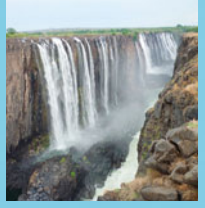

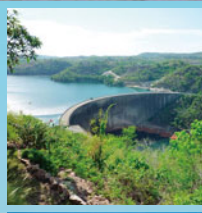

Primer:
Development of ILBM Platform Process

—Evolving Guidelines through Participatory Improvement—

Ministry of the Environment
Government of Japan

SHIGA UNIVERSITY

ILEC

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Primer:
Development of ILBM Platform Process

– Evolving Guidelines through Participatory Improvement –

Research Center for Sustainability and Environment, Shiga University (RCSE-SU)
International Lake Environment Committee Foundation (ILEC)

1. Introduction

This document is a primer version of the parent document entitled **"Development of ILBM Platform Process – Evolving Guidelines through Participatory Improvement"**. While the parent document gives a detailed account of the conceptual and theoretical basis of ILBM and how an ILBM Platform Process may be developed, this primer version focuses only on the latter, with greater emphasis on the practical and procedural aspects of development and use of the ILBM Platform Process.

2. Six Pillars of Governance

The adequacies and inadequacies of lake basin management for individual lake basins may be determined by reviewing and assessing the existing management activities and practices. Based on the comprehensive surveys of the state of world's lakes conducted over the past decades, relevant review questions have been categorized into six thematic domains, including; (1) Institutions to manage a lake and its basin for the benefit of all lake basin resource users; (2) Policies to govern people's use of lake resources, and its impacts on lakes; (3) Involvement of people to facilitate all aspects of lake basin management; (4) Technological possibilities and limitations that often dictate long-term decisions; (5) Knowledge of both traditional and modern scientific origin as the basis for informed decisions; and (6) Sustainable finances to support implementation of all of the above-noted activities. Relevant issues regarding these domains include:

- <**Institutions**> Is there a focal-point institution in charge? Are the relevant capacity building and training programs effective? Is the institution focusing on priority skills? Is it inclusive and open to cooperating agencies, community groups, etc.? Are any mid- course corrections needed?
- <**Policies**> Is there a management plan with a realistic implementation scope? Does an adequate management plan already exist, or should the existing plan be updated? Are the relevant priorities and phasing clear? Does strong political will exist to support sustainable management? Is sustaining and building political will and commitment appropriately incorporated as part of the management program?
- <**Involvement of people**> Do effective mechanisms exist for participatory implementation? Does the existing management plan include all relevant stakeholders for its implementation? What changes have occurred in regard to awareness and understanding of the problems, and their linkages to stakeholder activities? What are the perceptions of program stakeholders?
- <**Technological possibilities and limitations**> Are the existing technologies working well? If yes, could their performance be further improved? If no, what are the reasons for their not working properly? Have there been unexpected adverse impacts of technology applications? If yes, have the adverse effects been appropriately mediated? If no, should the applications be further replicated? Have either technology options or costs changed, and are such changes reflected in the management plan?
- <**Knowledge and Information**> Is there a common, shared knowledge base

about the priority management challenges? Does a monitoring system exist to measure changes in key governance and other relevant indicators? Is the data base sufficient? What are the remaining key gaps? Are information management tools adequate to be effectively deployed?

- <**Finances**> Are the currently available financial resources adequate? How can access to financial resources other than those currently available be improved?

These six major topics comprise the essential governance ingredients that collectively form the management regime for the integrated approach for lake basin management encompassed within Integrated Lake Basin Management (ILBM) – They are referred as the Six Pillars of Governance in ILBM (**Figure 1** and **Figure 2**).

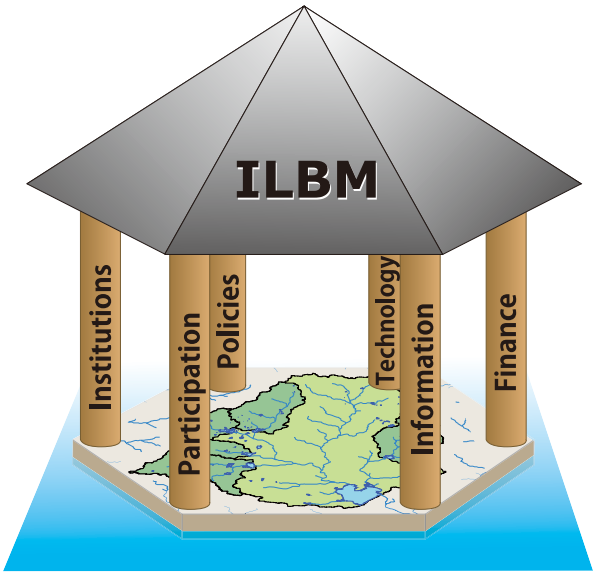

Figure 1. Conceptual Illustration of ILBM Platform Structure with Six Pillars of Governance

Figure 2. Simplified Image of ILBM Platform Structure with Six Pillars of Governance

3. The Lake Brief - A Unifying Thread for the ILBM Platform Process

The ILBM Platform Process (ILBM-PfP) begins with the preparation of a 'Lake Brief' (see **Box 1**). The preparation process may be facilitated by identifying the 'Impact Stories,' the past incidents of success and failure, the management implications surrounding the unique physico-chemical characteristics, limitations and prospects facing the basin community, etc., that feature the lake basin environment and its community (Section IV). The remaining sections may be developed around these elements, particularly with regard to the issues and challenges to be described in Sections V and IV. Useful inputs, in the form of reviews and suggested refinements, can be obtained effectively through an iterative process including workshop elaborations. Inclusion of appropriate figures, tables, illustrations, maps and other visual materials will obviously increase the usefulness of a Lake Brief.

ILEC also has prepared a Questionnaire (**Annex A**) to guide the development of a comprehensive Lake Brief. The Questionnaire elements include the bio-geophysical features of a lake basin, its socio-economic and governance features, and impairments to its sustainable use, including its ecosystem regulating services.

I. Introduction

This section should describe the socio-economic context (people, livelihoods, economic characteristics, types of institutions, laws and policies, political structure, etc.) of the region, country, or basin in which the lake is located. It should summarize the overall importance of the lake and its basin from the perspective of its significance as a natural habitat, and its social, economic, institutional, political, cultural and/or recreational importance to the human population in the region, and its global importance, if any.

II. Description of Lake (to be based in part on **Part I** and **II** of Annex A)

II.1 Overview

This section should provide information on the lake's biophysical features, including basic physical characteristics (lake surface and drainage areas, lake depth and volume, water residence time, etc). It also should describe drainage basin characteristics (lake watershed and upstream and downstream river basins), including the basin landscape and land use patterns. The Lake Brief also should summarize the lake's environmental state in regard to its drainage basin. The human and environmental benefits derived from the lake/reservoir and its drainage basin also should be identified and discussed.

II.2 State of the Lake

This section should include scientific findings and data that describe the past and present state of the lake's water environment, including water quantity and quality, aquatic biota (flora and fauna), and the state of its ecosystem health. Any regionally- or globally-important aspects of the lake's environment also should be identified.

Box 1. General Outline a Lake Brief

The general structure of a Lake Brief is as follows:

I. Introduction
II. Description of the Lake and Its Basin
III. Management of the Lake and Its Basin
IV. Major "Impact Stories" of the Lake
V. Major Lake Basin Governance Issues
VI. Key Challenges to Lake Governance
VII. References

Annex A. Lake Questionnaire (checklist of data and information on biophysical and managerial issues facing the lake basin)
Annex B. Six Pillars of Governance (checklist flowchart of governance issues facing the lake basin)

III. Management of the Lake and Its Basin (to be based in part on **Part III** of Annex A)

Some of the key questions to answer in this section include the following:

- What do we know about management of the lake and its basin?
- What are the major resource values of the lake and its basin; how are they used/exploited economically; who benefits and who loses in the use/exploitation?
- What are major socio-economic and political implications of the lake and its basin, particularly with regard to development, use and conservation of their resources, to the basin population?
- What are the resource use conflicts; how are they managed; are they? managed well?
- What are the current environmental and governance problems with the lake and/or its basin; how are they being managed?
- What do basin inhabitants, including fishermen, consider the overall environmental and ecosystem status of the lake to be? Are their perceptions consistent with scientific findings?
- What is (are) the apparent and not-so apparent root cause(s) of identified problems?
- Who or what suffers from the impacts of these problems/issues, and how?

