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NEWSLETTER

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

— For Better Lake Management —

This Newsletter is also available in Japanese.

ILEC/UNCRD/UNEP/ONEB/PSU JOINT EXPERT GROUP WORKSHOP

The Second Expert Group Workshop on River/Lake Basin Approach to Environmentally Sound Management of Water Resources

The Second Expert Group Workshop on River/Lake Basin Approach to Environmentally Sound Management of Water Resources: Focus on Policy Responses to Water Resources Management Issues and Problems was held from 16 to 25 January 1989 in Bangkok and Hat Yai, Thailand under the joint auspices of the International Lake Environment Committee (ILEC), the United Nations Centre for Regional Development (UNCRD), the United Nations Environment Programme (UNEP), Office of the National Environment Board (ONEB) in Thailand, and the Prince of Songkhla University (PSU). Fifty-eight scientists and policy-makers (23 from Thailand) from 11 countries and 2 international organizations (in addition to the sponsoring organizations) attended the workshop.

The workshop was an integral part of a three-year project on river/lake basin-wide approach to water resource management which had been launched in 1987 jointly by ILEC, UNCRD and UNEP in response to the growing needs in developing countries to address water resources management issues in a broader social context. It was fortunate that the workshop marked one of the first activities organized in line with the objectives of the Natural Resources and Environment Protection Year of Thailand.

The workshop consisted of two parts. The first part was held from January 16 to 21 at Ambassador Hotel in Bangkok. The emphasis of Part I was to review and evaluate the past and current policy responses to the problems and issues identified at the first workshop which had been held in February 1988 in Japan aiming to shed light on situations of nine case-study regions. The second part was held from January 23 to 25 at JB Hotel in Hat Yai, the exact location of Songkhla Lake Basin in southern Thailand, and the special focus of the second part was an in-depth review of strategies and approaches to water resources management of the lake.

OUTLINE OF PART I

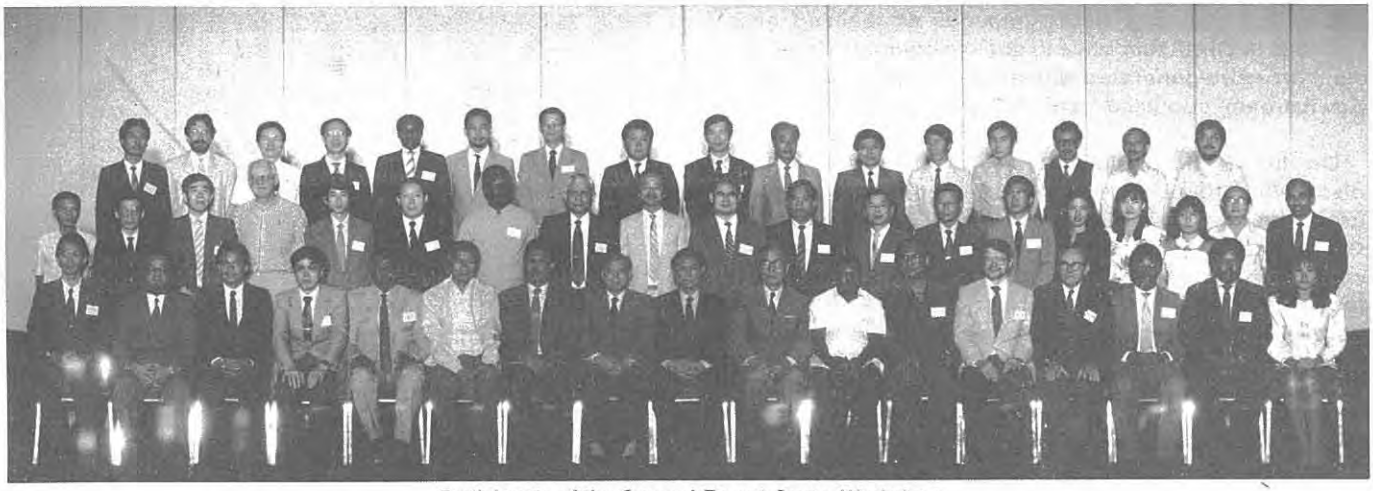
Following the keynote addresses and general resource paper presentations on the 16th, nine case-studies were classified into three categories of the following three problem domains, and comparative discussion on each three case-studies was made centering on a resource paper of each session during 17th-19th:

