BALI DECLARATION

INTRODUCTION

Water is a fundamental requirement for all life, unifying all living organisms, flora, fauna and humans. Lakes, reservoirs, wetlands and other lentic water systems represent the most important sources of freshwater, with lakes and wetlands collectively containing more than 95% of the liquid freshwater on the surface of our planet. The essential role of freshwater in mainstreaming the aquatic and terrestrial landscape that provide life-supporting ecosystem services, diversity and health is also fundamental to human existence. However, the global distribution of this fundamental resource is uneven, and our human water demands are growing faster than our capacity to address the negative impacts resulting from multiple needs of water for food production, industrial processes, human, domestic and wildlife consumption, navigation, hydropower and other uses. The result is serious alternation of freshwater ecosystems, environmental degradation, local climate modification, and other anthropogenic changes, collectively leading to such water-related disasters as large-scale land subsidence and drastically changed river morphology, sometimes bringing about droughts and floods of unprecedented magnitude.

Lakes are facing multiple stresses on their environments, including increasing effluents from point and nonpoint sources, artificial alterations of lake basins, excessive water use, invasions of alien organisms, global climate change, and changes in human priorities. These stresses have resulted in significant degradation of the life-supporting ecosystem services provided by these freshwater bodies. Lakes, reservoirs, wetlands and other lentic water systems are the last frontiers in the survival and resilience of our society, in that they provide us not only with freshwater resources and other ecosystem services, but the health of lake ecosystems reflect how we value our present civilization and the future wealth and conditions for our descendants.

Against this background, the 16th World Lake Conference, held in Southeast Asia for the first time in the beautiful island of Bali, Indonesia, has chosen the theme, "Lake

Ecosystem Health and Its Resilience: Diversity and the Risk of Extinction." To better relate the Bali World Lake Conference discussions and conclusions, multiple actions are needed to address an increasing wave of environmental degradation and overexploitation of lakes, reservoirs and other lentic water systems, particularly in Indonesia and other countries around the world.

PREAMBLE

- Realizing that lakes and other lentic water systems provide the widest range of aquatic ecosystem services essential for human livelihoods, health and well-being, including resource provision services (drinking water supply, agricultural irrigation, fisheries, recreation, transportation, hydropower generation), regulating services (flood and drought mitigation, self-purification, climate mediation, shoreline ecotone buffering, diverse food-chains) and cultural services (aesthetics, spiritual, anthropogenic and historical values);
- Noting that the ecological integrity of many lakes and reservoirs around the world has been altered in recent decades through the modification of hydrology and fluxes of pollutants;
- Recognizing that aquatic ecosystems are typically part of a larger network of linked upstream and downstream lentic and lotic water systems;
- Acknowledging that on the basis of their basin characteristics, transboundary lakes exhibit great human water security and biodiversity threats;
- Noting that human activities in a lake will have impacts on the environmental and socioeconomic aspects of the lake, and that proper ordinances related to lake operations and resource extraction should be developed and appropriately disseminated so that lake stakeholders will have thorough knowledge and understanding of the importance of lakes in human lives and for making informed lake management decisions; and
- Realizing that cultural values can play vital roles in lake management, but that several interrelated factors that include motivation, communication, commitment, consistent participation of communities, proper mentoring, and decisiveness of the local government is necessary for successful implementation.

The participants at the 16th World Lake Conference reached the following consensus:

- There is a need to better understand lake ecosystem processes to shape effective and sustainable management strategies;
- In term of lake management, social network analysis can help identify existing social structures and possible intervention points for increasing the problem-solving capacity of governance networks;
- Maintaining forest cover and land use management is essential to reduce sedimentation, with the areas contributing most to sedimentation should be priority areas for rehabilitation;
- Domestic wastewaters should be treated before these effluents are discharged into lakes and reservoirs, and that such treatment can be facilitated by integrated wastewater treatment plants built by the government;
- Introduction of exotic and invasive species is a major problem threatening fish diversity, including endemic species in lakes of several countries, examples being Lake Biwa in Japan, Lake Lanao in the Philippines, and Lake Matano in Indonesia, and efficient and effective actions are needed for their possible eradication;
- Local wisdom can also play an important role in lake management, examples being the Tri Hita Karana of Balinese Hindhu philosophy, and help illustrate the relationship between people to people, people to nature and people to gods;
- Because unsustainable aquaculture practices negatively influence lake water quality, implementation of rules to address this issue should be developed and enforced;
- Children and the young generation should be made aware of the importance of the aquatic ecosystems and undertake actions to clean their lakes and maintain healthy environments;
- Ecohydrology, ecotechnology and palaeolimnology can play valuable roles in addressing many lake issues including risk management and disaster preparedness;
- Spatial, temporal and online monitoring of lake ecosystems and their services are very important;
- Since they fundamentally affect one another, lentic (standing water) and lotic (flowing water) water management should be addressed with an integrated approach such as Integrated Lentic-Lotic Basin Management (ILLBM), which is also consistent with many objectives of the Sustainable Development Goals (SDGs);
- Science-based conservation taxes can play important roles in supporting efforts to improve lake water quality, such as that exemplified by Lake Kasumigaura in Japan;

and agreed to make the following specific recommendations:

- Achievement of ecosystem health must be emphasized and ensured as the main goal in utilization of lakes by government, local communities, industry, agriculture and other stakeholders;
- For Indonesian conditions, it is important to have fundamental regulations and propose specific bodies for coordinating lake management, with concrete actions for 15 priority lakes being needed to cover zoning regulations, assess carrying capacity and alternative livelihoods for local communities;
- It is important to have public-private partnerships in lake management, including sustainable financial support;
- To prevent invasive species threats, national and local legislation can play important roles through authorization of government financial support and facilitation of public participation;.
- Integrated Lentic-Lotic Basin Management (ILLBM) should be promoted as a useful conceptual framework to complement the conventional Integrated Water Resource Management (IWRM) and Integrated River Basin Management (IRBM) frameworks for managing aquatic ecosystem;
- Collaborative research, both nationally and internationally, should be strongly pursued to develop accurate and useful databases, particularly for tropical inland water systems;
- Regional networks for collaborative research should be developed to increase knowledge and promote sharing of experiences in managing lake basins;
- Direct all the above actions in some manner toward achieving the Sustainable Development Goals (SDGs) that related to lakes and lentic-lotic water systems;
- As for the need to accelerate international cooperation in lake basin management in Asia, those having been successfully pursued over the past decades on various subjects between Indonesia and Japan provide many useful hints for future collaborations.