IV. Major"Impact Stories"

The 'impact stories' represent narratives of human interventions, whether successful or not, that were introduced in the lake basin to attempt to deal with its management challenges. The stories must be told simply and concisely, with particular emphasis on the context of their development and their results.

V. Major Lake Basin Governance Issues (see also **Annex B**)

Managing a lake and its basin may be depicted by answering the following types of questions:

- Who (individuals, groups, institutions) are the key players in developing and implementing the actions/programs to be undertaken to address identified lake basin problems?
- What is the existing legal and policy basis for lake basin management?
- What plans and policies have been introduced to manage a lake and its basin, and how well have the problems been addressed?
- What roles do the general public and NGOs have in managing the lake and its basin?
- What are the major introduced control measures (to address domestic, industrial and other pollution loads; urban and agricultural runoff; water flows and withdrawal; commercial fishing; wetlands and riparian zones, etc.)?
- What are the major financial mechanisms used to facilitate the control measures (user fees, taxes, fish levies, zoning charges, tradable permit systems, etc.).

These questions are more comprehensively addressed in the boxes on the upper part of the flow diagrams in Annex B for each of the lake basin governance categories.

VI. Key Lake Basin Governance Challenges (see also **Annex B**)

Key lake basin governance challenges may be characterized by answering the following types of questions:

- What attempts have been made to establish sustainable institutions to address multi-national and multi-sectoral issues, and multi-stakeholder interests involved in managing a lake, its basin and its resources for sustainable use?
- Has there been an emergence of political interest and/or commitment to managing and/or using a lake, its basin and its resources in a more sustainable manner and, if so, what were the reasons for the emergence?
- Will efforts be undertaken to establish a new legislative framework and/or policies for managing lake basins for sustainable use?
- Will efforts be undertaken to enhance stakeholder participation in the design and implementation of lake basin management programs?
- Will plans/programs be developed to strengthen linkages between lake basin management programs, and broader national and regional water resources management efforts?
- Will efforts be undertaken to better incorporate scientific information and research results into lake basin management programs?
- Will efforts be undertaken to develop financing and/or subsidizing mechanisms for lake basin management activities focusing on sustainable use?

As a means of simplification, the initial version of a Lake Brief can be prepared in the form of a PowerPoint presentation. The full text version of the Brief (which will be periodically revised and amended) can then be prepared as the Platform members collectively gain knowledge regarding the overall lake basin situation and the long-term challenges facing them in its management.

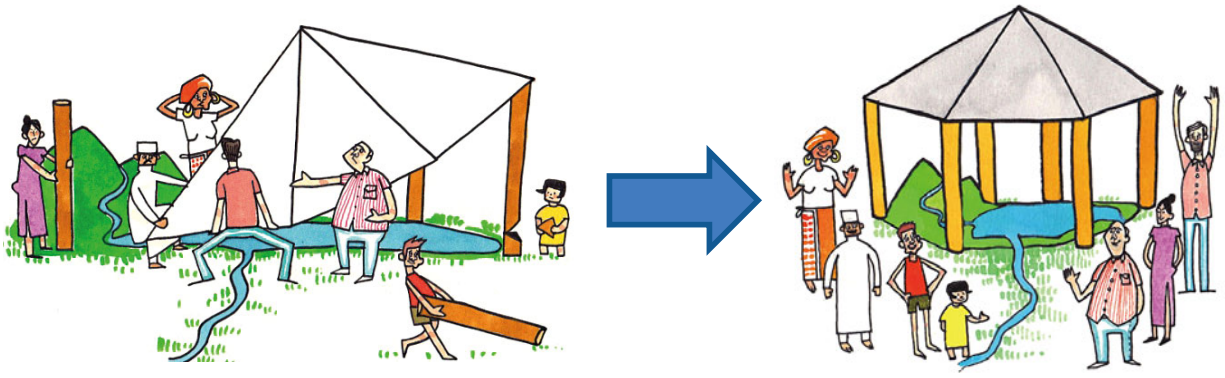

Figure 3. Transformation of ILBM Platform Structure by Strengthening the Six Pillars of Governance

Box 2. Development and Implementation of a Management Plan in the ILBM Platform Process

The ILBM Platform Process takes for granted that development of a lake basin management plan and its implementation are is an integrated part of the Process itself. If there is an existing management plan that is not working to the satisfaction of all the stakeholders, the ILBM Platform Process should be able to clarify what aspects of the plan need improvement and how, over time. On the other hand, if there is no management plan, which is often the case in many developing countries, the ILBM Platform Process should be able to indicate what the necessary components of the plan could be and how they may be coherently integrated into it. Exactly how such a plan should be, and could be, developed, would depend on a number of factors. In some cases, the national government may be ready to support individual lake basins with financial resources for undertaking structural and nonstructural intervention projects. In other cases, there may be bilateral and multilateral technical collaboration and/or financial assistance organizations willing to assist in the development of a plan. In either case, the very existence of the ILBM Platform Process would be very useful for both development and implementation of such plans.

4. Analysis of "Issues" and "Challenges" Regarding Six Pillars of Governance

The ILBM PfP takes the form of either a basic (i.e., 'once-through') process (**Figure 4**) or a cyclic process (**Figure 5**). Based on most cases of lake basin management in developing countries conducted to date, the basin stakeholders usually find ILBM PfP useful regardless of whether they use the basic or cyclic process. This experience is based on the observation that the conventional approach in planning for lake basin management is primarily a government-driven activity, thereby often exhibiting a very 'top-down' as well as 'expert-driven' approach. This deprives a broad range of stakeholders from being involved in the planning process in any significant way, despite the fact that they are usually the ones most directly and indirectly affected by the implementation of such plans. A basic process may, or may not, subsequently be transformed into a cyclic process, depending on the interests and capabilities of the members developing the Platform. In many cases, however, the need to transform the basic process into a cyclic process will become apparent over time, with the collective aspiration to do so also growing over time.

The development of the cyclic ILBM PfP is described below by referring to its block diagram version illustrated in **Figure 6**. The ILBM-PfP begins with **Step 1)**, "Description of the State of Lake Basin Management," for which the information and data gained in preparing the Lake Brief for a given lake and its basin play a key role. The analysis of "Issues," "Needs," and "Challenges" regarding the Six ILBM Governance Pillars identified in Sections V and VI of the Lake Brief will take place in **Step 2)** of the PfP.

The **Step 2)** can be elaborated in some depth as follows:

1) The "Issues" identified in Section V of the Lake Brief should include those identified by individual stakeholder groups, as well as collectively by multiple stakeholder groups;
2) Some of the "Challenges" identified in Section VI of Lake Brief may be clear and straightforward, and the approaches to address them may become clear rather quickly through a constructive consultative process among the concerned stakeholders. Others may be more involved, requiring much time and collective efforts on the part of multiple stakeholder groups. They also may be left for consideration in the subsequent rounds of analysis in the cyclic process.

Notwithstanding the above, the identified "Challenges" may be associated more or less intuitively with the Six Governance Pillars. The "Issues" and "Challenges" can be elaborated using a **"Issue – Challenge – Six Pillars Matrix,"** to be described later in Section 6 of this document.

