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NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

— For Better Lake Management —

This Newsletter is also available in Japanese.

SHORT TRAINING COURSE ON ENVIRONMENTAL EDUCATION

An internarional environmental education traing course for 7 foreign teachers and health experts was held by ILEC in Shiga Prefecture, Japan, over a period of 10 days between 20-29 October, 1994. This was the first time that ILEC has held a short training course on environmental education and all the participants agreed that the course was both worthwhile and successful.

The course included both lectures and study visits. The participants (from 4 different countries) appeared to be favourably impressed by the Shiga Project (ILEC's Pilot Project on Lake Environmental Education in Shiga). Also included on the course were school visits and on 27 October visits were made to Moriyama-Kita junior high school and Sawayama elementary school. The purpose of the visit was to inspect the program and curriculum which ILEC has been helping to implement with the goal of participation of both elementary and junior high school students in the protection of lake environments.

The purpose of ILEC's environmental education project, which now crosses international borders and covers six countries (Japan, Denmark, Thailand, Ghana, Brazil and Argentina), is to promote environmental education at primary and secondary school levels with emphasis on freshwater lake environments in Asia, Africa and Latin America.

The following report was written by one of the participants, Michael Chiagbey of Ghana, on his impressions of the course.

INTRODUCTION

On the whole I feel the training course was well planned and executed. All activities were carried out on time and the course was a successful one. The duration was rather short if you consider the lively discussions which had to be stopped because of time. Although there are financial considerations that have to be taken into account, the duration could have been extended to at least three weeks. However, I must congratulate ILEC for the excellent organization and the kind way that the organizers handled the participants.

CONTENT OF COURSE

The materials which were presented were useful, however, I feel more materials could have given if more time was allowed and more experts were involved in the lectures and discussions. For example an expert on water borne disease, which is a serious problem in my project area, would have been extremely useful. Perhaps handling of serious problems from other countries would

also have been extremely beneficial.

USEFULNESS OF TRAINING TO MY COUNTRY

I was impressed by Japan's serious attempts to control environment pollution. The work on Lake Biwa is very commendable. I have acquired new knowledge and ideas which will be useful to my country. I will do my best to disseminate the ideas to the highest level within the Environment Protection Council of Ghana. I got a lot of ideas from the other participants, which will help in developing better strategies to tackle Environmental Education in Ghana.

CONCLUSION

The short training course was successful. However, future courses, if there are any, should consider the problems of other countries. Environmental Education has a long way to go and we must all work relentlessly to develop methods which are appropriate to inform and educate people, and the public generally, on environmental and geographical problems at locations around the world.

BITEX (LAKE BIWA TRANSPORT EXPERIMENT) SYMPOSIUM/WORKSHOP

- What is going on the lake? -

For the scale and the social importance of Lake Biwa, the number of researchers studying Lake Biwa is limited to reach any definite conclusion or integrated idea. It is therefore necessary to have joint investigations among the researchers from multi-disciplinary fields, and the results obtained should be compared and be discussed mutually.

BITEX-93 (Lake Biwa Transport Experiment), the fruit of such necessity, was organized by Lake Biwa Research Institute (Japan) and the Centre for Water Research (Australia) from August to September 1993.

The aim of this experiment was to examine the mechanisms of horizontal and vertical transport of mass, momentum and energy in Lake Biwa and to relate these mechanisms to the biogeochemical process operating in the lake. The study covered the transport between the North and South basins, where the horizontal exchange and dissolved and suspended nutrients and plankton take place most frequently.

The experiment involved a total of 177 biologists, physists, chemists, technologists, students and staffs from 7 countries. The participants carried out the experiment using newest instruments and have analyzed thousands of samples and more than several giga bytes of data for a year.

LBRI and CWR, again in combination, held BITEX Symposium/Workshop at Otsu/Nagahama, Shiga, Japan, from 5 to 10 November, 1994 under the auspices of the Science and Technology Agency of Japan, the Japanese Society of Limnology and the Ecological Society of Japan.

At the symposium for the public, six researchers representing the participants of BITEX-93 respectively presented the results at following five sessions; 1. Large Scale Transport, 2. Small Scale Transport, 3. Importance of Perimeter, Surface and Benthic Layers, 4. Biogeochemical Changes Induced by Typhoons, 5. Enclosure Experiment, and showed the new scenarios which would solve the problems, "what is going on in the lake". After the respective sessions, presenters, eight panelists from various fields and audiences discussed together in order to deepen understanding.

