

Chapter 4. Effective Institutions

Responding to Change

If we think of lake basin management in terms of “who does what?”, then this chapter on Institutions is about the “who”; the following chapter on Policy is about “what”. Some key questions addressed here include:

- What are “institutions” in the lake basin management context?
- What organizational forms exist, and which work well in which cases?
- How can coordination among already-existing institutions be achieved?
- How does the broader “governance framework” related to lake basin management?

Institutions: Society’s Response to Scarcity

In the absence of scarcity, there is little need for institutions. In the “story of a lake” in Chapter 3, population densities were initially low and development limited. There were enough of the lake’s natural resources—water, fish, reeds, other products—for all to enjoy and consume as much as they want. As a result of both population growth and economic development, however, resources started to become scarce—that is, their uses become congested, and it becomes necessary to control and limit access to the “commons” and allocate the goods and services provided by the lake basin through rules of various sorts. Institutions are the originators, custodians and implementers of the agreed “rules of the game,” or the “humanly devised constraints on human behavior”.

As the level of scarcity and complexity grow, the nature of institutions also changes. Management, and institutions, typically evolve from the individual (or private management), to communal forms of management, to public or national management. For international lakes, transboundary management is difficult to achieve and typically occurs at a later stage of development. Basically, institutions are society’s way of responding to the problem of “scarcity” by devising rules to allocate the goods and services provided by the lake and implementing those rules.

Institutions and institutional arrangements are essential to address the “common pool” aspect of lake management, to reduce the conflicts that otherwise inevitably arise from competition. Yet they are not costless. The lake briefs indicate that institutions and institutional arrangements are expensive to set up and maintain.

What are effective institutions?

In the context of lake basin management, effective institutions generate an improvement in the lake environment by distributing resources equitably and efficiently. Specifically, effective lake institutions, individually and as a group, share a number of characteristics. It is observed in the Lake Briefs that effective institutions...

- respond to new problems as they evidence themselves both in the ecosystem and in the “human system”.
- tackle critical problems at the most appropriate scale. For example, hot spots can be identified within the lake basin and dealt with on a localized basis (e.g., Missisquoi Bay in Lake Champlain; Akanoi Bay in Lake Biwa; numerous islands in Lake Malawi). For issues confined to these locations, local institutions may be sufficient.
- remember, learn, and build and maintain both personal and institutional relationships (“social capital”) with key stakeholders, including funders. This is greatly facilitated by the continuity of key staff. A key individual, catalytic and sometimes charismatic, can play a critical role in institution building, even if not permanently attached to a single organization.
- mobilize resources, direct government financing (or budgetary sources, if a government line agency or local government), and external funding.
- address collective choice problems (conflicts) that make it difficult for existing (usually sectoral) governance and user stakeholders to solve on their own business as usual basis. It does this by involving stakeholders to identify problems and suggest solutions. It also addresses the political problem of handling conflicts

and tradeoffs among stakeholders, including new ones.

- secure the trust of the regulated and legitimacy among the public (Chilika Lake, India after 1997; Laguna de Bay, Philippines), and
- forge issue linkages, especially where source and affected party are different.

Effective institutions accumulate “institutional capital” as they evolve and learn. Institutional capital comes in various forms—social, human, informational, and physical. It allows effective institutions to change their agendas in response to changes in the natural and human environments; to address problems involving many different stakeholders (collective-choice problems); to be prepared for crises, in part because they are capable of learning from the experiences of others; to focus on critical problems; to enjoy a high level of legitimacy and trust among key stakeholders, built up over time through credible commitments; and to mobilize financial resources on a sustained basis, especially from a variety of different sources, including end users.

A Typology of Institutional Forms for Lake Basin Management

Institutions can take various forms. The following examples are listed in order of increasing formal powers. However,

this does not necessarily imply that more formal structures are better than informal organizations. Given the long time required to build effective institutions, building from below (a “bottom-up” approach) and on the basis of accumulated institutional capital may create the most effective and strongest institutions.

