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NEWSLETTER

International Lake Environment Committee

=Promoting Sustainable Lake Management=

This Newsletter is also available in Japanese.

A Global ILBM Initiative Getting Under Way

Integrated Lake Basin Management (ILBM) is a conceptual framework formed during the process of putting together outcomes of GEF-Lake Basin Management Initiative Project executed by ILEC from 2003 to 2005. It aims for a gradual improvement of lake basin governance through the integration of six governance elements (Institutions,

IN THIS ISSUE

Policies, Technology, Participation, Information, Finance), taking into account natural conditions unique to a lake basin and its historical processes that have taken place during the development of society and culture.

Since April of 2008, ILEC has been working with Shiga University and the University of Shiga Prefecture through the so-called "ILBM Governance Project". It is part of Shiga University's Research Project *"Studies on how to improve basin governance for the sustainable resource management in the lake basin"* sponsored by the Ministry of Education, Culture, Sports, Science and Technology, Japan. This year, to conclude three year's project, ILEC organized an expert meeting during November 2nd to 6th, 2010 in Kusatsu, Shiga, Japan by bringing together a number of experts working on the creation of ILBM platforms in various parts of the world. The objectives are to review the past three years' activities and identify key issues and challenges to be tackled in the next step. The outcome of the discussion there was disseminated to the general public at an international symposium under the title of "Lake Basin Governance and Policy Reform in River Basin Management". The symposium took place on November 7th, 2010 at Lake Biwa Museum, Shiga, Japan

The Lake Basin Governance Project has been implemented with three objectives: 1) to promote the development of ILBM platforms around the world, 2) to develop instruments and tools to support ILBM implementation, and 3) to refine the concept of ILBM. The following are key achievements during the past three years' activities (For details, please visit ILEC homepage at www.ilec.or.jp).

(1) Development of ILBM platform

ILBM platform is useful to reform local programs because it facilitates a basin to take in knowledge and information about governance improvement gathered through case studies on a global scale. They include various views on values and different sorts of problem-solving approaches developed over the history in wide-ranging lake basins. Through this process, ILBM platform helps stakeholders to develop a broad cooperation. The following progress has been made in the four key regions supported by the project.

<Asia>

In South Asia (India, Nepal) and Southeast Asia (Malaysia, Philippine, Thailand), development of ILBM platforms is taking place, with due adaptation to local conditions. Also, ILBM-guided local basin initiatives are starting to improve their lake basin management. Amongst of all, India, Nepal and Malaysia are seeing ILBM as part of their national policy framework and making various efforts to apply ILBM concept.

<Latin and South America>

In Mexico, a number of workshops have been organized in Lerma River-Lake Chapala basin towards the development of ILBM platform in the past three years. These efforts resulted in a successful creation of ILBM promotion committee consisting of national research institutions, universities, NGOs, and local governments. Its collaboration with the Ministry of Water Resources has also started. Recently, a five-year action plan has been developed with a view to networking the whole sub-basins to cope with various challenges for the sustainable livelihood.

<Africa>

In Lake Victoria Basin, which involves five basin countries (Kenya, Uganda, Tanzania, Rwanda, Burundi), ILBM has

been the focal principle for the Lake Victoria Basin Commission (LVBC) since its inauguration for coping with their transboundary lake basin management issues. In Zimbawe, ILBM has been introduced in 2009 for the stakeholders to deal with the issues of disfunctional wastewater systems causing serious pollution of Lake Chivero. The lake is a major source of water for millions of people in Harare and the surrounding suburban region. In Africa, fundamental challenges are how to localize ILBM principles and how to introduce ILBM platforms to start practical actions.

<North Europe>

In Russia, preparation is taking place to produce lake briefs for five lakes (Lake Ladoga, Lake Chudskoe/Peipsi, Lake Ilmen, Aral Sea, Caspian Sea). Another ILBM challenge is under way in this region aiming for the extended basin network which covers not only lakes and rivers, but also Baltic Sea.

(2) Development of Tools for ILBM Implementation

ILBM proposes a new framework for global water policy development. Its implementation, including dissemination and promotion, needs to be supported by effective tools. To this end, following tools have been developed, which may be called building blocks of ILBM Platform.

- **Guidelines for "Lake Brief" Preparation**

  Protocols and procedures were formulated to support the preparation of "Lake Brief" which describes overall status of a given lake basin and identifies its governance challenges.

- **Development of Knowledgebase "LAKES"**

  A new search engine called "LAKES (Learning Acceleration and Knowledge Enhancement System" - a knowledgebase combined with an operating system - was developed to gather a wide range of governance-related information including Lake Briefs. It is designed to be useful for readers to improve their lake basin governance.

- **Renovating World Lake Database**

  The existing World Lake Database of ILEC was restructured so that it can make its update easy and meet the needs for improving lake basin governance.

