, such as the LLDA. As such, the Authority faces a challenge to improve its overall water resources management approach, but at the same time delegate responsibilities for management and protection of micro-watersheds to other stakeholders. In view of competing and conflicting uses, the LLDA is more than ever challenged to further expand its regulatory tools and market-based instruments to increase the sustainable use of environmental resources. .

The Government's Integrated Water Resources Management approach challenges the LLDA to not only strengthen itself as a watershed management authority, but also to increase its cooperation with LGUs, River Councils and civil society at large. The Co-Management approach will have to be implemented for both environmental and investment planning and implementation. As such, the LLDA will have to move towards taking an active role as facilitator to provide incentives for watershed institutions and its users to engage their own resources for environmental improvement.

7.3 Strengthening Local Capacity and Involvement in Environmental Planning and Management

Co-management of micro-watersheds will also require capacity building in environmental planning and management of various levels of local governments and communities. The knowledge and experience gained from the past capacity building activities, i.e., (i) the LLDA Re-engineering Program, based on the results of studies funded by the World Bank/Japan PHRD Grant; and (ii) the Netherlands-assisted "Sustainable Development of the Laguna de Bay Environment Project", are expected to play an important role in the enhancement of these institutions/ partners and their engagement on multi-stakeholder and micro-watershed-based planning and implementation of environmental interventions. It should be noted that the LLDA for its part has already undertaken training of LGUs and River Councils and has provided the latter seed money from corporate funds and portions of the fishpen fees to LGUs. However, the LLDA admittedly confirms that its ongoing initiatives are not sufficient to address the challenges for improving watershed management.

VIII. Strategies for IWRMD Implementation

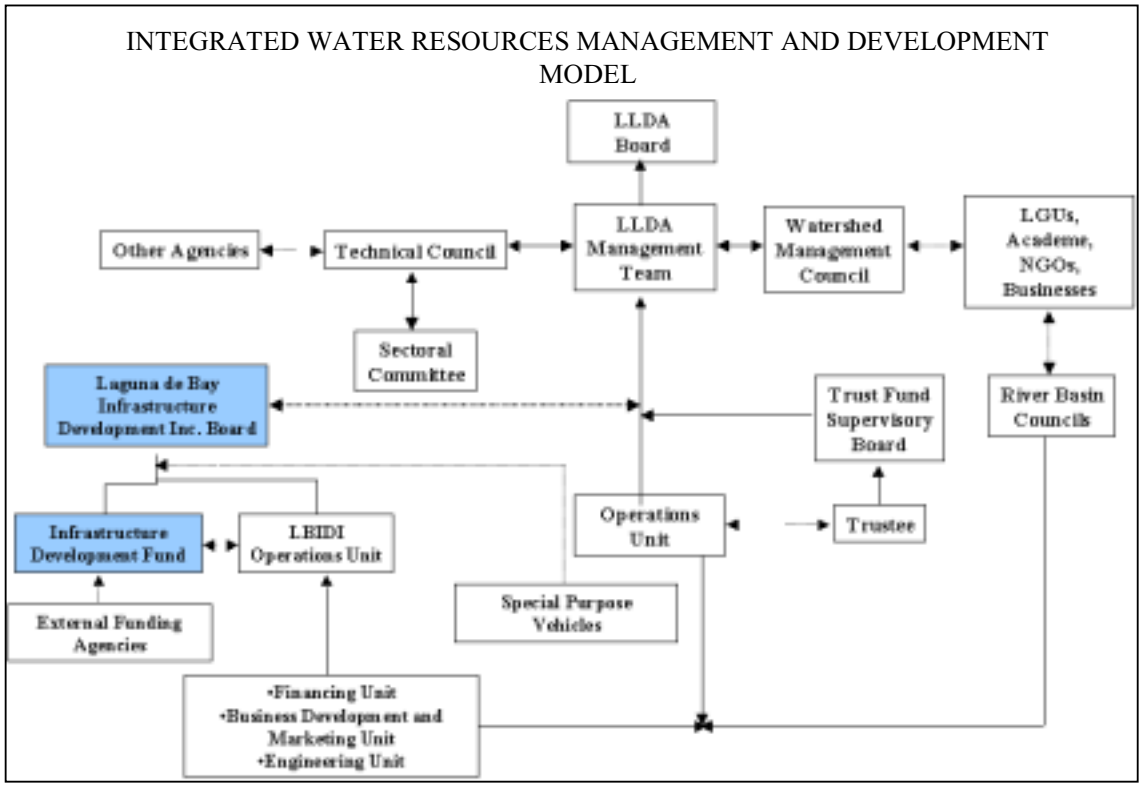
In the recent times, LLDA has introduced and advanced in accordance with the Master Plan and the set policy objectives and institutional responses, a range of institutional, market-based, conflict resolution, technical and engineering measures as well as community-based watershed management interventions to halt the rate of deterioration of the water resources in the region and improve IWRMD implementation in a sustainable way.

8.1 Institutional Strengthening of the LLDA

Almost all the previous studies on the environment in the Laguna de Bay Region singled out LLDA as the only Authority with a focused mandate of improving the environmental condition of the Lake and its watershed. LLDA was found to be unique with respect to (i) regulatory, policy, and development mandates that are focused on the Lake water quality, (ii) its 40-year track record in the region, and (iii) transparent financial status and a semi-corporate structure, potentially attractive to private sector for investment in infrastructure development. Further, a comparative study of the local or regional development (water) agencies in other countries (European, United States, Indonesia, and Thailand) showed that among the government owned corporations in the Philippines, the mandate, geographic focus, and structure of LLDA is the most compatible to those development agencies that are operating successfully in the countries studied. These studies recognized the need to strengthen LLDA, to focus LLDA on the core water-related problems in the region, and to provide opportunity to lead the transformation of LLDA into an effective apex body capable of rallying stakeholders around a common vision and management system for the Lake and its watershed.

Since its creation in 1966, new tasks and demands have emerged. In the year 2000-2001, the Re-engineering study for the LLDA was conducted through a grant from the World Bank. The LLDA Re-engineering study brought to fore the inadequacy of the existing LLDA organization to confront new challenges such as a rapidly growing demand for lake water to serve the needs of an expanding metropolis and lakeshore towns. It needs to properly coordinate infrastructure development and regulate the multiplicity of resource uses by various sectors. The study recommended a new organizational structure and staffing anchored on integrated water resources management and development (IWRMD) model, pointing out to the urgent need to prepare LLDA for an apex role in managing the lake and its watersheds, a role that requires facilitating interaction and balancing the conflicting interests of a large set of stakeholders amidst alarming threats on the sustainability of the lake. The model focuses the limited resources available on the most pressing issue. These issues are evaluation of the quantity and quality of available water resources under alternative land uses, allocation of raw water and reused water to competing uses and users, development of water supply and demand management strategies and mechanisms to increase welfare derived from scarce resources of water and capital in a sustainable manner, and remediation of highly polluted water and sediments in the Lake.

Figure 6. The LLDA Institutional Re-engineering Model



The main characteristics of the institutional model are as follows:

- The primary mandate of the re-engineered LLDA will be policy-making, planning and implementing an integrated water resources management and development for the lake and its river systems including enhancing water quality and quantity, expanding the regulatory responsibilities for monitoring compliance with water standards, expanding the EUFS;

- The scope includes the overall management of Laguna de Bay and its river tributaries, shorelands and aquatic resources and expanding it to include groundwater in the future. Included in this scope is raw water pricing

development and implementation, environmental infrastructure development and coordination of land use planning in collaboration with LGUs;

- The level of autonomy will expand from its current status as a Government Owned and Controlled Corporation (GOCC) relying solely on operating revenues to an investment-oriented development organization through the proposed Laguna de Bay Development Corporation

- The LLDA becomes the apex body in the Laguna de Bay Region with the responsibility for coordinating integrated watershed management and development program.

In this model, the LLDA Board remains as the policy-making body of the Authority. In order to make the decision-making process more inclusive, two advisory groups shall support the Board: the Technical Council and the Watershed Management Council. The Technical Council will serve as a permanent advisory council to LLDA for making policy for resolving issues related to institutional arrangements in the Laguna de Bay Region including harmonization and resolution of conflicting and overlapping functions, activities, policies and plans that exist or arise between and among the LLDA and other government agencies and GOCCs in the region.

The Watershed Management Council will be a multi-sectoral advisory council to support policy and planning activities in the lake watershed among the sectors with stakes in the region. The Council will serve as a convergence point for the review of sectoral policies and programs that have implications on watershed resources.

The model includes a proposed Laguna de Bay Development Corporation (LBDC) that after a 2- to 3-year pilot program will serve as the investment-oriented infrastructure development arm of LLDA, hence creating greater autonomy and flexibility for the Authority to actively involve in infrastructure project development. Further, the model includes two advisory councils (technical and watershed management) and a Trust Fund formed from the revenues generated by the Authority for supporting watershed management related projects in collaboration with LGUs and other stakeholders.

8.2 Environmental User Fee System (EUFS)

There are ample command and control instruments in the Philippines that should be used more effectively by DENR and LLDA to compel compliance in the region. The assessment of the regulatory structure in the region clearly describes the adequacy of the power, scope, and the rules governing air, water, land, and waste management, but there is lack of more innovative, market based incentive instruments to leverage the existing laws to compel compliance with the environmental quality standards. The strategy of LLDA is to apply these two instruments in combination.

Implementation of the EUFS started in January 1997 as Phase 1 of the National Program. It was designed in a manner that integrates and harmonizes command and control (CAC) and economic instruments with the objective of generating mechanism to improve environmental enforcement and compliance status of firms located in the Laguna de Bay Region. The system now forms an integral part of LLDA's Environmental Management Program.

The EUFS is primarily aimed at reducing the pollution loading into the Laguna de Bay. It makes all dischargers of liquid waste directly accountable for environmental damages brought about by their day-to-day operations by internalizing the cost of environmental degradation and enhancement into their business decisions and actions. Eventually, the foremost goal of the EUFS is to limit point sources wastewater discharges to a level that would ensure that water bodies within the Laguna de Bay system would be protected and made suitable for their intended uses.

