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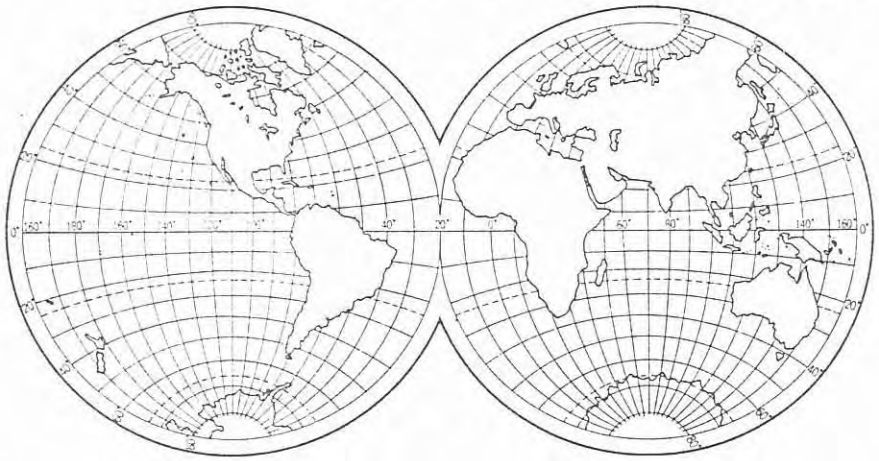
NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

— For Better Lake Management —

This Newsletter is also available in Japanese.

Across the Globe, Across the Generations
ILEC's 10th Anniversary



The Lake Biwa Declaration adopted at the 1st World Lake Conference in 1984, which led to the establishment of ILEC two years later, included proposals to mobilise scientists, administrators and the general public for the sake of saving the world's lakes from further deterioration and destruction.

The Kasumigaura Declaration, which was adopted last year at the 6th World Lake Conference (**see report on page 4**), widened the scope of work that must be done by including proposals on population and biodiversity; reflecting the change of people's attitude and awareness on environmental issues in general and lakes and reservoirs in particular. The Declaration also asked all those concerned with the preservation of lakes, such as administrators, business people, academics and the public, to establish a new partnership for our common future.

A small NGO, such as ILEC, will always be limited as to what it can do by itself, but through global partnerships that achievement can be multiplied into something really worthwhile. We believe our partnerships with organisations such as UNEP, SIL, CCIW and AWB, as well as through our multi-talented and connected Scientific Committee, ILEC has indeed made a significant contribution to the preservation of the world's environment over the last 10 years and will continue to do so for many generations to come.

IN THIS ISSUE

ILEC Activities in 1995

January-March: JICA/ILEC group training course on Lake Water Quality Management. This was the 5th course since its inauguration in 1991, with researchers from developing countries and countries with economies in transition gathering in Kusatsu, Shiga for 10 weeks.

Professor Matsui makes a presentation to a JICA/ILEC trainee

March: Publication of "Compact-size Data Book of World Lake Environments Vol. 2 - Africa and Europe".

Symposium on Aral Sea and the Surrounding Region; and Forum on Caspian, Aral and Dead Sea in Shiga.

Completion of construction and move to ILEC's new office buildings (see Newsletter #26).

May: 7th General Meeting of the ILEC Scientific Committee, with Professor Jørgensen becoming new chairman (see Newsletter #26).

June: Commemorative ceremony and symposium on the opening of the UNEP/IETC Shiga Office (see Newsletter #26).

The UNEP Executive Director, Ms. Elizabeth Dowdeswell at the new UNEP/IETC Shiga Office in June, 1995.

October: Publication of "Directory of Water Related International Cooperation" - introducing international cooperation projects directly targeted at developing countries and countries with economies in transition.

6th International Conference on the Conservation and Management of Lakes (World Lake Conference), Ibaraki, Japan (see page 4).

JICA/ILEC Training Course - A Trainee's Viewpoint

Fatimah Md. Yusoff - trainee on 1996 Lake Water Quality Management Course

JICA/ILEC's training course on lake water quality is a noble way of sharing Japanese experiences in water pollution controls with developing countries. Mutual exchange of technologies and ideas between Japan and developing countries are important in dealing with the water pollution problems these countries are facing now and will face in the future. During the three month course, the participants not only learned and acquired knowledge from experienced scientists and researchers in classrooms and laboratories, but experienced pollution control and prevention activities in various local and national government organizations, autonomous bodies and industrial sectors in many places across Japan, especially around lakes Biwa and Kasumigaura.

