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NEWSLETTER

International Lake Environment Committee

=Promoting Sustainable Lake Management=

This Newsletter is also available in Japanese.

Global warming and lakes

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World freshwater resources are shrinking measurably in many regions because water is being consumed at a rate greater than it can be recharged. Freshwater resources are also shrinking qualitatively because many systems are increasingly polluted with a wide variety of human, agricultural and industrial wastes. Concomitant with these anthropogenic impacts, climate change is expected to directly affect both the quantity and quality of water and may exacerbate the effects of many other human activities on lakes.

Changes in average air temperature, changes in frequency, duration and amount of precipitation, and rising sea levels are predicted due to changes in large-scale atmospheric phenomena as outlined in the IPCC 2007 reports. At higher latitudes, precipitation is expected to increase whereas it is expected to decrease at lower latitudes although the distribution of these changes varies regionally and locally. The effect of all these changes on lakes will be alterations in water temperatures and annual stratification patterns, changes in inflow quantities from surface runoff, changes in the amount and duration of winter ice cover, which will affect evaporation and alter of water levels. Indeed, long-term monitoring records of lake surface water from around the world have indicated that many lakes and reservoirs have experienced increases in water temperature in Africa, the Americas, Europe and Asia (Figure 1). With global warming and reduced precipitation many lakes have been shrinking. These include Lake Chad in Africa. Freshwater lakes may become saline and saline lakes, such as in the semi-arid prairie region of North America, will increase in salinity. During winter of 2001-2002, Lake Erie in North America was ice-free for the entire season, a situation that occurs infrequently. Increased winter evaporation contributed to the already low water levels in the Great Lakes caused by below-average precipitation and increased evaporation from summer warming.

Northern lakes may be particularly vulnerable to global climate changes. Warming of frozen ground, which includes near-surface soil affected by short-term freeze-thaw cycles, seasonally frozen ground and permafrost can lead to ground surface subsidence and the formation of thermokarst that generate marked changes in ecosystems and landscapes (Lemke et al., 2007). Lemke et al. reported extensive thermokarst formation in central Yakutia (Russian Federation) and significant expansion and deepening of thermokarst lakes near Yakutsk from 1992 to 2001. Thermokarst formation might be expected to increase the number of lakes and wetlands in an area but this is not necessarily true. From satellite data Smith

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et al. (2005) found a widespread loss of large lakes in Siberia despite slight precipitation increases over an almost 30 year period. However, they also found that the effects of thermokarst formation on lake formation varied: in continuous permafrost total area increased but in discontinuous, sporadic and isolated permafrost there was a decline. They proposed that thermokarst formation should be viewed as a continuum in which initial permafrost warming leads to development of thermokarst and lake expansion and is followed by lake drainage when the permafrost breaks down further and water is released to the subsurface. Smith et al. (2005) concluded that the ultimate effect of continued climate warming on high-latitude, permafrost controlled lakes could result in their widespread loss.

River deltas, such as that of the Mackenzie, along the circumpolar arctic coast are rich in lakes. In the Mackenzie Delta flood pulses generated by ice breakup control the degree to which river water moves off-channel to restore waters in the lakes and wetlands. From an analysis of more than 30 years of water level data from the Mackenzie Delta, Lesack and Marsh (2007) found that river-to-lake connection times had lengthened in the lowest elevation lakes and may have shortened for the highest elevation systems via sea level rise and declining effects of river-ice break-up. As a result, the higher elevation lakes are now at risk of drying up while the lower elevation systems with increased water levels may allow fish to inhabit a greater area of the delta.

Global warming may also affect the chemical and biological attributes of lakes and reservoirs. These will vary for different systems and their geographical location. For example, in a recent study, Flanagan et al. (2003) analyzed published limnological data for arctic and temperate lakes between 41 and 79oN. They found that average algal biomass during the ice-free season increased significantly with phosphorus levels and suggested algal biomass could sharply increase in relatively unproductive arctic lakes with increases in water temperature due to climate warming (including reduced length of ice cover and consequent increased availability of solar radiation for algal growth) and nutrient concentrations due to permafrost melting.

Many biogeochemical processes in lakes have some degree of regulation by water temperature. The warming of lake water could increase biological productivity, decomposition and therefore nutrient and energy cycling. Hypolimnetic warming can lead to periods of deoxygenation in deep lakes while warmer waters may exclude cold-tolerant species and thereby alter the biodiversity and food-webs in lakes.

