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# NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

— For Better Lake Management —

This Newsletter is also available in Japanese.

## 4th International Conference on the Conservation and Management of Lakes "Hangzhou '90"

The 4th World Lake Conference "Hangzhou '90" took place from 5-10 September 1990 at Shangri-la Hotel in Hangzhou, China, located on the shore of Xi-Hu (West Lake). It brought together more than 422 participants, of which 120 were from outside China representing some 30 nations. Ninety-nine papers were presented orally, and more papers were also submitted to poster sessions.

### Organizers:

China National Environment Protection Agency (NEPA), The Chinese Research Academy of Environmental Sciences (CRAES), International Lake Environment Committee (ILEC).

### Co-hosts:

Zhejiang Provincial Environmental Protection Agency, Hangzhou Municipal Environmental Protection Agency, Zhejiang Provincial Institute of Environmental Sciences, The Nanjing Institute of Geography and Lake.

### Sponsors:

United Nations Environment Programme, United Nations Centre for Regional Development, International Water Resources Association, International Association of Water Pollution Reservation and Control, China National Nature Science Foundation, International Society of Limnology, Shiga Prefecture.

On 5th September, the conference commenced with keynote addresses by Prof. Qu Geping (Administrator of China NEPA), Dr. M.K. Tolba (Executive Director of UNEP), Prof. T. Kira (Chairperson of ILEC), Prof. H. Sazanami (Director of UNCRD), Mr. Chai Songyue (Deputy Governor of Zhejiang Province), Mr. Lu Wenke

(Mayor of Hangzhou City), Mr. S. Yamada (Vice-Governor of Shiga Prefecture). The following technical sessions were held during 5th-9th:

- Water resource management in lake basin context
- Siltation and toxic contamination and other health problems
- Integrated Lake Management
- Strategies for the control of pollutant sources
- Citizen participation and environmental education
- Choice of adequate technologies



Opening of "Hangzhou '90" at Shangri-la Hotel

- Lake ecology and compatibility between different lake uses
- Eutrophication and water resources economy
- Modeling and Planning
- Institutional and legal aspects and management
- Role and protection of aquatic bio-communities and wetlands.

In the closing session in the afternoon of 9th, convening of the 5th Conference in Italy in October 1992 was

announced. The outcomes of the conference was well summarized in the closing report of Prof. T. Kira.

## Summary Report of Hangzhou '90

Tatuo Kira

Enriched information on world lakes

One of the most remarkable achievements of this conference was no doubt a vast input of scientific knowledge to the present environmental state of Chinese lakes and reservoirs. The big volume, *Eutrophication of Lakes in China*, which was edited and published by Chinese colleagues prior to the conference, as well as a number of papers daily presented to relevant sessions, covered almost all the provinces of China, where only limited information on lakes had so far been available.

Preliminary syntheses were also reported on the data collected by the Joint ILEC/UNEP Project on the State of world Lakes. Particularly important was the report on its Canadian part, since about one-half of the total number of large freshwater lakes of the world over 500 km<sup>2</sup> in surface area is found in the country. Reports came also from Egypt and a few other African countries, Amazonian countries, India, Korea, Bulgaria, and so forth.

Eutrophication and use of ecotechnological measures against lake pollution

Eutrophication was the most important topic which the local organizers intended to deal with in this conference. We realized that most Chinese lakes in densely populated parts of the country tended to become hypertrophic. Xi-hu(West Lake) in Hangzhou was not an exception. We were impressed by the integrated countermeasures taken by the local environment agencies to prevent the progress of eutrophication and to protect the world-famous beautiful landscape of the lake.

One of the measures not adopted in Xi-hu was the use of wetland for removing nutrients from inflowing water. The effectiveness of this kind of ecotechnology was demonstrated by the report on Lake Balaton in Hungary, a detailed follow-up study on Kis-Balaton Reservoir which the participants of the last 3rd conference had a chance to observe. The same method was also effectively used in Yuqiao Reservoir in Tianjin, Hobei Province, and some other lakes in China. Wetlands were also found to remove heavy metals as reported from a few lakes in China and Kis-Balaton.

Besides the use of wetlands, other ecotechnological approaches to eutrophication control were also introduced. The recycling of harvested *Microcystis* and submerged macrophytes as animal fodders in China represented an interesting trial along this line.

Toxic contamination and chemical environment

A report from the Great Lakes of North America showed that the analysis of sediment core samples was a useful tool for elucidating the past history of contamination, and could be widely applied to other lakes.

This and an Austrian report on the behavior and transformation of heavy metals in the river sediments of the Danube are expected to help local researchers, since similar contamination seems to be widespread also in China. In addition, other changes in chemical environments of lakes such as acidification and salinization were reported.

Modelling

Several papers were presented dealing with different aspects of lake system modelling, demonstrating the steadily growing importance of modelling approach in the management planning and prediction of environmental change in lakes and reservoirs. Some new attempts were presented; e.g., an approach that could account for the shift of species composition and the change in properties of component organisms. A Chinese paper also proposed an interesting new model to be used for optimizing monitoring program—an area that deserves more attention, because it may be able to *squeeze* more information out of a data collection program which is always economically limited.