Japan has made excellent progress in environmental management in the last 40 years as evidenced from the greatly improved water and air quality, as well as public health. Japan's success in environmental pollution control is not only due to the concerted efforts at the government's level, but also due to historical, economic, social and cultural factors. Success in integrating environment into industrial policy, freedom of press, high standard of literacy, traditional respect for nature and positive industrial behaviour are some of the factors which were highly conducive to Japan's success in this area. We recognise that it is important to control these factors in developing countries.

With continued effort and commitment by JICA, ILEC and representatives from various countries, a strong network of cooperation in water resource management would lead to a better pollution controls in many developing countries.

Lakes and Reservoir Management

A Cameroonian Perspective - Jacqueline Nkoyok

The problem of lakes and reservoirs management in the world in general and in Africa in particular is a cause for concern for both countries in the North and South. They constitute real dangers for the existence of humanity, but equally have direct impact on the life of the people through such factors as diseases, disasters and desertification. The role of NGOs, actors for change closer to the population, is primarily to keep the population aware of all these dangers and elicit their contribution and participation as well as those of the government.

However, within the context of economic crisis, general poverty and social injustices, it appears in some countries that issues of development are given priority. In this situation; if these countries have to protect the environment in general and provide for the management of lakes and reservoirs there are certain strategies to adopt and a particular processes to follow.

In Cameroon, for instance, the environmental problem in lakes require a global view of the situation because of the location of Cameroonian lakes in different ecological regions. The solutions merit in this way specific methods after efficient diagnosis and an assessment of existing projects (Lac Tchad reservoir, Bamendjin's Dam, Maga Dam, Edea Dams, Lac Nyos etc.) The key elements to conserving and managing lakes in our country are: giving priority to lakes and reservoirs management; improvement of local technologies; and looking for technical assistance in building of partnerships and soliciting participation. The management of lakes and reservoirs for a rational use of their ecosystem is possible if all actors make it a priority and are on an equal footing. That is to say that they have equal access to information resources and decision making process.

In order to preserve the world's heritage with regard to lake ecosystems in Cameroon, the government is calling on donors or sponsors for study and implementation of a thorough survey of lakes in the country. This survey would be carried out in collaboration with national NGOs.

IETC's Lake Related Projects

In this brief article Dr. Habib N. El-Habr, acting Deputy Director of UNEP/IETC, tells us of two forthcoming projects of interest to ILEC Newsletter readers.

IETC has, among others, two projects focused on sustainable management of lakes/reservoirs and the related technologies applied for their conservation.

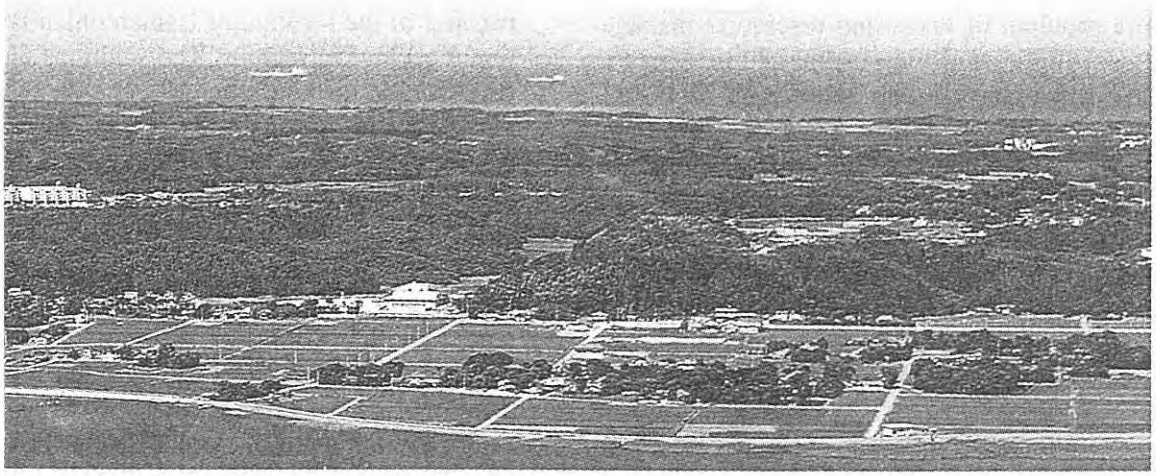
Urbanisation is increasing in most parts of the world. A major issue is how to provide good quality water to the increasing demands of urban centres due to both higher levels of population and increasing per capita demand due to changing lifestyles. It is also essential that the sources of water for urban centres are not contaminated due to domestic, industrial and agricultural activities.