The fee system is composed of a fixed fee and a variable fee. The fixed fee covers the administrative costs of implementing the system based on volumetric rate of discharge, while the variable fee depends on whether the BOD concentration is above or below the concentration threshold which corresponds to the existing effluent standard for BOD of 50 mg/L, regardless of total BOD load. This scheme has induced firms to be more cost effective in trying to comply with standards and in effect made the EUFS a model of mixed regulatory and economic instrument. An enterprise is required to obtain a Discharge Permit (DP), renewable annually, from the LLDA. The DP is a legal authorization for the enterprise to discharge their wastewater of acceptable concentration set under DENR DAO 35 to the lake or its tributary rivers.

The EUFS is planned to cover all water pollution sources from industrial, commercial, domestic and even agricultural sources. As a matter of strategy LLDA implemented the EUFS by stages. A budget of about P27 M taken from LLDA's corporate funds was initially

allocated to support implementation requirements including acquisition of additional fleet of vehicles and some laboratory equipment.

During the first year of the EUFS implementation in 1997, imposition of user fee was based only on the BOD content of industrial wastewater and was applied to around 120 industrial firms located within the LLDA's area of jurisdiction. These firms belong to five industrial sub-sectors that were estimated to account for nearly 90% of the total organic load into the lake: food-processing firms, pig farms and slaughterhouses, beverage manufacturers, firms engaged in dyes and textiles, and paper and pulp mills.

The following year, all industries that generate process wastewater were covered and on the third year, residential subdivisions and commercial establishments including food chains and restaurants that discharge wastewater into the environment were likewise, covered.

A more objective assessment can be presented in terms of the implementation of the Environmental User Fee System (EUFS). After the three-year introductory phase of the EUFS and into its regular implementation, the total number of firms covered as of December 2002 was 914. There has been significant reduction in the BOD loading into the lake from 1997 to 2002 as shown in Table 5.

Table 1. Estimated BOD Reduction in the Lake due to EUFS Implementation

Year	Cumulative No.of Firms	BOD Loading (in MT/year)	BOD Loading Reduction (%)
1997	222	5,403	
1998	255	4,432	24.08
1999	429	1,790	65.8
2000	628	2,309	19.08
2001	738	1,687	40.61
2002	914	791	61.3

The significant reduction in the BOD loading in the lake from 1997 to 1999 coincided with the introductory phase of the EUF and is a reflection of its successful implementation. The reduction in the BOD loading was due to several factors: (a) increased efforts among the regulated sources to treat their wastewater by putting up new or improving their existing treatment facilities, (b) wastewater recycling activities, (c) waste minimization, and (d) voluntary closure or plant relocation. This was greatly influenced by the strengthened monitoring activity complemented by faster resolution of pollution cases.

The actual impact to ambient lake water quality condition of the BOD loading reduction from point sources as a result of EUFS implementation is still undetermined. The LLDA intends to apply its newly developed Decision Support Systems and modeling tools to achieve full coupling of the results of laboratory analysis database on industrial pollution loads to the waste load model and the GIS-generated information.

Aside from the EUFS, the traditional regulatory system of the LLDA is still in place. All industrial establishments are required to register and those with wastewater discharge are required to have a Pollution Control Officer (PCO) that shall be accredited by the Authority.

The LLDA has developed a training program for PCOs for accreditation purposes, which includes lectures such as on clean technologies. Aside from generating a modest income for the Authority, it has also become a vehicle for disseminating the plans and programs of the Authority and the pollution laws being implemented in the Laguna de Bay Region. This program has gained wide acceptance from the industrial sector and there are a number of cases where they themselves request for a special training schedule.

8.3 River Rehabilitation Program : A Watershed Co-management Approach

The principle of co-management underpins LLDA's approach to ensuring the sustainable management of the Laguna de Bay watershed. The Authority believes that joint stewardship will enhance the complementation of the capacities and comparative advantages of the different stakeholders in rallying them towards the common objective of protection the lake. Such an approach is likewise seen to address the premise of externalities inherent to resource use and management and which exist among lake users and agencies' tasks to protect the lake, i.e., the need to develop a partnership by which the benefits and responsibilities of natural resource management are shared in the most efficient and equitable manner possible. Towards this end, the LLDA strives to encourage the participation of local communities and LGUs in the management of natural resources through cooperative arrangements and consensus-based decision-making, thus giving greater control and responsibilities to communities along with the needed resources, sustainable options and capabilities.

In 1996, the LLDA started a River Rehabilitation Program for the rivers and streams flowing through the 24 sub-basins or micro-watershed of the Laguna de Bay basin. This program has evolved from a mere physical clean-up of rivers to a more comprehensive and sustainable approach by encouraging broad multi-sectoral involvement and support.

The River Councils

One of the important achievements of LLDA has been the formation of River Councils (now federated) in the major river tributaries. Various stakeholders within each sub-basin such as local government officials, academic institutions, industrial and commercial establishments, religious groups, NGO's, PO's (people's organization) civic organizations, homeowners, etc. were organized to a River Rehabilitation and Protection Council (RRPC). There are now 24 River Councils (RCs), one for each of the 24 micro-watersheds of Laguna de Bay, established by LLDA. Each of the RCs is composed of 20 to 50 members from a cross section of society in the area. The councils are registered with the Securities and Exchange Commission as non-profit, non-stock organizations. They serve as the forum for sharing information and free discussion of issues on environmental protection, watershed management; program/project identification and prioritization. They also play a key role in project implementation at the micro-watershed level.

A systematic approach is being followed by the Council which includes (a) mapping the watershed, (b) comprehensive survey of the river system and its watershed, (c) development of a vision for a healthy river system and watershed and (d) based on this vision, formulate a River Rehabilitation and Protection Plan for the river in focus.

The involvement of the industrial sector in the RRPC has contributed to greater understanding and cooperation with the communities especially those who perceive industries as polluters of the environment. Most of the successful and active RRPCs are those with active members from this sector, whose representatives are often elected to higher position in the council.

All the RRPC were federated on June 26, 2001 to serve as an umbrella organization of the River Councils around the Laguna de Bay Region. The members elected the first set of officers among themselves. A conference of the RRPC/F is held every year where each council or foundation present their accomplishments and update the other councils or foundations on their present projects and future plans and programs. Likewise it serve as an occasion for enriching their knowledge through lectures by invited resource person on matters concerning solid and liquid waste management, waste exchange, and other topics of interest and concern geared towards enhancing the capabilities of the members to perform their tasks.

The LGUs

The Laguna de Bay Region consists of 66 provincial, municipal and city LGUs. Being permanent institutions despite periodic changes in leadership, their continuing presence and political power in the communities within the lake watershed can be harnessed for successful implementation of watershed management interventions. The LGUs are also in the best position to expand and sustain community participation through the barangays and eventually the households, and could be effective mechanisms in information dissemination and project implementation.

The Laguna de Bay Environmental Army

River clean-up campaigns are also being sustained and this involves the physical clean-up of rivers. The LLDA has organized the *Hukbong Pangkapaligiran* or "Environmental Army," a volunteer organization consisting mainly of fisherfolk and farmers, to lead the activity. The men and women of the Environmental Army are exemplars of volunteerism who play a vital role in raising environmental awareness and heightening motivation among various sectors to be involved in the rehabilitation effort. The program was so successful that led the LLDA to institutionalize the RRPC. A seed money of P50,000 or a little under US $1000.00 was given as seed money to support their activity or their registration as a foundation.

Fisheries and Aquatic Resource Management Council (FARMC)

In 1995 the President of the Philippines issued Executive Order 240 "Creating the Fisheries and Aquatic Resources Management Councils in Barangays, Cities, and Municipalities and their composition and functions." This is in accordance with the policy of the Philippine Government to ensure that the management and control over fisheries and aquatic resources shall be effected by the Philippine Government through the active and extensive participation of people directly affected. The law also called for the empowerment of the subsistence fisherfolk through meaningful participation in the management, development and protection of fisheries and aquatic resources for sustainable productivity. Republic Act 8550 known as the Fisheries Code of 1998 further strengthened the important role of the FARMC by specifying the composition of the FARMC and the responsibility of concerned government agencies in ensuring that the functions of the FARMC are recognized and institutionalized. The FARMC is composed of representatives from the Department of Agriculture, LGU, NGO, and fisherfolks including women and representative from the youth sector. Representation

from the LGU is given due importance to ensure that the plans and programs will be incorporated in the municipal or city development plan and given due priority.

The Executive Order is directed to the Department of Agriculture (DA), but in recognition of the exclusive mandate of the LLDA in the Laguna de Bay Region, the task was transferred by the DA to the LLDA through a Memorandum Agreement.