Schindler (1997) has summarized the interaction of climate warming impacts on lakes with other human impacts:

- Delayed recovery of acidified lakes;
- Decreasing DOC (dissolved organic carbon) concentrations in warming lakes could be accelerated by acidification;
- Eutrophication may increase, even though nutrient loads may decrease because of increased retention times;
- The impact of oxygen consuming effluents may be more severe as dissolved oxygen saturation decreases with increasing temperature;
- Hypolimnetic oxygen deficits could be increased with longer stratification periods in eutrophic lakes;
- In lakes undergoing warming and acidification, organisms may have increased UV radiation exposure due to decreasing DOC concentrations;
- Climate warming interactions with toxins will be many and complex, ranging from reduced toxin loads and increased retention, to increased revolatilization, decomposition and cycling; and
- Increased human demand for water will interact with climate warming to compound already severe problems in water quantity and quality, impacting all aspects of society and the environment.

Interannual data variability is a major confounding problem to detect changes due to climate warming even with long-term datasets (Jassby et al., 2004). Assessing the impact of climate change on lakes is complicated by the many anthropogenic impacts that have occurred, and are occurring, on the physical, chemical and biological characteristics of lake systems. Although Arhonditsis et al. (2004) noted that several long-term studies have found a coupling between lake water temperature and individual organism physiology, population abundance and community structure, there is generally a scarcity of such long term data records for lakes, particularly for biological processes. Therefore, demonstration of climatic change impacts from field data is similarly rare. Impacts such as changes in land-use and water abstraction may equal or exceed climate-induced changes. Furthermore, our ability to predict climate change impacts on lakes and to devise effective management strategies to cope with, or ameliorate, these are restricted by the quality of climate change predictions at regional scales together with our generally poor understanding of many of the effects of climate change and variability on lake ecosystems (Meyer et al., 1999). As lakes are a major source of renewable fresh water for human societies in many parts of the world (ILEC, 2003), there is an urgency to obtain this information and improve our predictive capabilities.

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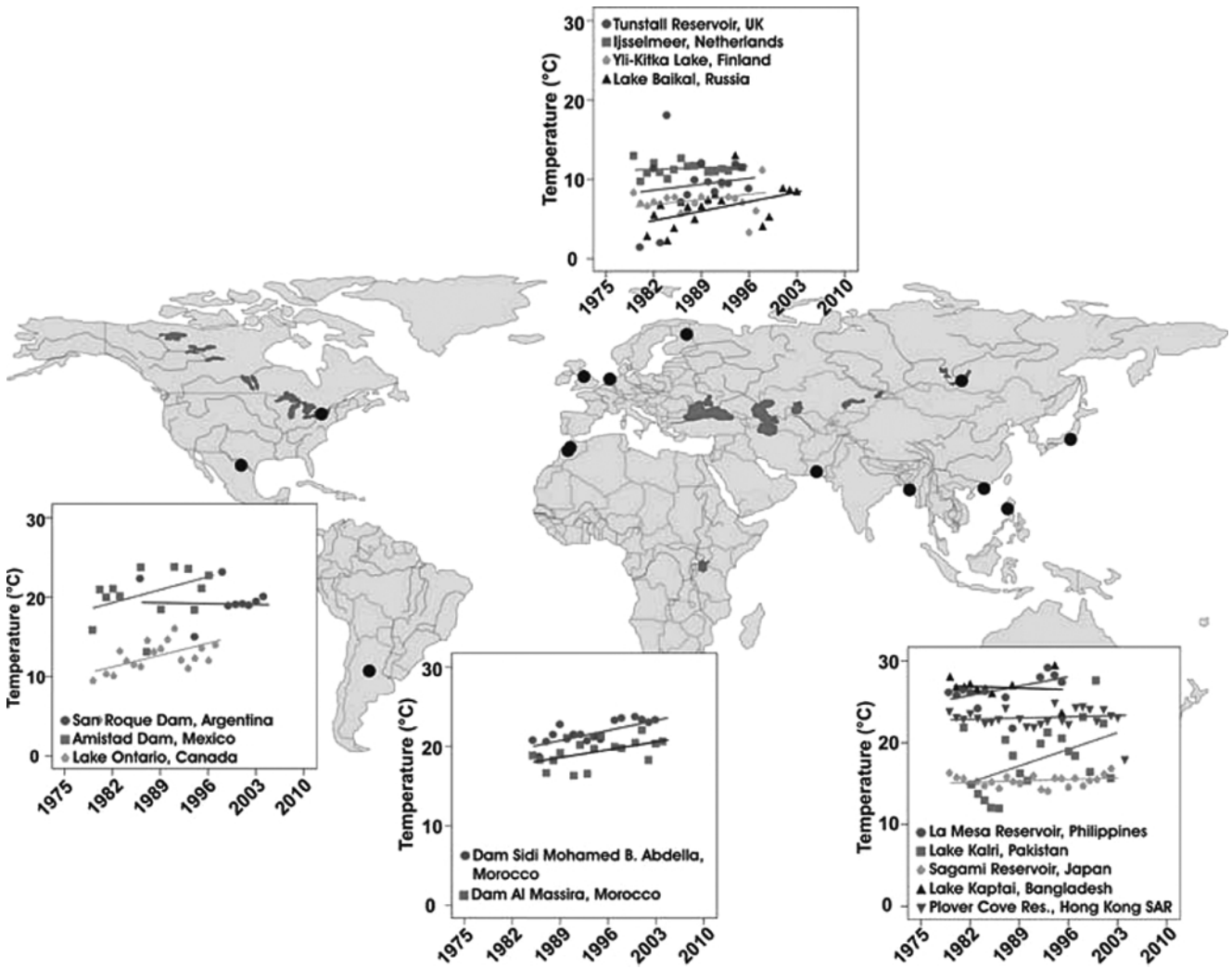