* Policy Responses to Environmental and Social Problems Resulting from Water-Land Use Interfaces (Cases of Lake Dianchi, Lake Victoria, and Yahagi River)
* Policy Responses to Conflicts Among Competing Water Uses/Users (Cases of Laguna Lake, Songkhla Lake, Lake Kasumigaura)
* Policy Responses to Environmental and Social Effects of Water Resources Development Schemes (Cases of Amazon Region, Sagling Dam, and Lake Biwa).

The following two summaries are examples of case-study reports.

Environmental Impact Assessment for the Porteira Hydroelectric Project (BRAZIL)

This paper describes the Brazilian legal environmental system, particularly the rules for environmental licensing



Participants of the Second Expert Group Workshop

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of hydroelectric projects. It shows how the licensing system considers different phases of the project and the role of the environmental impact assessment and statement in approving or rejecting the project through the discussion of mitigating and compensatory measures. Some highlights of the Brazilian Constitution concerning environment and Amerindians are also presented. A short discussion on environmental problems in the Brazilian Amazon is given.

Hydroelectric projects in the Amazon, both existing and planned, are presented together with the potential environmental impacts of dams and reservoirs in the region. The importance of detailed baseline studies in the region prior to dam construction is stressed, due to the scarcity of information, together with the complexity and fragility of Amazon ecosystem dynamics. The Porteira engineering project is discussed in terms of its purposes in generating energy for the region. Some details of the civil project and of the river/reservoir system are also given.

The strategies involved in the Porteira environmetal impact assessment are presented and discussed. Baseline studies and the environmental control plan of the project are presented for Amerindians, protected areas, biota conservation, demographic patterns, archeological sites, water quality, etc. It shows how the environmental control plan draws up programmes and policies that would minimize the assessed impacts and ensure that the project meets its objectives.

Evolution of the Lake Biwa Water Resources Management and Environmental Conservation Policies (Japan)

The basic objective of this 2nd-year study is to illustrate Lake Biwa and the intra-prefectural undertakings and accomplishments in terms of increasing socio-economic development pressure over time and shifting emphasis on resource values, impending lake management issues, and policy measures and their intricate relationships.

Seven subjects were chosen for elaboration: i. e. 1) structure of laws on the water environment and water resources, 2) Lake Biwa Comprehensive Development Project, 3) water quality conservation policy, 4) Ordinance on the Eutrophication Prevention, 5) land use and environmental conservation, 6) problems of water use and management, 7) involvement of people and the administration and their roles on water pollution issues. The linkage and overlapping relations among these subject areas were analyzed to emphasize the development and conservation dynamics. Emphasis was also laid on the changing water demands as realized over decades in direct response to socio-economic development pressure generated within the prefecture and in the downstream population and industrial centers.

On the 20th, participants were divided into four discussion groups for synthesis. Among deliberations at group discussions were:

GROUP 1: Policy responses to environmental and social problems resulting from water-land use interfaces.

Three broad categories of strategies and approaches were identified:

A. Institutional arrangements

There are four types of institutional arrangements found to have relevance to lake management; i. e. rights to the use of resources, incentives, regulatory mechanisms, and technical assistance. The institutional arrangements are already in place in most countries studied. Their sufficiency, however, depends much on the support and involvement of the greater sector of society. Necessarily, people's support and involvement can be enhanced only through adequate awareness of issues related to lake management.

B. Organizational arrangements

The models discussed included; (1) the authority model (e.g. cases of Lake Victoria and Laguna Lake), (2) sectoral/ministerial model (e.g. Lake Dianchi), and (3) quasi-governmental model (e.g. Yahagi River). Lessons extracted from the discussion are: (a) the coordination mechanism depends so much on the size or scale of the basin area, (b) the coordination mechanism depend upon the relative importance of the lake basin area, (c) coordination arrangements require periodic review and modifications, and (d) coordination is dependent upon the coordinative capability of the coordinators.