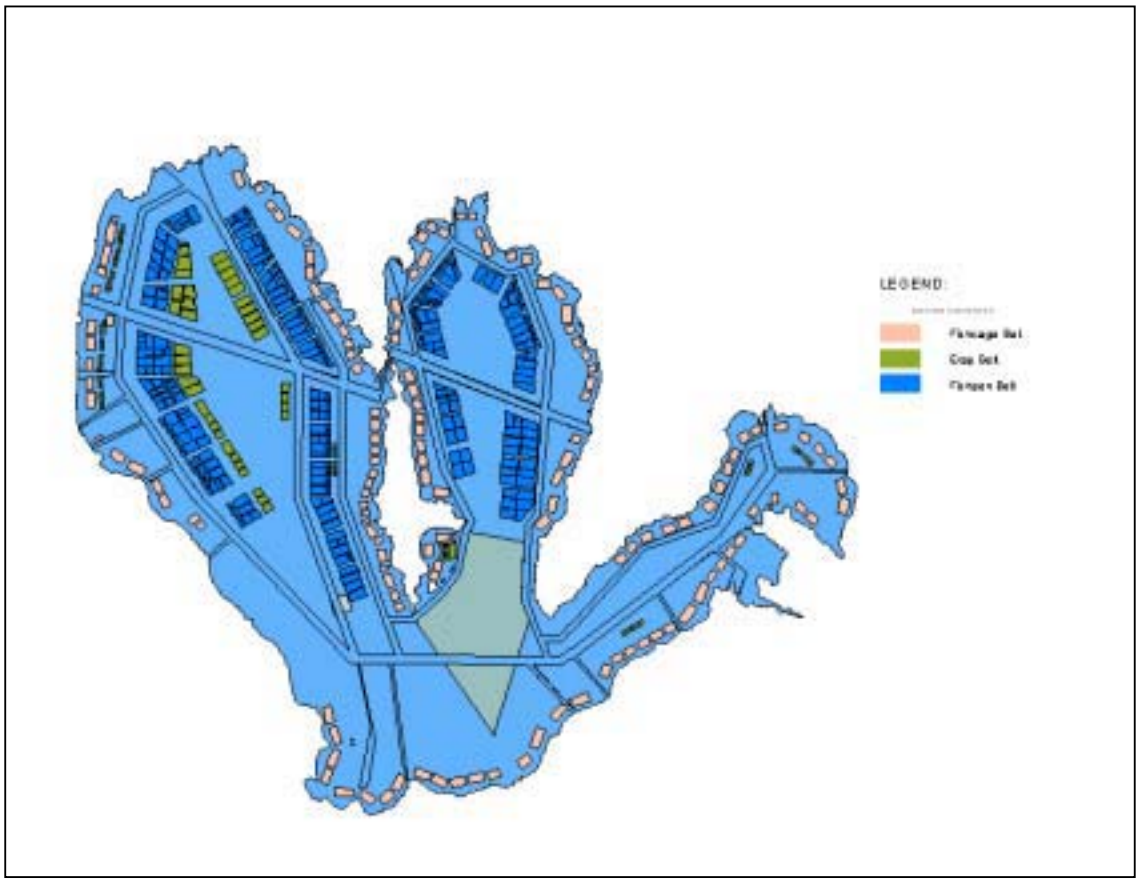
Even before the passage of these laws, the LLDA have already established links with fishermen organization and have rendered financial and technical assistance in their operation. Support came in the way of financing their training as *Bantay Lawa* (Lake Guard) and deputation of qualified fishermen as Fish Warden in coordination with the Bureau of Fisheries and Aquatic Resources. Funds coming from the development fund of the LLDA (section 4.1.4, 5.4.2, Figure 8) are also being given to implement clean-up activities in the lake, and in the surveillance of illegal fishing activities.

8.4 Laguna de Bay Zoning and Management Plan

Considered as the most feasible management system for the equitable allocation of the lake's fishery resources, the Zoning and Management Plan (ZOMAP) for the lake was approved in 1996 under the Laguna de Bay Master Plan to regulate aquaculture operation in the lake. Fishpen and fish cage belts were delineated in specified location in the lake, with a total area of 100 km^2 and 50 km^2, respectively (Figure 8). The area allocation was determined through the estimated carrying capacity of the lake for aquaculture, which was based on the long-term primary productivity data from different locations in Laguna de Bay [5]. Limits were set on

the maximum area that can be occupied for fishpen operation, i.e. 0.05 km^2 for a corporation, 0.01 km^2 for a cooperative and 0.005 km^2 for an individual owner. The maximum area for fish cage is .001 km^2. A permit is issued annually to qualified operators who are required to pay P6,000.00 per hectare (.001 km^2) for fishpen and P4,200.00 per hectare for fishcage. Open areas within the fishpen belt are awarded to an operator through public bidding. The fish cages are still in the process of being transferred to the fish cage belt.

Figure 7. Zoning and Management Plan (ZOMAP) of Laguna de Bay



In consonance with the provision of RA 4850 on the distribution of benefits from fishery to the LGUs, the fishpen fee collected by the LLDA is shared based on the following scheme: from 1983 to May 1996 at 20% to the lakeshore LGUs, 5% to the Project Development Fund (PDF) and 75% to the LLDA; from June 1996 to present at 35% to the lakeshore LGUs, 5% to the PDF and 60% to the LLDA (Board Resolution No. 15, Series of 1996 dated June 27, 1996). Currently, from a fishpen fee per hectare of P6000.00 (US$120.00), irrespective of existence of fishpens, every lakeshore municipality receives a share of 15%, which is distributed by LLDA directly to lakeshore barangays within specific shoreland municipalities. An additional 20 % is directly shared with the municipal LGUs with fish pens off their shore. The LLDA specifies that their share should be used to finance environmental projects.

The guidelines on the release and utilization of the fishpen fee shares of lakeshore LGUs had been defined and established as early as 1986 under Board Resolution No. PCLL-20, Series of 1986. The release of the fund shall be only based on the cost estimate of LGU-proposed programs, projects or activities related to environment, livelihood, river embankment and flood protection works, watershed development and the like for review/approval by the LLDA. The LGUs are required to render a quarterly accounting of the funds indicating the nature of disbursements, its balances and the physical accomplishments. Such report is prerequisite to the release of additional and succeeding municipal fishpen fee shares. However, during June 1996 deliberation on the modified sharing of fishpen fees, the Board of Directors, three of whom are local government officials (Governors of Rizal and Laguna and the President of the League of Mayors), waived the requirements for the release /use of fishpen fee shares as they

were perceived as cumbersome, hence making the funds inaccessible to the LGUs. Nowadays, the only requirement imposed by the LLDA is the official request of the LGUs.

8.5 Shoreland Management Program

It took almost thirty years for the LLDA to assert its mandate on the management of the 140 km ^{2} shoreland of Laguna de Bay. The first action taken was the issuance in 1995 of Board Resolution No. 10, Series of 1995 asserting LLDA's authority and exclusive jurisdiction over Laguna de Bay and banning reclamation projects and disallowing any non-environmentally feasible activities in the lake. On December 14, 1996 the rules and regulations on the use/occupancy of Laguna de Bay shoreland areas was approved by the LLDA Board through Board Resolution No. 23, Series of 1996. It took another two years to create a new unit at the LLDA, the Special Concerns Office, which later became the Special Concerns Division, to take the lead in implementing the rules. In 1999, the guidelines on the lease of the untitled shoreland areas under LLDA's jurisdiction were also formulated and implemented.

Under these rules, it is the declared policy of the LLDA, pursuant to RA 4850 as amended to: (i) properly manage and control the use and/or occupancy of the shoreland areas of Laguna de Bay, within the context of national socio-economic development plans and policies and environmental concerns; (ii) maintain all shoreland areas lying below elevation 12.50 meters as buffer zones in consonance with the Authority's policies, plans and programs for the management of the water quality and protection and conservation of the water resources of Laguna de Bay; (iii) exercise administrative and regulatory control on the land use and/or occupancy of the shoreland areas within the context of the plans and programs of the LLDA,

and to manage such uses and occupancy along desirable environmental considerations; and (iv) provide an administrative system whereby the rights of legitimate titleholders shall be respected.

The LLDA is looking into the effectiveness of the current policy instruments for shoreland management and control due to a number of implementation and enforcement issues:

- Development projects/activities have overtaken regulation and control (the law, P.D. 813, defining the shoreland was enacted in 1975, while the policy guidelines were issued in 1996);
- Lack of resources to monitor shoreland activities and enforce the rules and regulations;
- Indifference of lakeshore LGUs manifested in siting of illegal open dumpsites on shoreland and riverbanks; proceeding with local development activities/projects without the needed environmental clearances and permits from the DENR and LLDA.;
- While the policy tools are existing (Shoreland Occupancy Permits, Notice of Violation, Ex-Parte Orders and Cease and Desist Orders), they are insufficient for the purpose of shoreland restoration and environmental regulation and control.

In order to closely monitor the fast development in land use and environmental conditions in the shoreland areas, immediate assessment of the baseline condition is considered by LLDA as a priority. To improve the planning and institute policy reforms as well as to support the regulatory tasks of the LLDA, a shoreland/watershed information system using the GIS-based

Decision Support System will be developed and a full mapping exercise for at least two pilot areas will be undertaken in the next two years.

8.8 Capacity building

The Sustainable Development of the Laguna de Bay Environment Project which ended in August 2003 was supported by a grant from the Netherlands Government. The three-year project was carried out to ensure the sustainable development of the resources of the lake based upon a sound knowledge of the functioning of the system, its users and the institutional setting. It is specifically directed at capacity building and developing practical and realistic solutions for current problems and issues in the lake basin. Among the achievements of the project were the establishment of an Integrated Water Resources Management Unit and the establishment of an appropriate GIS/database and state-of-the-art modeling system to support decision-making. All of these are geared towards the transformation of the LLDA into an Integrated Water Resources Management and Development Authority.

8.9 Local and international partnerships and cooperation

Conservation of Laguna de Bay Environment and Resources (CLEAR)

CLEAR is a tripartite partnership formed by the LLDA, Unilever Philippines and the Society for Conservation of Philippine Wetlands (SCPW) with a common objective of pursuing the lake's membership in the Living Lakes Network. A Memorandum of Agreement was signed in June 2000 to ensure the continuity of efforts to conserve the lake's resources and empower and educate the communities within the watershed.

As private sector partner, Unilever provides funding support for advocacy initiatives and activities that influence and mobilize the business sector towards corporate responsibility. As a collaborating agency, the LLDA coordinates the tripartite partnership's activities and provide funding support for biodiversity studies on the lake and environmental education projects. As the NGO partner, SCPW has been tasked to design and implement advocacy activities for lake conservation, coordinate with other environmental NGOs in the lake region and be the focal point for coordination with other Living Lakes partners throughout the world.

The idea of joining the network started in November 1999 during Unilever's meeting on Sustainable Water and Integrated Catchment Management (SWIM) in Liverpool, England. The lake's candidacy was formalized in November 2000 during the 5th Living Lakes Conference in Lake Biwa, Japan.

Laguna de Bay was accepted as the 18th member of the Living Lakes Network in August 2001, during the 6th Living Lakes Conference held in the Lake Baikal area in Ulan Ude, Siberia. Its admission to the network was a "breakthrough for Laguna de Bay and a milestone for Philippine environmental history" (Jerry Esplanada, Philippine Daily Inquirer). More importantly, it brings the conservation of the lake to the attention of the international community, which can serve as a positive pressure on the government to take serious actions on preventing the deterioration of the lake environment.