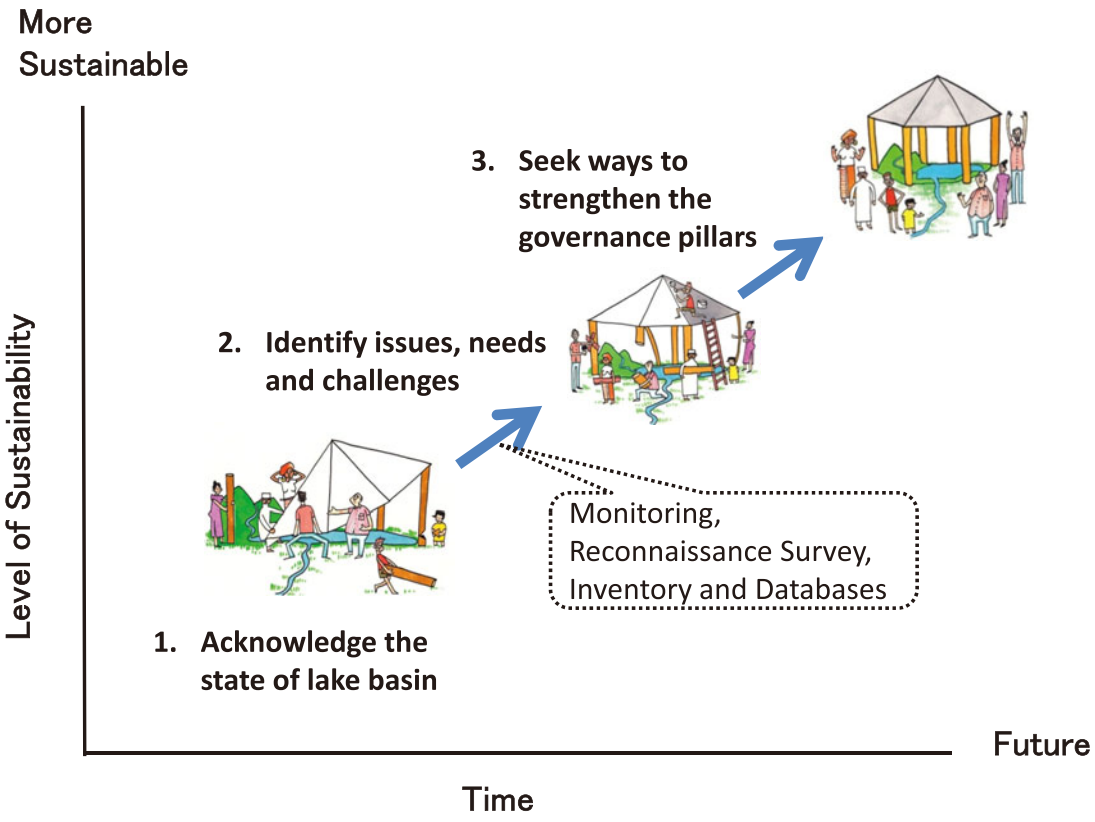

Figure 4. Conceptual Image of a Basic ILBM Platform Process

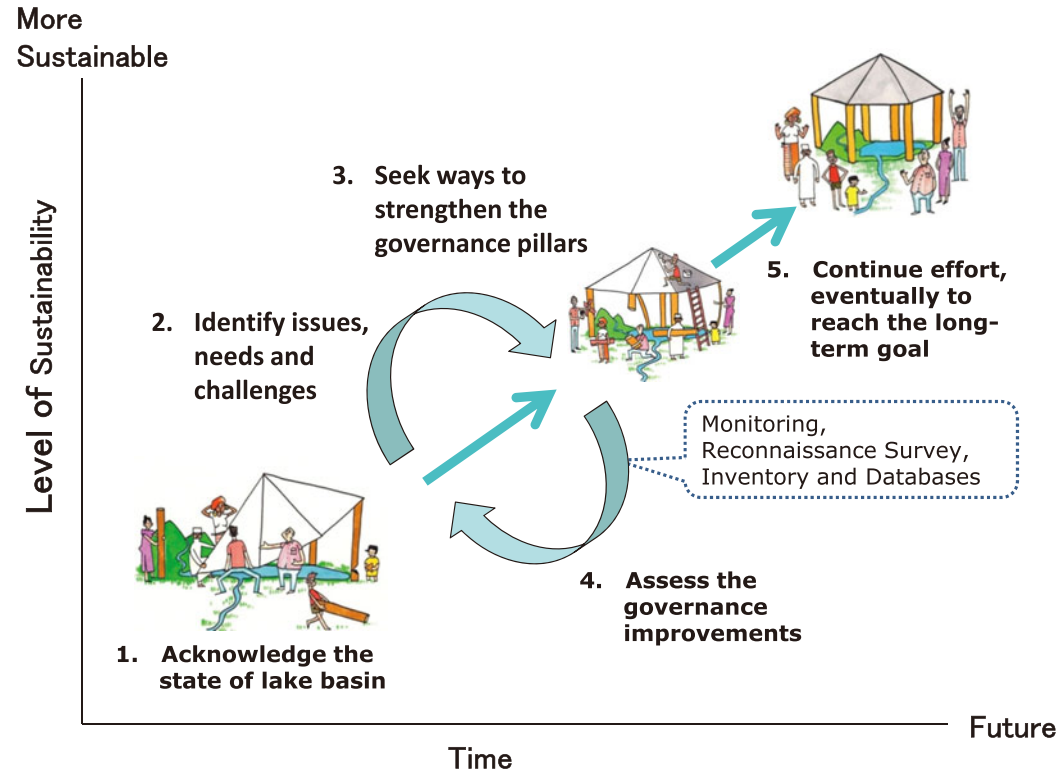

Figure 5. Conceptual Image of a Cyclic ILBM Platform Process

5. Ways and Means for Meeting the Challenges, and Implementation of the Agreed Actions

For **Step 3)** of the PfP, as illustrated in **Figure 6**, the stakeholders should be ready to discuss and consider how the "Challenges" identified in **Step 2)** above may be addressed. This step generally requires collective, critical self-analysis of the background and reasons why such "Challenges" arose in the first place, and how they may be most productively addressed. A set of guiding questions, prepared on the basis of the compiled documentations of past lake basin management experiences, may be very useful for this step. **Figure 7** illustrates an example of a set of such questions directed to Institutions (the full set of guiding questions is shown in **Annex B**. It is emphasized that the questions provided in **Figure 7** are only examples of the types of questions relevant to this step. The Platform members can modify them and/or add their own questions as necessary.)

Determining the means and approaches for addressing the identified "Challenges" will usually require a great deal of 'soul-searching' on the part of the Platform members. This may range from simple information-sharing (i.e., for the concerned stakeholders to decide to share information already available, but exclusively owned by each stakeholder separately), to collective actions (i.e., for the concerned stakeholders to undertake joint actions by mobilizing collective resources), to joint engagement in developing and implementing various intervention plans and projects anew, possibly by involving external technical and financial cooperation programs willing to be part of the jointly-developed ILBM Platform concept.