Customary and self-regulated management

Customary and communal structures for single sectors, such as fisheries, are effective in many situations with low population pressure and fairly abundant resources. In many cases, local sectoral organizations have expanded into multisectoral institutions without the “benefit” of regulatory oversight (Box 4.1).

Coordinating committee

As population pressures and competition for resources grow, often a first step towards coordinated management is the creation of a coordinating committee. A committee or office, typically consisting of sectoral agencies (or, internationally, representatives from member governments), is formed to coordinate efforts, while implementation remains with existing sectoral and regional institutions. These committees are often weak since they do not have legislative backing, a separate budget, or independent staffing. As such, they are voluntary creatures of the sectoral ministries or, in international cases, of the member

Box 4.1. An Evolving Institutional Base: The Lake Naivasha Example

In 1929, the owners of the Lake Naivasha, Kenya foreshore organized themselves into the Lake Naivasha Riparian Owners Association (LNROA) in order to regulate the use of the lake bed periodically exposed in front of their properties as the lake level rose and fell naturally. These owners were, in general, wealthy, influential Europeans and European-Kenyans who wanted to protect this land because it provided lake access, a scenic foreground to their properties, and was useful for grazing activities. Other groups with an interest in the lake, such as fishermen, nomadic Maasai grazers, and residents of the local towns and villages were not part of the Association.

The LNROA was granted custodianship of this riparian land by the colonial government in 1933. The Association successfully regulated access to these riparian lands from that time through to the present day although, for most of that period, it was not an active organization. In the early 1990s it started to become more active because of the increasing pressures on the lake. It changed its name to the Lake Naivasha Riparian Association (LNRA) and expanded its membership base to include members that were not riparian property owners but who had an interest in the health of the lake.

During the 1980s and 1990s the population within the lake basin grew dramatically and a thriving cut-flower trade commenced on the shores of the lake. The larger flower growers organized themselves into a representative institution—the Lake Naivasha Growers Group—to respond to adverse publicity, including claims that their industry was polluting the lake. For a number of years, the LNRA and the LGG were in conflict. However, by the late 1990s these conflicts had been mainly sorted out and the two institutions started working together for the management of the lake.

A management plan was drawn up for the lake in the late 1990s and the Lake Naivasha Management Implementation Committee (LNMIC) was formed to implement it. The LNRA plays a leading role on this cross-sectoral institution along with representatives of many other groups with an interest in the lake—fishermen, town people, and government agencies such as the Kenyan Wildlife Service. The LGG are not formally members and nor are representatives of the settlers in the upper catchment and the traditional Maasai. These groups will likely be brought into the process, both due to the recognition by many riparian groups that the sediment load entering the lake from the upper catchment may become a problem to themselves, and because of new environmental and water laws in Kenya. The recent Kenya Water Act allows for the formation of representative Advisory Committees in each catchment that will have influence in the allocation of water and the regulation of pollution. When this happens, the LNMIC will likely evolve into the regional Advisory Committee and the evolution of the lake management institution will continue.

governments. Many international lake basin commissions fall into this category.

Coordinating agency

A coordinating agency has legal authority or some higher level authorization (such as cabinet approval), a separate budget and staff, and (sometimes) organizational independence from sectoral agencies. It does not have executive authority but exists to coordinate the actions of sectoral and regional institutions. For these reasons it is more powerful than a coordinating committee. Examples include the Lake Chilika Development Authority, the Cambodia National Mekong Committee, the Department of Lake Biwa and the Environment (Shiga Prefectural government), the inter-agency Lake Dianchi Protection Committee and Bureau, and the International Joint Commission of the Great Lakes. Most of the active lake basin management bodies in our briefs are coordinating agencies. The coordinating agency may be concerned with just the lake or it may also include the catchment. Its powers include persuasion, facilitation, and convening.