The Philippine 12th Congress through House Resolution No.140 commended and congratulated the LLDA, Unilever Philippines and the SCPW in the successful bid making

Laguna de Bay as the 18th member of the Living Lakes Network. This has made the protection and conservation of the lake as an international imperative.

Three-way Partnership with Chesapeake Bay (U.S.) and Tha Chin River (Thailand)

In August 2002, the LLDA forged a partnership with United States agencies (US-AEP, USEPA, USAID, etc.) on sharing of knowledge, experiences, and best practices on community-based environmental management and resource conservation in Chesapeake Bay in eastern United States, as well as with the Pollution Control Department of the Kingdom of Thailand on Integrated Watershed and Water Quality Management and Public Participation in the Tha Chin River Basin. LLDA's River Rehabilitation Program and its partnership with the River Councils in the river systems in the lake region was cited as one of the best practices on community-based resource management scheme during the international workshop that was held in August 2002 in Manila.

IX. FINANCING IWRMD IMPLEMENTATION

Under the LLDA Institutional Re-engineering Studies in 1999-2000, an assessment of the financial performance, financing and investments of the LLDA in the context of its key functions and IWRMD framework, was undertaken for the years 1995-1999.

9.1 Capitalization

The LLDA was created under RA 4850 in 1966 as a quasi-government agency with a corporate structure and management operations. Of its authorized capital stock of Php7.0 million, the total issued and outstanding and subscribed capital stock amounted to PhP387.14 million representing only 55.3% of the total authorized capital. Of this, 92.2% is accounted

for by the National Government and the remaining by the Rizal and Laguna Provinces, various municipalities and private corporations and individual stockholders. Of the total paid-in capital of Php173.27 million, 94.12% is paid up by the National Government. The two provinces took up only 14.9% of their combined subscriptions. Calling for additional subscription is a clear option to improve LLDA's financial position. Easily the Authority can generate PhP312.86 million from this option.

9.2 Financing

Under its present mandate, LLDA is authorized to source its funds from the following:

- National Government subsidies and financial assistance to carry out its social overhead projects, upon recommendation of the NEDA Board;
- Bilateral and multilateral sources through their technical assistance grants or loan facilities;
- Contracted loans through floating of bonds and other debt instruments;
- Sale of stocks and invest in secured debt instruments
- Public-private partnership
- Build-Operate-Transfer contracts with private entities pursuant to thee BOT Law (RA 6957 as amended by RA 7718

The LLDA can also make recommendations to the proper government agencies on the peso or dollar financing requirements of its mandated functions, technical support, the level of priority to be given to certain projects, and accordingly solicit assistance from the national Government or any of its instrumentalities.

The Charter of the LLDA further allows the Philippine Government to guarantee the payment for principal and interest of the loans, bonds, debentures and other obligations of the Authority

While the LLDA Charter provides for broad opportunities to expand its financial base, these are limited and hampered by the long, tedious and multi-layered approval process of the National Government, thus affecting the proper timing and provision of financing for long-term sustainability of the lake and watershed resources.

9.3 Flow of Revenues Through the LLDA Mandate/ Functions

As a GOCC with an enabling Charter, LLDA can raise revenues and retain the same for its own disposition. The following are the revenue raising sources of the Authority:

- Processing fees for clearances and permit;
- Reasonable fees from users/beneficiaries of the resources, e.g., water supply, aquaculture (fishpen fees), etc.
- Administrative fines and penalties for violation of pollution control laws, rules and regulations;

The LLDA Board of Directors fixes the rates of the fees to be collected, and recommends to the President the approval of the sharing of the fees with LGUs and other government agencies, if necessary. This excludes the fishpen fees the sharing of which has been provided under EO 927.

The LLDA Charter also allows it to collect these revenues and to earmark the collection for environmental management and development of the lake and its watershed. However, it is this requisite earmarking for environmental enhancement that also limits the Authority's flexibility to embark on initiatives which are strategic to its mandate. The LLDA should engage in pioneering activities/projects so as not to compete with the private sector. It is prohibited to invest its funds in high risk endeavors and debt instruments without recourse to commercial banks or investment houses and in highly speculative stocks. Ironically, while the law gives LLDA revenue-enhancing capabilities, it cannot improve its employees compensation package without amending its Charter, particularly exempting the LLDA from the coverage of the salary standardization law.

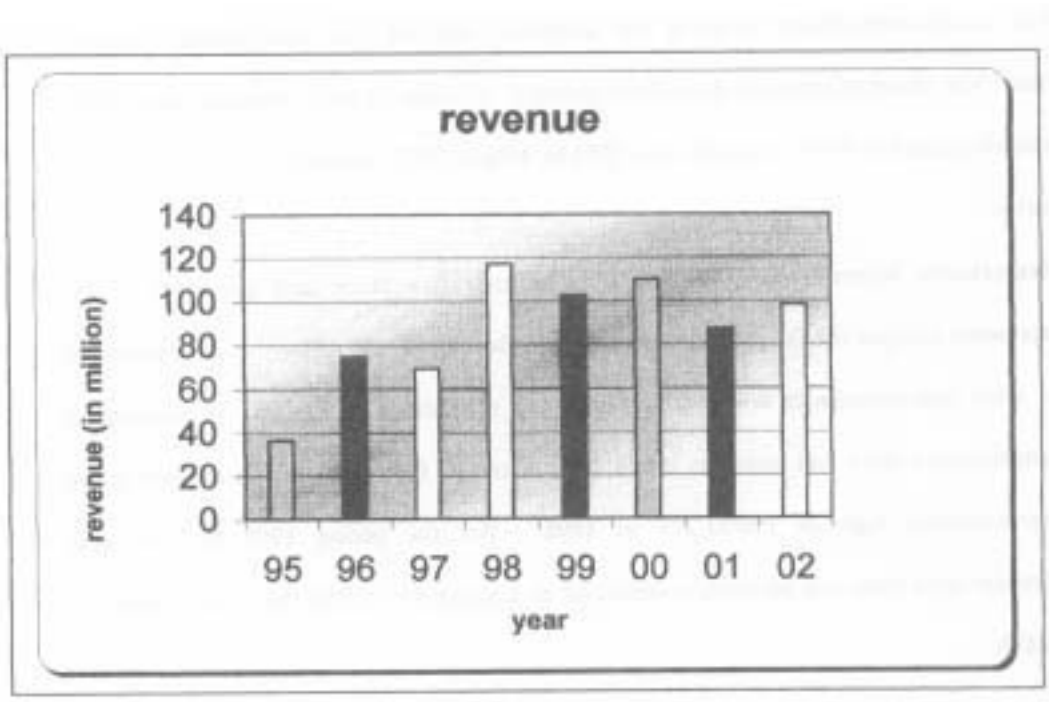
The revenue performance of the LLDA for the years 1995-2002 is summarized below (Table 7). The annual percentage growth rate for each revenue item to the total revenue are presented in Figure 11.

Table 2. Corporate Revenues Sources

	1995	1996	1997	1998	1999	2000	2001	2002
	(in Million Pesos)							
Revenue from operations								
Fishpen/Fishcage Fees	17.873	44.571	17.054	28.505	25.856	36.938	22.901	39.766
Fishpen repairs/processing	0.121	0.012	–	0.008	0.022	0.008	0.013	0.211
Survey Fee Fishpen	0.039	0.040	0.404	0.718	0.326	0.816	0.642	0.926
Barging Fees	0.380	0.437	0.676	0.595	0.352	0.418	0.470	0.046
LLDA Clearance Fees/Air Pollution	7.175	9.210	11.903	16.537	19.746	17.844	17.060	7.192
Discharge Permit	–	–	6.660	14.798	12.490	13.334	11.964	21.376

Fees								
Laboratory Fees	0.370	0.398	0.223	0.650	0.225	0.126	0.341	0.625
Admin Fines Pollution	1.395	5.194	16.114	33.217	24.649	20.004	14.080	13.762
Shoreland Management Fees	–	–	–	–	0.112	1.225	2.133	2.194
Survey Fees Land	–	–	–	–	–	–	0.055	0.193
Water Abstraction	–	–	–	–	0.184	1.158	1.607	1.844
Receipts from Market	0.488	0.421	0.036	0.025	0.064	0.389	–	0.026
Interest on Marketable Securities	8.388	11.77	12.47	18.873	15.776	13.940	13.985	7.484
Interest on Other Bank Account	0.073	0.143	0.121	0.235	0.167	0.207	0.169	0.103
Miscellaneous	0.261	1.586	3.482	2.937	2.414	3.256	1.394	2.278
TOTAL	36.563	74.502	69.143	117.098	102.383	109.663	86.814	98.026

Figure 8. Annual Revenue Collection



Analysis of the above figures on the relative contributions of the various revenue sources indicate the following trends:

- **No perceptible trend in fishpen fee collection:** Except for the windfall collection of fishpen fees in 1996 after the Supreme Court Decision in December 1995 ruling out the authority of LGUs over issuance of fishery permits and favoring the jurisdiction of LLDA over fishery and aquaculture regulation in the Laguna de Bay area, the 1995-2002 fishpen fee collections could be considered as normal levels. Further, in 1997 all registered fishpen structures were fully transferred to the approved 1996 Fishpen Belt.
- **Steady increase in revenues from environmental regulation:** These essentially consist of Environmental User Fee, processing fees and other environmental permit/clearance fees, wastewater/effluent sampling and laboratory analysis fees, development clearance fees. The share of revenues from environmental activities to total revenues since EUFS was introduced in 1997 increased from 28% to 46% in 2002, averaging 45% for the 8-year period.
- **Remarkable increase in collection of administrative fines and penalties:** This represents charges for failure to meet the established water and effluent quality standards or other non-compliance with the set rules and regulations of LLDA. Collection of administrative fines and penalties range from a low of PhP1.395 million in 1995 to an unprecedented high of PhP33.217 in 1998. For the period 1995 to 2002, the administrative fines and penalties contributed an average of 18% to the total revenues of LLDA.
- **Increase in average growth rate in investments in marketable securities:** This revenue source contributed an average of 14% to total revenues of LLDA for the period.