C. Local community participation

It was proposed that community participation can be further enhanced and sustained through various interventions or mechanisms, e.g. formation of federation, informal education/information campaign, information sharing, partnership between NGOs and local government.

GROUP 2: Policy responses to conflicts amog competing water uses/users.

Conflicts have many sources such as increased demands on the resources, lack of information, lack of consultation or representation, cultural differences. In water resource development and utilization the following institutional arrangements should be considered; (1) overall rules for water resources use (in most cases, the national laws, regulations and the like are inadequate to deal with water conflicts), (2) rules for specific decision making such as majority rule, absolute rights, money, benefit-cost analysis, consensus, (3) information systems, (4) specificaion of rights, responsibilities and liabilities, and (5) structure of state management organization.

Nine case-studies identified various policy tools and instruments which were adopted to deal with managing social conflicts over water use. These includes; zoning and licensing, user charge, compensations and subsidies, information generation and dissemination, organizing work among interest groups, organizing water users' organizations, establishing mechanisms for receiving and addressing complaints, contracts, inter-agency coordination, public hearings, construction of new infrastructure, and doing nothing.

Dr. Hidehiko Sazanami, Director of UNCRD, delivers addresses during opening of Part I at Ambassador Hotel in Bangkok.

GROUP 3: Policy responses to environmental and social effects of water resources development.

The major topics of discussion this time were the scope, methodology, and procedures of environmental impact assessment (EIA). In the countries represented by the group members, nearly all the countries have adopted a formal EIA system, and it can be viewed as a tool for promoting consultation on the proposed project. But the manner differs from one country to another depending on various factors.

It is frequently observed that development of reservoir coupled with forced resettlement results in the increased pressure on land resources, which in turn increases the risk of soil erosion in the upper catchment areas, bring about cumulative effects on the river basin community. Because the conventional approach to EIA tends to restrict its scope of analysis only to the direct environmetal impacts, development of an analytical framework capable of assessing cumulative effects is needed.

While a great majority of the population benefits from water resources development programmes and projects, there are people who are adversely affected and given little policy attention. The relief measures for the impacted population are frequently short-sighted and implemented without regard to their real plights. To rectify this situation, a variety of method could be adopted to encourage popular participation in the process of project planning and decision making, e.g. information dissemination, public hearings, involvement of local community representatives.

GROUP 4: Manpower development in the field of water resources management.

The analysis of problems and issues shows the need for manpower training programme. The possible target groups should include the policy makers, managers, and technical staff. However, due to some limitations in the resources needed for training, priority is placed on the training of managers. The training programme should be short (about two weeks) and be designed to achieve the following objectives; (1) provide a broad knowledge of structures and function of ecosystem and social systems, (2) develop capability to translate policies into operational actions, (3) develop capabilities to identify, perceive, and analyze environmental problems/issues and provide options, (4) develop in the managers, the capability to operate a simple lake watershed simulation model. Educational materials may include: case-study reports, expert reports, software, a simulation model to be developed from nine case study reports. Recommendations were also made to encourage workshop organizers to promote actual training courses.

OUTLINE OF PART II

In the second part of the Seminar, Lake Songkhla, in southern Thailand was closely examined as an example case-study. Having covered the general outline of issues concerning water resource control in the first part, the Seminar shifted its focus in the second part to specifics so as to deepen the participants' understanding of current problems from a more practical point of view. While Lake Songkhla (a brackish lake) is presently rich in fish and other natural resources, a fresh water distillation plan has been under consideration for some time to fulfill the increasing needs of agricultural and industrial developments currently underway around the Lake. In this respect, it was indeed worthwhile to closely examine the situation at Lake Songkhla for it represented a major dilemma facing many of the water resource control projects throughout the world.

The first day of the program centered around discussions on environmental and social issues imposed by water resource control and fresh water distillation as well as the development plans of the areas surrounding the lake. The results of a survey of the lake conducted by Songkhla University was presented along with detailed reports on Lake Nakaumi/Sinji case in Japan where the fresh water distillation plan was discontinued, as well as the conditions of Lake Laguna, the Philippines and Kasumigaura, Japan, where the distillation was successfully completed. On the basis of such reports, the discussions that followed covered the efficacy of fresh water distillation as a means of water resource control as well as its possible effects on the ecosystem of a given source of water.