Coordinating agencies face several major challenges:

These agencies are often quite weak and have to contend with the complexity of preexisting, often imbedded, institutions and stakeholder groups. For example, the Chilika Development Authority maintains institutional linkages with seven state government organizations, four NGOs, three national ministries, two other national organizations, four international organizations, nine research institutions, and four different categories of community groups (see [Pattnaik](#)). This is a difficult coordinating task and requires strong leadership coupled with firm political backing by politicians to succeed.

Successful coordination and the trust relationships required for coordination rely on the presence of key individuals, especially at the chief minister or governor level but also in agency management. The experience of the Lake Laguna Development Authority and others is that one of the greatest challenges facing a development authority is the frequency of changes in the government and appointed directors (see [Santos-Borja](#)).

It is important that “coordination” not become a pretext for shedding responsibility. An effective agency must be an advocate for integrated lake management policy, working together with stakeholders to solve problems and, ideally, with a policy patron at a supra-sectoral level, such as the governorship. Preparing a lake basin management plan is an effective tool for policy coordination (see Chapter 10 on Planning).

Executive (regulatory) agency

A regulatory agency can actually carry out actions, such as levying fees or creating enforcing regulations, under its own authority. Since the potential always exists for conflict with sectoral agencies, executive agencies should be authorized through legislation and retain powers such as permitting, policy setting, financing and implementation.

Since the existence of such an executive agency means that others have to give up power, they are often hard to establish. Prerequisites for creating an executive agency often include a) a long evolutionary history of trust building; b) a crisis; and c) no international borders. Probably the best instance of such an agency outside the governmental structure is the Lake Laguna Development Authority, which combines coordinating, development and regulatory functions (see Box 4.2). The water resources departments of Orissa and Madhya Pradesh (Lake Chilika and Bhoj Wetland, respectively) provide both coordinating

Box 4.2. Institutional reengineering of the Laguna Lake Development Authority

Inherent in the existing LLDA Charter is the developmental function for water resources development purposes, but at present the LLDA is performing more of its regulatory function than its planning and development roles. This overarching mandate of LLDA has not been realized because of lack of capacity and appropriate mechanisms to enable the Authority to initiate and involve the private sector in capital intensive infrastructure development projects in the region. Further, the financial flexibility of LLDA and other government owned corporations, in terms of sourcing finances and utilization, has largely been constrained by the Philippine Government’s multi-layered approval process for fund solicitation through the NEDA/Investment Coordinating Committee.

Performing the diverse functions as regulator and to a limited extent as a developer has overstretched the LLDA and resulted in its inability to fully accomplish its original mandate as a development agency. This is evident in its current business strategy and financial profile, thus the need to delineate and segregate its regulatory and planning-developmental functions. Likewise, the LLDA has realized that building institutional capacities for undertaking large-scale infrastructure projects in the region requires that the regulatory and policy-making function of LLDA is balanced with a strong, but segregated, development function. This was the starting point of the institutional re-engineering program. Previous studies identified potential investments of around US\$381 million to maintain the environmental quality in the Laguna de Bay area through dredging, embankments, sanitary landfills, and sewage and treatment plants. LLDA urgently needs to develop the capability to leverage and facilitate private sector participation in necessary large-scale environmental and water-related infrastructure projects in the lake area.

Source: Laguna de Bay Brief

and regulatory authorities, but are not lake-specific agencies. The actual executive powers vested in an executive agency can include the following functions: Regulatory, Development, Conservation, and/or Restoration.

The Role of Local governments

Local governments play a critical role in lake basin management, since localized issues can often be handled best at local level. In addition, local authorities are often the most accountable to the public and may be the best placed to facilitate stakeholder dialogues at the operational level. They are the most capable of responding to local needs in addressing the economic, social, and environmental challenges of sustainable development. Their decisions on land use zoning, transportation, construction, public health, ecological zoning, solid waste management, and industrial incentives all affect water resources.

Few of the 28 lakes surveyed are managed entirely by a local government, however. The Bhoj Wetland and Lake Baringo are controlled by a municipal and a county authority respectively, while lakes Biwa, Chilika and Toba are under intermediate levels of government. The remainder are managed at the national or international levels.