Leveraging LLDA's Revenues for Environmental Enhancement

Section 3 of Executive Order 927 of 1983 provides that fishpen fee will be shared with lakeshore local governments (refer to _____). The Authority collected PhP21.752 million and P50.736 million in fishpen fees during 2001 and 2002, respectively. 35 percent of this revenue collection was disbursed to LGUs for environmental and other projects.

That project development and implementation funds, and for that matter environmental funds, can be effective mechanism for channeling corporate revenues to help address environmental problems, has been demonstrated by LLDA through its Project Development Fund. This Fund has allowed the LLDA to provide financial resources for implementation of environmental and social development projects and activities at the LGU level. If not for the fact that some of the releases out of the PDF to LGUs go to their General Fund, which can be used for maintenance and other operating expenses rather than implementation of concrete projects on the ground, the PDF could provide much-needed financial resources when government financing may be too limited or unavailable.

X. Priorities for IWRMD Implementation for 2004 and Beyond

The revitalized development mandate of LLDA reflects a paradigm shift of Laguna de Bay's current environmental management policies and practices, and challenges the status quo of present resource uses. These policies embrace a wide range of sectors and interest groups whose mindset and behaviors must be modified if the Lake's resource use conflicts and issues are to be effectively mitigated and addressed. Within the policy statement, policy objectives, and the strategies presented in section __, LLDA has already set the priorities and initiated a

number of activities along policy implementation and institutional strengthening under the following:

10.1 Institutionalization of a Re-Engineered LLDA

The lost opportunities to re-organize on time has prompted the LLDA to be more aggressive in the pursuit of its reorganization based on an institutional model which builds on a fully integrated water resources management and development institution. One of its strengths is the proposed wider representation and participation of the stakeholders through the Technical Council and the Watershed Management Council. The model was adopted by its Board of Directors on 25 January 2001 through Board Resolution No. 157, Series of 2001. Representations were already made at the Philippine Senate and House of Representatives that resulted to the filing of House Bill 4252, a draft bill to strengthen the LLDA. No less than President Gloria Macapagal-Arroyo in her speech during the Presidential Visit to Laguna de Bay in October 2002 expressed support to the re-engineering of LLDA to make it more responsive in carrying out its mandates, considering the impact of its operations on the lives of millions of people living in its watershed.

Although it is still a long way to go**, the LLDA has already been operating on the principle of integrated watershed management**. Adoption of a framework that is focused on integrated water resources management has been imperative due to a number of factors: strategic location and economic-environmental significance of Laguna de Bay, multiple use of the lake water and watershed resources; and inefficiency of the institutional arrangements.

10.2 Expanded Community Networking and Development for the Lake Watershed Management

Although the objectives of the stakeholders and the resource uses in the region may not always coincide, LLDA is considering to institute two coordination councils (a technical council and watershed management council) that will represent the desires and aspirations of the stakeholders of the region in the decision making processes for future planning and program development and implementation. Furthermore, these councils will help in resolving conflicts that may arise among the multiple of users in the region.

The proposed Watershed Management Council should provide guidance and directions for the activities of the River Basin Councils. In addition, these councils will be the implementation arms and monitors of the integrated watershed management plan that is proposed to be prepared immediately. The River Basin Councils will be responsible for the watershed management planning, implementation, and monitoring at the sub-basin level. They will facilitate the process of mobilization, planning, implementation, and monitoring of the different watershed management activities undertaken by different stakeholders.

10.3 Improving Compliance and Expanding Market-Based Instruments (MBIs)

The third core strategy of LLDA is to improve regulatory compliance and expand the MBIs in the region. Further, LLDA is considering new approaches to compliance in the region including:

- Allow room for consent agreement and phased in industrial compliance before resorting to sanctions
- Apply limited but swift and highly publicized sanctions (Public Disclosure Program) in case of polluters that frequently violate the laws and assessment of the environmental performance of LGUs (LGUs Performance Certification Program)
- Leverage the resources available at the judiciary institutions in the country in support of the compliance monitoring and enforcement activities
- Develop an enforcement communication and a compliance extension program to educate the communities and the businesses about the existing laws and the consequences of noncompliance
- Prioritize the polluting hotspots and the regulated community both for communication and education and sanction purposes

It is the policy position of LLDA that MBIs should not replace traditional regulatory systems. Rather, they are to be used as complementary tools for promoting efficient use of resources. MBIs force polluters to choose the most economically efficient abatement steps in order to reduce the amount of fees/charges they have to pay. The effect is to turn their energies from attempting to circumvent regulations to that of developing cheaper, more effective means of abating pollution. LLDA believes that such a system then becomes part of the economic climate in which regulated entities operate. If the fees are set properly, there will be strong economic incentive to invest in pollution-control technology or to modify processes so as to reduce or prevent waste.

To leverage its unique experience in MBIs, the strategy is for LLDA is to expand the Environmental User Fee System (EUFS) to improve compliance using four strategies:

- Revising the existing formula for industrial EUFS to address the built-in incentive to dilute wastewater, make the system dynamic to respond to ambient environmental conditions by introducing an stream factor and bring the system in conformity with the national system that is being introduced by DENR;
- Expanding the covered parameters by introducing Total Suspended Solids, among others, in addition to BOD for which industrial pollution charges will be levied;
- Expanding the coverage of the system to other industries (at least doubling the number of firms covered today)
- Exploring arrangements to include the households in the coverage of the EUFS starting with BOD load of the waste
- Exploring the opportunities for introducing EUFS for raw water abstracted from the Lake

10.4 Environmental and Water Infrastructure Development

In the Philippines, implementing a commercially sound development project is carried out by the nascent nature of the domestic capital market that makes the availability of long-term financial resources almost non-existent. Thus, many Build-Operate-Transfer (BOT) projects have relied on international capital with its concomitant exchange rate hazards. However, the availability of long-term finance from domestic sources is expected to improve as a result of continued reforms in corporate governance and the stock and bond markets. Further, the most successful models for the geographically focused development agencies in other countries, e.g., Tennessee Valley Authority in the United States, rely on commercially based project

development concepts. These experiences combined with increasing favorable capital market environment and the support of multilateral agencies put LLDA in a unique position to carry out the necessary re-engineering process toward meeting its original mandate, that is, development and sustainable management of the water resources in the Lake and its watershed.

The new institutional model of LLDA segregates overtime the regulatory functions from the development mandates. As part of the re-engineering effort, LLDA intends to establish an initially wholly owned subsidiary, LBDC, as a vehicle to carry on infrastructure project development and market these projects to private sector or other investors. As an entry point, LLDA plans to pilot test the viability of LBDC by prototyping one water supply project development. If the results show success, LLDA will seek the approval for establishing LBDC on a permanent basis. LBDC when formed will enable the Authority to fulfill one of the most important covenants of its chapter.

In addition, LLDA intends to develop an infrastructure plan to identify and prioritize the possible infrastructure needs in the region. This will be done through updating the 1995 Master Plan for the Laguna de Bay region. The purpose of the plan is to: (i) develop a roadmap to meet future needs by characterizing the existing conditions, (ii) establish needs and uses, (iii) assess the environmental conditions, (iv) determine competing demands and stakeholders issues, and (v) complete related economic, social, and financial analyses for the plan. The objectives of an infrastructure plan is to assure that a comprehensive multidisciplinary approach is used, alternatives are considered, stakeholders are included and

that business and investment principals are incorporated into the planning process. Such objectives will lead to a clear and transparent development process that does not favor special interests or projects that do not wisely use the limited financial resources available.

10.5 Laguna de Bay Watershed Environmental Action Planning (LEAP)

The Environmental Action Planning was piloted as part of the Netherlands-assisted Sustainable Development of the Laguna de Bay Environment Project. It has been enhanced and transformed into the LEAP, a mechanism that ensures meaningful community participation in the planning and implementation of community-based environmental projects. The LEAP approach uses the sub-watershed or micro-watershed as the basic analysis and planning unit. This allows for a comprehensive understanding of the biophysical and socio-economic processes in the area defined by hydrologic boundaries. Under LISCOP, the 24 sub-basins of the Laguna de Bay will be covered by LEAP as a preparatory activity for micro-watershed carrying capacity assessment that will lead to identification, selection or priority measures that address the most pressing environmental issues in a given micro-watershed. These projects will serve as the interventions for resource co-management and local investments in partnership with the LGUs, LLDA and the River Councils and communities. So far, LEAP has been piloted in four micro-watersheds of Laguna de Bay, namely: Pagsanjan-Lumban, Muntinlupa, Tanay and Calauan-Bay-Alaminos.

LEAP is a response for the need for tools and methodologies that support participative and pro-active approaches to the management of environmental resources in the lake watershed,

which is envisioned to institutionalized in the LGU development planning and investment process. This activity is also expected to enhance the capability of LGUs and River Councils to actively and effectively pursue an environmental agenda in their respective areas. The LEAP stepwise approach is presented in the figure below.

FIGURE 9: LEAP STEPWISE APPROACH

One of the key features of the LEAP process is the interface of the programmatic environmental impact assessment (EIA). The approach for undertaking the programmatic EIA will adopt the LEAP process as this already integrated the assessment of environmental risks. The process as well as the result of stakeholder mapping, micro-watershed characterization and assessment of carrying capacity will serve as the basis for the preparation of the Micro-watershed Environmental Assessment Report and the subsequent issuance of Environmental Clearance Certificate for the selected project by the DENR-EMB. Thus, the approach of integrating the EIA requirements with the LEAP renders the micro-watershed assessment and planning more comprehensive and integrated. Planning for the mitigating the cumulative impacts of projects to be implemented by LGUs at the sub-basin level will be more strategic.

10.6 Financing Co-managed Investments in Watershed Development

Through the World Bank/Netherlands-funded **Laguna de Bay Institutional Strengthening and Community Participation (LISCOP) Project** to be implemented over a five-year period, the LLDA hopes to be able to improve the environmental quality of the Lake and its watershed and to strengthen the development governance that will support its sustained management. It also aims to fully optimize the level of interaction of the environmental, economic, and institutional dimensions of resource use and management through a combination the following strategic interventions, which also form the integral components of the LISCOP. These are (a) co-managed investments for watershed development (component 1); and (b) strengthening institutions and instruments (component 2).

