

Water Governance in Latin America and the Caribbean

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Executive Summary

As emphasis is increasingly focused on water in many parts of the globe as a crucial resource for economic advance, the quest is to understand the limiting factors which impede its sustainable development. Latin America, with enormous water resources in many parts of the continent, but extreme scarcity in others, faces particular water dilemmas. Having both the world's wettest ecosystems and the driest deserts makes it very important to conceptualize the most advantageous use of the resource. Increasingly attention has turned to governance as the bottleneck, rather than the financial aspects of development. Clearly huge sums will still need to be spent in the water sector in the coming years, but there is a nagging suspicion that similar huge sums that have already been spent in the past decades have not been as wisely spent as they could have been. Most governments, as well as bilateral and multilateral financing agencies, and increasingly private financiers, are therefore looking toward improving the governance of the water sector in order to make investments in it more effective and efficient.

To choose better water investments we need to have a better appreciation of what is possible with improved governance, of how to identify improved governance, how to design institutions for it, and how to incorporate it into planning and investments. This paper reviews the theoretical and empirical bases for water governance in general and then presents five specific cases from Latin America which highlight different aspects of governance. The studies range from nation-wide and sector-wide cases in Brazil and Chile, to irrigation sector reform in Mexico, the private concession of municipal water supply and sanitation in Buenos Aires, to a very localized experience in Honduras which attempts to integrate all sectors of the local economy to protect and develop a lake ecosystem.

The views put forward here neither exclude or unanimously support any one political or social theory. They more or less conclude that "it all depends upon the specific situation!" In some situations "interest group theory" may help describe the outcomes of water policy, but in other cases the "bureaucratic politics" model may be more appropriate. Certainly, we must always pay attention to politics and institutions; legislation and legal regimes traditionally follow from their interplay.

None of the cases reveal perfect outcomes, but each illuminates governance issues that will have to be faced by other countries trying to develop their water as an integrated resource for all users and uses now and far into the future. The Brazil and Mexico cases both show that the amount of detailed work and effort required to support user groups and local institutions is enormous. Therefore, the time needed to achieve policy outcomes is much greater than expected, and opportunities may still be missed to

incorporate private sector elements into water management and finance. The Chile and Buenos Aires cases exemplify the issues arising from private property rights and privatization of public utilities. Both cases are widely quoted *pro* and *contra* privatization for such a sensitive resource as water. Our examination of the distributional aspects of these two cases brings out serious consequences of privatization for the poorer and less well organized sections of society, although we recognize that the institutional frameworks to regulate the new private entities were themselves immature and weak. No doubt their performance will improve over time as they gain experience by actually regulating the water rights and monopolies created. The Honduran case shows how complex the institutional needs become when organization is focused at the lowest levels of government.

In all the reported cases one should be careful not to judge the outcomes on short time horizons. Mature water governance systems on other continents have developed slowly, over decades or centuries. Situations with such stark social conflict as those in Chile or Buenos Aires are already beginning to adjust toward becoming more balanced and benign as the larger society rejects the extreme and harsh initial conditions. Who can say where these cases will be in 30 years time? The pragmatic, empirical method of trying an approach and then modifying it as problems become apparent, has a great deal to offer the countries of Latin America. Institutions, such as the Inter American Development Bank and the other multilateral and bilateral financing institutions, can help by encouraging Latin American countries to choose governance policies that address economic, environmental and social water issues in an integrated and holistic manner. Such encouragement can take the form of intellectual sharing, institutional capacity building, and even financial support for appropriate institutions. The encouragement should not, however, be short term, for as the cases demonstrate it takes a long time for policies to be implemented and consequences to be felt. It is in the long term that fruitful adjustment to meet local realities will occur.

Section I

Definitions and Principles

Introduction

The goal of this paper is to present a coherent discussion of water *governance*, and show how it relates to water development in Latin America. Unfortunately, there seems to be great misunderstandings of what is encompassed by the concept of *governance*. In the eyes of most technical persons (engineers, economists, development planners, etc.) governance is about laws, regulations, and institutions. The naive belief is that, if one has the correct laws, regulations, and institutions then, one will get good governance of the water resources regardless of what else is happening in the country. The practical experiences, however, are quite different. In many countries the best laws and regulations, and the best institutional frameworks are in place, but the actual performance of the water sector is very poor. Practical observers will note, however, that without a reasonably functioning political system it is entirely unreasonable to expect textbook laws, institutions, and regulations to function as they claim to. Note that we have not suggested that the *best, most rational, or efficient* political system, but rather a *reasonable* one be sought. What is needed is a new framework within which to examine the interaction between politics, laws, regulations, institutions, civil society, water service providers, and the consumer-voter.

The notion of governance, when applied to water refers to the capability of a social system to mobilize energies, in a coherent manner, for the sustainable development of water resources. The notion includes the ability to design public policies (and mobilize social resources in support of them) which are socially accepted, which have as their goal the sustainable development and use of water resources, and to make their implementation effective by the different actors/stakeholders involved in the process. An adequate level of governance performance is one aspect of the development of water resources, other aspects being the technical/physical and the economic. These aspects are by no means free of overlaps, but governance points us to the political and administrative elements of solving a problem or exploiting an opportunity. Governance of water is a subset of the more general issue of a society's creation of physical and institutional infrastructure, and of the still more general issue of social cooperation, which reminds us of the problems of defining who are the stakeholders, communication among stakeholders, the allocating of contributions and outputs, and the creation of institutions. Governance is a more inclusive concept than government per se; it definitely embraces the relationship between a society and its government.

Water Governance

Water governance refers to the range of political, social, economic, and administrative systems that are in place to allocate, develop and manage water resources and the delivery of water services for a society.

Civil Society

Civil society can be considered to be composed of all non-governmental organizations such as professional societies, labor unions, interest groups, trade groups, political parties, and other freely formed clubs and associations. In contemplating water governance, the broadest definition of civil society should be used.

Principles

Water governance should be:

- **Open.** Institutions should work in an open manner. Together with the government agencies and private companies, they should actively communicate about what the institutions and the government do and the decisions they take. They should use language that is accessible and understandable for the general public. This is of particular importance in order to improve the confidence in complex institutions.
- **Transparent.** In addition to being open, good governance requires that all policy decisions are transparent so that both insiders and outsiders can easily follow the steps taken in the policy formulation. This is particularly important with regard to financial transactions, which should discourage suspicious or illegal transactions.
- **Participative.** The quality, relevance and effectiveness of government policies depend on ensuring wide participation throughout the policy chain -from conception to implementation. Improved participation is likely create more confidence in the end result and in the Institutions which deliver policies. Participation crucially depends on all levels of government following an inclusive approach when developing and implementing policies.
- **Accountable.** Roles in the legislative and executive processes need to be clearer. Each of the institutions must explain and take responsibility for what it does. But there is also a need for greater clarity and responsibility from all those involved in developing and implementing

policy at whatever level. The “rules of the game” need to be clearly spelled out, as should the consequences for violation of the rules, and have built-in arbitration enforcing mechanisms to ensure that satisfactory solutions can still be reached when seemingly irreconcilable conflicts arise among the stakeholders.

- **Effective.** Policies must be effective and timely, delivering what is needed on the basis of clear objectives, an evaluation of future impact and, where available, of past experience. Effectiveness also depends on implementing policies in a proportionate manner and on taking decisions at the most appropriate level. Most importantly, the policies should be incentive-based. This will ensure that there is a clear social or economic gain achievable by following the policy.
- **Coherent.** Policies and action must be coherent and easily understood. The need for coherence in governance is increasing: the range of tasks has grown; and so has diversity; challenges such as climate and demographic change cross the boundaries of the sectoral policies on which the government has been built; regional and local authorities are increasingly involved in water policies. Coherence requires political leadership and a strong responsibility on the part of the institutions to ensure a consistent approach within a complex system.
- **Efficient.** Classical economic theory demands efficiency in terms of economic efficiency, but there are also concepts of political, social, and environmental efficiency which need to be balanced against simple economic efficiency. For example, minimizing transaction costs will go along way toward political efficiency.
- **Communicative.** Governance institutions and systems need to communicate among the actors and stakeholders in very direct ways. Correctly done, this will lead civil society to be socialized into governance over a wide range of issues. Governance in the water sector can be used as an education model for all other sectors and vice-versa.
- **Equitable.** Equity between and among the various interest groups, stakeholders, and consumer-voters needs to be carefully monitored throughout the process of policy development and implementation. It is essential that the penalties for malfeasance be, and be seen to be, equitably applied.

- **Integrative.** Water governance should enhance the effectiveness of Integrated Water Resources Management (IWRM). The institutions will have to consider all uses and users within the traditional water sector and also their interconnections with and impacts upon all other potential users and sectors.
- **Sustainable.** Water governance must serve future as well as present users of water services.
- **Ethical.** Finally above all, water governance has to be strongly based upon the ethical principles of the society in which it functions. This manifests itself most strongly in the issue of property rights for use, access, and ownership of water.

Need for Collective Action

Collective or cooperative action arises because many results valued by human beings cannot be achieved by individuals acting alone. When people act together, two issues always present are 1) whether their collective action achieves the outcomes that are sought, and if so, 2) whether the benefits of that success are shared among participants in such a way that they renew their contributions and the collective action can be repeated or can continue. An enterprise is defined by its participants, who are those who significantly contribute to its activity and its product, and receive significant benefits in return. For example, a water worker or an investor is a participant, while a household customer usually is thought of as outside the enterprise. Who is a participant and who is not also marks the boundary, which of course is an abstraction, between the enterprise itself, and the people and activities who are not within the enterprise but form its environment.

Over time, successful patterns of collective action, like individual actions, become learned behavior on the part of their participants, and crystallize into social habits, cultures and institutions, and, often becoming over time easier and more efficient to enact. Patterns of collective action, or enterprises, can have a wide range of purposes and forms, and the possibilities of relationships and interactions among such patterns are also numerous and fluid, notably including nested relationships, in which one social institution or pattern, such as common acceptance among a population of some form of property rights, forms a necessary enabling environment for another more particular collective action, such as a social or collective pooling of effort or resources for a desired future outcome (investment). Awareness of the positive cumulative results of successful collective action gives credibility to and makes possible further social enterprise and arrangements. Very importantly, such awareness of the benefits of social

cooperation can become a form of social capital, which can be expressed in functional trust within an enterprise (willingness to accept authority), and can also be fungible, and used outside a particular social enterprise. For example, the success of a multiplicity of social enterprises can be applied to the development of large-scale frameworks or meta-arrangements for regularized cooperation, of which government is an important, and in a sense a pinnacle case. The fact that social capital achieved in one forum is often carried into another forum or enterprise is an important characteristic of the very permeable boundary between the enterprise and its environment, and is necessary to understand the political aspect of water governance, which will be discussed below.

The existence of government, although it is often a hard won social development, is itself not sufficient to assure the delivery and maintenance of the collectively desired good. One function of social arrangements is to prevent harm to a collectivity of stakeholders, including preventing or restraining *bad* people from causing damage, as much as enabling *good* people working together to do good (noting, of course, that the *good* and *bad* people may be the same people). A potential source of harm is over-reaching by institutions themselves, including governments. Since participants in a collective action, including a government, are the same as their fellow human beings, in terms of being potentially self-seeking and opportunistic (trying to capture collective goods for private ends), agreed and enforced constraints are required (electoral, legal, cultural or other) to ensure that a government or other collective action is not used for exploitative individual or private purposes.

Both the water provision enterprise, with its rules and its provisions for monitoring and enforcing its rules, and the social arrangements and laws outside it, which form its setting and within which the provision enterprise is nested, have important governance aspects or elements, which can be called, respectively, interior governance and exterior governance.