- **Update of Training Syllabus**

  Capacity building has a key in the effective implementation of good governance. The training syllabus being used in JICA-sponsored, ILEC-organized ILBM Training Course has been updated by taking in the latest information available.

(3) Refinement of ILBM Concept

ILBM has evolved as a new basin management framework to manage lakes, rivers, groundwater and coastal zones in an integrated manner, paying attention to the three natural scientific features of lentic waterbodies, such as lakes and reservoirs, which include "Integrating nature", "Long retention time", and "A complex in-lake dynamics involving bio-physiochemical processes").

- **Emphasis on Ecosystem Services**

  Waterbody and its basin are integral part of an ecosystem, from which nature and human beings get a number of benefits called ecosystem services. In order for these services to be enjoyed in a sustainable manner, it is necessary for effective basin management to be established in a manner that a wise balance be maintained, while paying attention to the three features of lentic waterbody, between the two fundamental ecosystem services – Resource Provision Services (water supply, fishery, irrigation, hydropower generation, etc.) and Regulating Services (biodiversity, healthy food-web chain, natural capacity of purification, buffer and control of flood and drought, etc.) .

- **Nesting Structure of Basins**

  A wider basin has a hierarchical structure (nesting structure) composed of micro-, meso-, and macro-basin, being temporally/spatially related to each other. Among the waterbodies in a given basin, lentic waters are the most vulnerable system, therefore their sustainable conservation needs to be prioritized as a central issue to the basin management.

- **Linkage of Lentic Waterbodies and Lotic Waterbodies**

  Various waterbodies in a basin - lakes, rivers, groundwater, coastal zones - are divided into lentic water and lotic water. In other word, a basin water system is composed of a series of combination of these two water systems. This view provides a new comprehensive basin management approach giving attention to the linkage between lentic and lotic water systems. ILBM may be called IL2BM (Integrated Lentic/Lotic Basin Management). As lentic water systems are more vulnerable than lotic ones, their conservation needs to get maximum attention.

With these improvements and refinements, ILBM is continuing to evolve as a supporting tool to enhance and renovate the governance in real basins. Its usefulness is increasingly recognized in various parts of the world; its further promotion is expected to take place. Recently, ILBM is beginning to be regarded as an effective management framework not only for lakes and their basins, but also for a wide range of water basins which include lentic water systems. It will go on evolving as a leading framework to guide global water resources management policies, complementing and supplementing the conventional goal-oriented frameworks, such as "Integrated Water Resource Management (IWRM)" or "Integrated River Basin Management (IRBM)", which tend to focus on the effectiveness of planning, rather than process. ILEC is going to promote ILBM on a global scale in collaboration with partner organizations as a "Global ILBM Promotion Center".

Invitation to 14th World Lake Conference

- Lakes, Rivers, Groundwater and Coastal Areas: Understanding Linkages -

The World Lake Conference is a biennial international event co-organized by local host organizations and the International Lake Environment Committee Foundation (ILEC). Previous thirteen conferences have made significant contribution to the conservation of world's lakes and their basins. The 14th conference will take place in Austin, Texas, USA during October 31 – November 4, 2011, co-sponsored by ILEC and the River System Institute – Texas State University. Located in central Texas, Austin is situated along the six-coupled Highland Lakes, a major cascade reservoir system in central Texas. With a myriad of nearby rivers and springs, the city is the best place for the venue of the World Lake Conference.

Along with the dialogue to promote the sustainable management of lakes and their basins, which is the continuing spirit of the conference, the 14th conference will emphasizes the hydrologic linkages between lakes and their upstream and downstream waterbodies (rivers, groundwater, coastal areas) and will be organized under the theme of "Lakes, Rivers, Groundwater and Coastal Areas: Understanding Linkages".

Lakes provide a variety of ecosystem services (supply of water for drinking, irrigation and industry, fishery, recreation, hydropower, navigation, etc.). Lakes receive water and pollutant inputs from upstream portions of their basins via inflowing rivers and groundwater aquifers. In turn, their discharges affect downstream rivers, groundwater and coastal areas. The structure and function of all these water systems depends significantly on the hydrologic linkages between the still (lentic) and flowing (lotic) waters that characterize them, as do the life-supporting provisioning and regulating ecosystem services they provide to humanity. This hydrologic reality requires that lakes and their upstream and downstream waterbodies be assessed and managed in an integrated manner recognizing their linkages. This includes consideration not only of relevant scientific and technical issues, but also the socio-economic and governance elements that control the use of these water systems for meeting human water demands, and for maintaining the viability of aquatic ecosystems.