Moreover, the presentation of a film depicting the disaster of a large scale flood that had swept over the southern part of Thailand including Songkhla last November, illustrated the need for an accurate flood forecast system, while at the same time, demonstrated the importance of well-devised development and forest preservation plans particularly in the areas surrounding a major water resource.

On the second day, the participants went on an excursion around Lake Songkhla. The excursion, covering from the northern to southern tip of the lake was especially meaningful in gaining understanding about the actual conditions of the lake and of some of the major developments in the surroundings. By observing at first hand, the bird sanctuary and other precious natural preservations, the participants were able to learn much about efforts to maintain the balance between the developments and nature.

On the final day, after a presentation on the water resource control project of Lake Songkhla, time was set aside for a panel discussion under the title of "Development and Control of Brackish Water Resources." Having had the opportunity to listen to a number of presentations and to observe the actual situations of Lake Songkhla, the panelists as well as the audience were absorbed into a lively discussion on the subject, unconscious of the passage of time. While it was clear that more time was needed to sort out different points of view, a number of valuable suggestions were made as to "how to take environment into consideration in determining development plans around a water resource." These suggestions were particularly important in view of the situation at Lake Songkhla where the decision must be made concerning its fresh water distillation plan as well as for other similar projects under consideration in developing countries in general.

Finally, it must be remembered that in the second part of the seminar, participation by a number of administrators and researchers from the Lake Songkhla region has proven particularly effective in realizing lively and informative discussions, a fact which should be noted in planning future seminars.

LIST OF PAPERS

PART I: POLICY RESPONSES TO WATER RESOURCES MANAGEMENT ISSUES

Keynote Addresses

Sazanami, H.

Regional Development and Water Resources Man-

Part II at JB Hotel in Hat Yai

agement.

Hashimoto, M.
Manpower Development and Training in Lake Environment Management.

Resource Papers

Nakagami, K.
A Strategic Concept of River/Lake Basin Management and Planning.

Tangtham, N. and K. Chunkao
Methodology and Application of Watershed Classification in Thailand.

Nakamura, M.
Risk Analysis Issues and Perspectives in Developing Countries.

Hufschmidt, M. M. and D. S. McCauley
Institutional and Organizational Mechanisms for Integrating Land Use Decisions with Water Resources Management.

Nickum J. E. and K. W. Easter
Institutional Arrangements for River/Lake Basin Management with Emphasis on Managing Conflicts.

Matsui, S.
Policy Responses to Environmental and Social Effects of Water Resources Development.

Case Studies

Zhang, J. and Liu H.
Institutional Analysis for Water Resources Management in Lake Dianchi Basin (China).

Machooka, S. M., *et al.*
Case Study on the Kenya's Lake Victoria Basin (Kenya).

Naito, R., *et al.*
An Analysis of the Roles and Functions of the Yahagi River Method (Japan).

Felizar, F. P., *et al.*
Policy Responses to Fishery Conflict in Laguna Lake (Philippines).

Setamanit, S., *et al.*
The Developing Planning of the Songkhla Lake Basin with Particular Response to the Proposed Salinity Barrier Project (Thailand).

Muraoka, K., *et al.*
Comprehensive Development of Lake Kasumigaura and its Environmental Management (Japan).

Branski, J. M., *et al.*
Environmental Impact Assessment for the Porteira Hydroelectric Project (Brazil).

Haeruman H., *et al.*
Policy Response to Water Resources Management Issues and Problems: Case Study of Sagling Dam, West Java (Indonesia).

Imai K., *et al.*
Evolution of the Lake Biwa Water Resources Management and Environmental Conservation Policies (Japan).

Papers presented in PART II

Ratanachai, C. and R. Suwannatachote
Social Impacts of the Proposed Salinity Barrier in Songkhla Lake: A Review Paper

Lheknim, V. and P. Leelawathanagoon
Ecological Effects of the Proposed Salinity Barrier in Songkhla Lake: A Review.

Hobo, T.
Development and Management of Brackish Water Zones: A Review of the Land Reclamation and Salinity Barrier Project in Lakes Nakaumi and Shinji, Japan.