Section II

Theoretical Bases for Water Governance

The theoretical bases of governance with regard to water are a subset of theories of collective behavior. Unfortunately, no one simple theory explains every situation. We often find a marked difference between the philosophical Continental European and Latin American approaches and the pragmatic British schools of thought, whose empiricism recommends them when addressing water resources governance. For example, a relatively clear original demarcation of property rights and experimentation with these rights over time has led the US to flexible approaches to water governance. This approach allows for adjustments when economic and social conditions change, because it does not aspire to build institutions that cover all possible eventualities. We also find systems which are hybrids of the Civil law (descended from Roman law) and Common law (pragmatic, from Britain) approaches, as well as systems with other ancient roots, such as those of the pre-Colombian Americas, India and Islamic countries, and further systems of social rights and responsibilities which remain traditional and uncodified, and not necessarily less strong because they are manifested in cultural expectations rather than written rules.

The state has an important role to play through its core function of defining property rights and responsibilities. In modern pluralistic democratic societies, the foundation of the state rests upon the *publicization* (the term for the shift from the private to the public sphere) of the costly monitoring and policing needed to protect productive assets from being redistributed to intruding claimants. Without this policing, called the *law*, systems of property would never have advanced beyond appropriative behavior backed by force.

Examples of different property rights regimes, with their associated rights and obligations, include:

- **Open Access Resources**

There is no defined group of users or owners and the benefits are available to anyone. Individuals have both privilege (the ability to act without regard to the interests of others) and no right (the incapacity to affect the actions of others) with respect to use rates and maintenance of the asset. This applies particularly where the common resource is plentiful, and the distributive and management issues of scarcity have not arisen.

- **Common Property Resources**

The management group (the owners) has a right to exclude nonmembers and nonmembers have a duty to abide by the exclusion. Individual members of the management group have both rights and duties with respect to use rates and maintenance of the property

- **Private Property**

Individuals have the right to undertake socially acceptable uses and a duty to refrain from socially unacceptable uses. Other (non-owners) have a duty to allow socially acceptable uses and a right to expect that only socially acceptable uses will occur.

- **State Property**

Individuals have a duty to observe use and access rules determined by the controlling agency of the state. The agency has the right to determine these access and use rules.

In most countries water is state property, but a typical history of water property rights follows the path starting out originally as an *open access resource* which was initially appropriated by a group and became a *common property resource* with ultimately the state appropriating these rights from the common pool resource ownership group to create *state property*. The state is then faced with how to deploy the resource to the advantage of all the citizenry. How this can be done fairly and equitably without reducing incentives for efficient use of the resource is the key to water governance at the beginning of the 21st century.

An important matter is to what extent the processes of *publicization* and *devolution* of water rights serve segments of a population, or its entirety including all its members. If the water resource is managed excessively through private markets, only those with property or income (effective demand) will have access; if it is managed by public authorities, it is still not certain that poor, isolated or socially unmobilized elements will maintain access to water proportional to their numbers or their needs. Latin America has cases which span the whole range of property rights regimes from the almost unlimited regime in Chile through the intermediate regimes of Mexico and Brazil to most of the other countries which rely exclusively upon state property rights. Clearly, the choice of property rights regime is a fundamental one which need careful consideration and debate within each country.

Many questions can be posed about the viability of any of the property rights regimes based upon the collectivity of the individual players and their initial resource endowments. Conceptually it should be a short step from successful collective action at the group level on common property resources (CPR) to

being able to achieve consensus on public policies to govern state property at a national or state level. Unfortunately, doing this in any society tends towards creating *winners* and *losers*. The mechanisms to compensate the losers are often quite difficult to arrive at in a pluralistic society, particularly when the losers are already disadvantaged groups, or not numerically or politically strong. This is where *Politics* enters the picture.

Models of Governance

The bureaucratic politics and process model. This model is based on political-bureaucratic bargaining in a federal system. Its focus is typically the executive branch, with the elected legislature hardly in the picture. Classic cases are drawn from US foreign policy problems (for example, the Cuban missile crisis) where Congress was not a major player, but this is the opposite from the situation in water, where the executive branch until recently was largely excluded by Congress

The congressional behavior model. A second federal model concentrates on the elected congress, with the view that to understand congressional behavior is to understand that congressmen are "single-minded seekers of reelection." It follows from this that congressmen's goals are to improve the welfare of their constituents in the shortest possible time frame. The realities of information processing are also important in describing congressional behavior. With humanly limited capacities to absorb and judge, legislators are so overloaded with information that they have to be extremely selective in committing their attention. Legislators deal with this by specializing in a particular and limited area; in other domains they take their cues from other sources (colleagues, outside groups, committee reports) that they have learned to trust.

The interest group model. When a national legislator thinks about the constituency that elected him, he or she rarely if ever sees an undifferentiated mass of individual voters. They see categories of interests. In some cases, they see only a few dominant interests. There are literally hundreds of active interest groups--environmental groups, water resources groups, professional associations, and industry associations-involved with water policy. These interest groups often have overlapping concerns and overlapping memberships. They constitute vital channels for particular publics to participate in the federal governmental process. Pork barrel projects are the fodder for the well known "iron triangles" of legislators, bureaucrats, and active interest groups that develop in specific issue fields (the term "pork barrel" was first used to describe the exchange of benefits in successive US Rivers and Harbors Acts).

In the water area, an old idea of the *concurrent majority* (Calhoun, 1853) may be much more relevant than newer views on the interest group model. Under this older concept it was recognized that major government policy decisions must be made with the approval of the dominant interest groups directly affected. It appears, for example in the US, for federal water quality legislation, that the environmental NGOs and lobbyists are actively encouraged to give their approval before legislation can be passed.

It is also valuable to carry out an *interest group* analysis of the feasibility of pursuing specific governance goals. This approach has been tested by Dinar et al., (1998) on the water sector of Pakistan with a specific focus on a new and very large drainage project which involved both hardware investments and institutional (software) reforms. They examined the likelihood that the various interest groups would be powerful enough to influence the investment and management decisions in their direction.

Principal-Agent Theory. One attractive way to approach making specific political analyses is to rely upon the recent findings of *Principal-Agent Theory*. Principal-agent models have been employed in many different academic fields in order to explain relationships among actors including: business, in which the principal is the boss and the agents the employees; economics in which the consumer is the principal and the producer is the agent; and in various political science sub-fields, in which members of the legislatures are the agents of their constituents, or bureaucrats are agents of the executive, or the governments of third world countries are the agents of international lending institutions, and so on.

The literature on principal-agent theory is quite extensive. Proponents claim that the theory has been successful in explaining much of the reality of the relationship between certain sets of actors not only for economic relationships, but also for complex political interactions.

Regime Theory and Public Choice. A useful development of interest group theory is the use of the concentration or diffusion of costs and benefits of public choices to predict what decision-making system will prevail. Table 1 shows schematically how this can work. If we look at the distribution of both the benefits and the costs of a particular action by the state, depending upon whether the benefits (and the costs) are concentrated on a few recipients or widely dispersed throughout the economy we can predict what type of political regime will dominate. For example, when Garcia and Valdes (2000) said that the problem with water governance in Latin America was the “tendency to privatize the benefits and socialize the costs,” he was referring to the upper right hand box in Table 1. Under this distribution of benefits and costs, one would expect *Client Politics* to dominate the outcomes. This may be a reasonable outcome given the fact that more acceptable regimes, such as *Majoritarian Politics*, may lead to inertia.

Section III

The Politics of Water Governance

Often a driving force in any area of governance is *politics*. The top of Figure 1 shows schematically the conventional view of the relationship of politics to governance. It portrays an orderly world where politicians act as rational legislators in formulating laws for the general welfare, which in turn are implemented by institutions, which carry out the legislated water policies through rules and regulations. Real politics, however, is not so neat and in 1936 Harold Lasswell said it best in the title of his book; *Politics: Who gets What, When, and How?* The lower panel of Figure 1 shows how WHAT, WHEN, and HOW might interact in a real situation with the laws and institutions. Governance is now not seen as a simple linear process, but as discursive and a highly complex set of interactions between laws and institutions, and personal and group interests as well as the general interest.

For a water enterprise, politics is certainly part of the governance domain. Contestatory, often very personalized maneuvering, aimed at the building of consensus and support for policies and persons, is certainly part of the concept. The application of politics to water problems was called *hydropolitics* by John Waterbury in his cautionary tale in the *Hydropolitics of the Nile Valley* (1979) which demonstrated the powerful combination of local and international politics. *Hydropolitics* can occur inside or outside a water enterprise, but the politics of water governance are primarily the play of the sociological factors (structures, institutions, even leader personalities) that lie outside the water enterprise. These reflecting the more general sociology of the country, that is to say, of the water institution's setting. The enterprise's own governance is nested within these factors and the boundary between the enterprise and its environment is permeable, and social capital, which can take the form of political power, can also move in both directions across it.

We have attempted to suggest that the politics of water governance are typically the sociological factors (structures, institutions, etc) that lie outside the immediate operations of water provision in Figure 2. The governance of water is nested within these factors. Politics is factors outside the water sector, reflecting the more general sociology of the country involved, that is to say, of the water provider's setting. Both the water provision enterprise, with its rules, and the politics outside it, which form its setting and within which the provision enterprise is nested, can be considered parts of governance and could perhaps be called, interior governance and exterior governance.

Both the interior and exterior governance affect the water provision enterprise, and can make it succeed or fail. The exterior governance may be such that the provision enterprise never comes into existence, or even occurs to anyone as a solution to a population's water access problem. So in a sense, a favorable or at least neutral external environment/setting is critical for the existence/success of a water provision enterprise, in addition to the requirement that internally it meet certain conditions as well.

One thing that the external sphere can provide for the specific water enterprise is stabilization of certain things, such as property rights, broad rules and laws, so that the enterprise can build on stable expectations with regard to surrounding realities, not be coping with constant external flux and unreliability, which can be paralyzing of local activity. In other words, the water provision enterprise can draw strength from its external world. For example, the creation of Californian groundwater basins was aided by certain more general California state laws (Ostrom, 1990). If the water provision enterprise succeeds, it can also validate and strengthen the external politics that made it possible. Delli Priscoli (2002) points out that cooperative water development in Holland in the earlier part of the 20th century was an important part of nation-building for the modern Dutch welfare-state.

It is not surprising that for water enterprises to feel the influence of the governance which is exterior to it nest-wise as uncomfortable. Delli Priscoli (2002) talks about engineers' discontent with "political" interventions. Many interventions from the external governance sphere could indeed be constraining, but others could be at a given moment unhelpful but be supportive, integrative and helpful in a longer run. The nest-wise view of governance of Figure 2 tells us that authority, or political capital developed entirely outside the water sector, can be brought to bear within water affairs, for the good or for the ill of the water enterprise.

Section IV

Empirical Bases for Water Governance

There is strong evidence to support the notion that, despite a wide range of property rights regimes, user groups could develop into sustainable institutions over many years (centuries in the case of the Spanish irrigation property rights sharing systems). Ostrom provided examples from the US, Indonesia, Nepal, Mexico, Peru, Philippines, and Sri Lanka. Maass and Anderson (1978) provide in depth analyses of the development of the governance of irrigation since the 15th century in Valencia, Murcia, and Alicante in Spain and in the 20th century in California. Essentially, there is the demonstrated possibility of identifying a level of decentralization, and regulation to produce effective water governance

The question is how governance can continue to address the age-old problems of access to water given the unusual contradictory nature of water itself. Water is a fugitive resource, but it is essential for human and ecosystem life, it is sometimes a public good sometimes a private good and often somewhere in between, its development can lead to natural monopolies, and it presents major economic and physical externalities, etc. These, and other quirks, have lead in the past inexorably to some combination of *market failure*, *government failure*, and *system failure*, which need to be addressed by governance regimes.

By *market failure* we mean those aspects which can lead to non-economic outcomes these are caused by:

- The existence of upstream downstream externalities (environmental, economic, and social)
- Unpriced assets and missing markets; for example, there is no market for water rights, or some aspect of water services (e.g. flood control) are not priced.
- Flood control and water quality can often be public goods
- There are economies-of-scale in most water investments and many management systems.
- The transaction costs of trading or selling water may be prohibitively high.
- Who owns the property rights may not be clear.
- There may be large ignorance and uncertainty about water markets, droughts, floods, etc., leading to inability to set prices correctly.
- The policies may be shortsighted and miss benefits and costs due to third parties.
- The choices may be irreversible.
- Provision of many water services are natural monopolies.