Another unique feature of the 14th World Lake Conference is learning from management experiences in Texas, where all lakes are manmade (reservoirs). They exhibit multiple-purpose uses to meet both human and ecosystem water needs. Average annual precipitation range 7-fold across the state, giving much stresses, both in quantity and quality, to these reservoirs. How to maintain a wide range of water use opportunities under these stressful conditions is a management challenge. The experiences of managing multiple-use Texas reservoirs under this range of climatic variation may provide good lessons to arid/semi-arid areas with similar geographic and climatic conditions such as Central and South America. In addition, situated along the border of Mexico, Texas conference will give participants a good opportunity to discuss transboundary water management issues. For details about the conference, including registration, paper contribution, please visit the official conference website (http://www.wlc14.org/).

ILBM-AFSAN (ILBM for African Lake Basin Management with Sanitation Challenges) – Activities of 2009-2011

Many African lakes, located in arid/semiarid regions, have ecosystems with vulnerable tropical forests. Most countries with these lakes are weak in financial basis, national or local, and slow in the development of social infrastructure. The sustainable use and development of lakes in these countries are almost collapsed, and yet they are not able to develop a picture for the future recovery.

ILEC is undertaking a project funded by the Ministry of the Environment of Japan for improving water environment in some African lake basins through the application of integrated lake basin management (ILBM) approach. More specifically, the project aims to assist the development of a framework to help local people formulate their integrated lake basin management plans and policies by themselves. Another aim is to provide an indirect support to their initiatives trying to improve water environment and sanitation conditions in the basins. For this purpose, four lakes (Lake Nakuru, Lake Victoria, Lake Chivero, Lake Malawi) were chosen as typically environmentally vulnerable and susceptible to the effect of development and climate change.

For the past two years, the project undertook to gather relevant information in collaboration with local partners and some field visits to some key areas (February 2010), and organized two workshops in Kisumu (Kenya) and Harare (Zimbabwe) in February 2010 and February 2011. Our local partners include Egerton University, Nakuru Water and Sanitation Service Company (Nakuru, Kenya), a local NGO called OSIENALA and Lake Victoria Basin Committee (Kisumu, Kenya), and Zimbabwe University (Zimbabwe).

Field-visit surveys uncovered several facts, including both negative and positive. The negative ones include an observation that there are no regulations in place about industrial effluents leading to an overload to wastewater treatment plants, and, because of their malfunctioning, polluted waters are being discharged into the lakes impacting them severely, causing all sorts of water pollution problems such as eutrophication. The positives ones include the effort of local NGOs promoting ecological sanitation toilets in the areas where no toilet facilities are still installed, which are intended to make use of human excreta for agricultural use.

During the two workshops held in Kenya and Zimbabwe, a lot of exchange of information and opinions took place among the local stakeholders, through which a number of challenges they are facing became clear. ILEC is going to support local stakeholders' efforts to improve "basin governance" as an essential approach to sort out their problems and address their challenges.

Mal-functioned Sewage treatment plant (Zimbabwe, Chitungwiza City)

JICA Training Course: Conservation of Southern Marshlands in Iraq

Eighteen trainees from six Ministries of Iraq Government (Ministries of Planning, Environment, Water Resources, Municipality and Public Works, Agriculture, and Ministry of Higher Education and Scientific Research, i.e. Thi Qar, Misan and Basrah Universities) and three Provincial Councils (Thi-Qar, Misan and Basrah) attended the JICA Training Course mentioned in the title. It was conducted during 2-16 December 2010 in the form of lectures at the office of various organizations (ILEC, UNEP-IETC, JICA-Osaka) and some field visits in Shiga Prefecture, Japan.

Photo: At the Konan-Chubu Water Reclamation Plant

The huge marshland in Southern Iraq, located near the juncture of Tigris and Euphrates rivers, dried up during the time of Fussain-Regime. It seemed to recover, but it is starting to dry again because of a sharp decrease in the river flow as a result of construction of dams in up-stream countries, Turkey, Syria and Iran. There are many challenges in this marshland area: lack of water quantity, poor water quality, provision of safe drinking water, developing local economies for raising income levels of marshland residents, etc.

In this training course, trainees received a lot of useful lectures, including UNEP-supported Southern Iraq Marshland Restoration Project, JICA-supported Iraq Rehabilitation project, ILBM-based lake basin governance, water conservation through vegetation and use of soil, protection and use of reed, roles of government, water quality monitoring techniques, JICA promotion project on agriculture and stock-farming, etc. During these lectures, they visited some water-related facilities in Kinki region, including sewage treatment plants, human excreta treatment plants, Lake Biwa Museum and Aqua Restoration Research Center.