Taneerananon. P., *et al.*
Water Quality Management for Songkhla Lake Basin.

Chunkao K.
Watershed Management as Related to Songkhla Lake Basin.

PARTICIPANTS

Brazil J. M. Branski: *China* Liu Hongliang, Li Guangrun, Zhang Jiqiang, Hou Bin: *Indonesia* Herman Haeruman Js., Edy Brotoisworo, Poetoranto Setyo Sabdo: *Japan* Michio Hashimoto, Takehiko Hobo, Saburo Matsui, Ken-ichi Nakagami, Takehiko Fukushima, Hideo Harasawa, Renzo Naito, Aichi Sano, Nobukazu Mizushima, Yoshiro Niki, Masahisa Nakamura, Michio Akiyama: *Kenya* S. M. Machooka, David Mshila, Morris Omondi: *Lake Chad Basin Commission* Abubakar B. Jauro, O. C. Iribvoje: *Malaysia* Ho Yueh Chuen, Lim Teik Keat: *Philippines* Enrique P. Packardo, Francisco P. Fellizar, Floro R. Francisco: *South African Development Coordination Conference* J. Akerman: *Sri Lanka* A. Attanayake: *USA* Maynerd M. Hufschmidt, James E. Nickum: *Zimbabwe* Chris H. D. Magadza: *Thailand* Sanga Sabhasri, Chid Nilpanich, Choab Mongkolrat, Surin Setamanit, Kasem Chunkao, Nipon Tangtham, Suree Khaodhier, Samakkee Boonyawat, Suchart Nawagawong, Natha Hungspreug, Sawat Tulyapach, Chakrit Manotham, Maitree Duangsawasdi, Kirasak Chancharaswat, Nicomb Kunlayasiri, Prasit Niratisayakul, Apichart Anukularmphai, Cahlerm Keokungwal, Jaranthada Karnasuta, Sapa Sakulkaew, Siripong Sholsiripunlert, Traibhun Mekjaroon, Banterng Vorasri: *Sponsoring organizations* (ONEB) Pravit Ruyabhom, Arthorn Suphapodok, Sunthud Somehevita, Suphavit Piampongsant, Chalermsak Wanichsombat, Sirithan Pirotboriboon, Pornchai Taranatham, Orapin Wongchumpit, Sittiporn Kajornatyudh, Wiwatana Pratoomvieng, Chalida Jangchadjai, Pramote Niltanom, Songduaen Poonwattanasombat, Nisanat Sathirakul, Masahiro Ohta, Hiromi Hironaka, Yoshinari Anbe, Bangkoh Danwarawijitara; (PSU) Phasook Kullavanj, Siripongse Sribhibhadh, Sunthorn Sotthibandhu, Pichai Taneerananond, Sunchai Klinpikul, Chatchai Ratanachai, Rapeepun Sawannattachote, Prospithaya Kanataratana, Narong Na Chaing Mai, Vachira Leknim, Pimolpan Leelawatanagoon, Sumet Cahiwatcharagoon, Somsak Boromphanarat, Reengchai Tanasakul, Apichai Juthasiriwong, Charoen Nithithanyoung, Panichai Tinnimit, Rachaneeb Kalayankunavuti, Samornrat Vatanathom, Somsong Yipintsoi, Tripob Bhongsuwan,Visit Kasempimolporn, Wilaiwan Borom-

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Participating in the Second Seminar

This year, the seminar was held in Thailand for 10 days in the latter half of January. Being one of the fastest growing economies among the ASEAN countries, Thailand is faced with some major issues concerning the balance between development and environmental preservation, which made the country particularly appropriate as a venue of the second seminar.

Overall, there appeared to have been great progress in the degree of our understanding of the situations throughout the world. While the majority of presentations made in the previous seminar merely covered the general outline of the results of individual case studies that were underway, this year, the focus was shifted to a consideration of specific policies regarding water resource control. All of the case study reports from China, the Philippines, Thailand, Indonesia, Kenya, Brazil and Japan, included some description about the structure of their respective administrative system as well as the role and functions of relevant organizations.