At the workshop, we had 40 presentations based on the data collected during the last year experiment period, and discussed forthcoming papers, publication and small-scale joint researches to be held continuously.

The symposium/workshop made the inter - disciplinary studies possible; the word, 'compatible' is using for computers, however, this word can be also used for the study which talks same language.

The most noteworthy results from the symposium/workshop could be obtained from "enclosure experiment". This experiment aimed at surveying the condition of 'enclosed' lake water by a large-scale *hexagonal tube* with a polyester curtain. The results derived from the experiment disproved the usual idea that advocation would greatly make influence on the distribution of phytoplankton; we could indicate that the apparent multiplication of *phytoplankton* in Lake Biwa was not only due to nutrient loading but water temperature structure (*themocline*) would be the key to solve the mechanism of phytoplankton bloom.

2ND LA PLATA WORKSHOP HELD IN ARGENTINA

The La Plata River basin in South America has one of the largest concentrations of reservoirs anywhere in the world. Five countries, Brazil, Bolivia, Uruguay, Paraguay and Argentina share the river basin. Until recent years there was a minimum of exchange of information and experiences between these nations. To promote interaction, the 1st La Plata Workshop (International Workshop on Regional Approach to the Reservoir Development and management in La Plata River Basin) was organized by ILEC and UNCRD (the United Nations Centre for Regional Development) in Brazil and Argentina in August 1991. It turned out to be a great success with more than 80 participants.

To expand and develop the work done by the first workshop, a second La Plata Workshop was held in Argentina in August 1994. It was held by the Salto Grande Reservoir and in Buenos Aires. The Workshop had more than 50 distinguished participants including reservoir managers from the five basin countries, lake/reservoir environment specialists, urban planning specialists and high ranking staff of international development agencies. Ing Alberto Calcagno served as a local organizer.

At the first part of the workshop in Salto Grande, many presentations were made on reservoir water quality management and fisheries. Lectures and actual experiences on modelling were also provided by Professor Sven. E. Jørgensen. During the latter half of the of the workshop at the meeting room of the Interamerican Development Bank (IDB), institutional aspects for lake/reservoirs environment management of the basin was focussed on.

The final recommendations included an establishment of a regional organization consisting of institutes/organizations in the basin. Following the recommendation the La Plata River Basin Regional Network was established on 19 August 1994. Ing. A. Calcagno took the office as coordinator of the Network. Several organizing committee members were also appointed.

LA PLATA RIVER BASIN REGIONAL NETWORK

The participants concluded that little progress had been made on the effective implementation of the recommendations of the first workshop while the general diagnosis made at that time remained still valid.

The need to enhance systematic communication, cooperation, interchange of information and the optimization of research, planning, operation and management of river/reservoirs was stressed.

It became very clear from the discussions that the establishment, implementations and operations of a regional network in the La Plata Basin was an urgent need to develop further the interaction and already existing cooperation, and to promote future activities, projects and programmes related to watershed and water resources management, planning, reservoir protection and rehabilitation.

Objectives of the Network

The La Plata Basin network should improve, stimulate and enhance the following activities among its participants:

1) Education, information and communication

- Integration of educational activities to develop formal training courses (post graduate), in-service training, environmental education.
- Exchange of information through publication of newsletters, synthesis and joint papers as a result of cooperative work. General public information.
- Industry of regional capacities: organizations, research, and technology development projects, human resources, teaching and training activities, technology availabilities (models), data banks, etc.

2) Cooperation

Development of further cooperation among the various institutions in the watershed as a way to stimulate technological transfer, joint research projects, workshops and seminars, both on specific topics or integrated approaches to watershed/reservoirs and water resources management.

3) Integration

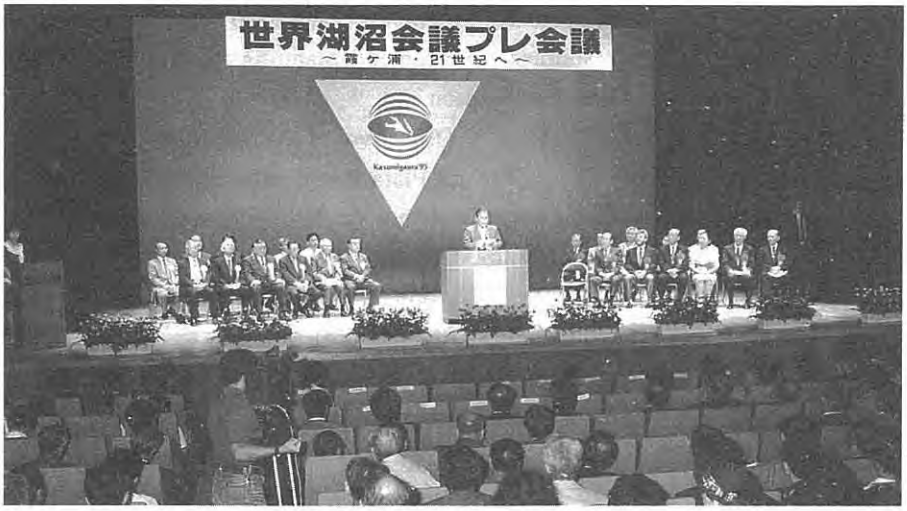
Development of integrated activities in the network and among the various regions. The network would provide a "conceptual umbrella", a basic structure with an approach to stimulate integrated management activities.