In addition to the possibilities of market failure there is always the possibility of *government failure*;

- Failure to correct market distortions.
- Price regulation.
- Subsidies to resource users and polluters.
- Inappropriate tax incentives and credits.
- Over-regulation or under-regulation.
- Bureaucratic obstacles or inertia.
- Conflicting regulatory regimes.
- Short-sightedness.
- Voter ignorance and imperfect information.
- Special interest effects, including political weaknesses and vested interests.
- Little entrepreneurial incentive for internal efficiency.
- Imprecise reflection of consumer preferences and the bundle purchase affect.
- The ability of the government to control and regulate the sustainable use.
- The non-payment of services linked to water.
- The independence and impartiality of the organisms of regulation.
- The effective knowledge of the resource, the demands imposed on.
- the resource, and the current uses that are made of it.

Finally, there is a set of sources failures more generally called *system failure*;

- Gaps in the institutional structure that impede the use of politics.
- Absence of legislation.
- Lack of effective mechanisms for intersectoral dialogue.
- Lack of mechanism for the participation of the community and interested parties.
- Absence of mechanisms for coordination, decision, and conflict resolution.

Many of these failures are serious and have to be faced when developing water governance. These three types of failures are inherent in all liberal economic regimes in all countries and have to be addressed by government action. The ones that are likely to be the most difficult are those dealing with institutional and communication gaps. An empirical examination of how to overcome the problems caused by these failures is essential in each setting if effective water governance is to be achieved.

In her *Good Government in the Tropics* (1997), Judith Tandler noted that we know a lot more about what makes *bad government* than how to do *good government*. She draws from a variety of resource management cases, including water, in the State of Ceara in Northeast Brazil. Her results tend to debunk conventional nostrums and preconceptions of how governance should be, and drive us back to a close functional analysis of all cases. For example the conventional views that “clientism is bad” and “associationalism is good” have to be reversed in case after case. Viewing water governance through the theoretical lens of *Industrial Performance and Workplace Transformation* Tandler’s results undercut such conventional goals as reducing the size of government, restricting the potential for bribery, and subjecting public agencies to market-like pressures—none of these were practiced by Italy, a successful country.

Referring to cases of irrigation provision and drought management in Ceara, she says:

“The state government, in these cases, was also contributing in a major way to the creation of civil society by encouraging and assisting in the organizing of civic associations, including producer groups, and working through them. These groups then turned around and independently demanded better performance from government, both municipal and central, just as if they were the autonomous entities portrayed by students of civil society. This complicates the current popular assumption of one-way causality, according to which good civil society leads to good government and, correspondingly, good government is dependent on the previous existence of a well-developed civil society.”

Section V

International Principles of Water Governance

The Dublin Water Principles (1992)¹ through the “participation clause” and through “water as an economic good,” brings water firmly under the state’s function of establishing and maintaining a system of property rights, and through the principle of management at the lowest feasible level asserts the relevance of meaningful decentralizations. Since Dublin, significant international goals have been set with regard to water governance. The Hague Ministerial Declaration (1998) called for *“governing water wisely to ensure good governance, so that the involvement of the public and the interests of all stakeholders are included in the management of water resources.”* At the UN Millennium Assembly (2000), Heads of State emphasized conservation and stewardship in protecting our common environment and especially *“to stop the unsustainable exploitation of water resources, by developing water management strategies at the regional, national and local levels, which promote both equitable access and adequate supplies”*. Finally, at the Bonn 2001 Ministerial Declaration the ministers recommended action in three areas with water governance as the most important: they proposed that *“Each country should have in place applicable arrangements for the governance of water affairs at all levels and, where appropriate, accelerate water sector reforms.”*

In the Latin American region the San Jose Declaration of 1996 and the Declaration of Buenos Aires in 1996 both amplified and strengthened the Dublin Principles and the 1996 principles enunciated by the Global Water Partnership in 1996. The two Latin declarations stressed transboundary rivers and conservation and sustainability.

In addition to these goal-oriented principles, there are a multitude of international laws and treaties that refer to water and resource management (Wolff, 2000). Most of the international treaties refer to river navigation between two or more countries, but there are many other bilateral and multilateral treaties dealing with water quantities and quality in transboundary rivers. The UN Convention on the *Law of the Non-Navigational Uses of International Watercourses* is the only comprehensive international law governing transboundary water conflicts. It is in itself nothing more than a set of guidelines to encourage bilateral and multilateral coordination without sanctions. To date it has been ratified by only eight

¹The Dublin principles that guide the IWRM principles are: (i) Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. (ii) Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels (iii) Women play a central role in the provision, management and safeguarding of water; and (iv) Water has an economic value in all its competing uses and should be recognized as an economic good

countries with 35 being required to bring the treaty into force. There are, however, many countries that are committed to solving transboundary water conflicts in the region. Arrangements between Mexico, Guatemala, and El Salvador for resolving water disputes, and the Plata Basin Committee involving Argentina, Bolivia, Brazil, Paraguay, and Uruguay are just two examples of the several multilateral and bilateral treaties, agreements, and basin agencies in the region. Garcia (2001) discusses the remaining cases.

Section VI

Latin American Water Imperatives

Even the title of Dourojeanni and Jouravlev's (2001) *Crisis de gobernabilidad en la gestion del agua*, report to CEPAL (2001) implies that something is seriously amiss in water governance in Latin America. According to them, the five major factors that lead to the crisis are;

- lack of integrated planning of water use;
- the generally dispersed and uncoordinated agencies of the state, NGOs, local governments, the intellectual community, and the multilateral, bilateral, and international agencies who interfere with water planning (in any one watershed as many as 150 different actors may intervene in a plan);
- the lack of a transparent (clear rules of the game) and effective institutions for arbitrating conflicts over water use;
- the emphasis on certain management instruments, often imported concepts, over carefully thought through instruments that may fit the local conditions better; and
- a lack of perceptions of what is actually necessary to effectively govern water.

The Inter-American Development Bank (IADB) has reviewed its member countries' strategies and policies regarding water in several important studies (Lord and Israel, 1996, Garcia and Valdes, 2000, Garcia, 1999, and Garcia, 2000) and issued its own paper on *Strategy for Integrated Water Resources Management* in December of 1998. The IADB (1998, p.7) saw a need to help the countries in *a shift from development to management and from a sectoral to an integrated approach*. The IADB noted that the political and economic changes necessary to follow this strategy were already underway in the region and that the aim is to:

- Conserve water through more efficient ways to allocate the resource giving due consideration to social equity issues;
- Find better ways to solve conflicts among uses and users, including environmental uses and freshwater ecosystem functions and services;
- Account for the social, economic, and environmental value of water in the process of sustainable development; and
- Increase the participation of communities and the private sector in decision-making and financing.

Lord and Israel (1996) give a good description of market, government, and system failures and approaches to incorporate the corrections into the national water strategies of the various Latin American countries. A major governance (political) dilemma faced in the development of water resources in Latin America, according to Garcia and Valdes (2000) is the tendency *to privatize the benefits and socialize the costs*.

Despite Dourojeanni and Jouralev's gloomy assessment of water governance in Latin America, there are many encouraging examples given in the literature cited and in the cases reported on below.

Setting National Water Policies. The design of public policies regarding water requires the definition, within a framework of social acceptance, of key elements for water management. In this respect it is important to identify the degree of social agreement in subjects as relevant as the following:

- Roles and functions of the public and private sector
- Balance between environmental and production/economic roles
- The extent and manners of centralisation and decentralisation of functions
- Sectoral and integrated management
- Degree and manners of community and stakeholders participation
- Extent and manners of public regulation and areas of entrepreneurial freedom.

Many of the countries in the region now have adopted a national water policy and are in the process of completing national water plans.

Preparation of National Water Plans. Water Policy must be translated into laws articulating water rights, and how to deal with water quality. The plans should also include investment policies, public sector institutional reform, an indication of the balance to be struck between environmental and production economic roles for water, the role of the private sector, cost recovery and pricing policies, and investment appraisal.

Section VII

Institutions for Water Governance in Latin America

Garcia (2000) reported on the organizational structures used for water governance in Latin American countries. Based upon a 1999 ECLAC study he presented the results shown in Table 2 indicating the institutional frameworks currently in existence. Most of the countries, apart from Argentina, Brazil, and Mexico still rely solely upon national level institutions. The Honduran case for local level management given below is a new venture in that country.

Only a handful of the countries had National Apex Bodies specifically designed around water. Most are located in other line agencies. Nine countries had ongoing or proposed River Basin Organizations (RBO). In terms of legislation, Brazil, Colombia, Costa Rica, El Salvador, and Mexico have water laws existing or proposed that promote river basins as the unit for management of water resources. Chile is considering a new law where river basins may be selected as the management unit. Many other Latin American countries are developing institutional and legal frameworks to manage water at the regional level by creating river basin authorities. The IADB has financed, or is likely to finance, 20 projects at the basin management level in countries such as Argentina, Bolivia, Brazil, Chile, Columbia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Peru, and Venezuela.

Garcia (2000), in Table 3 gives the details of the types and the structure of River Basin Organizations in the region. Transboundary organizations were only seen in the same three large countries, Argentina, Brazil, and Mexico, with smaller participation by Bolivia, Uruguay, and Paraguay.

There is a wide variety of service providers, usually local authorities, but increasingly public-private partnerships of some sort for water supply and to a lesser extent wastewater treatment. Latin America has a rich endowment of civil society institutions and community based organizations, many involved in grass-roots level water and sanitation.

One area which Dourojeanni and Jouralev stress is institutional capacity building. Latin America is a region with good technical schools and universities capable of supplying the needed manpower, however, the government institutions are unable to attract them in the numbers and quality needed to develop the institutional infrastructure required to resolve the water governance crisis.

Another area where the Latin countries need to act is in the assessment of performance of public institutions. Rees and Solanes (2001) have proposed a major comparative study of institutional regimes in the region. Part of the study would be to devise criteria for the assessment of institutions and management systems. The criteria suggested are all part of the principles for governance that we promulgate at the outset of this paper.

- Operational effectiveness
- Economic efficiency
- Distributive equity
- Environmental quality
- Consultation/Participation
- Integrated, holistic Management
- Governmental Stated Expectations

Important areas for governance which are often neglected are those institutions which deal with inter-sector coordination and those that control financial decisions. Often these institutions reside outside of the water sector in the Ministry of Finance or the Bureau of the Budget. By their choice of budgetary allocations they can radically change and interrupt carefully thought through sector policies unless the inter-sectoral issues have already been coordinated between the ministries and other water institutions. The institutional results shown in the Tables 2 and 3, back up the gloomy comments of Dourojeanni and Jouralev discussed above. Clearly the Latin American countries have a long way to go in organizing their own and the regional water governance.

Section VIII

Integrated Water Resources Management (IWRM) Instruments

Management systems are the predominant set of institutions (in a broad and wide sense: laws, regulations, public and private organisations), practices and ideas, which determine the manner in which water resources are managed. They also comprise methodologies for planning for IWRM, for water resources assessment, for conflict resolution, for encouraging a water-oriented civil society, and demand management.

It is obvious that many water crises are due to an increase in demand for the resource, hence, anything that would reduce the amount demanded would greatly help in the solution of the problem. There would still remain problems dealing with existing levels of resource conflicts and environmental degradation, but a reduction in demand would make the problems now assuming crisis proportions more easy to deal with. For example, total water demand has declined in the US from a high in 1980 despite large increases in wealth and population. This means that maintaining aquatic environmental quality is getting progressively easier. Conscious pricing policy or water conservation policies incidentally have not brought about this decline. It appears to be largely due to reductions in water use consequent to higher energy costs, effluent limitations on wastewater discharges, mandated energy efficiency improvements to domestic and commercial water appliances, decline in the value of irrigated crops, and enforcement of federal in-stream water requirements for ecosystem maintenance. Each subtracted a small amount, but the sum total has made a big difference in US water use. These effects are what we described above in the discussion on external governance issues.