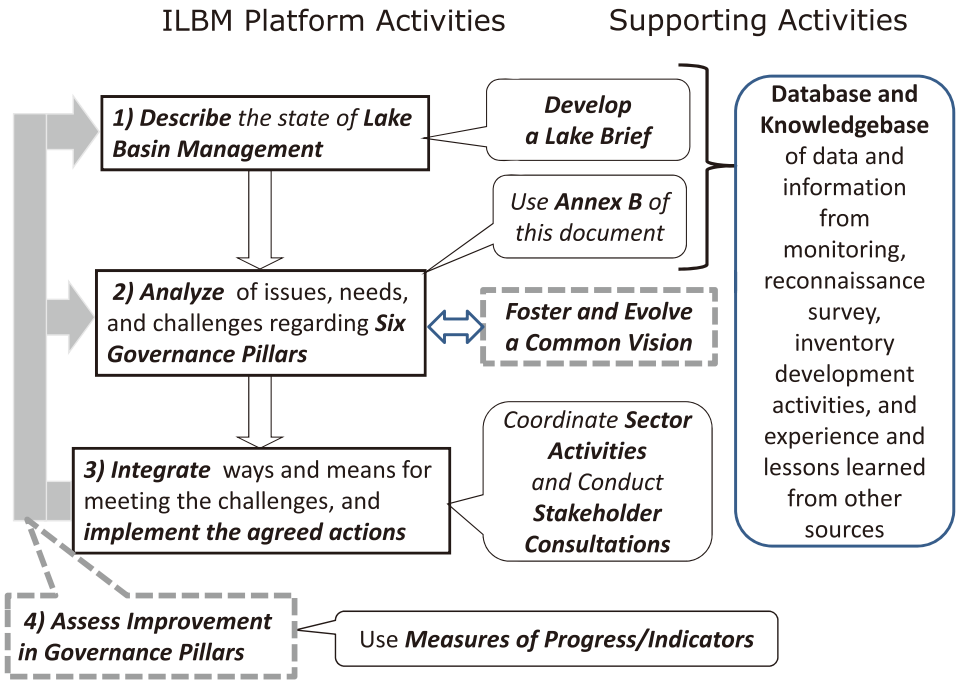

Figure 6. Flow Diagram of Cyclic ILBM Platform Process

<Fact-checks on the state of governance>

- *Is there a (Are there) lake basin management institution(s)?*
- *If yes, what do they/it do? Who plays the major role? How well is the role played?*
- *Is the organizational structure proper? What are their strengths and weaknesses? How can they improve their institutional capacity?*
- *If no, is there an organization or a program that should play the role? Should there be an organization or a program newly established?*
- *What are the priority needs for further strengthening the institutional capacity?*

For making organizations and programs more effective for action

<Exploratory assessment for governance improvement>

- *How should the institutional setting be improved at the national, regional and local levels to help formulate and implement individual lake basin management plans and programs?*
- *Is the institutional linkage between the national program and the regional and local programs (i.e., vertical institutional linkage) sufficiently strong in both directions? Are there good links between the decision-makers and the stakeholders at all levels? If not, how should they be established and strengthened?*
- *Does the national policy allow and encourage all stakeholder organizations, including governments, industries, scientific institutions and citizen groups, to work together (i.e., promote the horizontal institutional linkages)? What are the obstacles and how could they be removed?*
- *Are there capacity building (training) programs within the institutional arrangement? Are they working well? If not, what are the priority needs in capacity building and how could they be fulfilled?*
- *What improvements are required to enhance institutional capacities, particularly for dealing with rules of the law (e.g., command-and-control) and behavioral modification and change (economic incentives, voluntary compliance, etc.), and how they could such improvements be made?*

Figure 7. Example Questions to ask regarding Institutions
(See **Annex B** for Example Questions for Other Pillars of Governance)

6. Key Considerations in Formulating the Proposed Approaches in Meeting the Challenges

There are key considerations to keep in mind for successfully identifying and qualifying the "Challenges" facing the PfP members is that they share the same overall picture of the lake basin facing unsustainable resource management. Sharing the same picture may be achieved, for example, through;

- Consolidation of, and/or minimization of duplication of, efforts by different stakeholder organizations;
- Efficient implementation of collaborative actions, using the available resources collectively mobilized;
- Development of innovative ideas that would not have been possible with individual stakeholders working in isolation, including modification of existing plans and programs, joint implementation of projects;
- Acquisition of external funds and technical inputs for the collectively developed proposals; and
- Sharing of, as well as development of, the data and information for collective pursuits.

It is often the case that the PfP members already have their own sectoral plans and programs, some of them even with funding and institutional arrangements for implementation. The PfP members can recognize who, when, how and for what purposes such plans and programs are being developed and implemented. Suggestions for their modifications and revisions, if deemed necessary, may be made during the PfP process. As agreed, due modification may be most productively made during the course of the cyclic process of ILBM.

In the process of identifying and qualifying the possible challenges, the PfP members need to be alert about the realistic targets of achievement, i.e., by whom, by when, and by how much would be possible, taking into account that the targets of overcoming the challenges may be affected by the nature of activities in relation to Six Pillars of Governance. For example, the nature of "Challenges" could be straightforward in implementation (e.g., undertaking a structural intervention project) but also resource-intensive one, or it could be highly demanding in terms of elaboration (e.g., overcoming policy differences) but not so resource intensive. In either case, the PfP members may or may not be able to easily reach a consensus decision easily. However, the PfP members would feel much more comfortable and confident knowing that the process is highly facilitative, focusing on incremental improvements in closing the gap between the state of governance today and the prospective future state commonly aspired by the PfP members.

To the maximum extent possible, the proposed approaches in PfP should be based on collective common-sense judgment. Indeed, there are so many things that could have been carried out to meet the collective challenges, but which were not carried out because of the potential transaction costs in overcoming the institutional barriers among the stakeholder groups.

The **"Issue–Challenge–Six Pillars Matrix"** can be expanded to include **Proposed Approaches, Responsible Stakeholders, and Indicators,** as shown in **Figure 8**. The content of the matrix will serve as a basis for the Cyclic ILBM Platform Process, at **Step 3)**, "Integrate ways and means for meeting the challenges and implementing the agreed actions" depicted in **Figure 6**.

	Challenges	Pillars of Governance and Cross-Pillar Implications						Short-term Actions (next ½-2 years)	Mid-term Actions (next 2-3 years)	Stakeholders	Measures of Progress / Indicators
		Ins.	Pol.	Par.	Tec.	Inf.	Fin.				
Issus 1											
⋮											
Issus n											

Figure 8. Conceptual Framework of "Issue-Challenge-Six Pillars Matrix", with Proposed Actions, Responsible Stakeholder Groups, and the Measures of Progress or Indicators

A water vender collecting the contaminated Njoro River water, Kenya

Gully erosion at one of the inflowing rivers into Lake Victoria, Kenya

7. Use of Governance Improvement Indicators

There are two important considerations for assessing incremental improvements in lake basin governance:

① Time intervals for review and assessment; and
② Assessment methodologies and indicators.

The time intervals for review and assessment can vary from a few months to several years, depending on the nature of the challenge to be addressed in order to see improvement. For example, if monitoring of lake surface water is regularly conducted at certain sampling points, and data are readily available, a time interval period longer than the monitoring interval would then be meaningful. On the other hand, the state of the lake bottom ecosystem, for example, would probably not be part of a regular sampling program, and its analysis may require special sampling and laboratory analysis techniques involving a team of specially-assembled researchers.

The assessment methodologies and indicators to be adopted for PfP can also vary widely depending on the nature of governance improvement challenges. Among the methodologies in the literature, that proposed here is one used for monitoring and assessment of international transboundary environmental projects by the Global Environment Facility*. This methodology uses two types of "output-oriented" indicators, and one type of "outcome-oriented" indicators. Of the two "output-oriented" indicators, the first are the "stress reduction indicators", and the second are the "enabling process indicators."

a) Examples of "stress reduction indicators" may include:
① Increased reed bed area resulting from de-siltation operations;
② Reduced industrial pollution loading because of more stringent enforcement;
③ Reduced excess water withdrawals;
④ Reduced agrochemical application per cropland area;
⑤ Reduced silt and sediment carried into the lake;
⑥ Extent recovered from decreased infestation by invasive species of fauna and flora; and
⑦ Reduced areal extent of illegal occupancy resettled outside of the riparian land

b) Examples of "enabling process indicators" may include:
① Realization of stakeholder involvement in preparation and creation of a management plan;
② Enactment of regulations on the mesh size of nets in order to reduce the quantity of inadvertently-harvested juvenile fish; and,
③ Legal and institutional reforms for harmonization of various environmental management plans.