There are some important lakes/reservoirs in different parts of the world which are the main sources of water for major urban centres, as well as providing water for agricultural and industrial uses. Water allocation between the various uses, as well as between the different prefectures or states of the countries concerned, is now creating conflicts since the lakes/reservoirs can provide only a limited quantity of water on a sustainable basis. In addition, high nutrient loads from domestic, agricultural and forestry activities are contributing to serious eutrophication and growth of aquatic weeds, thus resulting in further environmental degradation.

The aim of the first of these projects will be to provide a focus for different countries, where major lakes/reservoirs are being used to supply water to urban centres. Emphasis will be on sharing of knowledge in terms of technology and management practices used for sustainable management of such lakes/reservoirs.

The second project is a case study looking at six lakes in Indonesia in terms of state of the environment and technology assessment needs for their sustainable management. We shall keep the ILEC Newsletter informed of our progress.

Kasumigaura '95



6th International Conference on the Conservation and Management of Lakes - Kasumigaura '95

The 6th, and so far most successful, Conference dealt with subjects such as: Utilization of Lakes and Reservoirs, and Conservation of Lake Environments; Preservation and Management of Freshwater resources; Mechanism, Control, and Prediction of Eutrophication; Chemical Contaminants-the Sources, Fate, and Biological Effects within lakes; Administration Aspects of Lake Environment Conservation; Roles of Citizens and Enterprises, and Environmental Education; International Cooperation; and Kasumigaura Sessions.

Considering the large number of subjects dealt with it was a surprisingly successful conference with participants from a wide range of backgrounds such as scientists, engineers, administrators, and citizens. This was, in fact, the biggest event ever co-organised by ILEC. Previous ILEC related conferences have involved somewhere around 600-800 people. This ten-fold increase, though remarkable by itself, is also a phenomenal number for a scientific gathering. Of the 8,000 attendees some 5,000 were ordinary citizens which would seem to reflect the concern ordinary Japanese people have about water and lake related matters.

The large number of subjects dealt with must also have been a factor in attracting such a large gathering. In the International Cooperation session, The World Bank held a special workshop which was very well received by participants with a great deal of input from members from developing countries. The ILEC Environment Education Programme was also very well received with a large number of participants at the session.

For its part, Ibaraki Prefecture strongly encouraged the participation of members of the public and businesses. Past conferences have concentrated on scientific aspects and it was felt that to have a truly effective meeting the collaboration of all the people and organizations concerned with the environmental conservation of lakes was necessary. The Conference attracted more than 8,000 participants from 77 countries. The congratulatory address at the opening ceremony was given by the Crown Prince of Japan who was accompanied by the Crown Princess. Some 36 subjects were covered in oral and poster sessions.

The positive public awareness of environmental issues since the Earth Summit in Rio de Janeiro in 1992, undoubtedly played a part in the heavy turnout.

The state and issues of world lakes were presented at the Conference, and it was clearly stated that the international cooperation of all the people who are engaged in the conservation of lakes around the world is necessary and important. Moreover, many good ideas were put forward to improve the water quality of the host-lake "Kasumigaura"

Ibaraki Prefecture has pledged to make further efforts for better lake water quality management and contribute to the conservation of lakes around the world. The conference ended with the adoption of the Kasumigaura '95 Declaration dealing with issues such as; Population and Biodiversity; the Environmental Impact of Development; Knowledge and Technology Transfer; Partnership; Education and Integrated Catchment Management.

Lácar '97

After the success of the 6th World Lake Conference held in Kasumigaura, Ibaraki, the 7th Conference is scheduled to be held in the city of San Martin de los Andes in Argentina in October, 1997. What follows is a summary of the objectives of the forthcoming conference with specific reference to South America.

