

## PLENARY SESSION II

Plenary Paper:	<b>The Conservation and Management of our Freshwater Ecosystems</b>
Chairman:	Magdalena C. Cantoria
Rapporteur:	Clare R. Baltazar
Discussants:	Carlito R. Barril Macrina T. Zafaralla Jose R. Velasco

### I. SUMMARY/HIGHLIGHTS OF DISCUSSIONS

The discussants focused on three inland resources, namely, Laguna de Bay, Lake Taal and Lake Buhi. Interrelationships of human activities and the changes taking place in each aquatic resource were presented. All agreed that each inland resource must be managed individually using appropriate management strategies because each lake had its own unique set of problems depending on the particular set of environmental conditions surrounding it.

**1. Laguna de Bay** is the largest and most important lake in the Philippines with about 76,000 families directly dependent on the lake for their livelihood. But the lake is considered by many as dying and according to Dr. Carlito Barril, "Laguna de Bay could be on the threshold of an ecocatastrophe with very serious implications, including social unrest and political upheaval." He focused on water quality as a key environmental indicator needed for sound management and sustainable development of the lake.

Dr. Macrina Zafaralla, on the other hand, identified three factors responsible for stunted fish growth in Laguna de Bay: 1. heavy siltation; 2. pollution; and 3. salinity. Allowing polluted Pasig river water to flow into the lake is considered a risk and a hazard to people's health and well being. Further, she concluded that the complex problems in Laguna de Bay were primarily rooted in the lake's multiple uses and destruction of the watershed.

How can Laguna de Bay be saved? Dr. Barril proposed seven urgent measures and two ultimate measures as water quality management strategies to save Laguna de Bay.

**2. Taal Lake** has its own set of management problems but it is ecologically better situated compared with Laguna de Bay, Dr. Zafaralla explained. She considers sanctuary area dedication and gear regulation (particularly the "suro" or push net) as sound policies to apply to this lake. Four zones have been proposed for efficient management of Taal Lake -- the tourist zone, the aquaculture zone, the open fishery zone and the fish cage zone.

**3. Lake Buhi** is shallower than Taal Lake and its littoral zone slopes gently so that it favors the establishment of fish cages and fish pens. Dr. Zafaralla identified three problems in this lake.

1. When the lake was used in 1983 to irrigate five adjoining towns, the operation caused the lake water to drop below the critical level of 0.8 m, thus exposing the fish cage culture of tilapia which was teeming at that time.
2. The area allocated for the sanctuary was 86 ha but in 1987, about 400 fish cages were found within the sanctuary.
3. In 1983, the endemic sinarapan or the smallest commercial fish in the world was threatened with extinction when the predatory tilapia was released into the lake by BFAR.

Dr. Jose Velasco mentioned the dual functions of natural resources: productive and protective. He lamented the lack of funding or government support for research and development on production and on protection. We should cultivate both personal and the country's interest in the kind and direction of R & D we undertake. He reiterated the recommendations of Dr. Guerrero but with strong emphasis on discipline as individuals and as a society, even to the point of coercion. This is to minimize abuses and exploitation of our own natural resources.

## II. RECOMMENDATIONS FOR CONSERVATION OF FRESHWATER ECOSYSTEM

1. More studies on endemic freshwater species and their ecology should be conducted.

There are 43 indigenous freshwater fishes in addition to numerous aquatic invertebrates and plants found in our lakes, rivers and swamps. Studies to be pursued should be in the areas of biological assessment, population dynamics and fisheries management of natural freshwater ecosystems.

2. Anti-pollution laws and fishing regulations, particularly for rivers and lakes, should be enforced strictly.

Little or no control has resulted in high morbidity of our rivers due to pollutants and depletion of fisheries resources brought about by overfishing. Existing laws and regulations for pollution control and fishing in rivers and lakes should be improved or revised and enforced.

3. There is a need to protect endangered species.

The Liguasan marsh, Lakes Lanao, Taal and Buhi are recommended areas to be reserved for the protection of endangered freshwater fishes and mollusks.

4. There should be more stringent regulations on the introduction of exotic species.

Evaluation and impact studies should be done on all introduced species prior to their propagation and dispersal to ensure protection of both the endemic species and the environment.

5. Water in fishponds should be used more efficiently. Integrated farming and recycling should be considered.
6. There is a need for more small impoundments. In upland areas, where soil erosion is critical and poor living conditions exist, there should be more small impoundments to conserve water and protect the environment.
7. There is a need for multisectoral and wholistic approach to freshwater ecosystem management. Ecosystem management could best be accomplished through agroecological approach, proper watershed management and waste treatment by industries, and enforcement of fishing regulations considering socio-economic and political factors.
8. More public awareness and information on conservation of freshwater ecosystems should be generated. Information drives should be done at all levels through the educational system, churches, mass media and every possible venue.