The focus of IWRM instruments should be to help overcome the market, government, and system failures listed earlier. There is a large literature on all of these instruments. As mentioned above, demand for water can be reduced by voluntarily, and mandated, leading to a reduction of the demanded quantities by conservation involving many different technical, social, and economic tools. Essentially, this means that the consumer will change his or her consumption preferences. Regulatory instruments involving permits, restrictions, and allocations to various users and uses can also reduce water demand.

The instruments that have been receiving the most attention in Latin America, however, are those addressed to market failure. A major emphasis in the Chilean water reforms has been on the correct

pricing of the water resource to reflect opportunity costs over and above the tariff, similar attempts are underway in Costa Rica and Ecuador where downstream users pay the watershed owners and managers for watershed services. Pricing is also a major part of the Brazilian reforms. This is called demand management by pricing. Using an IWRM stance it is important to learn the lessons from the recent decline in water demand in the US—external governance can be an important instrument in water sector governance.

Encouraging a water-oriented Civil Society is one way to encourage voluntary water conservation and intelligent responses to classical regulatory and economic instruments. Creating such a society also makes the resolution of water conflicts more amenable to arbitration and final settlement.

Section IX

Some Illustrative Case Studies

Five case studies have been included to give a flavor of some successful, and less successful, water developments in Latin America. The purpose here is to focus upon the lessons that may be learned for water governance in the region. The cases report on nationwide policy reform (Brazil and Chile), a sectorwide reform (irrigation in Mexico), an urban water concession (Buenos Aires, Argentina), and a purely grass-roots attempt at water governance (Lago Yojoa, Honduras). The discussion here focuses on the high points, and the details of the cases are given in the Annex . The following boxes evaluate the lessons learned from a governance point of view, not necessarily from the point of view of individual sectors or stakeholders.

BRAZIL

Description of Case	Policy and management system established in Brazil demanded by the 1988 Constitution
Policy Change	he National Water Resources Policy spelled out in the new water legislation to achieve; 1) sustainability--to ensure that future generations have adequate availability of water of suitable quality; 2) integrated management--to ensure the integration among uses in order to guarantee continuing development; and 3) safety--to prevent and protect against critical events, due either to natural causes or inappropriate uses.
New Legislation	National Water Act (1997) Legislation to establish Agencia Nacional de Agua (ANA) (2000)
New Institutions	Agencia Nacional de Agua (ANA) National Water Resources Council
	State Water Resources Councils River Basin Committees
IWRM Instruments Used	River Basin Agencies IWRM plans, decentralization, participation, water pricing, permit systems, water resources assessment, shadow pricing of bulk water
External Governance Impacts	Constitution of 1988, lead to major revisions in thinking about natural resources use. The states moved ahead of the federal government and passed their own legislation putting pressure on the federal government. Rapid economic growth with increasing demands for water and water services. Globalization issues and the experiences of other countries with concessions dictated some of the actions.
Outcomes	The creation of ANA which is to oversee the implementation of the water law was delayed until 2000. So it is too early to say what the outcomes have been.
Lessons Learned for Governance	To follow a fully participatory and open process in policy formulation takes a long time. This case has taken more than 16 years to arrive at the starting point for implementation. This is a high cost to pay for the delays.

CHILE

Description of Case	Incorporation of the Market Concept into Water Resources Policy in Chile
Policy Change	<ol style="list-style-type: none"> 1) water is not only a factor of production in agriculture, but also in other sectors, and must be transferable like any other economic input; 2) inappropriateness of linking a flow resource (water) to an immobile stock resources (land); 3) separation of water rights from land rights; and 4) treat water rights as any other property rights allowing for leases and sales.
New Legislation	Water Code (1981)
New Institutions	Directorates of Water (DGA), irrigation (DR), and planning (DR) in the Ministry of Public Works
IWRM Instruments Used	Pricing, private sector participation
External Governance Impacts	Since 1970 Chile followed a successful export-oriented market-based approach to economic development. Role of the private sector in hydropower development also had a large impact upon water policies.
Outcomes	Generally considered an initial success, but several problems have arisen that have led to the need for more government intervention in the water sector. Conflicts between the consumptive uses and the non-consumptive uses not anticipated in the initial assignment of rights, concerns for environment are not adequately addressed in the current system
Lessons Learned for Governance	As scarcity becomes more widespread there is a need to regularize and formalize traditional water rights, greater attention to managing conjunctive use of ground and surface waters, and improve the administrative and judicial system for dealing with water disputes.

MEXICO

Description of Case	Devolution of water rights and management of publicly owned irrigation systems to Water Users Organizations (WUO) in Mexico. 80 irrigation districts (ID) covering 3.2 million ha were to have the O&M transferred to water users.
Policy Change	Part of the National Development Plan (1989-94) was: 1) to develop infrastructure to eliminate gaps in water services; 2) promote efficient water use; and 3) improve water quality
New Legislation	National Water Plan (1975), The National Water Law (1992)
New Institutions	National Water Commission (NWC) (1989), has 6 regional management offices providing technical support to 32 state offices. National Institute for Water Technology (IMTA) designed to improve water efficiency and water quality preservation Each ID was split into "hydro social" units called <i>modulos</i> . Under the <i>modulos</i> farmers willing to organize themselves, operate, and maintain the modulo have to form <i>Asociacion Civil</i> . WUO is entitled to collect and administer the water fees <i>Sociedad de Responsabilidad Limitada de Interés Público</i> (SRL) were formed of associations of WUOs
IWRM Instruments Used	Management systems; water resource assessment; demand management via cost

External Governance Impacts	recovery, regulations, and conservation; and heavy dose of institutional development Mexico joined NAFTA in 1993 forcing efficiency improvements in irrigated agriculture to compete with US and Canadian agro-products. A period of rapid economic and social change in Mexico with major political upheavals in the traditional governing party.
Outcomes	76 of the 80 IDs have been handed over to WUOs, water fees paid by water users covered 80% of O&M (up from 18% in 1988); water distribution efficiency rose by about 10%; 80% of farmers in a small survey say that they are generally happy with the performance of the reform, 45% claimed that the fees were too high, but that the communication among the stakeholders was good. Training and technical services given to the farmers by NWC and IMTA were highly appreciated.
Lessons Learned for Governance	This case demonstrates that even a complex transfer within a formerly highly centralized governmental owned system can be achieved in a relatively short time of about 10 years. However, there is some concern that the private and small irrigation units which make up 2.8 million ha, still are much more efficient than the government IDs.

ARGENTINA

Description of Case	In 1993, the Government of Argentina gave a 25 year concession to supply water and wastewater services to the City of Buenos Aires
Policy Change	Financial crisis lead to sell-off of nationalized industries. The water concession was ordered by a Presidential Decree with no public discussion
New Legislation	National Administrative Reform Law (1989)
New Institutions	<i>Ente Tripartito de Obras y Servicios Sanitarios</i> (ETOSS)—the independent regulator <i>Agua Argentinas</i> —the consortium of private companies awarded the concession
IWRM Instruments Used	None other than the economic instruments
Impact of External Governance	Since 1990 Argentina had been a pioneer in utility reforms in Latin America, largely through privatizing publicly owned utilities
Outcomes	According to the concessionaire, in terms of the original intentions the concession has worked out very well. US\$1.6 billion of private funds have been invested , a 37% increase in water production, extension of drinking water to 1.6 million additional people, connection of 1 million inhabitants to the sanitation network, a billing recovery rate of 94%, and the price of water below its 1993 rate. There are concerns about the economic distibutional impacts of the concession upon the poor.
Lessons Learned for Governance	The concession seems to have violated most, if not all, of the principles enunciated as the desiderata of good governance. The decision was made with no discussion and the first open discussion with the stakeholders took place 7 years after the inception of the project. Existing customers have faired well and the new customers less well because they have borne most of the cost of the expansion of the system. The whole concept of privatization and the letting of new concessions awarded in Argentina and other countries in the region may have been negatively impacted by this project. It certainly has slowed much of the original enthusiasm for such developments in other countries.

HONDURAS

Description of Case	Sustainable Development Plan for Yojoa Lake, Honduras
Policy Change	Local initiative by initially 16 municipalities on the shore of the lake.
New Legislation	No new legislation outside of municipal ordinances
New Institutions	The Association of the Municipalities (AMUPROLAGO) (1995) Technical Unit
IWRM Instruments Used	Management plans, participation, regulation, and integration of all uses and users.
External Governance Impacts	Outside support and guidance from the VIDA foundation, the Spanish Agency for International Cooperation (AECI), Secretariat for Natural resources and the Environment (SERNA), the Electric Energy Company (ENE), and the School of Forestry Sciences (ESNACIFOR).
Outcomes	So far the outcomes are mainly organizational with planning meetings
Lessons Learned for Governance	Exemplary program at the level on small communities. The goal is to develop in an integrated way the total development of the 13 coastal and 3 other basin communities in a way that will give a holistic view of where and when development conflicts with sustainability.

Section X

Some Lessons for Water Governance

No matter the resource endowment countries cannot escape basic elements, including the dependence of governance on underlying economic and social conditions, the scarcity of internal economic resources in many cases, the existence of new external pressures in addition to internal forces for development. Despite the simultaneity of pressing development issues, nations must resist the temptation to follow the sequencing of concerns seen in earlier historical cases, particularly by postponing sustainability goals. Under present conditions sustainability and economic development are not separable. This is in part because, contrary to the more costly sequential historical examples, the most efficient moment to build sustainability into a water system is in the early stages of its design and construction. Nonetheless, it is important that the international circle of experienced water managers help those facing intensely stressful situations by shaping and espousing the principles of IWRM, so that they make long range prudence actually achievable in present real-world circumstances.

We started with some principles of what we could expect of good governance and reviewed the conceptual and empirical foundations of water governance. What we have found is that while there are many different schools of thought concerning theory, the practice will make itself clearer if careful *post-hoc* examinations are carried out. While the case study material presented here is not complete it does seem to carry some important governance messages. First, and foremost, governments and states are likely to get into serious political and social difficulties if they ignore the ideas of participation and openness. The Buenos Aires case shows how a project with excellent economic outcomes (as predicted from the outset) can lead to social conflict when these two principles are ignored. On the other hand, maybe the Brazilian water case shows that the cost of full participation may be excessive delay and a near institutional paralysis. The Mexican case shows how a formerly strictly hierarchical government agency can decentralize decision-making and devolve power down to the level of farmer's groups. However, by not looking at the broader water system some opportunities for more efficient water uses have been overlooked. The Chilean case is *sui generis*. Chile has been a world leader in water governance, and as such has had few examples to follow. The external governance of the Chilean experience is instructive since there was a major commitment to developing the entire economy on an export-oriented open basis. Water just had to follow suit. Many mistakes with openness, transparency, participation, and ecosystem concerns were made in the hurry to get effective water markets set up. However, the genius of the system is that it is adaptive and now these concerns are being addressed 20 years after the initial laws were

passed. Recall that 20 years is a very small time span with respect to water policy and governance: it took the US almost 200 years to finally build in participation and ecosystem concerns into its water governance. Most countries are now trying to accomplish this within 20 years! The case of Lago de Yojoa in Honduras shows an attempt to build water governance from the bottom up. It is too early to say whether it will be successful or not, but the structures for integrated development of all resources at the local level certainly looks promising.

It is possible, of course, to view water governance in a too complex way ignoring some of the essential prerequisites. First, and foremost, is the existence at the national level of a commitment to develop water policies and strategies. Without this commitment nothing will work. If it does not exist the commitment can be developed over time by means of local NGO or international encouragement from outside agencies. Given this national commitment, then a further set of prerequisites can be identified—namely, laws and institutions. Both of these are dependent upon the national commitment to a changed water policy and also to the interplay of the various political and institutional actors outlined in this paper. The actual design of these laws and institutions are, as the case studies attest, likely to be different in each country.

The major driver of the types of water governance developed within a country is likely to be the distribution of the economic benefits and costs of state intervention and how they are spread over society. There is a wide spectrum of the particular regimes of governance depending upon this distribution and which can lead to many differing political outcomes. In formulating water policy and water governance it is imperative to examine these potential regimes *ex ante*—*ex post* may be too late to easily remedy poor outcomes.