At the end of the course, trainees developed their action plans. These plans cover a wide range of approaches, such as increasing diplomatic efforts for water problems-solving, applying for World Heritage registration for enhanced marshland conservation, constructing water purification plants to secure safe drinking water, developing local industries to improve the livelihood of residents, etc. Trainees from the Ministry of Agriculture proposed a plan to enhance a buffalo production by reforming conventional methods for breeding. They also proposed to establish a multi-stakeholder forum inviting all interested organizations to solve the marshland problems.

JICA and Japanese Government are expected to provide a multidisciplinary support to Iraq and its people. All trainees gave a high evaluation to Japan and Japanese. It may be an indication of their expectation to Japan.

JICA Training Course: Integrated Basin Management for Lake Environment

This traning course, sponsored by JICA, is the longest training program being organized by ILEC. It lasts about two months from early January to middle March. This course was originally started as “Water Quality Management Taining Course” in 1990, and renewed to the present one in 2005 after successful completion of the previous program.

The training course took place from January 17 to March 11, 2011. Nine trainees participated from eight countries (China, Haiti, Uruguay, Venezuela, Ethiopia, Kenya, Malawi, Egypt).

Trainees learned the basics of Integrated Lake Basin Management (ILBM) and how to address lake basin management challeges in their basins in a sustainable manner. At the end, all trainees developed action plans implementable at home, taking into account what they have learned. It is our hope that their action plans will be successfully implemented.

Texas Reservoirs and their Management

Beverly Saunders & Walter Rast,
International Center for Watershed Studies,
Texas State University, San Marcos, Texas USA

Texas is a state of contrasting and dramatic landscapes, ranging from large pine forests, to barrier island coastlines, to blackland prairies, to rolling hills, to mountainous desert regions. It is located in the south central part of the United States of America (USA), and lies along the northeastern border of Mexico. With a land area of 678,354 km2, larger than the total land area of France, it is the second largest state in the USA. With the exception of its most eastern portion, Texas is considered semi-arid, with evaporation exceeding precipitation throughout much of the state (Simmons 1986).

Texas faces many challenges in regard to ensuring sustainable water resources, including rapid population growth, major competing water uses, and the significant costs of infrastructure development. The environmental impacts associated with meeting these water needs also are paramount. It is likely that water, more than any other natural resource, will determine the future of Texas in the coming decades. The state contains over 15 major river basins, eight coastal basins, two of the most prolific groundwater aquifers in the western hemisphere, and more than 300,000 km of streams and rivers (Figure 1; TWDB 2007). Texas also is a land of manmade lakes (reservoirs), containing only one natural lake (Caddo Lake) in its northeast portion.

Texas has a history of fluctuating precipitation patterns, being vulnerable to both prolonged droughts and unpredictable (and often rapid) floods. There is a gradient of precipitation across the state, ranging from more than about 1,524 mm (60 inches) in the eastern edge of the state to about 250 mm (10 inches) in the far western part of the state. The same is true for evaporation, with the corresponding numbers ranging from 1,168 mm (46 inches) in eastern Texas to 2,184 mm (86 inches) in west Texas. Recurring and unpredictable droughts throughout the state are particularly problematic, having been the focus for much of the state's efforts in regard to its water planning (TWBD 2007).

There are about 440 reservoirs in Texas with more than 1.2 million m3 (1,000 acre-feet) of water conservation storage capacity, including 196 major reservoirs. Of the 196 major reservoirs, with a total reservoir conservation storage capacity of 51.2 billion m3 (41.5 million acre-feet), 175 are used as water supplies, irrigation water sources, or for industrial purposes. Other uses may include flood control, power generation and recreation (TWDB 2007). In fact, with all its surface waters being state owned, Texas has more public freshwater than any state in the contiguous United States (Simmons 1986).

Texas reservoirs currently account for more than 50% of the state's available surface water, providing slightly more than 40% of the state's entire water supply. According to the 2007 Water Plan, water demands will increase by about 27% by 2060, from almost 21 billion m3 (17 million acre-feet) in 2000, to 26.6 billion m3 (21.6 million acre-feet) in 2060. The proposed eight new major reservoirs included in the 2007 State Water Plan would increase the available surface water by about 1.4 billion m3 (1.1 million acre-feet/year), equivalent to about 16% of the projected 9.2 billion m3 (7.5 million acre-feet/year) water shortage by 2050.

Texas reservoirs are managed by a myriad of agencies and organizations at multiple levels of government, as well as the private sector. The major reservoirs are operated mainly by governmental entities, particularly river basin authorities. These various agencies and organizations include:

- Federal agencies – these agencies operate reservoirs in Texas directly under congressional authorization. The US Army Corps of Engineers is the most important agency, controlling 43% of the total reservoir capacity in Texas, mostly the major reservoirs;
- Water districts and river authorities – these entities are operationally-autonomous local government units organized to deal with specific water issues in individual river basins. River authorities are a special type of water district, created by State legislative fiat as a means of developing basin-wide river management plans. They control about 25% of the total number of reservoirs in Texas;
- Cities and counties – these local governmental units own and operate another 25% of Texas reservoirs;
- Private companies – About 20% of the reservoirs in Texas, mostly small ones, are controlled by private companies (Wurbs 1985).