* See, Duda, A. (2002) "Monitoring and Evaluation Indicators for GEF International Waters Projects," Monitoring and Evaluation Working Paper 10, World Bank, Washington, D.C.

c) The "environmental status indicators" may include:
   ① decreases in the nutrient concentrations;
   ② improvement in the state of ecosystem health, as reflected in an increased biodiversity index; and,
   ③ utilizing the questionnaire surveys, determination of the extent to which communities and stakeholders benefitted from the changes in environmental conditions.

It is to be noted that the values and information associated with "stress reduction indicators" and the "enabling process indicators" which can be regarded as the necessary-condition indicators, are easier to obtain, as well as being rather straightforward as measures of progress toward improved lake basin governance. In contrast, some of the "environmental status indicator" values are not easy to obtain, and are much less straightforward to interpret, compared to the other two types of indicators, although the indicator is an indispensable one in the Platform Process. The indicator values have to be interpreted on a much more long-term basis, and sometimes with the help of auxiliary tools of analysis and interpretation such as sophisticated and specialized instrumentation and mathematical modeling tools.

The sequential nature of the indicators is also important. For example, if eutrophication of a lake is to be controlled by a sewerage system, construction of treatment and reticulation systems may become necessary. One of the first processes required is knowledge of the state of water quality, as well as the state of ecosystem integrity of the lake (environmental state), while developing a plan for enhancing the enforcement (enabling process), and for constructing a wastewater treatment system (enabling process). Identifying and obtaining the necessary financing from various sources will need to be explored and realized (stress reduction). The households and business operations would then need to expend their own funds to connect to the system (stress reduction). If there is no legal requirement for their connection to the system, enactment of a bylaw as an enabling process would be necessary. The need for the installation of a nutrient removal capability, or tertiary treatment capacity, may then become an issue, with mobilization of additional funding (stress reduction).


Water collection in Kisumu, Kenya


Lake Chivero water intake infested with water weeds

8. Knowledge Base and Data Base Systems

An enormous quantity of information has been generated so far, and will continue to be generated, on a wide range of thematic subjects pertaining to lake basin management, on both a national and international basis. Much of it pertains to natural science topics, including physical, chemical and biological aspects (limnology, hydrology, climatology, ecology, biochemistry, etc.), all of which contribute to understanding the state of lakes, reservoirs and other lentic water bodies. There also is a growing number of studies on the managerial aspects of aquatic, terrestrial and riparian ecosystems, including water quality, sediment quality, and shoreline environments, together with the inflowing and outflowing water systems, extending out to the upper watershed tributaries.

A needed component that has not been produced, however, is the compilation and utilization of holistically- and practically-synthesized information on such thematic and disciplinary subjects. Both on the compilation of global experiences and lessons learned in managing lakes and their basins, a detailed account of the Six ILBM Governance Pillars is provided in: "Managing Lakes and their Basins for Sustainable Use: A Report for Lake Basin Managers and Stakeholders", ILEC (2005), available on the website: (http://www.ilec.or.jp/eg/lbmi/index.html) An electronic training module of this document is available on the website: (http://wldb.ilec.or.jp/ILBMTrainingMaterials/index.html) The document has played an instrumental role in the conceptualization process of ILBM, and now that the number of such efforts is growing, developing and sharing the knowledge being continually generated and accumulated is ever more important.

For the purpose of addressing this goal, an interactive knowledge base cum knowledge mining system, called LAKES (Learning Acceleration and Knowledge Enhancement System) has been developed. LAKES currently has the capacity to process several hundred documents for the purpose of 'mining' the imbedded knowledge with the use of free keywords, as well as use of the included prepared thesaurus, ranging from the level of whole documents, to pages, paragraphs, and even individual sentences.. LAKES also is linked to a database system called the World Lake Database, a repository of the output of Survey of the State of World Lakes (1986-1988) for reviewing and downloading information and data for individual lakes, as well as for cross-cutting analysis among the lakes of water quality parameters. This system is capable of also serving as a depository of lake basin management data that may already have been generated and made public in the form of hard-copy reports and technical papers, but not in any form of an electronic database because of an inability to develop and maintain such a system. As the number of ILBM-related efforts increases, this need will definitely increase as data and information compiled in the form of a Lake Brief also are expected to grow. Screenshot Images of the "LAKES" Knowledge Base System and the World Lake Database System are shown in **Figure 9.**