It is now widely accepted that sustainable development principles are grounded to a large extent on the preservation of fresh water resources from over-exploitation and contamination. Natural lakes constitute a major part of these resources available for present and future generations. Together with man-made lakes, they constitute valuable environments for the development of multiple water uses and the enhancement of social and cultural assets. These water bodies depend on inputs from watersheds, lakeshore land uses and lake water management. Thus, an integrated basin management approach should be devised to guarantee environmental conservation and sustainability.

South America displays a wide variety of lake environments, both natural and man-made, as regards climate, geological setting, water balance, watershed land uses and development, and ecosystem conditions. Thus, many case studies will address the situation of heavily stressed water bodies subject to contamination and eutrophication, which require mitigation and restoration measures. Participants' attention will also be drawn to nearly pristine environments which pose the challenge of devising management systems to stimulate resources development within the constraints of sustainability and environmental conservation.

Reservoirs play on important role in the region particularly for energy production and irrigation. Reservoir development involve many technical, economic, social and the transition from lotic to lentic environments. Topics dealing with reservoirs have been incorporated to stimulate discussions about the numerous experiences available in the region.

Most reservoirs and many natural lakes in the region are located in large international river systems or other type of interjurisdictional water. The management of lake water resources in watersheds shared by two or more countries poses the need for even more comprehensive basinwide technical and institutional approaches which will be given special consideration at the Conference.

In order to preserve ecological integrity and ensure the conservation of natural resources for future generations, the sound management of lakes and reservoirs should promote the rational and sustainable utilization of water resources to enhance economic, social and cultural assets. The Conference will offer the possibility of interchanging experiences among experts in managing conflict that arise from the search of apparently contradictory objectives. As a case study, Lake Lácar will illustrate its own dilemma related to the preservation of the protected environment where it is located, Lanin National Park, and to the economic development of its community based on the outstanding possibilities for tourism that such a setting offers for winter sports, fishing and sightseeing.

The Conference seeks to provide a forum and to stimulate discussions on economic and social uses of lake environments and on suitable management approaches to ensure sustainability. To this end the active participation of managers, decision makers and experts from international corporations, private enterprises, governmental agencies and citizen movements will be encouraged.

The Conference is particularly concerned with the role of formal and informal environmental education and public information as they are key issues to build up public awareness and develop a sustainable behavior regarding the protection and control of its environment. Session topics have been included to deal specifically with these issues and simultaneous activities will be planned to allow for the discussion of local, regional and international experiences.

LAKES OF THE WORLD

Conservation of Dal Lake and Inland Waters in India - Brij Gopal

India is a land of great contrasts and contradictions. The state of her water resources reflects them most. An average annual rainfall of 117cm and the mighty Himalayas with their perennial snow cover and numerous glaciers ensure a wealth of water resources in India. But the extreme spatial and temporal variations in precipitation result in a great contrast of floods and droughts. The contradictions are seen in the ambivalent human attitude: waterbodies are held in great reverence and also treated with contempt, both at the same time. Many rivers and lakes are considered holy but, despite increasing awareness and concern for the environment, most of the waterbodies are highly polluted and eutrophic.

Indian Lakes and Inland Waterways

Major Problems

Like all other countries, rapid eutrophication and pollution from industrial effluents are the major problems of Indian inland waters also. The rapid growth of human population and its concentration in urban centers along the rivers and around lakes and reservoirs has made a direct impact on waterbodies. The accompanying agricultural revolution based on intensive mechanisation and use of fertilisers, pesticides and irrigation, as well as rapid industrialisation have resulted in degradation of water quality both directly by discharging effluents and indirectly by increased demand for water.

It is indeed revealing that about 70% of the 3,100 or so large (population of 100,000 and above) and small (population above 50,000) towns in India have neither sewerage nor treatment facilities. Less than 6% of large cities and 2% of small towns have adequate sewage collection and treatment facility. It may be surprising to learn that many major towns on the banks of the river "Holy Mother Ganga" did not have sewerage facilities until a few years ago. Several important cities like Srinagar (Kashmir), Nainital, Udaipur, Bhopal and Hyderabad are spread around important lakes and reservoirs into which the wastes are partly discharged. Domestic wastes, thus, constitute the single largest source of organic pollution in all inland waters of the country.