Planning and management

Several Chinese papers on planning, dealing with lakes under completely different climates, again emphasized the role of ecotechnological methods such as reforestation, improved management of agricultural lands, etc. to cope with the water shortage and water quality deterioration prevailing in China. Expensive environmental technology has to be avoided, though it seemed to be a necessary element in water quality management for the abatement of particular industrial pollution.

An attempt, quantitatively evaluating the environmental capacity of lakes, proposed by the Japanese National Institute of Environmental Studies was noteworthy in its implication to the sustainable development of lake basins and their resources.

Emerging *ethnolimnology*

Two papers respectively from Nigeria and India were of special interest for me in that they represented a new field of study on man/water systems. It was reported that different tribal tradition and ways of life resulted in different lake environments in Nigeria. There was also a presentation on the process of temporary eutrophication



Well-maintained lakeshore of Xihu-Lake

of a pond in India, caused by a local water festival. Such relationships between the lake and human life not only offer a unique area of lake study but may also provide important suggestions to reasonable lake management.

These reports reminded me of the ethnobotany, an already well-established branch of botany which has hitherto contributed much to the development of new plant resources such as new crops and medical drugs. May we similarly expect the advent of *ethnolimnology* in the future ?

UNCRD session on water resources management in a lake basin context

The UN Center for Regional Development(UNCRD), International Water Resources Association(IWRA), and ILEC organized such a special session in this conference. The UNCRD session was devoted to the presentation and discussion of the major findings in the expert workshops on River/Lake Basin Approaches to Water Resources Management, a joint three-year project by UNCRD/ILEC/UNEP. It consisted of the reports of five case studies in China, the Philippines, Thailand, Indonesia and Brazil as well as two resource papers and a paper contributed by UNEP.

The session identified and reaffirmed several needs of particular importance in the effort to further environmentally sound and socially acceptable management of water resources: viz. for a basin-wide perspective in dealing with environmental problems and water resources management issues; for a broader perspective over and greater sensitivity to the complex policy issues stemming from the interaction of social, economic, cultural and political factors concerned; for alternative institutional and organizational arrangements to ensure concerted efforts among scientists, administrators and local communities; and for developing effective and practical approaches to necessary manpower development.

ILEC session on environmental education and citizen's participation

In the first half of the session on environmental education, three speakers from Denmark, Brazil and Japan reported their experiences with experimental classes in elementary and/or junior high schools in which education programs on water and lake environments were conducted within the framework of ILEC's Education Project. Although the project is still going on, correspondence between school children, teachers and the advisers of three countries has already started with useful mutual stimuli. A report from Jianxi Province showed that similar efforts in environmental education were also actively in progress in China.

The later half of the session consisted of five papers dealing with citizens' participation in coping with environmental problems. One of the papers was a Japanese case report in which salt-barrier construction project in a brackish lake was discontinued at the last moment of its completion owing to the opposition movement by the local residents.

The audience heard with sympathy the report from Hangzhou that emphasized the role of citizens' affection for Xi-hu in their effort to protect the lake. The representatives of the ladies union of Shiga Prefecture, engaged in the voluntary movement to save Lake Biwa from pollution, were so impressed by the report that it led to the discussion and conversation between the citizens of the two countries, notwithstanding the difficulty with simultaneous interpretation.

The papers and discussions in this session seemed to have aroused fresh interests among the participants and attending citizens by suggesting a new horizon in environmental studies. Therefore, we expect to extend this ILEC session into the following world lake conferences.

## — Book Review —



Eutrophication of Lakes in China.

Edited by Jin Xiangcan, Liu Hongliang, Tu Qingving, Zhang Zongshe and Zhu Xuan; Published by the Fourth International Conference on the Conservation and Management of Lakes "HANGZHOU'90"; Beijing; 652pp, (1990).

(All inquiries to: Jin Xiangcan, Water Environmental Institute of the Chinese Research Academy of Environmental Sciences, Beiyuan, Beijing, 100012, China. Price 30US\$)

«Eutrophication of Lakes in China» was published in 1990 by the 4th International Conference on the Conservation and Management of Lakes, "Hangzhou 90", under the support of International Lake Environment Committee(ILEC) and Chinese Research Academy of Environment Sciences(CRAES).

This book is a special one on the eutrophication of lakes and reservoirs in China. It is the latest achievements of years' studies and researchs of dozens of limnologists, environmentalists, and scientific workers. It contains the main contents of the research programs on eutrophication of main lakes and reservoirs in China between 1986 and 1990 and those summing-up's, Chinese limnological and environmental scientists have presented this book as a special gift to the 4th International Conference on the Conservation and Management of Lakes to be held in September, 1990 in Hangzhou, China, and to their colleagues of the world. It is hoped that the publication of this book would enhance international academic exchange, help scientists of the