Under this time pressure the empirical approach of trying an approach and then modifying it as problems become apparent has a great deal to offer the countries in Latin America. Institutions, such as the Inter American Development Bank and the other multilateral and bilateral financing institutions, have a great deal to offer to the Latin American countries in terms of encouragement to choose governance policies that address the economic, environmental and social in an integrated and holistic manner. The encouragement could be in the form of intellectual sharing, institutional capacity building, and even in financing of appropriate institutions. The support, should not, however, be short term, for as the cases demonstrate it takes a long time for the policies to be implemented and the consequences felt.

Some general observations about water governance based upon this paper are:

- Governance depends to a large extent on the underlying economic and social conditions
- There is no one prescribed approach to governance that will work in all cases
- Much more is known about *bad governance* than about *good governance*
- The role of government in sponsoring civil society can be pivotal to good outcomes
- The role of governance mechanisms outside of the water sector can be critical to the success of water governance within the sector
- The positive roles played by government bureaucrats and public sector labor unions generally are under appreciated in the general discussion of governance
- Institutions, laws, and management systems develop slowly and adapt to often rapidly changing environmental conditions. (Sequencing)
- The current rapid pace of economic, social, and environmental change threatens to overwhelm the capacity of the countries in Latin America to develop laws, institutions, etc. at a more measured pace. (Simultaneity)
- Because of the simultaneity of pressing development issues, nations in the Latin America must resist the temptation to follow the sequencing of concerns as happened historically in the North. Under present conditions sustainability and economic development cannot be seen as separable.
- The development of water governance in the developed world was typically driven by internal forces (economy, population, declining resources, political pressures). This is not the case in the developing world which is experiencing external pressures from bilaterals, multilaterals, and international NGOs at the same time as it is experiencing the same internal pressures as the developed countries. (Stress)

Table 1: Framing Regimes through Public Choice Theory

Distribution of Costs of State Intervention

<i>Distribution of Benefits of State Intervention</i>	Concentrated		Diffused	
	Concentrated	INTEREST GROUP POLITICS	CLIENT POLITICS	
		Organized lobby activity: high but contradictory Expected outcome: deadlock, compromise, policy see-saw	Organized lobby activity: high but one-sided Expected outcome: stable capture	
	Diffused	ENTREPRENEURIAL POLITICS	MAJORITARIAN POLITICS	
Organized lobby activity: low unless 'policy entrepreneur' intervenes Expected outcome: Inertia bias, may be offset by entrepreneur activity		Organized lobby activity: low Expected outcome: Inertia bias except after calamity		

Source: Rees (2001)

Table 2: Institutional Framework for Water Governance in Latin America (adapted from Garcia, 2000)

Country	Levels	National Responsibility	Province or State Responsibility	Watershed or River Basin Organizations
Argentina	National and Provinces	Water Resources Under-Secretariat, Public Works Secretariat, Ministry of Infrastructure and Housing	varied: administrations, authorities, bureaus, departments, ministries of ecology and environment	Bi and Trilateral commissions with neighboring countries
Bolivia	National	Presently: varied. Proposed: National Water Authority to be the Ministry of Sustainable Development and Planning (MSDP). Advised by a Water Council.		Proposed: tech support to the MSDP by a National Watershed Commission
Brazil	National and States	Water Resources Under-Secretariat, Ministry of Environment, Water Resources and Legal Amazon. National Water Resources Council. Recently, the National Water Agency (ANA) was created (2000)	State Water Resources Councils. Water Resources Secretariats	River Basin Committees and Water Agencies, as part of the whole system
Bahamas	National	Bahamas Water and Sewage Corporation Proposed: National Water Resources Advisory Council		
Jamaica	National	Water Resources Authority		
Costa Rica	National	National Weather Service, Ministry of Environment and Energy. The institutional framework is being revised. There is a single regulatory entity for all services		Several watershed Committees, unrelated to the whole system
El Salvador	National	Presently no single authority. Proposed: a water supply regulatory entity and a water resources regulatory entity		Proposed: allow the formation of river basin committees. Creation of a pilot river basin organization
Honduras	National	Proposed: General Water Resources Directorate, Environment and Natural Resources Secretariat. Institutional framework being revised		Proposed: river basin organizations at municipal and local level.
Nicaragua	National	Proposed: A National Water Authority.		
Colombia	National	Within the National Environmental System, which includes: Ministry of Environment, Regional Autonomous Corporations, Municipalities.		Regional Autonomous Corporations

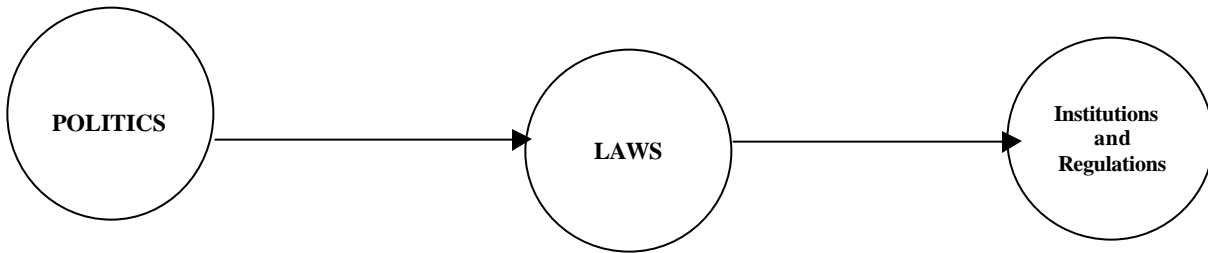
Cuba	National	National Water Resources Institute.		
Ecuador	National	National Water Resources Council. Proposed: Public sector as regulator only.		
Guatemala	National	Presently, no single authority. Proposed: As part of a Natural Resources Institute, within a Ministry of Environment.		Lake watershed authorities.
Haiti	National	Presently, the Ministry of Agriculture. Proposed: A National Water Council under the Ministry of Environment.		Proposed: watershed organizations.
Mexico	National and States	National Water Commission (CNA) under the Environment, Natural Resources and Fisheries Secretariat.	Diverse Secretariats. Proposed: decentralization of CNA.	Basin Commissions as part of the whole system.

Table 3: Types of River Basin Organizations in Latin America (Garcia, 1999)

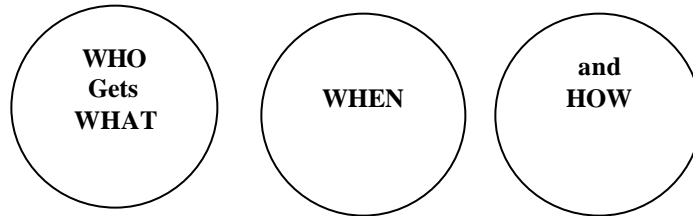
Type of RBO	Main actors	Origin or main purpose	Role in planning and operation of dam projects	Selected examples
Watershed management	Central government as executing agency for specific projects. User and community organizations. Bi or tri-national commissions.	Rural development within its boundaries, or downstream effects in a hydraulic structure or hydrological regime.	Negligible. If a dam is present, it preceded the watershed management activities.	<i>Alto Lempa</i> , El Salvador. <i>Paute</i> , Ecuador. <i>Yaracuy</i> , <i>Bocono</i> , <i>Tocuyo</i> , Venezuela. <i>Trifinio</i> , Guatemala, Honduras, El Salvador.
River basin management	Government, municipalities, user and community organizations, civil society, stakeholders. Not necessarily the same in all RBOS.	Co-ordinate actions of government and NGO for solving overriding problems in the basin, usually pollution. Also implement water resources and environmental management process.	Usually small. There may not be a dam, or it may already have been built, or the government needs coordination for its construction. Same with other hydraulic projects.	<i>Tárcoles</i> , Costa Rica, <i>Amatitlán</i> , Guatemala, <i>Guaiba</i> , <i>Mogi-Guaçu</i> , <i>Apa/Miranda</i> Brazil. <i>Alto Lerma</i> , Mexico.
International boundaries and waters commissions	Ministries of Foreign Affairs. Supporting technical government organizations.	Forum to agree on differences about boundaries and use of transboundary waters or to implement an International Treaty.	Very little. If a dam is involved, it has been planned and designed by national organizations. The commission is used as a clearinghouse with neighbouring countries.	Mexico, Guatemala, El Salvador. <i>Plata Basin Committee</i> Argentina, Bolivia, Brazil, Paraguay, Uruguay.
Binational or Tri-national river basin commissions	Binational and tri national entities supported by the respective governments. Some may be entitled to draft, bid, finance and administer hydraulic projects. Some tend towards privatisation.	Usually formed for construction or operation of an international project. Some disappear after the project is operational. Some continue and generate other projects within their jurisdictional areas. These areas usually do not cover the whole basin.	Important, since some of them are able to promote new projects.	<i>Rio Bermejo</i> Argentina, Bolivia. <i>Salto Grande</i> Argentina, Uruguay. <i>Itaipú</i> Brazil Paraguay. <i>Yaciretá</i> Argentina Paraguay. <i>Pilcomayo</i> Argentina, Bolivia Paraguay
Regional corporations	Originally created for a decentralised public administration. Recently adapted for environmental management.	Autonomous organisations. May include the participation of local governments, civil society and other stakeholders.	Important, since some of them are able to plan and build infrastructure, including dams.	<i>Corporación de Cundina-marca</i> , Colombia

Figure 1
Relationship of Governance to Politics

Old Paradigm



Lasswell's Definition of Politics



New Paradigm

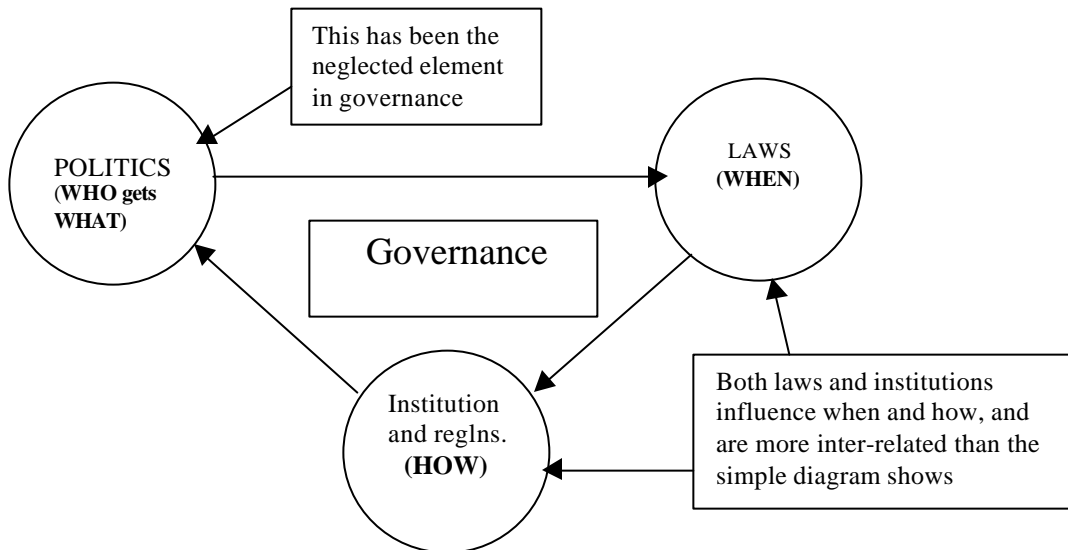
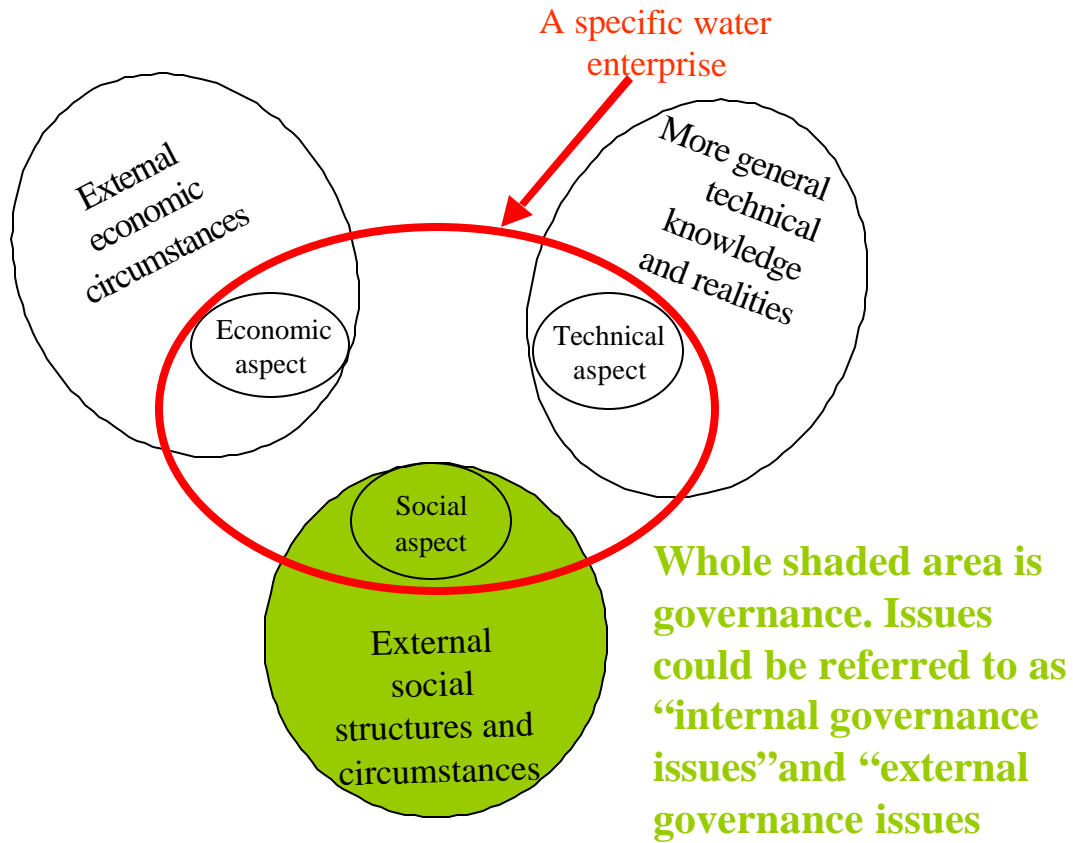