Four reservoirs in Texas lie along state or national boundaries, requiring special management actions to avoid water use conflicts. Toledo Bend Reservoir lies along the Texas – Louisiana border. It has a

surface area of 749 km2 (289 mi2), making it the fifth largest reservoir (by area) in the United States, and a controlled water storage capacity of 5.52 km3 (4.48 million acre-feet), and the portion of the basin lying within Texas is operated by a Texas water district. The lake itself, however, is jointly regulated by the interstate Sabine Compact, which dictates allocation of the reservoir water between the two states. Lake Texoma lies along the Texas – Oklahoma border. With a surface area of 360 km2 (139 mi2) and a water volume of 3.12 km3 (2.53 million acre-feet), it is owned by the federal government, and operated by the US Army Corps of Engineers, rather than the individual states (Wurbs 1985).

The International Boundary and Water Commission (IBWC) is another federal agency, but with an international mandate. It manages the international Amistad and Falcon reservoirs that lie along the Rio Grande, the border river between the United States and Mexico. Amistad Reservoir has a surface area of 262.6 km2 (101.4 mi2) and a volume of 6.98 km3 (5.66 million acre-feet), while Falcon Reservoir has a surface area of 338.5 km2 (130.7 mi2) and a summer storage capacity of 2.9 km3 (2.37 million acre-feet), while The major role of the IBWC is to oversee the binational 1944 Treaty that controls the allocation of the water of the Rio Grande, as well as the Colorado River, between the two countries.

There is no doubt that reservoirs are invaluable in regard to Texas' economic and social development, and will continue to be so into the future. Because of this development, however, reservoir capacity is decreasing at the same time water demands are increasing. It is clear that a holistic, integrated management approach that recognizes the hydrologic linkages between surface and groundwater sources must be implemented to address the increasing water needs of the state's citizens. As will be discussed in the upcoming 14th World Lake Conference, to be held in Austin, Texas USA during October 31-November 4, 2011, the Integrated Lake Basin Management (ILBM) approach promulgated by the International Lake Environment Committee (ILEC) represents a significant planning tool for addressing this goal. ILBM is currently being applied to the two international reservoirs (Amistad; Falcon) on the Rio Grande. Although only in the initial stages, it is anticipated that its application will significantly aid in ensuring the sustainability of the ecosystem services provided by these two important reservoirs.

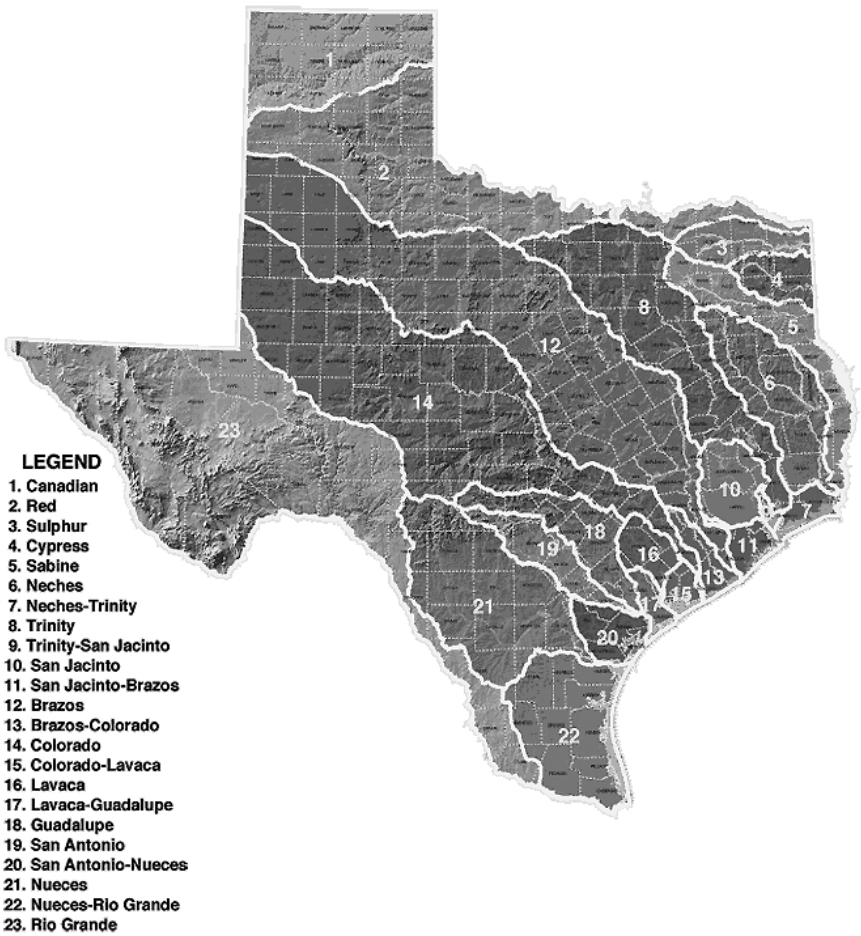

Figure1. River Basins of Texas

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Transboundary Waters Assessment Programme