It is becoming more and more evident that to solve the complex problems of water resources and reservoir management it is necessary to develop a true interdisciplinary approach with a systematic and articulated overview of biogeophysical, social and economic problems. The network will have the task to improve and spread this conceptual framework in the basin in order that adequate management of water resources can be achieved as a result of this approach.

4) Coordination

The network will have the function to coordinate activities among its members and also to propose further projects, programmes and training courses. One of the most important objectives of the network is to enhance quality control of the projects; to unify and standardize methodologies, environmental quality indicators, field data collection and processing procedures, geographical information systems development and remote sensing data acquisition techniques; to provide basis for intercalibration, promote ex post evaluation of projects and stimulate interchange of technologies.

Preliminary Conference for the 6th International Conference on the Conservation and Management of Lakes



A Preliminary Conference was held on 21 August 1994 at the Tsuchiura Citizen's Hall for the 6th International Conference on the Conservation and Management of Lakes, which will take place in October 1995 in Kasumigaura. The theme of the conference will be "Harmonizing Human Life with Lakes." About 1,500 people from 39 prefectures attended the preliminary conference.

The conference opened at 10 a.m. following speeches by the Governor of Ibaraki Prefecture, Masaru Hashimoto (also President of the 6th International Conference on the Conservation and Management of Lakes), the Director General of the Environment Agency, Sohei Miyashita (See Photo), the Minister of Construction, Koken Nosaka, and the Mayor of Tsuchiura City, Hiroyuki Sukegawa. A summary on the progress and purpose of the international conferences on the conservation and management of lakes was given by Professor Saburo Matsui of Kyoto University who chaired the programme committee. With the aid of slides, Professor Matsui gave an easy-to-understand lecture on the conferences, from the Inaugural Meeting at Lake Biwa, Shiga Prefecture, to the 5th Conference, which was held last year on the shores of Lake Maggiore in Italy. Professor Matsui then went on to introduce the 6th Conference, which will be held on the shores of Lake Kasumigaura next year.

After Professor Matsui's talk, Dr. Riccardo de Bernardi, chairperson of the 5th International Conference on the Conservation and Management of Lakes (and Director of the Istituto Italiano di Idribiologia), spoke on "Environmental Problems in Italian Lakes and lakes Maggiore and Orta as Successful Examples of Correct Management Leading to Restoration." He asserted that the activities of citizens played a significant role in purifying the water of lakes Maggiore and Orta, supporting this with examples. In the 1970s, through a programme instituted under Italy's environmental laws, Lake Maggiore recovered from eutrophication, while Lake Orta bounced back from harmful contamination and acidification.

The afternoon saw presentations on three key issues: lakes and organisms, lakes and lifestyle, and lakes and culture. All were based on the common theme of lakes and human life. From among the 41 proposals

officially received, 15 presentations were given, five on each issue. The audience also had the opportunity to ask questions and offer their own opinions.

After the presentations, a panel discussion took place on the subject of establishing a way of living that would be gentle to Lake Kasumigaura. Coordinating this discussion was professor Hiroyoshi Shiigai of the University Tsukuba, who chaired the Executive Committee for the preliminary conference. The panelists, Mr. Norihiko Ikeda, former chair of the Youth Chamber of Commerce of Tsuchiura, Mr. Akio Kanbayashi, president of Kasumi, Ms. Kazuko Tomiyama, a social critic, and Mr. Takehiko Fukushima, a researcher at the National Institute for Environment Studies, held a lively discussion, which included their impressions of the presentations.

In addition, the Citizens' Council for the World Lake Conference held the Kasumigaura Citizens' Night and the Water and Environment Fair and Flea Market. The residents of the Kasumigaura basin have great interest in the lake and are expected to become even more active in this area in the next year.