Figure 2
Schematic of Water Governance



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Annex I

Some Illustrative Case Studies

Case Study I: Irrigation Reform in Mexico

Based upon and abstracted from :

Gonzalez, Fernando, *Irrigation Reform in Mexico*, World Bank, 1998.

Velez, Enrique Palacios, *Breve Evaluacion del Proceso de la Transferencia de Distritos de Riego en Mexico*, International Congress of the Transfer of Irrigation Systems, Colegio de Postgraduados, Mexico, April 2-9, 2000.

Davila, Sonia, *The Organization of Small Irrigation Units*, Draft Technical Report for the National Water Commission, Mexico, 2000.

History of Irrigation in Mexico

Mexico has a long tradition in Water Resources Management and Development. There are 2,140 dams with a storage capacity of more than 50,000 cubic meters of which 505 can be classified as large dams (according to international standards). The country has more than 80,000 deep wells, 2,600 diversion dams, and 81,000 kilometers of drains and canals. Mexico has 6 million ha under irrigation, which makes it the seventh country with largest irrigated area in the world.

In an annual average, about 5,000 cubic meters of water are available per inhabitant, which is considered favorable, but on a watershed basis, in more than 50% of the country water is a scarce resource with a per capita availability of less than 2,000 m³ per year. Water for irrigation purposes represents 88% of the total consumption, the rest is used in equal proportions by urban areas and industry. Population growth and economic activities have contributed to the decline in water quality, mainly in densely populated areas, where 90% of pollution load is concentrated in 20 watersheds.

The share of agriculture in GNP has declined from 30% in 1940 to 8.4% in 1993. This percentage does not fully reflect the importance of the sector that employs 23% of the economically active population, and provides income and employment for most of the rural areas, where 30% of the population live. Irrigated agriculture contributes 50% of the total value of agricultural production and accounts for about 70% of agricultural exports. Irrigation development has been an important issue during the 20th century. The

area under irrigation has increased from 700,000 ha at the beginning of the century to 6 million ha in 1994.

Irrigation water policies have their roots in the 1917 Constitution, where water was declared national property, to be utilized only under previous authorization from the corresponding Federal Authority. Therefore, laws and regulations have developed over the last 80 years to define the scope of the Government's action, as well as the rights and obligations of public and private individuals and institutions that wish to utilize this national resource.

Some turning points in the institutional development of Mexico's water resources are:

- the creation of the National Irrigation Commission (NIC);
- enacting the Irrigation Law, both in 1926;
- the integration of water management within the Ministry of Water Resources (MWR) in 1946;
- the development of water resources through River Basin Commissions in the 40's and 50's;
- the development of large regions such as the northwest in the sixties;
- the integration of the first National Water Plan in 1975;
- the integration of the MWR to the Ministry of Agriculture (MA) in 1976; and
- the creation of the National Water Commission (NWC) in 1989.

Until 1926, the Mexican Government promoted irrigation through the concession of water and land to large landowners (Haciendas) and irrigation companies. A fund created to promote irrigation resulted in a subsidy leading to the concentration of income and resources in few families. Construction and operation of irrigation systems were under private administration. Theoretically, full cost recovery of investment and O&M was guaranteed, but the fund was not able to recover its loans.

In 1926 a change in policy was evident; the Irrigation Law and the creation of the NIC as a semi-independent body of the Ministry of Agriculture (MA), gave way to a new era. The Government's role was to build and operate irrigation infrastructure in order to increase agricultural production, settle the northern areas and promote regional development, mainly along the US border. All the regulations stated full recovery of investment and O&M, but actually only O&M costs was recovered. The idea was to create a class of middle farmers of about 100 ha. of irrigated land. The Law stated that the NIC should transfer the O&M of the systems once the users were capable of running them.

In 1935, the nationalization of oil and the land reform implementation promoted a change in national policy. The land reform strategy included irrigation, its main goal being to distribute the existing and new irrigated areas among small and poor farmers. This scheme did not promote cost recovery since water fees were conditioned by the user's capacity to pay. During this period, small irrigation was encouraged and the O&M of the irrigation districts (ID) was transferred to the National Agriculture Bank (NAB) with the idea of further passing this responsibility to the users. The O&M of mayor infrastructure and construction of the new irrigated areas remained within the NIC.

From 1935 to 1951 the O&M of the irrigation systems changed from the NAB to the NIC, then to the MA and finally to the new Ministry of Water Resources (MWR), created in 1946. During these 16 years, changes in responsibilities of Central Government Institutions reflected the struggle among different groups to control and manage irrigated agriculture. The MA argued that, in order to plan and improve productivity in the agricultural sector, O&M of irrigated systems should be its responsibility. The NAB wanted to link the agricultural credit to the recovery of investment and O&M costs. The MWR wanted responsibility of O&M due to the close technical relation between construction of infrastructure and O&M. During this period, an explicit policy required gradual transfer of the O&M of the IDs from the Government institutions to the users. In any case, the NIC had the responsibility to operate and maintain the storage and diversion dams, main canals and special structures, charging the users the cost of O&M. By 1950, 10 of the IDs were operated by users.

In 1951, an evaluation of the status of the IDs showed that lack of proper maintenance had caused malfunction of the control structures and a decrease in the capacity of distribution and drainage networks. Therefore, the area under irrigation decreased and the conflicts among users, that were not getting water on time, grew in the majority of IDs. To improve the performance of irrigated areas, in May 1951 a presidential decree was issued empowering the MWR to carry out the construction and O&M work of irrigation projects in order that "infrastructure and water could efficiently fulfill their economic and social objectives". A Directive Committee was formed in each ID including one representative from the privat sector and one from the social sector.

From 1952 until 1975 the MWR operated and maintained the IDs, using the Directive Committees as a mechanism to coordinate the actions of Government institutions and increase user participation. A successful program for the improvement of water distribution and on-farm water efficiency was launched; cost recovery of O&M was about 80%. However, the basic goal of transferring O&M to users was not developed and little attention was paid to the O&M of small irrigation.

The National Water Plan was formulated in 1975 with a time horizon of 25 years with the objective to define a strategy and policy for water resources management and development. The plan concluded that, although the country's national water balance showed a surplus, many regions were already experiencing critical deficits or a fragile equilibrium. In some watersheds and aquifers, water pollution was restricting water use and development even further. The National Water Plan stressed the need to implement policies to increase water use efficiency and to restore and improve water quality. Improving water management required adjustment in the Institutional and legal framework and greater participation of water users. Basic recommendations were:

- Reinforcement of regulations through a sole water authority.
- Integrated water planning and management.
- Adequate coordination.
- Decentralization of responsibilities.
- Introduction of pricing and other economic incentives to induce efficient water use and pollution abatement.
- Greater participation of users and specially the transfer of O&M of IDs to users.
- Development of a research and training program to support institutional improvement.

At present, 3.2 million ha are organized into 80 irrigation districts. The National Water Commission (NWC) managed these districts before they were transferred to Water User Organizations (WUO). About 2.8 million ha are privately run or collectively run small systems called irrigation units, 50% of which are ground water supplied. About 2.2 million ha of irrigated land is concentrated in 17 irrigation districts of more than 50,000 ha.

Reorganization of the Irrigation Sector

The basic recommendations of the National Water Plan were not introduced until 1989, since in 1976, a change in Government administration emphasized an administrative reform by economic sectors that gave way to the creation of the Ministry of Agriculture and Water Resources (MAWR) and disappearance of the MWR. As water management was fragmented, the IDs were integrated into the Rural Development Districts. By the end of the period 1976-1988, the infrastructure of the IDs was not properly maintained, water charges collected covered only 18% of O&M costs, and water use efficiency had declined. The concentration of population and economic activity continued to be an important factor in water unbalances and pollution problems. Financial constraints made it more difficult to achieve goals in the construction of new infrastructure and rehabilitation of the existing one, but the core problem was the lack

of an institutional setting that could promote a more efficient water use and restore the quality of the national waters. In February 1989, the first step towards policy implementation was taken with the creation of the National Water Commission (NWC) as a semi-autonomous agency of the MAWR, to become the sole federal authority dealing with water management.

The New Water Policy was part of the National Development Plan of 1989-1994. It called for a Government's new role to promote social participation, private investment, opening of the domestic production to external competition, rationalization of subsidies and privatization of non strategic public enterprises. Within this framework, water policy had three basic objectives: 1) develop infrastructure to eliminate gaps in water services; 2) promote efficient water use, specially in regions with scarcity and in the sectors where the existing infrastructure was not properly used; and 3) improve water quality, specially in watersheds and aquifers that were the most affected by pollution.

Under this framework, the most highly controversial, at highest level of Government, was the transfer of O&M to the IDs. This decision was taken due to the new national policy that redefined the role of the Government as responsible for regulation and promotion and not as an operator of irrigation works. Factors in the decision also were the inefficient and non-sustainable government operation of the IDs, the reduction of the budget for irrigation, and the lack of confidence of the users in the existing administration of IDs.

In a first stage, a Program for Modernization and Decentralization of the IDs was prepared for the period 1990-1994. This preparatory stage of the program took more time and discussion than was anticipated. Long meetings with Government officials within NWC and the MA, as well as with leaders of the users, sought consensus about key aspects. The drafting of legal documents to be negotiated with users took a long time and effort from a multidisciplinary group.

Under the program, the 80 IDs were classified into three different categories; 21, comprising 1.98 million ha, considered the most advanced in agricultural technology, infrastructure and social organization, could be modernized and decentralized with less effort. Approximately 40 IDs, with 850,000 ha were considered less developed and had to undergo a rehabilitation and organization program before the transfer. The other 19 IDs with about 400,000 ha, had special difficulties so they had to be carefully analyzed in order to establish special strategies before transferring O&M to the users. Each ID was to be divided into "hydro social" units called "módulos", that were going to be operated and maintained by the Water User Organizations (WUO).