ILEC Completes First Phase of Lake Basin portion of GEF Project

ILEC has completed the first phase (medium sized project MSP phase) of the Global Environment Facility's Transboundary Waters Assessment Programme (TWAP). This program was introduced in the previous Newsletter. Here we report on the main outputs and on the assessment methodology that has been peer reviewed and accepted by GEF. It is expected that the TWAP will be funded as a Full-Sized Project by the GEF later this year so it is likely to become a key ILEC activity for which we will require the input of our readers near and far. Please become familiar with it (See "TWAP" at ILEC Website www.ilec.or.jp) and provide us with your kind feedback at this early stage.

What is a transboundary lake basin?

There is a tendency, particularly prevalent among international organizations, to view transboundary lakes as lakes whose water surface is intersected by one or more national boundaries. Certainly, the prototypical "transboundary" lakes fit this description: Lake Victoria, the Lautentian Great Lakes, the Caspian Sea---they are all intersected by borders, and in some cases, their management is quite contentious because of this.

However, for a lake to be important in a transboundary sense---either received or delivering effects beyond a single country---the important thing is not where the lake's water surface lies, but where its drainage basin extends. This thinking is obvious to practitioners and is a direct result of the ILBM point-of-view but making this operational in a global-scale assessment requires much yet-to-be-done mapping (and awareness raising) efforts.

Nevertheless, the following definition has been accepted for further TWAP work: "a transboundary lake basin is as a drainage basin that spans more than one country". It is important to note that this applies to both the upstream as well as the downstream drainage basins.

How many are there?

This new definition, however, makes an inventory much more difficult to develop. With less than an hour of GIS work, we could tell you that there are 107 lakes with surface areas greater than 40 km2 that have their surface waters intersected by international boundaries, yet it is a much more time consuming task to figure out which lake basins share this characteristic. Determining where drainage basins are requires use of high-resolution elevation models, processing within a GIS, and then, equally importantly, confirmation with local experts and auxiliary information to confirm the delineation is correct.

Within the TWAP MSP, we did a partial analysis and identified 12,847 transboundary lake basins in Africa alone! For the whole world, we are looking at a sample size approximately 4 orders of magnitude greater than for just the "surface water intersected" type of lake.

When completed, the inventory of transboundary lake basins will be a key contribution of the TWAP FSP and of importance far beyond GEF.

Indicators are based on the ILBM framework.

The TWAP methodology proposes a suite of indicators to assess "risk" that are based on the well-tested ILBM framework. The indicators are (1) easy to understand, (2) meaningful and relevant for identifying high-risk lake basins, (3) available at the global scale, and (4) contributed to and accepted by stakeholders.

A full listing can be found in the project document (INSERT LINK HERE TOO) but we can note here that they center around the following 9 issue domains: biophysical conditions, human use, institutions, policies, participation, technology, information, finance, and planning. Please take a look at the document and give us you comments on the set of indicators, in particular about any indicators you think should be included but are not currently there.

Need for iterative approach.

The shear number of transboundary lake basins as well as the desire to populate all indicators for a given lake requires that the TWAP FSP for lake basins takes an iterative approach. We will follow four distinct levels for assessment:

- **Level 1.1**. Identify the transboundary lake basins and compile the basin indicators (over ~50,000 lake basins)
- **Level 1.2**. Compile more detailed indicators and refine the basin delineations for a reduced set of lake basins (approximately 500~1000 lake basins)
- **Level 1.3**. Compile most detailed indicators and auxiliary information through a stakeholder-driven questionnaire and meeting process (approximately 50~100 lake basins).
- **Level 2**. Verification of the indicators by using a small set of well-studied pilot cases.

Systems are linked.

The TWAP project has five working groups, i.e. rivers, lakes, groundwater, large marine ecosystems (LMEs), and open ocean. Each waterbody type is linked to the others through the hydrological cycle; however, the linkages are stronger between some types than others. For lakes, the key linkage is rivers, with groundwater and LMEs being important on a case-by-case basis.

The challenge for each working group, and TWAP as a whole, is to ensure these linkages are properly addressed. This explicit consideration of linkages, while inherent in ILBM, will certainly provide many new and fruitful outputs.