Figure 1 Examples of changes in mean annual surface water temperature from long-term lake monitoring stations. Lines are 'best fit' linear regressions. Data are from the UNEP GEMS/Water Programme's global database (GEMStat; www.gemstat.org) that contains data for 425 lake and reservoir stations. Reprinted with permission from Water Quality for Ecosystem and Human Health, 2nd Edition, 2008. UNEP GEMS/Water Programme, Burlington, Canada, 120 + vii p.

Promotion of Integrated Lake Basin Management

- Lake Basin Governance Project -

The "Integrated Lake Basin Management" (ILBM) offers a framework to suatainably mange and conserve lakes and their basins, taking into account three unique features of lakes (1. integration of the nature and human activities in the basin, 2. long retention time, 3. complex response dynamics within the lake). The ILBM concept has evolved from the findings of lake basin management experiences of across continents, detailed in the report entitled "Managing Lakes and Basins for Sustainable Use", produced as an output of the GEF(Global Environment Facility) financed and the World Bank executed project, implemented during the 2003-2005 period by ILEC. Since 2005, the usefulness of ILBM concept has been recognized by many organizations in different parts of the world, and now there is growing interest in applying the ILBM framework for meeting the challenge of sustainable management of "lentic‡ or non-moving water systems, such as lakes, reservoirs, wetlands and ponds, through improving their "Basin Governance".

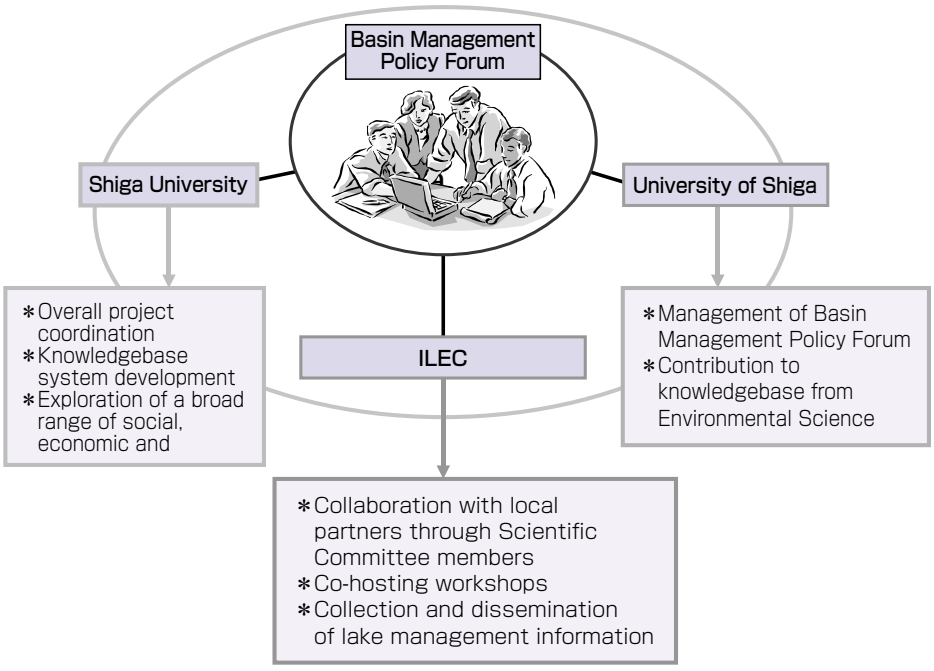
Unlike conventional approaches in which the government plays a central role in the problem solving, ILBM calls for improving the "Basin Governance", where various management actions be facilitated through formal and informal means that are directly or indirectly responsive to the three features of lentic water system.