Specifically, under the LISCOP, the LLDA will be restructured and strengthened to establish it as an effective watershed management agency in planning, regulatory actions, and enforcement as well as facilitating investments in environmental infrastructure. Regulatory incentives will be improved and combined with strengthening the capacity of watershed users. River Councils and communities will be engaged in implementing interventions through a fund that provides financing to supporting small-scale investments for improving environmental quality at the micro-watershed level. This would seek to improve the environmental quality of the Laguna de Bay watershed to enable the sustainable and equitable use of resources to different users. The end-goal is to secure sustainability in effective basin water resources management, institutional building, and poverty alleviation in the area.

The project already passed the due diligence requirement of the Philippine Government and approved by the NEDA Board. The signing of the loan and grant agreements place on January 26, 2004 in Manila. Meanwhile, LLDA is preparing the requirements for project effectiveness in March 2004.

As part of the incentives package to encourage LGUs to invest in environmental sub-projects and take a loan for their implementation, LLDA has come up with a package of incentives that consists of capacity building activities, sourcing of 50% of the equity requirement for sub-project financing from the Project Development Fund of LLDA, support to LGUs on construction supervision and monitoring.

10.7 Information, Education, and Communication (IEC) Program

An effective IEC program is necessary for an authority such as LLDA. This element as an important entry point for the implementation of the policy statement and the established objectives for the region. The IEC Program for LLDA will be structured and implemented as an integral component of all LLDA activities. Implementation of the Re-Engineering Action Plan of the Authority involves a wide range of sectors and interest groups whose mindset and behaviors must be modified if the Lake's resource use conflicts and issues are to be effectively mitigated and addressed. Multiple approaches and strategies will be employed in achieving the goals and objectives of the IEC program. The following approaches may be used singly or in combination to implement the program (i) social marketing, (ii) social and community mobilization and development, (iii) program support communication, and (iv) institutionalization/advocacy. An IEC program can serve both as a support mechanism to all LLDA initiatives and programs, as well as that of a catalyst for institutional and social change. LLDA intends to launch and IEC program to support its re-engineering objectives through:

- Develop broad-based support and establish a large and committed constituency for the revitalized mandate of LLDA
- Help promote the prioritization of Laguna Lake's resource management in the development agenda of national line agencies and LGUs
- Help bring together and build consensus among government, business, community, and the NGO sectors in efforts to protect the Lake and its watershed and reduce conflicts

- Help build on the international recognition and goodwill generated by the Lake's acceptance to the prestigious Living Lakes Network, an international body striving to preserve and rehabilitate endangered lakes and other inland bodies of water
- Help people become aware of and appreciate the value of Laguna Lake's watershed resources and the inter-related ecological processes that maintain them

- Motivate people to do what they can to arrest the decline of these resources and to improve their sustainable resource use and management

PART II - LESSONS LEARNED AND RECOMMENDED ACTIONS FOR NARBO

XI. EXPERIENCE AND LESSONS LEARNED

The LLDA is one of two river basin organizations existing in the Philippines. The Authority has a unique legal and institutional mandate that allows it to operate both as a regulatory and developmental agency, thus making the institutional setting more complex. For one, the LLDA has to coordinate with more than 50 government agencies and 66 LGUs within its area of jurisdiction. Its enabling law, RA 4850, as amended, has granted the Authority a wide array of mandate and functions. From a general mandate of promoting balanced grown and accelerate development of the Laguna de Bay area considering environmental protection, the Authority has evolved into a total resource management authority focused on IWRMD and environmental protection.

LLDA's lake management experience of 35 years, with IWRMD framework guiding its recent operations, has taught many lessons. Hereunder is an accounting of the key experiences and lessons learned based on the "Experience and Lessons Learned Brief for

Laguna de Bay Philippines" presented by Borja and the writer during the Regional Experience Sharing and Review Workshops, Lake Basin Management Initiative held in Manila on September 1-4, 2003.

11.1 Legislated actions on environmental protection are time-tested support to sustainable lake management

The ecosystem/watershed based jurisdiction as well as the unique institutional and legal framework make the LLDA a unique case. Furthermore, its proximity to Metro Manila puts it in a unique case that may not apply to other river basins in the Philippines. Its all inclusive, integrated mandate and jurisdiction have been recognized by the Philippine courts. For example, the exclusive authority of the LLDA to issue permits for the enjoyment of fishery privileges, specifically in the operation of fish cage and fish pen in Laguna de Bay was challenged in court by some fish pen operators and mayors of certain lakeshore municipalities. They invoked the provisions of Republic Act 7160 or the Local Government Code of 1991, which has granted the municipalities the exclusive authority to grant fishery privileges to erect fish corrals, etc. within a definite zone of municipal waters. The case reached up to the Supreme Court of the Philippines, which ruled in favor of the Laguna Lake Development Authority. Justice Hermosisima Jr. who penned the Supreme Court ruling on December 8, 1995, reflected his understanding of the lake environment as follows:

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

This milestone court decision has advocated integrated resource management and sustainable development at a river/lake basin level and guarded off any threats on the abolition of LLDA.

In another case, a private firm sued the LLDA, to assert its mandate on environmental regulation, when it issued them a cease and decease order for violation of LLDA's pollution control rules. The court affirmed LLDA's action as a "practical matter of procedure under the circumstances of the case, and is a proper exercise of its power and authority under its charter and its amendatory laws." From that time on, never again has anybody questioned the regulatory powers of the LLDA in the region.

11.2 Politics in Lake Governance

The policy-making power of the LLDA is vested upon its Board of Directors.of its ten members, two (2) are ex-officio representatives from the National Economic and Development Authority (NEDA) and the Department of Trade and Industry (DTI), four (4)

are elective officials, namely the Governors of the Rizal and Laguna Provinces, and the Presidents of the Mayors' League of Rizal and Laguna; four (4) are Presidential appointees such as the General Manager of LLDA, the Chairman of the Metropolitan Manila Development Authority, representative of the Office of the President, and the representative of Private Investors. The latter is supposed to be chosen from among the private stockholders of the LLDA, but most often is chosen by the President of the Philippines. Furthermore, the Board Chairperson who should be elected from among the members of the Board, is almost always designated by the Philippine President. Relevant sectors and lake users have no direct representation in the Board. This indicates how politics could influence policy decision-making process at the Board level.

To cite a specific example, the Office of the President issued Executive Order No. 75 on March 4, 2002 to create a Board of Advisors for the LLDA consisting of three (3) fisher folk representatives from the Laguna de Bay, supposedly to broaden the participation of various resource users in the management of the lake. A proposal to amend this executive issuance was submitted to the LLDA Board of Directors recognizing other sectors, aside from fishery, whose concerns and interests should be represented in the policy decision-making process. Unfortunately, the LLDA Board decided to defer submission of the proposed amendment in deference to the President.

For the last 34 years, the LLDA has been managed by fourteen (14) General Managers or an average of three years for every appointee except the last two appointees having been appointed on December 8, 2003 and February 2, 2004 by the President in succession with only less than two months in between.
The frequent shifts in the top management of the LLDA have affected the consistency of

policy enforcement and implementation of flagship programs. The General Manager of the LLDA is appointed by the President of the Philippines, thus, he serves at the pleasure of the President. The processing of his appointment and his tenure at the topmost post in the agency are subject to political underpinnings. This frequent changes in the General Managership of the Authority, in addition to the presence of political appointees in the LLDA Board who also sit at the pleasure of the President, have resulted in shifting of policy and program directions, thus posing serious implications to the sustainability of the development efforts in lake resources management [6]. It is the desire of the LLDA workforce and most of the stakeholders that the LLDA Manager be a career professional whose tenure is dependent on performance.

A worthy initiative of the Department of Environment and Natural Resources is advocating Good Environmental Governance. The program, which started this year, requires key officials and middle managers of the different bureaus and agencies under its supervision to undergo for two days a facilitated training workshop on Good Environmental Governance. One of the components that is being stressed is accountability to the people and to the environment. The commitments of all participants are recorded for future monitoring.

11.3 Delineation and Segregation of the Development Functions of the LLDA

Inherent in the existing LLDA Charter is the developmental function for water resources development purposes, but at present the LLDA is performing more of its regulatory function than its planning and development roles. This overarching mandate of LLDA has not been realized because of lack of capacity and appropriate mechanisms to enable the Authority to initiate and involve the private sector in capital intensive infrastructure development projects

in the region. Further, the financial flexibility of LLDA and other government owned corporations, in terms of sourcing finances and utilization, has largely been constrained by the Philippine Government's multi-layered approval process for fund solicitation through the NEDA/Investment Coordinating Committee.

Performing the diverse functions as regulator and to a limited extent as a developer has overstretched the LLDA and resulted in its inability to fully accomplish its original mandate as a development agency. This is evident in its current business strategy and financial profile, thus the need to delineate and segregate its regulatory and planning-developmental functions. Likewise, the LLDA has realized that building institutional capacities for undertaking large-scale infrastructure projects in the region requires that the regulatory and policy-making function of LLDA is balanced with a strong, but segregated, development function. Previous studies identified potential investments to maintain the environmental quality in the Laguna de Bay area through dredging, embankments, sanitary landfills, and sewage and treatment plants. LLDA urgently needs to develop the capability to leverage and facilitate private sector participation in necessary large-scale environmental and water-related infrastructure projects in the lake area.

LLDA will not be the only government owned corporation in the Philippines that have a wholly owned subsidiary. LBDC shall be incorporated as a public limited corporation under the Philippine Laws. If implemented properly, the benefit to LLDA would be the ability to leverage its resources with non-budgetary sources to implement large-scale infrastructure and other projects identified in the Master of 1995. This approach should also lead to greater efficiency, lower costs and higher PSP.

How financing environmental infrastructure and social development projects will be carried out through the LBDC is detailed in the succeeding section.