Please send any questions or comment to Thomas Ballatore, Technical Coordinator for the TWAP Lakes group at tballatore@gmail.com.

2nd World Lake Forum: Improving Lake Environment as Sustainable Habitat for Living Things

- A Partnership Project with COP-10 -

This year "World Lake Forum", was organized in Otsu City, Shiga, Japan on October 17, 2010 with a theme of "Improving Lake Environment as Sustainable Habitat for Living Things". It was held in connection with COP 10 on Biodiversity held in Nagoya, Aichi Prefecture, Japan, from 18 to 29 October 2010.

A main event of the Forum was a public seminar. It invited four experts, one from Kenya, one from Romania, and two from Japan. About 75 people from various groups gathered at the event.

The experts covered wide-ranging topics. Mr. John Gichuki, director of Kenya Marine and Fisheries Research Center, discussed fishery problems in Lake Victoria in relation to the change of lake environment conditions. Mr. Yasuhiro Fujioka, director of Shiga Prefecture Fisheries Experiment Station, discussed historical changes in fish and fish-related culture in Lake Biwa. Mr. Peter Lengyel, a Scientific Secretary of UNESCO Pro Natura Romania, introduced environmental activities for wetland conservation in East Europe. Mr. Masayuki Kurechi, president of Japanese Association for Wild Geese Protection, reported behavioral changes of the migrating geese to Japan, including the delay of their arrival times and the shift of their migrating stations to north. Experts argued that these changes might have something to do with global warming.

After though-provoking presentations by experts, a panel discussion took place, including questions from the floor. Participants discussed how to protect our lake environment as a key habitat for a wide-range of living things. Discussion further extended to how to address global warming which is threatening all kinds of fish and birds and, possibly, responsible for decreasing biodiversity.

Participants learned that solutions of protection of transboundary lakes and rivers, such as Lake Victoria and Danube River, involve complex processes beyond countries. They also learned lake environmental issues need to be addressed from wider perspectives considering biodiversity and global warming. The seminar provided an opportunity for each participant to think about what they can do to protect our lake environment and living things supported there.

International Consultation Meeting on Water and Wastewater Management

UNEP-IETC and ILEC co-organized an international consultation meeting on water and wastewater management on April 19-20, 2010 at IETC Shiga Office, Japan. This meeting aimed to develop UNEP-IETC's future strategies and programs on water and wastewater management and to foster international partnership towards this goal. ILEC, a supporting foundation of UNEP-IETC, cooperated with organization of this meeting to provide an ILBM perspective to the program of UNEP-IETC. The meeting brought together about 30 participants, including representatives from UNEP and other UN organizations, experts from India, Philippine, Vietnam, Iraq, Canada and Japan working at international organizations, universities, and institutions, and government officials from Japanese Government and Shiga Prefecture. All participants had a heated discussion for two days to achieve the objectives of the meeting.

Day 1 (April 19) started with introduction of UNEP strategies and activities, followed

by two case presentations, including one from IETC's wetland restoration project in Iraq, and another from Fleming College, Canada about the application of phytotechnology in northern part of Canada, in particular, how to design a constructed wetland for purification of water in cold area. Two ministries of Japanese Government (Ministry of the Environment and Ministry of Foreign Affairs) and Shiga Prefectural Government respectively gave their perspectives on water and wastewater management and introduced their recent activities and priority issues in the future. Toward the end of the day, experts discussed IETC's priority issues and activities in 2011-2013 in this area.

Day 2 (April 20) discussed how to enhance beneficial technology transfer and how to foster effective partnership for this purpose. JICA introduced their capacity building programs and participants from India presented their networking activities involving private sectors. ILEC, in a presentation of its project "Sanitation Challenges in Eastern Africa", stressed the need of the development of on-the-ground broad framework such as ILBM platform is essential to the success of these programs. The meeting successfully closed with a draft proposal of IETC programmatic package for 2011-2013 on water and sanitation management.

ILEC Scientific Committee Membership Reshuffled for 10th Term

New membership of ILEC Scientific Committee for its 10th term was decided. Dr. Chris H. Magadza, Director of Lake Kariba Institute (Zimbabwe), stepped down from the Committee after his 22 year's long service. He was taken over by Dr. Salif Diop (Ghana), Deputy Director of UNEP-DEWA. This replacement was approved at the board meeting held on June 7, 2010. Also approved was resignation of Ms Dianne Dumanoski (USA) and Mr. Anders Jagerskog (Sweden) for their difficulties assuming due role as a committee member. Dr. Magadza, even after resignation, will continue to play as a focal point in ILEC activities in Eastern Africa.