The disposal of industrial effluents is another major source of pollution. Various industries have been estimated to contribute about 16% of the total wastewater generated. Until recently, there were no effluent treatment facilities in the major industries. Even today, the treatment facilities have been installed in less than half of the polluting industries, and these too are inadequate and treatment is unsatisfactory. The continued discharge of tannery effluents with high levels of chromium into River Ganga at Kanpur is an example.

The non-point sources of organic and inorganic pollution are also very important but have received very little attention up to now. It is not simply the agricultural runoff carrying fertilisers and pesticides that needs to be quantified and regulated; a much more important source of non-point pollution throughout India is the human and cattle waste from scattered rural/semi-urban settlements around waterbodies. The sociocultural practices like mass bathing and religious offerings significantly contribute to the pollution load of shallow lakes and reservoirs. The runoff from large urban centers and mining sites is also important.

Further problems arise from the intense anthropogenic activity in the catchment basins. Deforestation, agriculture and overgrazing occur on a massive scale leading to erosion and heavy silt and nutrient load in the rivers. Almost all the reservoirs are silting up fast. Since most of the freshwater lakes in India are of fluvial origin and shallow (mean depth 2-5m), they are now filling up rapidly.

Besides these problems of eutrophication, toxic pollution and accelerated siltation, majority of inland waters face another important problem of excessive weed growth. This is particularly serious in lakes and reservoirs though the shallow reaches of most of the rivers in the plains are also greatly affected. Water hyacinth may be singled out as the most serious and common weed throughout the country, turning many shallow lakes and reservoirs into marsh-meadows.

Conservation measures

The impact of rapidly growing water pollution on human health as well as the fishery resources has been felt for quite a long time and Indian policy makers have been well aware of the magnitude of the problem. This is reflected in the fact that as early as 1954, legislative measures were taken in the state of Orissa to regulate the disposal of wastes and effluents in river waters by factories and a River Board was established for the purpose. Later, the Government of India enacted the Water (Prevention and Control of Pollution) Act in 1974. It made it compulsory for all industrial units to treat their effluents to prescribed limits before discharge into open water or on land. Further, it provided

for the establishment of the Central and State Water Pollution Control Boards which were given adequate powers to enforce the provisions of the Act. This legislative measure has, however, made very slow progress in its implementation and many industries are still without proper treatment facilities. It has emphasised upon reducing pollutant load from industries only. The municipal bodies are not explicitly covered by the Act and in the absence of a sewage collection system, they escape the blame for not treating it or discharging it into the rivers. Thus, the legislative action has helped little in improving the water quality.

Besides the legislative measure, little has been done for conservation of freshwaters including their biotic resources. Whereas wetland conservation has received some attention at the level of both the Central and State Governments, and a national Wetland and Mangrove Committee has been set up to advise on the subject, inland waters have remained neglected. Though a few inland shallow waterbodies have been covered by wetland conservation, it is doubtful if wetland management is at the same level as lake management. The wetlands are selected for conservation according to their value as waterfowl habitats and their high productivity is generally accepted. A programme of lake conservation was under consideration of the Planning Commission some years ago, but the exercise was abandoned.

The case of Dal Lake, where some effort has been made towards restoration of water quality, suffices to highlight the failure of a half-hearted exercise due to its secotral approach.

Dal Lake at Srinagar (Kashmir) has been considered for conservation and restoration for many years. This shallow oxbow lake connected with River Sutlej is a tourist attraction. There are hundreds of houseboats on the lake and are a major source of pollution. The domestic wastes from the surrounding local population also enters the lake. The lake is heavily infested with submerged macrophyte growth. Traditionally, floating islands are made using reeds and other aquatic vegetation for cultivation of vegetables. Harvesting of macrophytes has often been suggested as a nutrient removal technique for lake restoration. Accordingly, mechanical deweeding had been recommended to improve Dal Lake, and started in 1987. A recent study has however shown that mechanical deweeding has disturbed the stability of the lake, and affected the benthos and fisheries adversely. A new problem of red algal bloom of unknown origin has arisen in the deweeded areas. In the absence of effective check on inflow of domestic wastes and urban runoff, the lake continues to degrade further.