Operation, maintenance, and management of the IDs were defined to be responsibility of the water user organizations (WUO) in partnership with the NWC. The NWC no longer manages the entire system, it provides “water in bulk” to the WUOs, operates and maintains headworks for which users must pay. In some cases, an association of WUOs, called *Sociedad de Responsabilidad Limitada de Interés Público* (SRL), could operate and maintain main canals and large drains. The NWC also provides information about institutional and organizational issues, such as financing irrigation technology, crops and water management. The NWC also participates in conflict resolution and insures that infrastructure is repaired in the event of floods or other extreme situations. The WUOs are responsible for O&M of the “módulo”, including the maintenance of canals, drains, structures and roads. The NWC concedes its equipment and machinery and acquires new machinery to favor an easy start-up and technological improvement of O&M. The work is done or contracted by the WUO’s manager. The manager hires a chief of ditch-riders, a secretary and an accountant. In many cases, the manager and the rest of the personnel are selected from among previous NWC employees.

At the “módulo” level, before the beginning of a cropping season, farmers submit their cropping plan to the WUO. The WUO’s staff uses the individual plans to prepare an irrigation plan for the “módulo”. Once the manager of each “módulo” formulates the preliminary irrigation plans, they are sent to the district office of the NWC. The NWC reviews the plans collectively, and approves the water allocation for each “módulo”. Adjustments may be needed at districts or “módulo” level. Water is delivered to the “módulos” by a block system (bulk), through volumetric measurement, according to the schedules agreed between the WUOs and the NWC. Equity among “módulos” is an important consideration in the allocation. Any requests for changes during implementation of the irrigation plan must be made to the Hydraulic Committee of the irrigation district and approved by the district office of the NWC. The National Water Law provides a framework to establish water markets among the users of a “módulo” and among different “módulos”.

In the second stage, the NWC determines the irrigation districts to be transferred, the physical boundaries of the “módulos” to be established and a master plan for the complete transfer.

Institutions

The NWC is the sole water authority at national level in charge of water management and planning, construction and O&M of hydraulic infrastructure. In order to respond to regional water management, the NWC has 6 Regional Management Offices that are responsible for the administration of water within the

watersheds and to provide technical support to 32 state offices. In the state offices the ID Head Offices are responsible for the operation, maintenance and supervision of the irrigation systems at the district level.

The Mexican Institute for Water Technology (IMTA) is a research and training institute in water technology in charge of supporting the capability building programs of the water sector institutions. It was specially designed to promote water efficiency and water quality preservation.

The Hydraulic Committee is the highest decision-making body at the ID level. It is composed of representatives from the WUOs in the district and the Irrigation District Head Office. It is responsible for approval of special regulations to operate and manage the irrigation district, promote dispute resolution, follow-up the O&M programs, and give opinion regarding water fees.

At the módulo level, farmers willing to organize themselves to operate, maintain and manage a “módulo” in an ID, must form a non-profit organization called “Asociación Civil” under the local legislation. The WUO is also entitled to collect and administer the water fees received from users and perform, as a second priority, other activities related to irrigated agriculture. The organized users should be capable of hiring professional staff to fulfill their tasks. They need also show the corporate status and technical capability to operate and maintain the infrastructure (which is national property), and to distribute the water concessioned to them. A General Assembly, an Executive Council, and an Oversight Committee administrate each WUO.

At district level, to decrease the O&M costs, the WUOs of an ID may form an organization (SRL) to operate and maintain main canals, large drains, and the corresponding roads. Finally, the WUOs have organized themselves into a National Association of Irrigation Users to join efforts and to provide a national forum for discussion and sharing of experiences.

Legal Framework

The 1917 Constitution declared water as natural property and the Federal Water Authority must license any person or organization desiring to utilize it. The National Water Law promulgated in December 1992 and its regulation of January 1994 supersedes the Federal Water Law of 1972 as the legislative framework for the efficient management of national water resources. The new law requires greater user participation

in water management and establishes NWC as the federal authority for water management. The Water Law states that by the year 1996, users must operate all IDs.

The establishment of WUOs must be formalized through a title granted by the local state legislation stating the objective of the organization, the governing bodies, and the procedure to elect them. The title must be deposited with a notary public. The objectives, membership and organizational structure must be in accordance to the approved guidelines issued by the NWC.

A WUO must receive a title of concession of water and a permit to utilize the hydraulic infrastructure so as to be authorized to operate, maintain, and manage an ID. The water concession, which is a water right must be registered in the Public Registry. This registry ensures legal certainty of water rights, solves problems associated with third party effects, and provides the background information necessary for the operation of the water markets. To stipulate procedures for efficient management, the set of instructions for operation, maintenance and administration is an integral part of the title of concession. Another important document is the inventory of infrastructure machinery and equipment to be transferred.

From the start the Mexican model had all the irrigation water under the Ministry of Agriculture, the industrial water under the Ministry of Industry and Commerce and so forth. After President Salinas de Gortari under President Zedillo all of the water uses (agriculture, industry, fisheries, etc) were put under the Environment and Fisheries Ministry, but all of the programs that had to do with sanitation and drinking water were handed over to the state and municipal authorities. Currently the fisheries sector has gone to the Ministry of Agriculture and everything else stays with the Secretariat for Environment and Nature (SEMARNAT). The problem with this is that SEMARNAT is above the NWC, yet the law recognizes the NWC as the principal authority on water issues. As a result there are constant clashes between the institutions concerning responsibilities. Meanwhile the programs that were handed over to the states and municipalities are suffering because the states and localities do not have the trained manpower to implement them.

What Happened?

In 1994, after four years of the implementation of the modernization and decentralization program, 2.45 million ha, approximately 77% of the IDs, had been transferred to 316 WUOs and five SRLs. The program included 319,451 users from 38 IDs that were fully transferred and 16 that were in the process

of being transferred. The area of IDs transferred exceeded the original target by 30%, mainly due to the interest of users that visited the WUOs and learned about the advantages of the program.

The experience gained during the implementation period gave way to the new National Water Law that was enacted in 1992 and the regulation approved in 1994. Therefore, the present legal framework is a realistic instrument, which it also provides support for future development.

The extensive negotiation that took place during the transfer proved to be a learning process for both users and Government officials, and highlighted the importance of O&M and the acceptance of users to pay for it. This allowed full O&M cost recovery for the transferred IDs, including the cost of headworks made by NWC. Water fees paid by users allowed for recovery of 80% of O&M countrywide. The NWC used the subsidies that were previously granted to O&M to rehabilitate and modernize the ID, considerably increasing resources for the improvement of IDs. It is estimated that deferred maintenance was eliminated in 1.2 million ha. As a result of the program, water distribution efficiency increased from 57% in 1988 to 65% in 1994. The decentralization program will be further enhanced by the On-Farm Development Program, in which WUOs play a key role in project development and implementation. Financial resources are available through three different sources: fiscal funds, a loan from the World Bank, and resources from the WUOs.

The Colegio de Postgraduados, an academic independent institution, studied 4 IDs in different regions to evaluate the success of the program. The study consisted of a survey of Executive council members and farmers, taking water management and economic and social factors into account. Some of the findings were:

- About 80% of the surveyed farmers in the four irrigation districts said that the transfer of the district to WUOs improved water management and allowed for timely and adequate water delivery and maintenance of the irrigation systems.
- About 45% of the farmers thought the water fees were high.
- In the opinion of most users, communication between the WUO and the SRL or the WUOs and the NWC was acceptable but that in some cases efforts were being duplicated. Most of the users thought the WUO supported production but a small percentage believed it was the leaders of the WUOs that benefited the most.
- Most of the irrigation districts have reached financial self-sufficiency, but large variations in the availability of water affects income of the WUOs, which endure financial difficulties in times of water shortages or heavy rainfall.

2000: 100% of water users have been registered

2000: by December 31, 25 River Basin Councils, 6 River Basin Commissions, and 34 Groundwater Technical Committees (COTAS) had been created.

It is hard to evaluate each of these developments, but Davila (2000) indicates that the 25 river basin councils have reduced their work to the administrative and technical aspects of deciding, 1) how much water was captured in the rainy season, and 2) how much of the water should be allocated to each state according to its irrigation needs. The 6 river basin commissions function only when there are concrete specific questions to be addressed (dead Canadian geese in the Rio Turbio) and are not active otherwise. The big questions remaining for water governance in Mexico, and for other countries wishing to emulate Mexico, are; 1) should there be one institution in charge of all water issues, or 2) should there be one institution ruling water use while each sector takes care of its own water users, or 3) should there be one institution at the state level where the governors and local governments take care of adjusting to their resources leaving the NWC (or similar federal institution) to deal with allocation among the states.

Case Study II

Water Resources Policy and the New Water Law in Brazil

History

Based upon and abstracted from:

Porto, Monica, and Jerson Kelman, *Water Resources Policy in Brazil*, mimeo, 2000

Garrido, Raymundo, *Annex II: Water Resources National Policy in Brazil*, mimeo, undated.

This case study describes the policy and the management system as established in Brazil by the National Water Act of 1997, and discusses the many challenges facing the country as the government seeks to implement the Act and the later adjustments which created the Agencia National de Agua (ANA) in 2000.

The previous governing legislation, the Brazilian Water Act of 1934, was promulgated at a time when Brazil was changing from an agricultural to an urban-industrial society. Economic uses of water had to be regulated and the main criterion was to provide a safe yield of water supply for development of the country's significant hydropower potential. Although the law was innovative at the time--with provisions for pollution control, including the "polluter-pays" principle, it was never completely enforced. It was used mainly to regulate hydropower uses.

Because Brazil was reforming its constitution during the 1980s, the time was right for change in water governance. When the constitution was approved in 1988, Section 21 explicitly defined a National Water Resources Management System (Constitution of Brazil, Title III, Section 21 (XIX)). It defined water as a public good, administered by the Government (Constitution of Brazil, Title III, Section 20 (III)). The Constitution assigns the responsibility to administer water use in rivers, rather than in river basins, either to the federal government or to the state governments. Rivers that run entirely within state borders are administered by the state. Large rivers that flow through several states, or that serve as a border between states, are administrated by the federal government, although tributaries may be administrated by different state governments. Given this legal arrangement, water resources management at the river basin scale is dependent on the coordinated efforts of state and federal Governments.

From Theory to Practice

In countries, such as Brazil, that do not use Common Law, theory precedes practice. As mentioned above, Brazil's legal structure is based on the Constitution of 1988, which calls for the establishment of the National Water Resources System, to be detailed in a law. Before this law was discussed in the National Congress, the São Paulo State Congress approved a water resources law, in 1991. Many other states issued their respective laws, very much inspired by the law passed in São Paulo. The result is a homogeneous set of state laws. Application of the state laws to real cases would result in improvements in the legal system. In fact, this has already been observed. For example, the Water Resources Ceará State Law, approved in 1992, relied heavily on the action of the state government, through the agencies of the direct administration. However, it soon became obvious that the direct administration is too constrained (e.g., directors cannot hire or fire, no incentives for seeking efficiency) to be capable of implementing something new—such as water resources management at the river basin scale—that requires a long time to mature. For this reason, in 1993 the State of Ceará created a State Bulk Water Company -- COGERH—to act as the river basin agency for all river basins in the state. The lesson is that the Ceará Water Law was barely a year old before reality forced the creation of an entity not included in the law.

Pricing bulk water use, or alternatively, pricing water permits, may generate a substantial cash flow. To reduce any tendency to centralize the decision-making process, the water law calls for the formation of river basin committees, which would be formed only in basins with water allocation conflicts, actual or potential, and where stakeholders would be sufficiently committed to oversee the water issues. If these conditions are satisfied, then a river basin water agency should be created to function as an executive branch of the river basin committee. These water agencies would be Brazilian equivalents of the river basin agencies in Germany or France, or to the water district in the United States. However, river basin scale management is appropriate in most cases, but not all. Hydroelectric power plants in different river basins can be electrically interconnected. When a drought strikes a particular river basin, sometimes for several years in a row, the system may be sustained by power plants located in different river basins, separated by thousands of kilometers. In these circumstances, the electric power sector will tend to plan and operate the reservoirs from the interconnected system perspective, rather than from the river basin perspective.