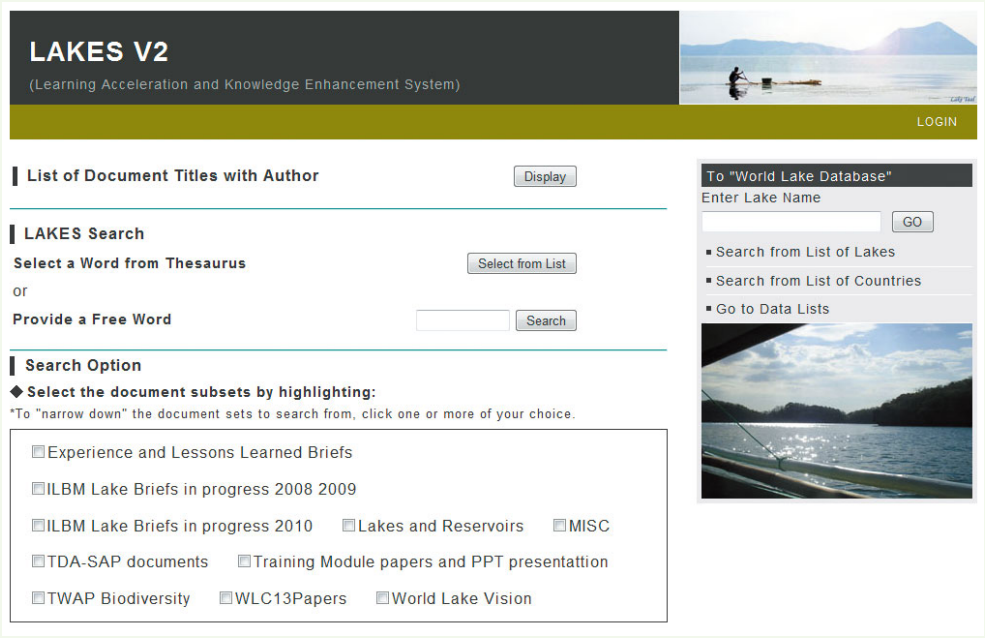

Figure 9-1. A Screenshot of "LAKES" Knowledge Base System

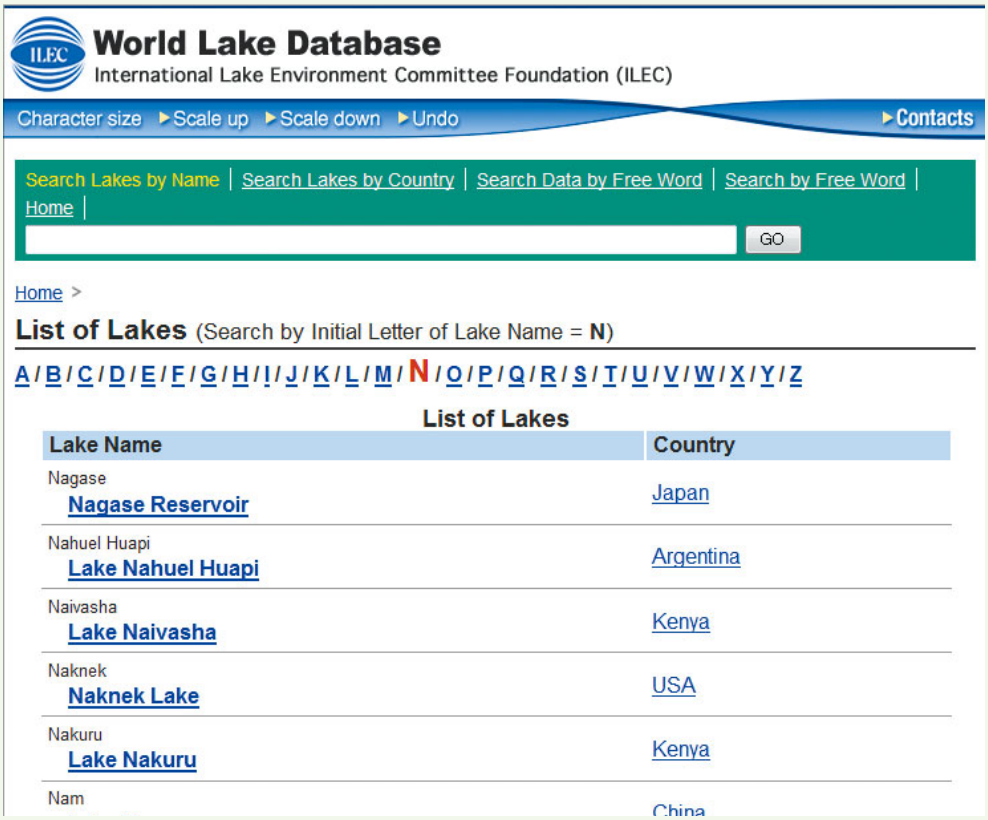

Figure 9-2. A Screenshot of World Lake Database

Figure 9. Screenshot Images of "LAKES" Knowledge Base System and World Lake Database System

9. Summary and Way Forward

Ongoing experiences clearly highlight two important observations in the ongoing development and dynamics of the ILBM-PfP approach, the first being the changing nature of PfP in response to the levels of stakeholder engagement, as illustrated in **Figure 10.**

As for the first observation of the transition of PfP over time, the indications are that there would be variations of transition from the current situation of no existing Platform Process evolving into the Basic Process, and then into the Cyclic Process. It appears that ILBM-PfP would 1) remain as Basic PfP; 2) transform to Cyclic PfP without becoming a statutory process; or 3) transform to Cyclic PfP as part of the statutory process. As for the second observation of the changing nature of PfP in response to the levels of stakeholder engagement, the emerging tendency is for the nature of PfP to change from non-statutory to statutory, and from less coherent to more coherent, as the levels of engagement in the formal and informal sectors evolve from "Low-Low" to "High-High," respectively.

It is hoped this "Primer" for "Development of ILBM Platform Process: Evolving Guidelines through Participatory Improvement" will be used for a growing number of case study applications dealing with extremely challenging lake basin management issues, collectively to contribute to the acceleration of improved lake basin management globally.

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1) Transition of Platform Process over Time

	Stages of Platform Process		
No. of Elapsed Years	**Lake Brief(LB)**	**Basic Process (BP)**	**Cyclic Process (CP)**
Within 1-2 year	• LB as part of BP and CP	• From BP to a management plan • From BP to CP	
Between 3 to 5 years			• CP as a routine process. • CP as part of a statutory process.
More than 5 years			

2) Changing Nature of Platform Process in Response to the Levels of Engagement

	Level of Formal-Sector Engagement in ILBM	
Level of Informal-Sector Engagement in ILBM	**from Low**	**to High**
from Low	**Fragmentary and Incoherent ILBM** ● Social neglects and inactions	● Government-initiated actions ● Structural interventions ● command-and-control
to high	● Citizen-initiated actions ● Non-structural interventions ● Incentive-based policies	**Holistic and Coherent ILBM** ● Overall societal commitments

Figure 10. Summary of Experience in Development of ILBM Platform Process in terms of 1) Transformation of Platform Process Over Time, and 2) Changing Nature of Platform Process in Response to the Levels of Engagement

Annex A. Lake Questionnaire

The components listed below will serve as a useful basis for preparing a Lake Brief. Although the questionnaire should be filled out as completely as possible, it may be necessary to initially ignore items for which there is little or no accessible information. The missing information and data may subsequently be obtained by the scientific community in the course of revising and improving the Lake Brief. As many reference materials as possible also should be identified for the subjects being discussed.

PART I. Characterization Information

PART I data and information is generally readily available from the inventory data source of a national database system, if not already available in the publically-accessible information sources.

1. Basic Information

- 1.1 Name(s)
  - 1.1.1 In English (All official names if identified by different names in different countries)
  - 1.1.2 In local language(s)
- 1.2 Location
  - 1.2.1 Latitude (range from West to East) and Longitude (range from south to north)
  - 1.2.2 Water surface elevation, relative to mean sea level
  - 1.2.3 Riparian country and sub-national (state, province, etc.) jurisdictions
  - 1.2.4 Non-riparian basin (upstream) countries and sub-national jurisdictions
- 1.3 Origin
  - 1.3.1 For natural lakes: Origin (e.g., glacial, tectonic, volcanic) and estimated age of lake
  - 1.3.2 For artificial lakes (reservoirs): Physical features and years of construction in phases
- 1.4 Basin and/or Watershed Map(s)
  - 1.4.1 Major inflowing and outflowing rivers
  - 1.4.2 Main cities and other relevant points of interest in basin
  - 1.4.3 National/sub-national jurisdictional boundaries
  - 1.4.4 Other maps, as appropriate
- 1.5 Basin Demography, Map(s)
  - 1.5.1 Population numbers, density and distribution
  - 1.5.2 Other relevant information (maps, etc. regarding geographical, demographical, land use, geohydrological information for lake and its basin and/or watershed, etc.)
- 1.6 Landscape and Waterscape
  - 1.6.1 Visual features of lake and basin (various photos of landscape, physical facilities, water quality problems, land and water uses in riparian and upstream regions, biological and ecosystem conditions, unique fauna and flora, etc.)

2. Morphology

- 2.1 Bathymetric Map (if available)
- 2.2 Lake Volume (km^3) and Surface Area (km^2)
- 2.3 Lake Length and Width (km) and Length of Shoreline (km)
- 2.4 Maximum and Mean Depths (m)
- 2.5 Intra- and Inter-annual Changes in Water Levels and Volumes; and Water Level Changes Due to Flow Regulation, if Available

3. Water Balance

- 3.1 Inflows (annual average in m^3/year), including Precipitation, Rivers (including indication if they are controlled), Groundwater, and Water Diversions
- 3.2 Outflows (annual average in m^3/year), including Evaporation, Rivers (including indication if they are controlled), Groundwater and Water Diversions

3.3 Water Retention Times (in years, if information is available), including Theoretical Filling Time (calculated as lake volume/annual inflow), and Theoretical Flushing Time (calculated as lake volume/annual outflow)

3.4 Information on Any Long-term Changes

4. Climate

4.1 Monthly Average, Minimum and Maximum Temperatures (℃) and Precipitation (mm)

4.2 Prevailing Wind Directions by Season; Wind Strength

4.3 Seasonal and Inter-annual Variability (description)

PART II. Biophysical, Chemical and Biotic Data and Information

5. State of Ecosystem

5.1 Description of State of Ecological Health, Including Conservation of Fauna & Flora

5.2 Description of State of Biodiversity Conservation

6. Physical Characteristics

6.1 Water Temperature (versus time and depth)

6.2 Freezing Period and Extent of Freezing

6.3 Lake Mixing (vertical and horizontal, including main bays and sub-basins)

6.4 Lake Stratification (period and extent)

7. Chemical Data

7.1 Chemical Water Quality (e.g., oxygen demand; nitrogen and phosphorus [organic, inorganic, particulate, and total, if available]concentrations, salinity, organic and inorganic chemical pollutant concentrations)

7.2 Pollutant Loadings (tons/year) from Rivers, Groundwater and Atmosphere

8. Biotic Data (Main Species, Exotic Species, Productivity Changes Over Time)

8.1 Overall State of Lake Ecosystem, including Biodiversity

8.2 Phytoplankton; Zooplankton; Fish

8.3 Benthos; Avifauna

8.4 Brief Description of General Ecosystem/ biodiversity Issues in Regard to Littoral Wetlands, Rivers, Atmosphere

8.5 Aquatic and terretstrial fauna in the littoral environments (e.g., birds and small animals)

8.6 Aquatic and terrestrial flora in the littoral environments (e.g., vegetations, shrubs and forests)

PART II data and information may already exist in the form of a database developed by the government agency or the research institution dedicated to monitoring the subject water body. Some of the parameter items may be regularly and continually updated through monitoring and assessment. However, consistently updating this kind of biophysical data requires financially and manpower commitment, and is difficult to continue. National, regional and global effort to support acquisition, compilation, assessment and analysis of such data and information is extremely useful and important.