Local governments cannot manage all lake basins problems. Many problems, because of the transmissivity of lakes, affect a wider area than just one local government jurisdiction. In addition, local governments often lack jurisdictional authority and resources to address context-specific issues, including a limited ability to bring other levels of government to the table; (the financial and human resources to implement properly sustainability initiatives; and the necessary political will, due to the brevity of the electoral or administrative cycle.

In practice, the lake and its watershed often occupy a low position on the priority list of local governments, especially in developing countries. Indeed, local governments can be major sources of lake degradation if they are indifferent to urban sewage, diversion of funds, support of activities that generate pollution as well as revenue and employment. In many countries, local governments are highly politicized and just as hierarchical as distant agencies, making consensus-building very difficult on cross-sectoral issue (Box 4.3).

Evolution of integrated lake basin management

As lake uses increase in scope and magnitude, conflicts increase, and the benefits of some sort of integrated management of the lake becomes more evident. Stakeholder institutions evolve, often working out new ways of sharing the resource and avoiding present and potential conflict, especially internally but also with other sectors. For example, moratoriums on fishing have been imposed in Lakes Baringo and Naivasha to allow depleted breeding grounds to recover; some agricultural drainage in Lake Biwa is treated and recycled to avoid unwanted scrutiny of a highly protected sector; and the horticulturalists of Lake Naivasha have responded to pressures from EU consumers and the Lake Naivasha Riparian Association to adopt state-of-the-art techniques for pollution control.

Institutions tend to arise and evolve for developmental needs, but can transform themselves into effective preservers of the lake (Box 4.4). The Laguna Lake Development Authority began with a resource development focus, but the national environmental agenda quickly began to assert itself in its operations. Shiga Prefecture shifted the Lake Biwa Comprehensive Development Plan upon its first renewal in 1982 from its initially almost exclusive focus on developmental projects towards environmentally-friendly public works, such as a wide-area sewerage system and a large infrastructure for irrigation. The prefecture then went beyond the Plan to establish research and educational facilities such as the Lake Biwa Research Institute, the International Lake Environment Committee, the Lake Biwa Museum and Shiga Prefectural University.

Trained and experienced staff play a critical role. Putting resources into building the conservation agenda and capacity of existing sectoral institutions may strengthen their commitment and capacity for dealing with resource issues directly, or in cooperation with environmental bodies. This may require modifications in personnel procedures, however, in organizations where trained staff are regularly reassigned. This has been identified as a problem in Lake Malawi and Lake Nakuru, and is probably quite widespread. On the other hand, there are cases such as Lake Chilika where highly qualified people with excellent networking skills are brought in to improve environmental capacity and enlist the support of stakeholders at all levels.

Box 4.3. Involving local governments in an integrated policy at Laguna de Bay

Lakeshore municipalities challenged the Laguna Lake Development Authority over the right to issue fishery permits, especially for the lucrative fish cages and fish pens. In 1995, the Supreme Court ruled in favor of the LLDA, noting that the lake “cannot be subjected to fragmented concepts of management policies where lakeshore local government units exercise exclusive dominion over specific portions of the lake water...The implementation of a cohesive and integrated lake water resource management policy...is necessary to conserve, protect and sustainably develop Laguna de Bay.” This decision re-iterated LLDA’s authority over permitting. It is also interesting to note that, since the permitting program began, the LLDA has maintained a revenue sharing policy of the fees with the local governments. This has undoubtedly contributed to the acceptance of the program at the local level

Source: Laguna de Bay Brief

Coordinating agencies rely on *sectoral institutions* to be effective. For example, Lake Constance relies on individual sectoral institutions that are sufficiently coordinated to integrate the management of lake conservation. The adaptability of existing institutions are essential to the successful management for Lake Constance. Also important have been the existence of infrastructure in place (especially sewerage) that allows upgrading at modest cost, a high level of social capital exhibited in the very strong research agenda of citizen groups and NGOs, a heritage of international cooperation, and the compulsion of EU directives.