Because "Basin Governance" is relatively a new concept, ILEC has been working closely with the Japanese experts gathered in the "Basin Policy Research Forum" established jointly with Shiga University and the University of Shiga Prefecture in March 2007. As a result of such efforts, a research project was proposed for funding to the Ministry of Education, Culture, Sports, Science and Technology-Japan for expanding the ILBM knowledgebase that was originally established in the above GEF report. A three-year project fund was awarded by the ministry, and the so-called "ILBM-Governance" project was initiated in April 2008. ILEC has since been collaborating with the two universities to pursue the project objectives of conducting consultative visits to the newly included ILBM case study lake basins.

The project is being implemented by the three member organizations, each providing its respective feature "resources". The role of ILEC is to provide the information available at ILEC that will be useful for the project, to coordinate local partners of the new ILBM cases with the help of ILEC Scientific Committee members around the world, and to co-organize workshops with local organizations wishing to promote ILBM. ILEC also works as a focal point for collecting and disseminating lake management information globally.

A process has been developed for compiling and analyzing a wide-ranging ILBM-related information using a "Lake Brief" format that will help elaborate the governance challenges facing the specific case study subject. The choice of target lakes and reservoirs were selected based on a broad range of considerations such as "region and location", "features and characteristics" and "problems facing the lake". In 2008, field visits were made to the following study sites.

A Framework of Collaboration in Lake Basin Governance Project



Japan Lake Biwa, Tone River and Kasumigaura-Teganuma and Inbanuma Basin, Lakes Shinji and Nakaumi, Lake Suwa
Outside Japan South Asia: Lakes Hussainsagar and Ujjiani Reservoir (India), Lakes Phewa, Rupa and Begnas (Nepal)
East Asia: Lake Laguna (Philippine), Lakes Chini and Bukit Melah, (Malaysia)
North-western region of Russia: Lakes Ladoga, Peipsi/Chudskoe and Illumen
Latin and Central America: Lake Chapala (Mexico) and Lake Atitlan (Guatemala)

Preparatory discussion for 2009 activities on selected lakes in Africa, Europe, North and South America has also been undertaken through correspondence and at an expert group meeting held in Stockholm in August 2008. A Workshop was held each in India and Mexico to help promote application of ILBM to local lake basin management cases.

South Asia	South Asia	South Asia	South Asia
South Asia	Lake Hussain sSagar and Ujiani Reservoir in India	August 28-29, 2008	IAAB (Indian Association of Aquatic Biologists)、ILEC
Latin and Central America	Lake Chapala (Mexico)	November 17-22, 2008	Corazon de la Tiera, Jalisco Environmrnt Agency, Jalisco State Water Commission, IETSO University, ILEC
Nepal	Kathmandu	December 14-20, 2008	National Lake Conservation Development Committee, ILEC

The Project's First-year Review Meeting will be held from 3rd through 8th March, 2009.