'94 ILEC ACTIVITIES

January 15 - 30
Fact finding mission to the Phillipines and Australia

January 24 - March 30
4th ILEC/JICA Lake Water Quality Management Training Course in Shiga

February 14 - 17
Brazilian trainees from ICETT welcomed

February 23 - March 11
Indonesian trainees welcomed

March
"World Lake Environments - Vol.1 Asia and Oceania" published

April 5
A Symposium for European Women's Study Tour entitled "On the Shores of Lake Biwa - A Gathering of Women" held in Shiga, organized by ILEC, Shiga Prefecture and Japan Foundation

April 8
Official Opening Ceremony of the UNEP/International Environment Technology Centre in Osaka

April 14 - 15
Cooperation in training course for an expert of the Venezuelan Environment Ministry

April 19
ILEC Lecture Meeting on Water Environment in Shiga

May 14
Cooperation in Ritsumeikan University symposium in Shiga

May 18 - 21
Cooperation in "Water Japan '94" in Osaka

June 28
Research Experiment on Environmental Education in Shiga

July 2 - 13
Fact finding mission to Indonesia on lake related international cooperation projects

July3 - 18
Mission to Venezuera for JICA Training Course on Lake Valencia

July 14
Cooperation in the training course of China - Japan Friendship Centre for Environmental Protection

July 14 - 19
Cooperation in "6th International Symposium on Saline Lakes in China"

August 2
Cooperation in "Lake Biwa Water Festival"

August 6 - 27
Mission to South America on Environmental Education

August 7 - 20
Mission to La Plata Workshop in Argentina

August 7 - 20
Mission to Sweden for the WMO Workshop

August 21
Cooperation in "Preliminary Conference of the 6th World Lake Conference in Ibaraki"

August 24
Conclusion of Memorandum with UNEP International Environment Technology Centre

August
"Guideline Book Vol. 2 - Spanish version -" published

September 3
Cooperation to " the *Rohdoh-Kinko* seminar" in Shiga

September 11
Cooperation in nature music festival in Shiga

September 25 - October 12
Fact finding mission to Europe for World Lake

Conference Booklet

October 10

Cooperation in "Kusatsu Citizens' Festival"

October 13 - 15

Cooperation in "GLENTEX '94" in Yokohama

October 17 - 22

Mission to Thailand for the Expert Meeting on UNEP/GEMS Project

October 17 - November 5

Fact finding mission to Indonesia on lake related international cooperation projects

October 20 - 29

Training Course on environmental education held in Shiga

October 22

"World Lake Seminar for Citizens" held in Shiga

October

"Guideline Book Vol. 2 - French Version -" published

November

"Survey of State of World Lakes Vol.5" published

December 11 - 23

Fact finding mission to China for World Lake Conference Booklet

LAKES OF THE WORLD

LAKE KASUMIGAURA (JAPAN)

Morihiro Aizaki

(Water and Soil Environmental Division, the National Institute for Environmental Studies)

Lake Kasumigaura, the second largest lake in Japan, is located near the mouth of the Tonegawa River, 50km north-east of Tokyo. This lake was originally brackish. The Hitachigawa River gate was built in 1963, 500m upstream of the confluence of the Hitachigawa and Tonegawa Rivers. Before the construction of the gate, the lake was primarily used for fisheries and water quality was maintained at reasonable level for an eutrophic lake. However, after the construction of the gate, the lake changed from brackish to fresh water after the implementation of a water resources development plan. The areas surrounding the lake have been rapidly changing since the construction of the gate.

Lake Kasumigaura consists of two main basins called Nishiura and Kitaura. Nishiura is usually called Lake Kasumigaura, and has the following dimensions; surface area 178 km^2, maximum depth 7 m, mean depth 4 m, volume $8x10^8$ m^3, watershed 1950 km^2. Lake Kitaura (Kitaura basin) is connected by a channel with Lake Kasumigaura and has the following dimensions; surface area 39 km^2, maximum depth 10 m, mean depth 5m, volume $1.9x10^8$ m^3, watershed 437km^2.

The past 100 years of this lake may be divided into three periods. In the first period (-1945), fishery was prosperous. Continuous annual catch of 8000 tons of fishes were recorded in this period. Pond smelt and Japanese whitebait were the main species caught. Transportation by water was also active in this period. Famous towns around the lake were developed by water transportation. Reclamation works were also started in

this period.