Since many of the participants were engineers, civil engineers in particular,who were also members of an administrative body, a number of questions raised during the QA sessions were focused on matters relevant to technological aspects of a given case study. Such considerations taken from both administrative as well as technological points of view, have proven to be highly effective in obtaining a full understanding of the conditions described in different case studies. I believe that this year's seminar was indeed very successfull in bringing forward this kind of double approach to the situations under discussion. I was particularly interested in observing the way in which each case study had avoided becoming bland and uninteresting, which is often the case with studies on administrative structures. I found that while many of the case studies were indeed concerned with administrative aspects of a given situation, their center of focus varied greatly according to the fields of specialization of those involved. For any technological or administrative system to function properly, it is necessary to carefully consider its specific circumstances and social background which serve as bases for the establishment of that particular system. Those involved with case studies conducted with such consideration should be especially encouraged to present their results at a site of international exchange, at the annual seminar in particular.

The first part of the seminar was more or less similar in format with the previous seminar. This year however, most of the second half of the seminar was dedicated to the examination of the Fresh Water Plan of Lake Songkhla. A full-day excursion around Lake Songkhla was a very educational experience from which the participants were able to learn much about the actual conditions and problems of the lake. I was particularly impressed with the reverse water irrigation system established in the northern part of Lake Songkhla, a setup that was very similar to what we have at Lake Biwa in Japan.

The Fresh Water Plan of Lake Songkhla did not appear to be very different from similar projects we have in Japan, at least in terms of technological standards. The greatest difference between the Japanese projects and this particular Fresh Water Plan was found in the degree of participation by local residents. While we are well aware of differences in the ways and processes of people's participation in government projects from country to country, it is necessary for us to specifically recognize such differences in evaluating policies and measures for water resource control devised in different counries.

The Japanese report covered the procedures of the Fresh Water Plan of Nakaumi. I got a general impression that the significance of this particular Japanese project was not adequately conveyed to the participants from other countries. This was perhaps partly due to discrepancy in social context as well as in the degree of recognition such projects receive in different countries. It may be true that much of the attention of the peoples of developing countries is drawn to successful cases of development projects in Japan. Nevertheless, in presenting the results of past projects executed in Japan, I find it equally important to have the participants from other countries understand the nature of projects that have failed in Japan. There is much to gain from understanding and analyzing the reasons for such failures. The Japanese presentation at the second seminar has proven to be highly successful in conveying specific examples of failures and problems involved in our past projects.

Michio Akiyama: Lake Biwa Research Institute, JAPAN

Holding of Planning and Cooperation Meeting for the Fourth World Lake Conference 'Hangzhou'90'

The Fourth World Lake Environment Conference is scheduled to be held in Hangzhou of Zhejian Province in western China in September 1990. The first circular about the conference has already been sent out to those concerned. The First Meeting of the Organizing and the Preparatory Committees was held between the members of the Chinese Organizing and Preparatory Committee and the ILEC members to discuss the details of the upcoming conference.

At the meeting held on January 29 and 30 of this year in Hangzhou, 15 Chinese members representing 5 different organizations, including Chairman Prof. Liu Hongliang (President of the Chinese Research Academy of Environmental Sciences) were present. From Japan, the Scientific Committee Chairman Tatsuo Kira, Committee member Saburo Matsui and Planning Director Imai participated in the meeting.

Opinions were exchanged as to the prospective theme of the second circular, preparation of conference materials, accomodation of participants and expected budget, between the Chinese and Japanese representatives at the meeting, on the basis of the results of the past three conferences. The Japanese members were particularly impressed with the enthusiasm on the part of the people of Hangzhou and Zhejian Province towards the holding of the Conference, which was a very encouraging sign, for it is the Chinese Committee that will take the leadership role in making further arrangements in the future.

Moreover, during the visit, the Japanese members had an opportunity to observe the conference hall, accomodation facilities and the lakeshore. Being one of the famous historical scenic sites, the area, together with its excellent facilities, presented a superb atmosphere.