It is helpful if political and basin boundaries are the same. Lake Biwa and its watershed are almost entirely coincident with the boundaries of Shiga Prefecture. Between 1972 and 1997, its development was governed under the Lake Biwa Comprehensive Development Plan, which distributed public works projects among existing agencies.

The governance framework for lake basin management

The enabling environment

Whether formal or informal, water management institutions operate within a larger context, or governance framework. Effective lake basin management requires that this framework create an “enabling environment” that provides the conditions for institutions to be effective. A governance framework includes laws and regulations both as they are formulated and as they are implemented as well as a judiciary to fairly adjudicate disputes (see Box 4.5). It also includes certain cultural endowments, such as those that promote trust or impute non-market values to lakes. International lakes must deal with questions of national sovereignty that make coordinated management more difficult than for national lakes.

Transparency and accountability

Especially in developing countries, a pervasive lack of accountability and transparency characterizes governance at all levels, even in democracies. Sophisticated laws, plans and policies are not implemented. Information, when

Box 4.4. Great Lakes: A large institutional infrastructure, evolving over a century

The experience of the Great Lakes indicates that formal lake management institutions need to evolve to remain relevant. Beginning with the establishment of the International Joint Commission (IJC) to implement the International Boundary Waters Treaty of 1909 between the United States and the United Kingdom (for Canada), a considerable ‘institutional infrastructure’ for Great Lakes resource management has been created through laws, treaties, conventions, compacts and formal agreements. The principal stakeholders of these formal institutions are the governments involved, both federal and state or provincial.

The IJC was established as an independent body to advise and make recommendations on problems (“references”) given to them by the governments and has been a pioneer in identifying emerging environmental problems, such as nonpoint source pollution and the effect of phosphorus on lake eutrophication. Initially, the IJC investigations only held public hearings on specific topics; otherwise, they were carried out in private because only the governments could give permission to release ‘internal communications... by boards, committees’. With the 1972 Great Lakes Water Quality Agreement between the United States and Canada, the IJC opened up to more public involvement in its very effective PLUARG (Pollution from Land Use Activities Reference Group) activities. It also assumed responsibility for monitoring pollution along the lakes, identifying 43 hot spots (Areas of Concern, or AOCs). Each AOC requires a Remedial Action Plan (RAP), and remains listed until both countries agree on its removal. By and large, the IJC has been able to retain its independence, although critical monitoring functions were assumed by the member governments after 1989, with mixed results.

New stresses, both from changes in stakeholders’ rights (Native Americans) and from problems arising from out of the lake basin (zebra mussels, airborne lead), pose severe challenges to which present institutional infrastructure must adapt.

Box 4.5. Public Interest Litigation in India

A major development in stopping the continuing degradation of lakes in India has been the involvement of the judiciary, sometimes at the highest level, the Supreme Court. Indian law courts have been extremely proactive on the issue of environmental protection. Groups of affected people and third parties have been filing public interest litigations (PIL) in courts across the country seeking remedial actions, especially for highly polluted urban lakes.

The Supreme Court, in a PIL in the case of Badal Khol and Surajkund lakes in Haryana state, held that the precautionary principle is part of the law of the land, and limited construction activity in the near vicinity of the lakes. Although PILs have generally helped in restoration of lakes, there are opposite instances, as was the case of the Rabindra Sarovar lake in West Bengal, where the PIL sought to legalize encroachment onto the lake.

(From M.S. Reddy and N.V.V. Char, Management of Lakes in India)

it exists, is hoarded as an instrument of power. Under these circumstances, it is especially imperative to involve stakeholders.

Customary rights

Sometimes the local government is able to assume the functions of lake management, especially where its boundaries coincide closely with a significant portion of the lake basin. Informal or “customary” institutions can manage user priorities or transfer rules, use rights for seasonal migrants, self-initiated lobby groups, and informal cooperatives. Outside investors using formal property claims sometimes appropriate resources used under customary rights, possibly contributing to the impoverishment of artisanal fishers and farmers. This type of conflict is very common in developing country cases, especially with the spread of fishpen culture in Asia. At Chilika Lake, arbitrary changes in traditional fishing rights to promote fishpen investments led to violent clashes with police that drew national attention to the lake.