PARTIII. Management and Policy Data and Information

9. State of Lake Basin

9.1 Description of Catchment Area (including size (km^2); general geography of region in relation to lake and neighboring water bodies [e.g., other lakes connected in cascade]); Inflow Catchment System; Outflow Catchment River System

9.2 Basin Hydrology (brief description of basin hydrology, including active and non-active parts)

9.3 Soil Types (refer to soil map, if available)

9.4 Land Cover, including changes over time (briefly describe seasonal land-use changes, via reference to land use maps)

9.5 Sub-surface Drainage (briefly description of groundwater flows, referring to hydrographical and hydrological maps, if available)

10. Uses of the Lake and Its Resource Development Facilities

10.1 Water, including Flood/Drought Control Facilities; Drinking Water Withdrawals and Facilities; Agricultural Water Withdrawals and Facilities; and Industrial Water Withdrawals and Facilities

10.2 Fisheries and Facilities

10.3 Tourism Facilities

10.4 Other Uses

11. Impairments to Lake Resource Uses, including Ecosystem Regulating Services

11.1 Increased Algal Growth

11.2 Increased Salinity

11.3 Wetland Destruction

11.4 Declining Fish Stocks

11.5 Other Impairments, including Governance Issues

12. Causes of Impairments

12.1 Upper Watershed Degradation (including erosion and siltation)

12.2 Point and Nonpoint Source Runoff from Urban Areas

12.3 Shoreline Degradation and Alterations

12.4 Other Impairments

13. Structural Management Responses

13.1 Sewerage Systems

13.2 Industrial Wastewater Treatment Systems

13.3 Solid and Hazardous Waste Management Systems

13.4 Other Relevant Systems

PART III information is generally readily-available as basic inventory information at the government level. If it is not already available, a reconnaissance survey may be usefully conducted.

14. Non-structural Management Responses

14.1 Rules (informal community rules; voluntary restrictions; formal rules such as industrial effluent regulations; protected areas [land use restrictions, ecological reserves];etc.)

14.2 Economic incentives (subsidies, taxes, etc.)

14.3 Raising public awareness (public awareness, including environmental education, environmental campaigns, activities of environmental NGOs and CBOs, etc.)

15. Socioeconomic Information (partial duplication of item 1.5 above)

15.1 Population Dynamics (numbers, distribution, main cities, percent urban/rural, etc.)

15.2 Education (extent and types of education, literacy rates, etc.)

15.3 Culture (languages, ethnicities, including indigenous peoples, religion, legends and beliefs about lake)

15.4 Economic Sectors (major industries and production statistics; regional economic development issues, including transportation, commerce sectors, livelihood issues in different parts of lake basin such as coastal upland and upper watershed regions; gross national income per capita within basin [noting also how it might differ from national average(s)])

16. Political Situation (partial duplication of Item 1.2 above)

16.1 Nations Within Lake Basin

16.2 Sub-national Boundaries

16.3 Brief Description of Region's History (Brief Description of governance challenges facing people (access to information, rights to participation, access to justice, etc.)

Joint meeting with Indian and African ILBM partners

Eco-san toilet in Rachuonyo district, Kenya

Baobab tree, Zimbabwe

Nursery bed of seedlings for reforestation, Lake Nakuru watershed

Washing in the river, Kenya

A seriously dysfunctional sewage treatment plant under partial repair

Annex B. Six Pillars on Lake Basin Governance

(A) Institutions (Developing organization for action)

<Fact-checks on the state of governance>

- *Is there a (are there) existing lake basin management institution(s)?*
- *If yes, what do they do? Who plays the major role(s)? How well is the role(s) played? Is the organizational structure appropriate? What are their strengths and weaknesses? How can their institutional capacity be improved?*
- *If no, is there an organization or a program that should play the role(s)? Should a new organization or program be established?*
- *What are the priority needs for further strengthening the institutional capacity?*

For making organizations and programs more effective for action:

<Exploratory assessment for governance improvement>

- *How should the institutional setting be improved at the national, regional and local levels for helping formulate and implement individual lake basin management plans and programs?*
- *Is the institutional linkage between the national program and the regional and local programs (i.e., vertical institutional linkage) sufficiently strong in both directions? Do good links exist between the decision makers and the stakeholders at all levels? If not, how should they be established and strengthened?*
- *Does the national policy allow and encourage all stakeholder organizations, including governments, industries, scientific institutions and citizen groups, to work together (i.e., to promote the horizontal institutional linkages)? What are the obstacles to this linkage and how could they be addressed?*
- *Does capacity building (training) programs exist within the institutional arrangement? Are they working well? If not, what are the priority needs in capacity building and how can they be fulfilled?*
- *What improvements are required to enhance institutional capacities, particularly to deal with rules of law (e.g., command-and-control) and behavioral modifications and changes (economic incentives, voluntary compliance, etc.), and how can such improvements be made?*

(B) Policies (Identifying effective actions)

<Fact-checks on the state of governance>

- *Do relevant national, regional or local lake basin management policies, plans and programs exist?*
- *If they do, are they up-to-date and have they been properly implemented? Have they been effective in addressing the identified problem(s)? If they do, but have not been properly implemented, or are not sufficiently effective, what are the possible major reasons for this deficiency?*
- *If they don't exist, should a new policy be developed to address the identified problem(s)? What issues should addressed be looked into as priority in the new policy.*

For identifying policies and actions that may be most needed and most effective:

<Exploratory assessment for governance improvement>

- *Does an overall national policy framework exist, with provisions for development and implementation of plans for lake basin management (i.e., are there national/regional conservation plans)? If yes, have the plans and programs been properly implemented with relevant priority considerations and phasing over time?*
- *If no, what specific provisions must be included, and how can such inclusions be realized?*
- *Do existing national/regional development plans recognize the importance of the sustainable use and conservation of lake basin resources?*
- *Do laws, ordinances and/or other regulatory provisions specifically directed to lake basin management exist (i.e., effluent standards; ambient standards [e.g., nutrient and chemical concentrations]; source-water protection classifications; etc.)? Have they been usefully implemented? Have they been effective? If not, how can the situation regarding these elements be improved?*
- *If there are legal provisions in place, but they have not been usefully implemented or effective, what are major reasons for this deficiency? Is it a result of inadequate enforcement, or inadequate public awareness, or both? How can their implementation be improved (other than simply providing more funding)?*
- *What types of policy reforms have taken place, or are being considered, to address the sustainable use of lake basin resources? What is currently being done to strengthen institutional capacity, promote environmental investments, and develop human resources?*

(C) Stakeholder Participation (Involving people and stakeholders)

<Fact-checks on the state of governance>

- *What are the major lake basin management stakeholder groups (i.e., government agencies and/or*
- *sectors; institutions; organizations; interest groups; private sector; lakeshore residents, downstream water users, etc.)? Do they share their mutual concerns, and if so, how?*
- *Do good mechanisms exist for all the stakeholders to be involved in development and implementation of lake basin management plans and programs? If yes, how well are they functioning?*

For developing mechanisms and fora for obtaining public opinion and input:

<Exploratory assessment for governance improvement>

- *How can existing stakeholder involvement be improved, particularly in designing and implementing specific plans and programs in lake basin management?*
- *How can the involvement of voluntary associations, village organizations, CBOs, NGOs, etc., be promoted to complement the role played by the government?*
- *What methods might be effective for stakeholder involvement (i.e., to allow citizen groups and NGOs to convey their concerns about the plans and programs developed without their involvement)?*
- *How can the involvement be better promoted/assured for women, disadvantaged peoples, and potentially adversely affected members of the community, particularly in relation to sustainable livelihoods and improved living conditions?*
- *How should the stakeholders collectively enhance lake basin biodiversity, which often plays a vital role in community livelihood enhancement and health status improvements in many developing countries?*
- *What are the merits and demerits of involving international/external NGOs in lake basin management? What are their relevant roles and potential benefits that are otherwise difficult to obtain?*
- *When rules are developed, are those potentially affected by them involved in their development?*

(D) Knowledge and Information (Informing the Process)

<Fact-checks on the state of governance>

- *What information and data prescribed in Annex 2 is available and, if so, from whom and how?*
- *Have the information and data identified above been sufficient to inform the stakeholders, and are they sufficiently reliable for decision-making? If not, what is currently being done to change the situation?*
- *Are the information and data identified above sufficiently inclusive of pertinent local sources, particularly of fishermen, farmers, house wives, children, and similar individuals?*
- *Have regular monitoring programs been implemented, and have they been proving useful for local decision-making?*

For filling the knowledge gap for more informed decision making in collaboration:

<Exploratory assessment for governance improvement>

- *Are past and current data and information collected, compiled, and analyzed for a target lake basin easily identifiable and/or accessible? If not, how should they be made more accessible and used for more informed decision making?*
- *Does a database exist to support the common interests and concerns of stakeholders, including one having data and information such as those listed in Annex 2? If not, is it possible for one of the stakeholder organizations to play a provisional role to liaise with a global data base, such as ILEC's World Lake Database? Under such circumstances, what data and information should be regularly updated, by whom, and how can the updated data and information be widely shared for collective and informed stakeholder decision making?*
- *How can institutions with data and information on a target lake basin, such as universities, governmental/ non-governmental research institutes, private sector laboratories, etc., increase their collaboration without being too possessive of their own data and information?*
- *What are some of the major knowledge gaps that require information on global experience and lessons learned, and how can access to such information sources be enhanced? Does a focal point organization already exist for undertaking this role? If not, who (what organization) could play such a role, and how should the role be undertaken to benefit the broadest range of potential beneficiaries in the basin?*
- *How can information dissemination to, and sharing with, the public be improved? How can transparency and access to such data and information be improved?*

(E) Technological Opportunities and Limitations (Responding with Technology)

<Fact-checks on the state of governance>

- *What technological interventions have been introduced for resource development (e.g., hydropower, water resources, etc.) and/or resource conservation (e.g., sediment removal, sewerage and pollution control, etc.)? How successful have they been, and what have been their positive and negative impacts?*
- *What technological innovations should be and/or should have been introduced, but have not been introduced? What are the reasons for this deficiency, and should they be overcome and, if so, how?*
- *What types of lower-cost and appropriate technologies are available and implementable, and how?*

For identifying and applying an appropriate mix of technological options:

<Exploratory assessment for governance improvement>

- *Have the adopted technologies successfully fulfilled their original expectations, considering that all technologies have their limitations, as well as unexpected increases in their application costs? If they have not, what are the reasons for this deficiency, and how can the situation be improved? Sometimes these technologies may shed undue adverse impacts on the lake ecosystem, particularly for large-scale technologies (e.g., ,hydropower, sewerage facilities, etc.).*
- *Have the introduced technologies subsequently interfaced well with the environmental and ecosystem behaviors that were generally not well known at the onset of their introduction? The adaptive approach (i.e., making adjustments based on the observed results of application) should be the key to any technology applications in lake basin management, with various stakeholders playing their respective important roles.*
- *Are lake basin stakeholders sufficiently aware of the cost implications of technological interventions, and the need for mid-course correction based on a consultative process involving all of*
- *the stakeholder groups, including government agencies? Some technologies can incur high initial costs, but low recurring cost. Other may have low initial costs, but high recurring cost. Still others may have both high initial and recurring costs. It is noted that, even if loan and grants are available, the recurring costs, including the initial costs to be paid off over a long period of time, and the operation and maintenance costs, must ultimately be paid by the basin population.*
- *What have the application results of such technologies been elsewhere? What types of technological and non-technological solutions can be usefully combined, and how could they be implemented?*

(F) Sustainable Finance (Mobilizing Sustainable Financing)

<Fact-checks on the state of governance>

- *What is the status of local funding and financial mechanisms for lake basin management, and what is their sustainability? Is this important knowledge sufficiently understood by the stakeholders for them to take appropriate financial responsibility?*
- *What are some of the important factors to consider in having access to international (external), national and state funding sources, and to make use of the respective financing mechanisms? What are the major issues that must be considered, or about which it is necessary to be prepared to address?*
- *What are other financial and funding possibilities, and how should they be pursued?*

For exploring different funding sources and financial mechanisms:

<Exploratory assessment for governance improvement>

- *Have past investments for lake restoration resulted in measurable improvements in water quality and ecosystem integrity? If yes, have the improvements increased related economic outputs, with more tourists, better quality water supplies, greater yield fish harvests, etc.? If not, what are some of the reasons for this failure, and how can the situation be improved?*
- *Are both the Polluters Pay Principle (e.g., strict enforcement of point and nonpoint source pollution control) and the Beneficiaries Pay Principle (e.g., appropriate charges for the users of lake water quantity and quantity) appropriately enforced? If not, why not, and how can the situation be corrected?*
- *Has the responsible lake basin focal agency maintained strong links with the national government? Has it been successful in receiving preferential funding and subsidies for improving the lake's resource values (e.g., improved water quality), because such considerations will depend on the viewpoint of regional/ national economic development policies being in balance with environmental quality improvement? A sewerage system, for example, may serve both to enhance livelihood amenities and to improve the lake environment. While the former benefit must paid for by the beneficiaries, the latter may be paid for with general tax revenue since it may be considered a benefit for the public at large.*
- *Are economic instruments (taxes; user charges; pollution fines; etc.) currently being practiced for lake basin management? How successful have they been, and what are possibilities for improvement? What is the status of the application of more advanced economic policy tools, such as pollution charges and tradable permits? What is the possibility of promoting PES (payment for environment) or PWS (payment for watershed services) within the context of global interests in enhancing biodiversity? What about the possibility of being part of the global movement toward establishment of a trust fund for protecting ecosystems of international and/or global significance?*
- *Can locally-raised revenues from lake basin resources be retained for local use and, if not, what actions might be possible to ensure such funds are retained?*

(G) Some Overall Governance Issues

- *How should trans-jurisdictional and trans-boundary issues be addressed in the lake briefs, and how should the regional and global governance improvements be pursued using such briefs?*
- *What are the climate change implications, and those of possible adaptation challenges to lake basin governance? How should the global environmental issues, such as the long-range transport of airborne pollutants, and virtual water exploitation (the cause of virtual pollution at the source; that is, growing crops for exportation in the lake watershed that leads to pollution of the lake, but does not affect the conditions at the locations to which the crops are being exported) be addressed in terms of improved lake basin governance?*
- *How can the need for capacity development, including not just targeted skills, but also a broad range of approaches for improving governance for lake basin management, be met? For example, what kind of programs would be useful for addressing such broad-scale issues as enhancing collaboration among concerned government agencies, promoting the establishment of stakeholder alliances, encouraging mid-course corrections in pursuing long-term plans and programs, etc.?*
- *How can the lake basin society promote the building and sustaining, rather than waning, of political will for improving lake basin governance?*

Lake Kariba, Zimbabwe

Community-based women's groups in Rachuonyo district, Kenya

Homa Bay, Kenya

Ministry of the Environment, Japan :

Research Center for Sustainability and Environment, Shiga University, Japan :

International Lake Environment Committee Foundation, Japan :