LAKES OF THE WORLD

LAKE SONGKHLA

Lake Songkhla, located close to southern tip of Thailand near the border of Malaysia, is the largest lake in the country, with a total area of 1,082 sq. km. The lake consists of 4 smaller lakes: Thale Noi, Thale Luang, Thale Sap and Thale Sap Songkhla. These extend from north to south, connected by natural waterways.

SITE RECOMMENDED FOR LAKE SALINITY BARRIER IN SONGKHLA LAKE

The Songkhla Lake Basin Planning Study (SLBPS) has indicated its recommendation of a site for construction of a salinity intrusion barrier in Songkhla Lake. The 1988 study, initiated by the National Environment Board and the National Economic and Social Development Board has been submitted to the Royal Thai Government.

The idea of constructing a salinity barrier had been proposed in an earlier SLBPS study, in which three alternative sites were considered. In the 1988 study, a recommendation was reached based on a comprehensive analysis of potential environmental and socio-economic impacts within the overall framework of positive regional development.

WATER RESOURCES DEVELOPMENT

Songkhla Lake basin's 8020 sq. km. is predominately agricultural, with rubber plantations and paddy rice fields occupying 73 % of the land area. Forest and swampland account for another 25 %.

Distribution of the basin population of 1.2 million (1980) ranges from 20 per sq. km. in the hills to 600 per sq. km. in some areas. Three-fourths of the labor force of 612,000 is engaged in agriculture, fishery and forestry. Per capita income has been growing faster than neighboring regions but is still below the national average.

Although rainfall is abundant, the rural agricultural sector is hampered by freshwater shortages during the dry season. This results in seasonal unemployment and migration to the cities. Flood damage is also a serious problem in particularly wet years.

The construction of a saline barrier Songkhla Lake would allow more efficient utilization of freshwater for irrigation and other human needs. However, there are concerns about the impacts such a barrier would have on the fishery of the lake as well as the environment in general.

The focus of the 1988 SLBPS study was to identify a wide range of adverse as well as beneficial affects of constructing a salinity barrier, and to recommend an optimal site.

THE SONGKHLA LAKE SYSTEM

The Songkhla Lake System, a coastal lagoon produced by sandbar formation, is located in southern Thailand. Its 1,082 km^2 surface area extends over 100 km to the north from its outlet into Gulf of Thailand.

Songkhla Lake should be considered in terms of four distinct but connected ecosystems:

Thale Sap Songkhla

This is a tidal and essentially marine dominated system with salinities usually ranging from 2-3 %. During the floods of the rainy season, salinities can drop close to zero. Average depth is about 1.5 m.

Thale Sap

The salinity of this part of the lake ranges from zero to the low two, falling in the range of 0.5-1.5 % for most of the year due to the mixing of fresh and saltwater which takes place in this zone. The relatively sluggish eastern portion of Thale Sap contains a dense stand of macrophytes which attracts large numbers of aquatic birds. Average depth is about 1.0 m.

Thale Luang

This is a largely freshwater part of the lake, although saline intrusion in very dry years can raise salinity levels to 1.1 %. The water is well mixed and highly turbid due to wind induced wave action. This turbidity tends to limit the growth of phytoplankton and macrophytes. Average depth is about 2 m.

Thale Noi

This is the most ecologically complex part of the lake system. Water weeds and phytoplankton are abundant due to high nutrient levels and clarity of the water

Lake Songkhla

column. The water is almost always fresh with pH levels in the acidic range due to high input of organic matter. Thale Noi and the surrounding swamp are well-known as a habitat for aquatic birds, and are protected by law as a non-hunting area.

SALINITY BARRIER

The site recommended for the proposed salinity barrier would divide the lake at the area where Thale Sap and Thale Luang meet. Because Thale Luang is already predominately freshwater the ecosystem would not be greatly affected by the barrier, at least in terms of water quality.

This site was chosen over alternative downstream sites which would have blocked intrusion of saltwater into the presently brackish Thale Sap.

The barrier would be 5.8 km long, with four 500-meter-long overflow sections and a 100-meter level control structure. The barrier would extend. 0.25 m above mean sea level.