World Lake Student Conference 2008

"World Lake Student Conference 2008", a students' version of World Lake Conference, was held for the first time in Shiga Prefecture, Japan. This event was first called by ILEC as part of implementation of Jaipur Declaration* issued at the 12th World Lake Conference (2007, Jaipur, India), which encourages active participation of all stakeholders including women and youth in local communities for conservation and wise use of water bodies. However, its organization was undertaken by the initiative of local students from six universities in Shiga and Kyoto Prefectures. They set up an organizing committee to design and implement this meeting with a spirit that students should be actively involved in the discussion of conservation and management of water resources and lake environment because they are the ones to bear the burdens as the next generation.

The conference invited ten students from 10 countries, G8 plus China and India, two big CO_2 emitters in Asia, because it intended to discuss not only conventional lake environmental issues, but also impacts of global warming on lakes.

On Day 1, students reported lake environmental conditions in their countries. On Day 2, they boarded a school-boat called "Umi-no-ko" with local elementary school children and learned about environmental education being given in Shiga Prefecture, while enjoying the view of Lake Biwa. On Day 3, they discussed two subjects in two groups, "Lakes and Education" and "Lakes and Co-existence", and put together their message in the form of a "student statement". On Day 4, the final day of the event, a panel discussion was organized with a theme of "Global Warming and Lake Environment", open to the public and joined by Dr. Michio Kumagai of Lake Biwa Environmental Research Institute and Ms. Yukiko Kada, Governor of Shiga Prefecture to help the discussion. The "student statement" was also handed to a representative of UNEP, located in Shiga Prefecture.

This event received broad attention from both inside and outside of Japan. It provided a good opportunity for us to learn about global warming and its threat on lakes, and to be reminded of the need for implementation of the sustainable management of lakes. ILEC hopes this conference will continue in the future. The University of California, USA has volunteered to host the next conference in 2010. ILEC also hopes to see these students actively working in the future World Lake Conferences.

* Jaipur Declaration:
(http://www.ilec.or.jp/eg/wlc/wlc12/wlc12_nov2_jaipur_declaration.pdf)

Students discussing lake environment issues

Invitation to the 13th World Lake Conference

The 13th World Lake Conference (WLC) will be held from November 1st to 5th, 2009 in Wuhan, China. This is the second time for the WLC to be organized in China, with the first one in 1990 in Hongzhou. In view of the recent remarkable development in China, the upcoming WLC offers a good opportunity to see the latest progress in China as well as changes in lake environment conditions during the last twenty years. Wuhan, the venue of the conference, is the capital of Hubei Province, located in Central China, where the Yangtze, the world's third longest river and its greatest tributary meet. It is a typical garden city featuring mountains and rivers.

The 13th conference will be jointly organized by the Chinese Society for Environmental Sciences (CSES), the Chinese Research Academy of Environmental Sciences (CRAES), Wuhan Municipality, a local host and ILEC. The theme of the conference is "Lake Ecosystem Restoration: Global Challenge and the Chinese Initiative", and participants will discuss a broad range of lake management issues, focusing on the following six main subjects;

1) Impact of global warming on lake environment & new problems or new mechanisms for protecting lakes.
2) Strategy, policy and legislation on water environment management in lake basin.
3) Water pollution mechanism, pollution monitoring, management and technology countermeasures of pollution control in lake basin.
4) Integrated management in lake basin and lake ecology.
5) Culture in sustainable utilization of lake and public participation.
6) Study on control of Chinese lake pollution.

ILEC plans to promote the application of Integrated Lake Basin Management (ILBM) framework through technical sessions and round tables. The coming conference features a number of special events aside from ordinary sessions, including international exchange programs each for children, students, ordinary citizens, and NGOs from various countries to increase their mutual understanding, and a "Governors' Forum" and a "Mayors' Dialogue" in which local governments' leaders managing lakes will exchange information and opinion about lake management challenges. Also planned is a technology exhibition, "The First China International Lake Management and Technology & Equipment Exhibition" (November 1-3, 2009), to be attended by companies, various institutions and organizations from China and oversees engaged in environmental conservation, such as improving water environment conditions.

Detailed programs will be shown in the third circular to be delivered in May 2009. The WLC is not just an academic gathering, but offers an opportunity to facilitate free discussion and proactive interaction among experts, ordinary citizens, and government officials. We are hoping to see as many participants as possible from all over the world. Information about the conference and the technical exhibition will be available on the official website (www.chinalakes.org).