In the second period (1945 - 1963), fishery and reclamation works were active just as in the first period. However, water transportation declined and almost disappeared, and land transportation systems were developed. Water quality changed to a brackish condition in this period due to the dredging work of outflow rivers for flood control. As a result, agricultural damage resulting from the use of salty water for irrigation occurred in many place. The Hitachigawa water gate was constructed both to control floods and prevent damage of agricultural lands from intrusion of brackish water started in this period. The first water supply for domestic use was constructed in 1960. Subsequently, Kasumigaura water supply work in the southern area of the lake started in 1962. At present about 620,000 people use the lake water for drinking and other purposes.

In the third period (1963 -), the fundamental concept of lake water utilization was changed. A comprehensive development project for the lake was started in 1971 for the purposes of development of water resources and flood control. Lake Kasumigaura was, hereon, expected to serve as a reservoir. Reclamation works finished in 1973. Total reclaimed area in the lake reached 2,660 hectors which is equivalent to 12% of the present lake surface. A large area of littoral zone with abundant aquatic plants disappeared due to this work. Annual catch of fishery increased from 1965 due to the use of motor boats and the start of carp culture in pens in the lake. An all time high annual catch of 18,000 tons was recorded in 1978. Recently the fishery industry has faced many problems, and the number of fishermen have decreased.

In the 12 years from 1978 - 1990 the population in the watershed increased by about 200,000 people and the number of registered factories increased by about 2,000, with a 300% incresase in industrial production. A public sewerage treatment plant opened in 1979, with services being provided to some 200,000 people in 1988. Pig farming has been active in this area, and about 400,000 heads of pigs were reared in 1991. Carp culture in pens was started in 1963 and increased rapidly in the lake. Annual catch of pen cultured carp reached a high of about 8,800 tons in 1983 and decreased to about 6,000 tons in 1991.

Land use in the watershed of Lake Kasumigaura in 1987 was as follows; town area, 10.7%; paddy fields, 21.6%; fields and orchards, 16.9%; forest etc., 40.5%; lake surface, 10.3% in 1987.

Recent water quality in this lake is shown in the Table. Although human activities have increased in the watershed in recent years, water quality has been maintained at a constant level. Through a number of countermeasures over a period of many years Ibaraki Prefecture has made efforts to recover the water quality. The fact that small changes in water quality have occurred for the better in the last decade is evidence of the success of these countermeasures. However, high Secchi disk transparency levels have been observed in winter in recent years with the decrease of chlorophyll-*a* concentration. Dominant phytoplankton species in the summer period have also changed in recent years from *Microcystis* spp. to filamentous blue green algae. These phenomena show that severe changes in the ecosystem have occurred in this lake.

TABLE WATER QUALITY OF LAKE KASUMIGAURA

	T-P (μg/l)	T-N (mg/l)	Chl-a (μg/l)	S D (m)	COD (mg/l)	Cl^- (mg/l)
1990	64	0.96	56	0.5	7.6	51
1991	71	1.3	58	0.6	6.8	42
1992	77	0.94	77	0.5	7.4	45

Forthcoming Events

Kasumigaura '95

6th International Conference on the Conservation and Management of Lakes-Harmonizing Human Life with Lakes —Towards the Sustainable Use of Lakes and Reservoirs—

Date: 23 - 27 October 1995
Venue: Tsukuba and Tsuchiura, Ibaraki, Japan
Organizers: Ibaraki Prefecture and ILEC
Official Language: Japanese and English

Sessions:

1. Utilization of Lakes and Reservoirs, and Conservation of Lake Environments
2. Preservation and Management of Freshwater Resources
3. Mechanism, Control and Prediction of Eutrophication
4. Sources of Chemical Pollutants and Their Fate within Lakes
5. Administrative Aspects of Lake Environment Conservation
6. Role of Citizens and Enterprises, and Environmental Education
7. International Cooperation
8. Kasumigaura Session

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Forum for Inland Lakes

Forum on Caspian, Aral and Dead Sea
Date: 27 - 29 March 1995
Venue: United Nations University (Tokyo, Japan) on 27 March
Lake Biwa Research Institute (Shiga, Japan) on 28 & 29 March
Organizers: The United Nations University, UNEP-International Environmental Technology Center, Kyoto University, Lake Biwa Research Institute and ILEC

A "Forum on Caspian, Aral and Dead Sea" will be held involving researchers and assistance organizations that have studied environmental problems regarding these inland lakes. The forum will include presentation of studies and discussions on relevant themes. Although the entire Forum is open to the general public, they are especially invited to participate in the sessions held on 28 March

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