MONITORING and RESEARCH

Presently, the Office of the National Environment Board is coordinating five programs to gather bass-line date for the Songkhla Lake Basin:

1) Water quality monitoring
2) Environmental status of urban areas
3) Pollution trends resulting from agricultural activities
4) Coastal water quality
5) Environmental status of forest and wildlife

EVENTS AND ACTIVITIES OF ILEC IN 1988

January	Mission to USA and Canada for appealing "Balaton '88"
February 8—19	The First Expert Group Workshop on River/Lake Basin Approach to Environmentally Sound Management of Water Resources, attended by 27 overseas and 27 Japanese experts (sponsored by ILEC/UNCRD/UNEP).
April 6—9	Participation of an ILEC representative in the 1st Conference for Preparations of a Master Plan to Save Lake Chad, in N'djamena, Chad.
April — May	Mission to Canada, USA for lake survey.
May 25 — June 4	Participation of ILEC representative in 6th IWRA Congress in Ottawa.
June 1	Liaison Meeting with CCIW/NWRI at Burlington over joint survey of Canadian lakes.
July 25 — August 12	Support of the International Training Course on the Management of Lakes and their Watershed in Kunming, China (participation of ILEC members as lecturers) .
August 8—19	Seminars and field trip in Thailand and the Philippines attended by 10 case-study team members of ILEC/UNCRD/UNEP Workshop in 3 countries.
August 31 — September 21	Mission to Europe for lake survey.
September 11—17	Support of the 3rd International Conference on the Conservation and Management of Lakes "Balaton '88".
October 18	Meeting with Dr. M. Gwynne (Chief, GEMS/UNEP) to explore cooperation through a lake database system.
October 24 — November 13	Mission to Brazil and Argentina for lake survey.
October 31 — November 10	Support of the International Seminar for Environmentally Sound Management of Lakes and Reservoirs Basin with Emphasis Water Quality, held in Argentina.
November 1	Commencement of Joint NWRI/ILEC Canadian Lake Survey.
November 22—24	Participation of an ILEC representative in the 1st Korea-Japan Environmental Science & Technology Symposium.
December	Contribution of 8 revised resource papers of the 1st ILEC/UNCRD/UNEP Workshop to Journal of Water Resources Development (Guest Editors, Profs. Kira and Sazanami).
December	Distribution of the First Interim Report "Data Book of World Lake Environment" including data on 63 lakes to world institutions and experts.
January — December	Eight liaison meetings for ILEC/UNCRD/UNEP Workshops attended by Japanese resource persons, case-study team members and secretariat staff.

IN-HOUSE MEETINGS

February 22—24	The 1st General Meeting of ILEC Scientific Committee in Otsu.
February 22	The 3rd Meeting of ILEC Board of Directors The 2nd Meeting of ILEC Board of Councilors
August 29	The 4th Meeting of ILEC Board of Directors The 3rd Meeting of ILEC Board of Councilors
September 18—20	The 2nd General Meeting of ILEC Scientific Committee in Budapest.
December 10	Preparatory meeting of the planning committee for ILEC's Technical Assistance Project.
December 26	The 5th Meeting of ILEC Board of Directors The 4th Meeting of ILEC Board of Councilors

FORTHCOMING MEETINGS

1. 4TH INTERNATIONAL CONFERENCE ON THE CONSERVATION AND MANAGEMENT OF LAKES "HANGZHOU '90"

Date: September 5—9, 1990

Place: Hangzhou, The People's Republic of China

Organization: National Environmental Protection Agency of China
Chinese Research Academy of Environmental Sciences (CRAES)
International Lake Environment Committee Foundation (ILEC)
The Environmental Protection Agency of Zhejiang Province
The Institute of Environmental Protection, Zhejiang Province
The Environmental Protection Agency of Hangzhou Prefecture
The Nanjing Institute of Geography and Lakes, China Science Academy

Main Topics:
1. Problem—Identification, and case studies
2. Sustainable management of lakes/reservoirs and their basins
3. Special sessions on the interaction of local, national and international agencies, scientists and citizens in lake management

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2. IAWPRC BIENNIAL '90

Date: July 29 — August 3, 1990

Place: Kyoto International Conference Hall, Kyoto, JAPAN

Organization: International Association on Water Pollution Research and Control (IAWPRC)
Japan Society on Water Pollution Research (JSWPR)

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