Lakes of the World:
Lake Atitlán, Guatemala

MSc. Juan Skinner,
The Atitlán Environmental Protection Society,
ILEC Scientific Committee Member

Lake Atitlán is Guatemala's most valuable lake and the second major tourist destination in the country. Its legendary landscape and blue, crystalline water, nestled in a cauldron punctuated by three perfectly cone-shaped volcanoes, have attracted humans for centuries. The shores cradle three Mayan ethnic groups directly dependent on the lake and its bounty of benefits.

Lake Atitlán is oligotrophic, 342 meters deep boasting a surface area of 130 km2 in a 548 km2 drainage basin, with 11 meters average water transparency, measured with a full scale white Secchi disk, and a volume of 25 km3 of water. The lake is situated 1,562 meters above the sea level. Its medium depth is 188 meters. The maximum length is 18.9 kilometers (NW-SE) and 11.7 kilometers wide (SW-NE). It is located in the volcanic axis of the Pacific edge of Guatemala in Central America. The lake has its origin a cataclysmic explosion forming a volcanic caldera 81,000 years ago. Lake Atitlán has a subsurface drainage basin and the water level has random fluctuations. The water renewal time takes 130 years.

In pre-Hispanic times fish and reeds were introduced repeatedly, but records of management practices and knowledge of the lake's ecosystem are lacking. Chronicles of Spanish friars dating back to 1,585 and contemporary anthropological studies enhance our understanding of indigenous customary laws and practices regarding distribution and use of lake resources. But not until 1958 did changes in consumption, recreational shore development, land use, and introduction of large-mouth black bass confirmed the need for interventions to preserve the lake environment to sustain its benefits.

The lake is an essential part of life for local indigenous people settled in 13 picturesque shore towns. It provides options for subsistence to many fishermen and water for domestic consumption to more than 100,000 inhabitants. The lake also provides a waterway among the different villages and the shallow littoral areas are used to grow reeds used to weave mats. Lake Atitlán attracts tourists from all over the world who come to relax and enjoy the beauty of the lake and its people. The income from tourism is extremely important for the growing economy of Guatemala.

The forests areas in the lake drainage basin have not reduced substantially in spite of the increase of population, now at 205,701 inhabitants. Forest cover reaches 34.26% of the basin land area; the highest in the country. The indigenous Maya in the basin reach 95.43% of the population, and include the Kaqchiquel, Kiche andTzutuhil ethnic groups. Their main way of life is agriculture, and the main crops cultivated are maize, coffee, avocado, onions, and many temperate vegetable crops. An average of 73% of the population lives below poverty lines, and 24% within extreme poverty.

In addition to its reduced fisheries production, Lake Atitlán has suffered from the deliberate introduction of the big mouth black bass. This introduction eliminated 16 native fish species used for traditional food of the Maya indigenous people and changed substantially the lake plankton populations.

Sewage pollution of shore areas is a critical problem for the tourist benefits of the lake and a public health due to the use of lake water for domestic purposes. Unleashed shore development produces a loss of littoral habitat and beauty of the natural landscape. The water front of 13 shore towns has been urbanized and construction of recreational homes have duplicated in the last ten years. There are no shore development plans or regulations, and there are conflicting laws and policies regarding land tenure.

The main land use in the lake basin is for agriculture, covering 33% of the land. Traditional maize based agriculture is changing to use synthetic fertilizers, and the production of vegetables for regional and export markets implies a growing use of pesticides. Due to the practice of water diversion for irrigation and the use of pesticides, the wildlife of rivers and creeks have been practically eliminated.

The consumption of industrial and processed foods by the indigenous population started in the 1980's. Due to the lack of waste management systems, litter has become the most visible pollution in urban settlements, roads, rivers, and the lake and its shore.

Lake Atitlán lacks land planning schemes and other policies to prevent the causes of lake degradation, such as the increasing shore development. Other threats, like over extraction of water has not been legislated to protect the lake. Most of the

policies and laws developed have objectives of biodiversity conservation and not of lake sustainable management.

In 1995 the lake and volcanoes were declared national park area in response to the 1940 Washington Treaty signed by Guatemala. Only in 1978 did management of Atitlán National Park fall to the Forestry Institute. Policies were confined to restricting forest use and reed harvesting. In 1989 Congress approved the Law of Protected Areas to conserve the country's boundless biodiversity, and the National Parks, including Lake Atitlán, were declared legally protected areas. Policies excluding human relations with nature continued to govern a centuries-old cultural landscape. This law was designed for woodlands, underscoring the urgency of policies concerning urban and agricultural areas of the lake basin.