11.3 Financing Environmental Protection and Social Development Projects

The LLDA experience shows that there is no way that environmental improvement will take place solely through soft approaches. The competing demands for scarce water resources of the Lake and its river system will require a comprehensive infrastructure development plan. An infrastructure development plan should ensure that the water quality of the Lake is enhanced and maintained at an optimal level and the development needs are addressed in an equitable and economically efficient manner. A concrete example is the problem on domestic wastes, particularly sewage. Without infrastructure support such as the establishment of sanitary sewer facilities, pollution from this source will not be abated and is likely to get serious due to the increasing demand for water by a growing population.

A component of the Integrated Water Resources Management and Development Model for the re-engineering of the LLDA is the provision of a special project trust fund and an infrastructure financing facility, to wit:

- **Environmental Trust Fund** – consists of a certain percentage of the operating revenue of the LLDA set up in trust exclusively for the support of LLDA to the implementation of environmental management projects and activities at the sub-basin or LGU level and at other environmentally concerned research and academic institutions and NGOs.

- **Laguna de Bay Infrastructure Development Fund (LBIDF)** - a pool of resources from institutional investors to be created for the purpose of funding the planning, programming, development and evaluation of recommended projects, and generating revenues by selling these projects to prospective bidders/sponsors for a project development fee. This Fund will initially receive contribution from LLDA (the Sponsor), multilateral agencies and local financial institutions during the initial states, and from international investors and private equity funds, when a more specific list of projects is developed. The Fund will be managed by the **Laguna de Bay Development Corporation (LBDC)** as Investment Manager of the Fund.

It is envisioned that LBDC would undertake both non-commercial projects financed by LLDA and government at the central/national and local levels, and commercial projects through private sector financing. Examples of non-commercial projects include solid waste management such as landfills, sewage collection and treatment systems, lakeshore protection works, dredging, among others. On the other hand, commercial projects would include water supply systems, central waste treatment and disposal plants, toll roads, eco-tourism, and other commercial/recreational facilities.

11.4 Integrated and Demand-Driven Monitoring and Research

The monitoring of the lake and the tributary rivers became a routine activity since 1978. Data piled up and the comprehensive assessment of the water quality water was set aside. No additional parameters were added and the sampling stations remain the same in spite of the

fast-paced development in the watershed. This was the basis for the criticism that the LLDA only focus on the lake and not on the entire basin.

Fishpens and fish cages proliferated in the lake and became a very important source of revenue for the LLDA through the collection of fishpen fee. Unfortunately, there was no monitoring program developed to assess its impact on the lake's ecology and water quality, and on the economy in the region. Thus, when the first zoning and management plan was prepared, there was very little quantitative information to assess the impacts. In this case, the precautionary principle was applied.

One of the limitations for pursuing a more demand-driven monitoring program and research in the lake is the lack of additional funds and personnel to pursue this activity. Although the LLDA has a pool of trained personnel, the enormity of the task to monitor the lake and the major tributaries and at the same time do the water quality analyses, including those coming from industrial effluents and outside clients, have given them less time to do a comprehensive assessment of the state of the lake.

To address this concern, research collaboration with international and local academic and research institutions. The LLDA has also started to assume its role as a "clearing house" for research in the lake to avoid duplication and to market the research needs of the authority.

With the credibility that the LLDA has established through the years, local research institutions have recognized the capability of the LLDA. At present it is an active partner of the University of the Philippines-Environmental Forestry Program in the implementation of the Philippine Millennium Ecosystem Sub-Global Assessment with focus on the Laguna de Bay ecosystem.

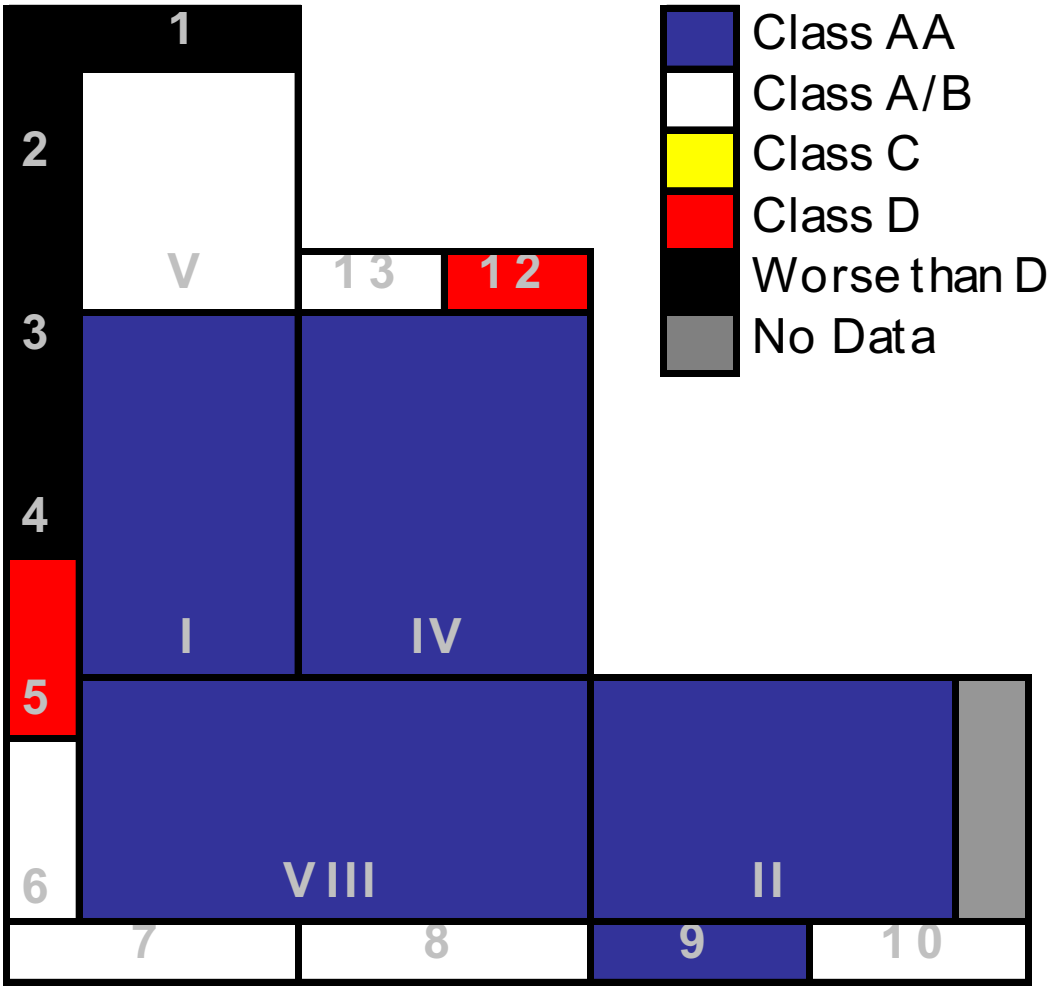
11.5 Knowledge and Information Sharing

LLDA boasts of its wealth of water quality data since 1974. After the comprehensive water quality assessment report of 1974 and 1978, the water quality of the lake and the tributary rivers was reported on a monthly, quarterly and annual basis. However, there were very little efforts on assessment that would guide management on planning and decision-making. Likewise, most of these reports are only for office use. As more students, researchers and practitioners became interested in the lake, the demand for water quality data also increased. In 1986, the LLDA started its publication of the annual water quality of the lake and the tributary rivers. A few years after, the publication improved through the addition of more parameters and a written report per parameter. The assessment of water quality is always based on compliance with the National Criteria (DENR-DAO 34) for Class C water (suited for fishery). A comprehensive ecological assessment of the lake has not yet been published by the LLDA.

Through the Sustainable Development of the Laguna de Bay Environment Project, funded by the Royal Netherlands Government, from year 2000-2003, the available data were extracted and transformed into different sets of information that were used in the development of a Decision Support System for Laguna de Bay. Training of personnel in hydrology, ecological and water quality modeling and GIS was vigorously pursued with the vision of making LLDA a credible center of information on the lake. One of the outcomes of this project is the presentation of water quality data into a simple schematic diagram that can be easily understood by non-technical people. It was inspired by the work of a famous Dutch painter, Piet Mondriaan whose simple lines and colors were adopted to present technical information to an easily understandable format. By looking at colors, people would immediately know the

current state of the lake and the tributary rivers. The Water Mondriaan as it is now called is posted in the LLDA website (Figure 13).

Figure 10. The Water Mondriaan



With this intervention, the criticism thrown at LLDA by the fish operators in the lake on the inability of LLDA to advise them on the condition of the lake to prepare them for making crucial decisions, has been addressed. What is needed now is more pro-active approach in

disseminating water quality information like publication in newspapers or leaflet distribution and other IEC materials.

11.6 Community Networking and Co-Management for Lake Watershed Development

With a wide area of jurisdiction and with limited staff to carry out effectively its mandate, the LLDA has long acknowledged that partnership is a key element in managing the resources of the lake [7]. The formation of strategic alliance with the Local government units, people's organizations and non-government organizations is needed to gain wide support in the implementation of its plans and programs and in the implementation of its rules and regulations within the region.

The shifting of management orientation towards stakeholders as co-managers of the lake water resources augurs well for value reorientation (common value and shared vision) and sense of ownership, as a prerequisite to the desired lake ecosystem orientation among stakeholders. Already the LLDA and Laguna de Bay are reaping the early fruits from the shift in the lake management paradigm as indicated from the experience with the River Rehabilitation and Protection Councils, the Fisheries and Aquatic Resource Management Councils, and the tripartite partnership CLEAR among others.

11.7 Lessons Learned from Program Implementation

- **The Environmental User Fee System (EUFS)**

The LLDA's experience in the implementation of the EUFS taught two important lessons: (i) start simple and build experience; and (ii) the battle cry should be **"READY, FIRE, AIM"** rather than **"READY, AIM, FIRE"** [8]. Thus, it is better to start simple, just fine tune as experience builds up.

The **right way forward** for pollution charges/ user fees that emerged are:

- Simple, modest approach;
- Sector-based pilot run to help in understanding feasibility aspects, administrative convenience, institutional arrangements, acceptability by all stakeholders;
- Pick one to two controllable parameters;
- Revise charges based on results of monitoring;
- Strong and credible regulatory arm with multi-stakeholder orientation;
- Pollution charges at all levels from zero discharge and increasing above the effluent standards.