Suggestions and Recommendations

Conservation of freshwaters defined as the management "to rehabilitate the physical, chemical or biological quality of an area altered by man's activities" cannot be accomplished by legislative action alone. The control or reduction of point discharges of domestic and industrial effluents is not sufficient when the non-point sources of pollution are of a greater magnitude. The rivers may also respond to the reduction in pollution loading by their inherent self-purification ability only if their flow is not drastically altered. Therefore, there is an urgent need to take remedial measures for prevention of pollution from non-point sources. This means an effective watershed management for every lake and river, with particular attention to the littoral/riparian zones which play an important role in the interaction of waterbodies with their watershed.

Dal Lake

Conservation of freshwaters requires a good understanding of their structural and functional characteristics, and the responses of their biota to various anthropogenic perturbations. There is very little, and generally fragmentary, information on most of the waterbodies in India. Hence, comprehensive limnological studies need to be undertaken on all major rivers and lakes. In this context, training and education in limnology and water quality monitoring and management are urgently required.

This is an abridged version of an article that first appeared in the Proceedings of the International Association for Theoretical and Applied Limnology, Congress in Barcelona, 1992.

New Publications

Compact-size Edition: Data Book of World Lake Environments - A Survey of the State of World Lakes - 3. The Americas

The third in the compact-size edition of the Data Book of World Lakes was published in March, 1996. This series is a re-compilation of data from the preceding five volumes of the Data Book of World Lakes Environments (1988-1994) into three volumes on a regional basis.

Guidelines of Lake Management Volume 7 - Biomanipulation in Lakes and Reservoirs Management R. de Bernardi and G. Giussani (Editors)

Although the practice of biomanipulation is in itself not new, systematic studies on the subject have only started relatively recently. Consequently, most of the papers dealing with this subject are appearing in scientific journals and are difficult to comprehend for non-specialists. The 7th book in the Guideline Series, published in March, 1996, gives a general introduction to the role of biomanipulation in lake management with emphasis on the control of excessive algal growth in lakes suffering from eutrophication.

Lakes in China - Professor Xiangcan Jin et al

This book, published in Beijing in 1995, was written by more than 100 Chinese limnologists, university professors and research scientists. The book systematically provides comprehensive scientific information and data on such matters as the natural environment, hydrology, aquatic biocommunities, limnological characteristics, water chemistry and the exploitation and development of the water resources of over 40 of the most important lakes and reservoirs in the five major lake regions in China. More information on this book can be obtained from the Chinese Research Academy of Environmental Sciences in Beiyuan, Beijing, China.

Forthcoming Events

3rd International Conference on Reservoir Limnology and Water Quality

The aim of the conference is to bring together limnologists and water quality engineers dealing specifically with reservoir limnology or topics relevant to understanding, predicting and managing reservoir water quality. The main topics that will be dealt with include: geographic peculiarities of reservoirs, nutrient cycles and eutrophication, food web interrelations, spatial heterogeneity in reservoirs and global climatic changes and reservoirs.

Date: 31 August - 5 September, 1997
Location: Ceské Budejovice, Czech Republic
Organised by: Hydrobiological Institute, Academy of Sciences of the Czech Republic

Tel: 42-38-45484
Fax: 42-38-45718
Email: hbu@dale.entu.cas.cz

Opening of Lake Biwa Museum, Shiga Prefecture, Japan

This museum, located directly opposite the offices of ILEC and UNEP/IETC on the shores of Lake Biwa, will be officially opened in October, 1996. As one of its main aims is to provide a venue for people to obtain a comprehensive understanding of Lake Biwa and world lakes, the museum will house both permanent exhibitions of the geological and human history of Lake Biwa, as well as areas for temporary exhibitions. Outdoor exhibitions will cater for large exhibits such as reconstructed forests, streams and ponds.

The stated principles of the museum are that it will be a place where people can participate and exchange information, and a place where people can consider a better coexistence of lakes and humans.

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION
Secretariat
1091, Oroshimo-cho, Kusatsu-city, Shiga 525, Japan
Tel : +81-775-68-4567, Fax : +81-775-68-4568, e-mail : ilec @ pop. biwako. or. jp

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