Scientific Committee Members for 10th Term (April 2010 ~March 2013)

	Name	Nationality	Affiliation
Chair	Masahisa Nakamura	Japan	Research Center for Sustainability and Environment, Shiga University
Vice-chair	Walter Rast	USA	Texas State University,Department of Biology
Secretary	Tsugihiro Watanabe	Japan	Research Institute for Humanity and Nature
Bureau	Nick Aladin	Russia	Zoological Institute of RAS
Bureau	Adelina Santos-Borja	Philippines	Laguna Lake Development Authority
	Luigi Naselli-Flores	Italy	University of Palermo Department of Botanical Sciences
	Sandra Azevedo	Brazil	Federal University of Rio de Janeiro
	Mohan S. Kodarkar*	India	Indian Association of Aquatic Bilologits
	Xiangcan Jin	China	Chinese Research Academy of Environmental Sciences
	Daniel Olago	Kenya	University of Nairobi
	Salif Diop	Ghana	UNEP, Division of Early Warning and Assessment
	Richard D. Robarts	Canada	UNEP GEMS/Water Collaborating Centre Environment Canada
	Juan Skinner	Guatemala	PRO-LAGO Lake Atitlan Environmental Protection Society

* Deceased on August 9, 2010.

IN MEMORIAM TO A WONDERFUL COLLEAGUE

ILEC would like to take this opportunity to express our sorrow at the untimely death of our colleague from India, Dr. Mohan Kodarkar. Dr. Kodarkar was a member of the ILEC Scientific Committee from April 2007 until his death on August 9, 2010, the only member from the South Asia region. Among his many activities, he was actively engaged in the revival of Hussain Sagar Lake, near Hyderabad, Andhra Pradesh, India. He was the Secretary of the Indian Association of Aquatic Biologists (IAAB), being instrumental in its development. Further, he played a key role in organizing and convening the 13th World Lake Conference (Taal 2007), held in Jaipur, India, during October 28-November 2, 2007. Dr. Kodarkar also had a major role in facilitating the application of Integrated Lake Basin Management (ILBM) in India and other countries in Southeast Asia region. He was a tireless and enthusiastic advocate of this approach, and will be a difficult person to replace on ILEC's Scientific Committee. Indeed, ILEC's experiences in India were enabled largely by the active involvement of Dr. Kodarkar.

An accomplished aquatic biologist, Dr. Kodarkar also was a very amiable and friendly individual, liked by all his Scientific Committee colleagues. He was a gentle spirit and a kind soul. His shining presence, smiling face, and scientific competence will be missed by his colleagues, his family and his friends. We give him our fond farewell and wish him good speed in his ongoing journey.

Activities of ILEC (April 2010 – March 2011)

2010

April – June

- TWAP 1st Steering Committee (April 13-14, Nairobi, Kenya)
- International Consultation Meeting on Water and Wastewater Management
  (April 19-20, jointly organized by IETC and ILEC at IETC Shiga Office, Japan)
- ILBM Training on Lake Taihu
  (May 14-22, Wuxi, China, Sponsored by World Bank)
- TWAP Lake Group Meeting (May 22-28, ILEC)
- World Environment Day Exhibition
  (June 2-24, jointly organized by ILEC and IETC at Lake Biwa Museum, Shiga, Japan)

July – September

- TWAP-IMAIG Meeting (July 14-16, Geneva)
- Field research for AFSAN Project
  (Kenya, Zimbabwe, August 27-September 10)
- 11th Environment Education Course for Water Environment Conservation (August 30-October 14, Sponsored by JICA)
- 2010 Stockholm Water Symposium (September 5-7, Stockholm)
- Preparatory Meeting for WLC14 (Texas, USA)
- 2nd World Lake Forum: Partnership project with COP-10
  (October 17, Shiga, subsidized by Environment Restoration and Conservation Agency of Japan)

October – December

- 1st Meeting of WLC14 Japanese Organization Committee
  (October 19, Shiga)
- ILBM-Governance Project: Final Review Experts Meeting
  (November 2-6, Shiga, sponsored by Ministry of Education, Culture, Sports, Science and Technology, Japan)
- ILBM-Governance Project: International Symposium
  (November 7, Lake Biwa Museum, sponsored by Ministry of Education, Culture, Sports, Science and Technology, Japan)
- 4th Training Course on Conversation of Southern Marshland in Iraq (December 2-16, Sponsored by JICA)

2011

January – March

- 6th Training Course: Integrated Basin Management for Lake Environment (January 17–March 11, Sponsored by JICA)
- Field research for AFSAN Project
  (Kenya, Zimbabwe, January 31-February 16, Commissioned by Ministry of the Environment, Japan)
- 2nd Meeting of WLC14 Japanese Organization Committee
  (March 2, Shiga)

ILEC

INTERNATIONAL LAKE ENVIRONMENT COMMITTEE

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