The Environmental User Fee System has created a strong incentive for regulated firms to reduce the BOD concentration of wastewater discharged into the lake. Unfortunately, it has also created an incentive for firms to dilute their discharges. This is a potential weakness of the system, and it suggests the importance of properly pricing input water to avoid perverse responses to EUFS.

Since the EUFS is implemented to complement the existing command and control approach for pollution control and abatement, administering the system vis-a-vis the existing regulatory

system was administratively complex and difficult to enforce. In response to this concern, the LLDA had to introduce policy refinements and clarifications into the existing rules and regulations to ensure effective implementation of the System and enforcement of existing policies and regulations.

It is the policy position of LLDA that Market Based Instruments (MBIs) should not replace traditional regulatory systems. Rather, they are to be used as complementary tools for promoting efficient use of resources. To leverage its unique experience in MBIs, the strategy is for LLDA is to expand the Environmental User Fee System (EUFS) using four strategies:

- Revising the existing formula for industrial EUFS by introducing other parameters in addition to Biochemical Oxygen Demand (BOD)
- Exploring arrangements to include the households in the coverage of the EUFS
- Exploring the opportunities for introducing EUFS for raw water extracted from the Lake
- Public Disclosure Program

Drawing on international and local experiences, a public disclosure program will be in place to create incentives for pollution control and improve the environmental performance of industrial polluters. This program is aimed to introduce the concept of public disclosure to LGUs and include them in a program of monitoring and disclosure of environmental performance that will encourage them to invest in improving their environmental management performance.

- **Shoreland Management**

In spite of LLDA's assertiveness in the field of regulation, it was not able to exercise on time its critical mandate on the 140 km^2 shoreland area. The thirty years gap from the enactment of the LLDA charter to the time that the LLDA was able to take action on the shoreland had become a window of opportunity for people to claim the shore land for socio-economic benefits. By the time that the necessary action took off the ground, the LLDA was and is still is, faced with the following problems: reclamation of shoreland areas, construction of illegal structures, dumping of solid wastes and spoils from construction work. Informal settlers have also found it convenient to settle in the shore land where all their wastes can be conveniently thrown into the lake. This is where the big problem lies since it would be very difficult to uproot the informal settlers.

The delayed action also made it difficult for people, specially the Local Government Units, to understand why that part of the lake within their municipality which remains dry at certain times of the year are not under their jurisdiction. In spite of the dissemination of the Laguna de Bay Shoreland Policy, LGUs still continue giving permits for the use of the shoreland, which by law, is the sole responsibility of the LLDA.

A very critical but sensitive issue is the interpretation of other agencies of government on what is the shoreland. By law, the shore land is a public land. However, other agencies of the government in charge of land management, surveys and land titling classify these areas along the shore land as alienable and disposable lands in spite of the fact that DENR Administrative Order No. 97-95 Series of 1995 has been approved to prevent such situation from happening. This requires action and political will by the top executives of the agencies involved.

In 1999, the LLDA Board allowed the qualified individuals or people"s association to lease a portion of the shoreland areas pursuant to the allowable use as long as the area is still untitled and not covered by any government development plans, programs and projects.

The LLDA's shoreland regulation is a very glaring example of a case wherein development projects/activities have overtaken regulation and control. A lot of people, including the Local Government Units have already put their stake in these areas. After the delineation of the shore land areas and the inventory of its status, there is a need to review the policy on the use of the shoreland and revise the existing rules, not in a way to adopt the existing situation but more so, to adapt the rules without compromising the objective of protecting the shoreland and the lake from further deterioration.

- **The Fishpen Conflict**

The ensuing discussion is based on the analysis presented in Pacardo et al. (1988) [9] and presented in Borja and Nepomuceno (2003) [10].

The introduction of fishpen technology in the lake is an illustration of ill-conceived policy-making and implementation common to many public agencies [10] The initiative in the early seventies was for the purpose of improving the socio-economic well-being of small fishermen. Eventually, it ended up in the hands of businessmen because of the failure to quickly implement the necessary financial assistance program to enable the fishermen to gain access to the industry.

The very lucrative fishpen business lured many capitalists from within and outside the region including politicians and military officers. Aside from the steady supply of fish in the region, it provided a source of revenue for the Authority through the collection of fishpen fees. While the policies were drawn, the policy-makers remained confident that the system would work. They underestimated the complexity and difficulty of coordinating the administrative and regulatory tasks involved in implementing the program. For sometime, LLDA lost its regulatory control when it devolved to lakeshore LGUs the authority to issue fishpen permits, as result of which over-proliferation of these structures reached 1/3 of the lake area in 1983. Illegal operation and expansion of fishpens were not controlled to the detriment of marginal fishermen who rely on open water fishing.

Thus, in 1983, the conflict was already in a critical proportions that led to loss of lives and properties. The fishpen controversy raised two essential issues in resource management: (1) the level of "efficiency" in developing and using the resources of the lake; and (2) the issue of "equity" among those who receive the benefit and those who pay for the consequences of environmental actions [11]. The proliferation of fishpens also took its toll on the lake. Fish production in the lake was negatively affected and fish harvest declined. The livelihood of marginal fishermen was severely affected.

The fishpen controversy caught national attention that led the President of the Philippines to issue strong directives to demolish illegal fishpens and rationalize the use of the lake. In 1983 the first Zoning and Management Plan of Laguna de Bay was formulated but the

implementation failed due to non-cooperation of the fishpen operators and the intervention of the local government officials. These were some of the reasons why in 1983 fishpen structures proliferated across the lake in unsystematic fashion in blatant disregard of the lake's carrying capacity. In 1996, the ZOMAP was revised and a more organized implementation scheme was developed. Unlike in the previous plan where fishpens can be constructed anywhere within the fishpen belt, a definite area with specified size is allotted to prevent expansion (Santos-Borja 1997). The strong political will of the General Manager at that time and the LLDA implementing unit, Lake Management Division, were instrumental in the successful implementation of the revised ZOMAP.

To augment the manpower needed to monitor the lake, the LLDA organized fishermen group and deputized them as wardens. Later the Fisheries and Aquatic Resource Management Councils were formed and became one of the partners of the LLDA in resource management. To sustain their efforts, minimal allowance is given to the President of the FARMC. A one-hectare area in the fishcage belt in each of the lakeshore municipality is also allotted to the municipal FARMCs to generate income which they can use to sustain their activities in the lake. However, this privilege is not yet fully explored by the FARMC pending the finalization of the implementing guidelines by the Authority. The task of maintaining the area for aquaculture is always challenged by the request of prospective fishpen owners to increase the area for operation so that they can be given the chance to do business in the lake. The vigilance of fishermen and the fishpen operators themselves is something that needs to be encouraged for in the long run, they stand to lose if the capacity of the lake to sustain fisheries is surpassed.

The LLDA is still trying to find a long-term solution to illegal fishing activities in the lake. With the enormous task considering the size of the lake and the manpower required the assistance of the LGUs through the maritime police, the FARMC and the Fish Wardens are essential but the activity could not be sustained due to lack of financial support. One of the recurring complaints is the intervention of local officials whenever their constituents are apprehended for illegal fishing.. Due to lack of alternative sources of livelihood, it is difficult to convince the fishermen of the negative consequences of their illegal practice. Although a cosmetic approach only, local officials and the LLDA regularly undertake lake seeding. An effective mechanism and institutional arrangement to address this problem is yet to take off the ground, but certainly there has to be necessary behavioral change on the part of lake users.

The shares in the fishpen fee of the LGUs are intended to support environmental improvement projects. Attempts were made by LLDA to monitor its utilization, but most LGUs resist these controls. Political will on the part of the local officials and vigilance of other stakeholders are needed.

XII. RECOMMENDED INITIATIVES/ACTIONS FOR NARBO

Finally, the following actions for adoption by NARBO are recommended. These have been identified by LLDA as gaps and/or areas for capacity building where information and experience sharing are needed and where NARBO can take a pivotal role.

(i) Establishment of mechanisms for proper water allocation among different water quantity and quality dependent uses in a river basin context is needed. There is

currently no operational system in the Philippines for pricing raw water as an economic good. Pricing of raw water is a policy direction that the LLDA intends to pursue. However, acknowledging the importance of the on-going national debate on water pricing in the Philippines, the LLDA deems the need for further studies before authorizing the implementation of a water pricing scheme that would at the same time promote conservation of water resources while simultaneously enabling the LLDA to generate revenues to fund watershed protection and environmental improvement activities.

(ii) Developing alternative conflict resolution mechanisms and corresponding institutional arrangements for balancing supply of and demand for water resources in a river basin context,

(iii) Market-based instruments for improvement of environmental performance of regulated sources of pollution, and the manner by which LGUs can be engaged in environmental management;

(iv) Approaches to address non-point sources of pollution;

(v) Interventions, regulatory tools, economic instruments, IEC strategies to address non-point sources of pollution;

(vi) Legislative measures, administrative and regulatory regime to address pollution from chemical substances;

(vii) Creating information tool box on strategies and approaches which have worked successfully with other RBOs on engaging local government units in environmental action planning and investing in micro-watershed improvement; balancing regulatory and development functions and leveraging/facilitating private

sector participation in augmenting small, medium and large-scale water-related infrastructure projects, among others.

CONCLUDING REMARKS

To conclude this paper, below is a quote from CODE-NGO and Environmental Science for Social Change which was commissioned by the DENR to undertake an assessment Snapshot of the Philippine Environment and Natural Resources Sector in 2002-2003:

> ***" 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. "***

The key lessons highlighted above indicate that managing a lake basin is "a work in progress" [12]. Understanding the lake and its environs and attaching to the resource the true value it deserves take considerable time and efforts. Along the way, RBOs realize that there is no way but to co-manage the lake and its watershed with the stakeholders under an IWRM framework. Knowledge and experience are gained, mistakes are committed but lessons learned make lake management closer to the ideal and/or expected conditions. Opportunities for improvement through innovations and creative solutions redound to the sustainability of the lake and the entire watershed.

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