The issues that determine the difference in citizens' views over the lake range from cultural diversity, gender issues, and economic conditions. According to current citizens opinion over the importance of the lake to daily life, 49% of the answers relate to the economic benefit the lake represents due to the attraction of its landscape. Such importance is expressed 10% higher by the better educated male population in the sample. In contrast, 31% of the female population consider water for different uses as the most important resource, compared to 14% in the male opinion over water. It is also important to observe that 10% more of the less educated population value lake water resources over the more educated citizens. We could interpret that the poorest and less educated population depends more on lake water resources than the more educated tourists business stakeholders that depend on the landscape beauty. Fisheries stand in the third place as an important lake resource, with both male and female on the same percentage of answers, and the less educated population giving it a greater importance. Only 4% of the basin citizens give the lake a recreational and water transportation value.

With respect to what citizens like the most about the lake, 72% are inclined towards the beauty of the landscape, 15% towards water related activities, 5% fishing and the aquatic life, and 7% claim to like everything about the lake. Regarding which are the two most important uses of the lake, local women claim in 45% of the answers that water and its use are the most important. In contrast, 35% of the men in the sample admit that water use is the most important. In conclusion, lake citizens value water resources the most considering high poverty levels and dependency on lake resources.

When inquiring citizens regarding their view of negative changes in the lake and its landscape, 53% of an overall opinion alleges an increase in pollution, mainly wastewater and litter. The opinion of women towards water pollution issues, as the greater negative changes in the lake, is 5% higher than men, and the more educated citizens interviewed point out the same problem.

Citizen participation in identifying lake problems reveals the fastest growing problem caused by a lack of urban and shore planning, with 9% of the answers expressing related problems such as poor maintenance and design of public beach areas, and unleashed construction and privatization of the lake shore. Twice as many men than women identify negative changes caused by the lack of urban and land planning.

Other negative changes mentioned include a decrease in fisheries production, lack of institutional collaboration, inadequate environmental policies, lack of authority and overpopulation. Other problems identified by few citizens, but not less threatening, are the lack of law and policy to protect the lake from over extraction of water outside the drainage basin. The loss of human relations with the lake water and a lack of proper financing for improvements and maintenance were also identified by citizens and stakeholders as threats to the lake environment.

Only 2% of the same identifies deforestation as an environmental problem in the lake basin. It coincides with the high percentage of forest cover. Many of the projects, policy and planning are directed towards protecting forests, while the lake landscape and water quality deteriorates reducing the benefits it provides to society.

The Lake Atitlán Environmental Protection Society searched and continues constructing a shared vision of Lake Atitlán, and is currently organizing discussion panels to develop policy proposals to the Guatemala government regarding the sustainable use and management of Lake Atitlán.

9th JICA Training Course on Environmental Education for Water Environment

The 9th training course on Environmental Education for Water Environment was conducted from September 1 to October 16, 2008, under guidance of Professor Munetsugu Kawashima as course leader and Associate Professor Satoshi Ichikawa as sub-course leader, both of Shiga University. This course is intended to support the practice of environmental education in developing countries, in particular countries with emerging economies, where environmental degradation is taking place in the name of economic development while action is delayed in tackling this situation. These countries need various kinds of support to improve environmental education, especially to young people for the next generation, from the development of education system, curriculums and materials, to the training of trainers. This year five young trainees, one from China, Brazil, and Vietnam, and two from Venezuela, participated to learn environmental education being implemented in Japan for water environmental protection. All of them are teaching environmental education in their countries.

Trainees working on education materials with a course leader

The training started with a field trip to Lake Biwa, followed with visits to a number of environmental education programs and conservation activities being practiced around the lake. Trainees learned about key issues in lake management, harmonious relationship between lake and people, and environment education being given at elementary and junior-high schools. The training also focused on methodology of environmental education, in which an original curriculum and materials developed in Shiga University were used. This year Dr. Chitchol Phalaraksh, a former trainee of 2002 and now associate professor at Chiangmai University, Thailand joined as a guest speaker. He talked about his follow-up activities in his country after the training, and showed education materials he developed. His participation shows a long history and value of this training course. ILEC, as organizer, is proud of him and his activities. As a wrap-up, each trainee prepared an "action plan" which they see achievable and effective in their own country. They left Japan with a promise to start action.