In other cases, pressures are from migrating populations rather than heavily capitalized outsiders. Traditional use rights of seasonal migrants in Lake Tonle Sap are under challenge as customary migrants overstay their welcome and entirely new populations come into the area. Similar conflicts between ethnic communities are widespread in Africa.

Customary rules can transcend post-colonial national boundaries. In the Lake Chad area pre-colonial rules are still in place to some extent for establishing the order of use priorities in the face of dramatic changes in size and form of the lake. In this circumstance, the lingering application of colonial Roman Law in assigning free access to ground-water overlying landowners is retrogressive.

The necessity of harmonization

Differences in regulations and their enforcement can lead to perverse economic behaviors for transboundary lakes. One of the most pressing needs in many international lakes such as Lakes Victoria and Kariba is to harmonize national regulations in areas such as fishery and pollution control. Harmonization is not necessarily the same as uniformity. The intention is to ensure that there are not conflicts between the laws and regulations across national borders, rather than to ensure that the laws are identical.

At the same time, harmonization should be tailored to the specific lake as opposed to the needs of the riparian nations. Laws are too often formulated for the entire nation, and may not be appropriate for a transboundary lake. Nigeria is important to the Lake Chad basin, but the basin is not dominant in Nigerian policy thinking. It is necessary for basin states to enable within-basin stakeholders to harmonize rules among themselves across borders, but not necessarily with other regions in each country.

Key Lessons

Based on the experiences detailed in the lake briefs, a number of lessons have been learned about creating effective institutions. Realizing that institutions may be private, communal, national or international, however, these lessons have to be applied at the appropriate scale and manner for each particular lake.

The key lessons are contained in the following bullet points:

- *Effective management requires a core.* Institutional effectiveness is stronger when the lake is closer to an economic or political-administrative center of a nation. “Marginal” lakes receive marginal attention. International cooperation may be particularly difficult to achieve when a lake is marginal to one of the major basin countries, as Lake Victoria is to Burundi or Lake Chad to Nigeria.
- *Scientific institutions often make a good starting point for lake-wide dialogue.* Informal peer groups at the technical level can be a key factor in creating supportive networks, especially across national borders. Whether it is the Great Lakes or Lake Biwa, resident research institutes and centers for intellectual exchange provide not only knowledge creation and dissemination but also neutral fora where people can develop a common discourse.
- *Effective management builds on existing institutions.* Developing a lake-wide institution is best done by building on a powerful sectoral institution, often catalyzed by a crisis. Institutions usually exist already at the sectoral level. For example, fisheries management bodies already exist in many of the lakes studied in the LBMI project. Efforts to undertake cross-sectoral management of lakes should build on these institutions, as problems arise.
- *Effective management is not afraid to act.* It may be difficult to determine whether certain management actions will be successful or not. Nevertheless, the Lake Briefs show that management institutions can be very effective if they are seen to be taking action to remedy problems, even when there is little reliable knowledge available. This is what the Lake Laguna Development Authority calls a “ready, fire, aim” approach.
- *Effective integrated management focuses on specific problems.* The best lake management experiences often focus on a limited number of critical points, such as the removal of phosphorus from detergents in Lake Biwa, the biological treatment of water hyacinth in critical bays in Lake Victoria, the addition of tertiary sewage treatment in Lake Constance, or the identification of 43 hot spots (Areas of Concern, or AOCs) in the Great Lakes. Public support will follow from these initial successes.

Further Reading

1. [Oya](#) touches on the issue of institutional organization in his review of river/lake basin management with examples from China, the Philippines, Indonesia, Thailand, Japan, and Brazil.
2. [Pattnaik](#) provides a first-hand account of how a lake management authority was developed and operated in a complex institutional environment for conservation of the Chilika Lagoon, India.
3. [Santos-Borja](#) discusses how a lake basin management authority was set-up and financed over a long-term period in the Philippines.