A New JICA Training Course on "Environmental Education for Waterside Protection through Nature-based Experience"

Trainees after plant-dyeing workshop (at Ohara, Kyoto, Japan)

This year ILEC started a new JICA training course for environmental education through nature-based experiences at the waterside. This course is different from our conventional ones in three ways, 1) An NPO leader acts as the course leader. Mr. Takeharu Shimakawa, representative of *Kankyo Lakers* and the one who took charge of the training, is one of few experts in Japan in this type of environmental education, 2) Most of the programs are given outdoors in the natural environment, 3) All trainees are young, active practitioners conducting environmental education in their own countries.

Training was conducted from August 8 to September 26, 2008, with participation of eight trainees from Argentina, Brazil, Costa Rica, Guatemala, Seychelles and Uganda. The objective of the training is to empower trainees so that they can develop, implement, and evaluate nature-based environmental education programs on their own that meet their local conditions, thereby disseminating and promoting this kind of education back in their countries.

The training covered wide-ranging topics and subjects. Some of the highly-evaluated ones by the trainees were: 1) Theory on ESD (Education for Sustainable Development), 2) Adventures and games in nature, 3) Activities with children, 4) Networking of organizations, 5) Visit to Lake Biwa Museum, 6) Agricultural activities at Ohara Farm of Doshisha University, 7) Contribution to community through environmental education by a private company, Opal Co., 8) Protection of turtles by NPO at Yakushima Island, 9) Environmental education class at Omi-Brotherhood Primary School, and 10) Environment policy, laws and ordinances on River management.

All trainees had a high opinion of this training course, including contents, organization, and guidance. A secret for the success is the initial approach. Exercises and games given at the start of training made trainees feel closer to each other and act freely in the group. Discussion time every Friday afternoon also helped trainees to review the lessons of the week and draw up a final action plan.

ILEC hopes that all trainees will implement their action plan successfully in their countries. It also expresses special thanks to Mr. Hitoshi Nishimura, associate professor of Doshisha University, Dr. Yasushi Kusuoka, researcher of Biwa Lake Museum, and all the other persons who supported this training course.

Activities of ILEC (January - December 2008)

January - March

- The 4th JICA Training Course on Integrated Lake Basin Management (January 15-March 14, hosted by JICA)

May

- The 1st Preparatory Meeting for WLC13 (Beijin, China) (May 1, with Chinese Society for Environmental Sciences)

June

- World Environment Day Promotional Event (June 1-30, jointly organized with UNEP-IETC)
- Field trip to lakes in Tone River basin (June 10-12, joint activity with Shiga University in "Global Lake Governance Project")

July - August

- ILBM Workshop for South-East Asia (Malaysia) (July 7-9, jointly organized with Shiga University in support of "Global Lake Governance Project")
- Environmental Education Class for Children (July 26, August 2, 19, Sponsored by Heiwado Foundation)
- ILBM Workshop for South Asia & India (Hydrabad, India) (July 28-29, joint activity with Shiga University in "Global Lake Governance Project")
- Training for Conservation of Lake Hussainsagar (India) (July 27-August 8, hosted by JICA)
- WLC13 Promotional activity (Stockholm, Sweden) (August 17-23, jointly organized with Chinese Society for Environmental Sciences)

August - September

- The 1st Nature-based Environmental Education Course (August 18 - September 26, hosted by JICA)

September - October

- The 9th Environmental Education Course for Water Environment Conservation (September 1 - October 16, hosted by JICA)

October - November

- The 3rd Training Course for Support of Iraq Marshland Restoration (October 23 - November 15, hosted by JICA)
- ILBM Workshop for Latin and Central America (Lake Chapala, Mexico) (November 17-22, Jointly organized with Shiga University in support of "Global Lake Governance Project")
- The 1st World Lake Student Conference (November 21-24, sponsored by Environmental Restoration and Conservation Agency of Japan)

December

- ILBM Workshop in Nepal (Kathmandu) (December 14-20, , joint activity with Shiga University in "Global Lake Governance Project")

ILEC

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