The proper mix of representatives on a river basin committee can make a big difference. Limited experience has shown that if the NGO's outweigh the users' representatives (e.g., water-supply/sanitation companies, industries, irrigation districts, power companies), the decisions of river basin committees tend

to be unfeasible because those who make the decisions do not have to pay for the consequences of their decisions. On the other hand, if decisions are left only to users, there is a risk that the environment would not be properly preserved for present and future generations. Also, the composition of the committees often requires many members, especially when they accept the “one man, one vote” concept. To avoid the associated transaction costs, the committees have adopted a decision-making process based on “weighted votes” for each category represented on river basin committees (similar to what happens in an assembly of shareholders of a private company).

One of the most awkward features of the water law is that it calls for yet another law to establish the criteria and juridical personality of the River Basin Agencies. Until the new law is passed, there will be a vacuum. Some efforts are being developed to ensure that, under the present legal structure, a “technical office” would temporarily perform the duties of the future River Basin Agency. In Ceara, the State Bulk Water Company, COGERH, that plays the role of the water agency for all the river basins in the state, was created before the existence of any river committee. Only after COGERH demonstrated positive results in managing the supply of bulk water (with the participation of the stakeholders) and after water users were better organized at the reservoir scale, did COGERH proceed to organize the river basin committees. This historical evolution is contrary to the concept embedded in either the national or state water laws that offer protections against the capturing of a river basin committee by its agency. Although this is a legitimate concern, the Ceara example demonstrates how difficult it is to build a complete legal system all at once. It would be preferable to build a legal system through an iterative process, which relies on actual experience.

Water use permits should apply either to quantitative uses of water, such as irrigation or urban supply, or to qualitative uses, such as dilution of industrial and urban waste. In most cases, however, quantitative and qualitative permits are issued by different government agencies, which are often rivals. Ideally, both kinds of permits should be issued by the same agency. Because of this, the same yardstick should be adopted to reduce quantitative and qualitative uses to a common basis.

Pricing bulk water should not be a source of revenue for governments, because there is a widespread disbelief in Brazil that the government is capable of carrying out new policies, such as the rational use of water resources. Instead, the corresponding river basin committee should preferably use the revenue in the same river basin where it originated. Ideally, revenue should decrease with time because the money raised with the bulk water fee should finance improvements for the river basin as a whole. This is a strong

argument against those persons which believe that accepting lower environmental standards is the only hope for developing countries to compete in the global market.

River basin committees do not need to be established across the board. Committees should be formed only in basins, or sub-basins, which have some water conflict, actual or potential. Local problems may induce the formation of committees for some of the upstream sub-basins. In this case, it is necessary to create a hierarchical relationship between basin and sub-basin committees, preferably to ensure the right of the committee of the larger basin to impose boundary conditions for the river flow, quantity and quality, leaving the sub-basin. This means that the sub-basin committees would be free to decide matters internal to the sub-basin without external interference, provided that the boundary conditions are respected.

In intermittent rivers of the semi-arid region of the Brazilian Northeast, continuous flow of water is assured for limited river reaches downstream from each dam. In these circumstances, it is more relevant to establish users association for each reservoir, rather than river basin committees. When it comes to flood control, community participation in the selection of solutions is highly useful. However, because flood protection is a community rather than individual benefit, government financing is unavoidable.

Governance Lessons Learned

The major lesson learned from the Brazilian case is that it takes a long time to formulate policy and legislation in a truly consultative and participative manner. It took the Brazilian government 13 years, from 1984 until 1997 to craft the National Water Act, and three more years to eventually pass the legislation establishing the institution, the ANA, which has the responsibility to carry out the 1997 National Water Act. Now that it has some of the most carefully crafted legislation, well thought out institutions, and has established the mechanisms for consultation and participation, it remains to be seen how well this system of governance will perform.

In the literature on these national actions (Porto, and Kelman and Porto) there is much discussion on structure, legislation, institutions, and regulations and very little on the actual political context in which these will have to survive. The types of political problems to be faced are hinted at in the implementation of the state laws that were based upon the national law and preceded it in time of passage. For instance, the problems alluded to above concerning the need to change the 1992 Ceara State water law the following year (1993) in order to create a bulk water company (COGERH) to act as river basin agency for

all river basins in the state. Ceara is a progressive state and Tendler (1998) describes some of its water governance problems.

Case Study III

Introduction of Markets into Chilean Water Resources

Based upon and abstracted from :

Briscoe, John, Pablo Anguita Salas, and Humberto T. Pena, *Managing Water as an Economic Resource: Reflections on the Chilean Experience*, mimeo, 10 pages, World Bank, Washington DC, July 1997.

Pena, Humberto, *The Role of Water Markets from the Perspective of the Utilities of Chile*, World Bank Water Week, 1997.

Bauer, Carl J., *Slippery Property Rights: Multiple Water Uses and the Neoliberal Model in Chile, 1981-1995*, *Natural Resources Journal*, Vol. 38, winter 1998, pp. 109-153.

History

There are few countries in the world that have seriously conceptualized what it means to deal with water not only as a natural and social resource, but as an economic good, too. Chile's uniqueness lies in the facts that it has put "water as an economic good" front and center-stage in its water policy, and that it has been translating this principle into practice for over 15 years.

Since the 1970s Chile has followed, with remarkable success, an export-oriented, market-based approach to economic development. There are several consequences that are of direct relevance in attempting to understand the water economy of Chile. First, there is a broad consensus across most of the political spectrum in Chile on the fundamentals -- export orientation, trade liberalization, maximum use of markets as a resource allocation mechanism and the private sector -- of economic policy. Second, the ideas of a liberal market economy are translated with consistency and rigor down into the operation of each and every sector of the economy. However, studies on the impact of the legal system for water allocation in Chile for the electric industry has found that it is also common for state-owned monopolies that benefited from exclusive rights to be privatized along with them, creating legal barriers to entry that maintain the monopolistic characteristics of the sector.

In practice, as will be seen later in this paper, the application of the market concept in the water sector presents various limitations as it has been applied in Chile. Some of them are being corrected in a Water

Water markets in practice in Chile

(a) In the Limari and Elqui Basins in the semi-desert climatic zone

The Limari and Elqui are adjacent basins in a very dry area with a well-regulated river. The Limari Basin is the area where water markets are generally considered to function best in Chile. The performance of the water market in this area is indeed impressive. There is a broad range of instruments available to buyers and sellers (ranging from short-term sales of specific volumes of water, to annual leases, to permanent sales of rights). The market behaves exactly as one would wish: within a particular area water is traded from lower-value uses to higher-value uses; prices are responsive to both temporary (seasonal) scarcity as well as longer-term scarcity; trading is quite active.

The functioning of the markets (and the users' associations at various levels) in this area are impressive. But there are some problems -- some emerging difficulties in matching the location of sellers (generally in the lower reaches of the Limari Basin) with buyers (increasingly wanting the water in the upper reaches): and the fact that urban water supplies are only partially integrated into the water rights system. It is important to note that this Limari case is exceptional and unique in the Chilean context, thanks to the available infrastructure of distribution and regulation and a complete register of the water rights. The results in other parts of the country are quiet modest and , in general, from Santiago southwards, the market is not very active.

(b) In the Maule Basin in the Mediterranean climatic zone

The Maule Basin is a large basin in the relatively well-watered Mediterranean climatic zone. Water in the basin was historically used primarily for irrigation, and, more recently, for hydropower, with flows regulated by a reservoir in the upper reaches of the catchment. In the early 1980s "consumptive rights" were distributed free of charge (as elsewhere in Chile) to existing irrigators. The Chilean Water Code of 1981 distinguishes between "consumptive" and "non-consumptive" rights, with the latter primarily dealing with hydropower. (Other non-consumptive in-stream uses, such as navigation, conservation of aquatic ecosystems, dilution of pollution and control of saline intrusion in estuaries are not dealt with as "rights".) The implicit assumption is that "non-consumptive rights" will generally not interfere with prior consumptive rights -- in fact the Water Code requires that the exercise of non-consumptive rights not damage existing consumptive rights.

In practice the interactions between non-consumptive hydropower rights and consumptive (mainly irrigation) rights turn out to be complex. The Maule Basin illustrates the complexity of these interactions. First, in several cases hydropower plants return water to the river 30 or more kilometers downstream of the abstraction point. Given the density of direct irrigation off-takes from the river, this means that there are numerous irrigators whose services are affected by these “non-consumptive uses” (almost 100,000 hectares are so affected by just one power station in Maule). The hydropower companies have made an effort (as is required by law) to compensate irrigators by constructing additional distribution canals so that prior rights are respected. Inevitably, however, there are some farmers (many, in the case of Maule) who perceive (accurately in at least some cases) their services to be negatively affected as a result.

A second complication arises from the fact that, although hydropower plants do not consume water, they affect the hydrographs in the downstream areas in a number of important ways. One result of the changed flow regime is that irrigation canals are now often not of the appropriate design and greater use has to be made of adjustable gates. A second impact is that, as a result of lower silt loads in the water, there are greater problems with controlling algae in the canals. Both of these factors mean that farmers have to incur additional costs in managing the irrigation systems.

The changed discharge patterns also have important effects on the value of pre-existing water rights. Before the construction of the hydropower complex in the Maule Basin, farmers had rights to a constant flow of water during the year (regulated by the pre-existing large reservoir). The license for the power stations stipulated a non-uniform pattern of releases, related to the monthly distribution of agricultural demand. While the power companies appear to respect these stipulations, the farmers are seriously dissatisfied, for several reasons. First, the farmers’ rights have essentially been truncated, because the rights no longer correspond to a uniform flow during the year. This effectively means that farmers can no longer sell their rights to users (such as towns) which are interested only in purchasing uniform flows that can be supplied with high assurance. Second, it is not sufficient for the power plants to simply release the agreed-upon quota on a monthly basis. The loss of control of the hydraulics of the system means major difficulties for the users’ associations in operating a demand-based irrigation system, with serious impacts on the complexity of managing the system, on costs, and on the quality of irrigation service. Third, there was inadequate consultation when the release regime for the hydropower plants was stipulated, with the consequence that the farmers do not regard the agreements as legitimate. Fourth and finally, there is an “organizational asymmetry” and associated communication challenges between an industrial-type organization (the Power Company) and a much more loosely knit farmer’s cooperative, on the other.

Case Study III

Aguas Argentinas, the Buenos Aires Concession

Based upon and abstracted from :

Loftus, Alex, and David A. McDonald, *Lessons from Argentina: The Buenos Aires Water Concession*, Municipal Services Project, Occasional Papers Series, No. 2, Ottawa, April 2001.

Alcazar, Lorena, et al., *The Buenos Aires Water Concession*, Policy Research Working Paper 2311, World Bank, DC, April 2000.

van den Berg, Caroline., *Water Concessions: Who Wins, Who Loses, and What To Do About It*. Private Sector and Infrastructure Network, Note No. 217, World Bank, October 2000.

Corrales, Maria Elena, *Comments on Case Study*, personal communication, January 2002.

History

The two main arguments advanced in favor of privatizing municipal services are that it generates better public accountability and that private concessions are more economically efficient than the public sector. The main reason, however, for privatising in the case of Argentina has been the fiscal deficit. The Buenos Aires water bidding process was the first one of this nature and the biggest too. There was very limited experience in these matters and several restrictions of the water systems and/or the specific situation of the Buenos Aires services were neglected. This situation could affect the governance of the overall concession due to the fact that the Bs As concession has not resolved some of the acute services problems of the city (coverage to the shantytowns and treatment of sewerage) and had been losing the confidence and trust among the population. Water concessions create value by improving the service coverage and quality, and by improving the overall efficiency of the utility's operations. How these benefits are actually distributed depends to a large extent upon how the contract is designed and regulated by political system. The stakeholders competing for this created value are the government itself, existing versus new customers, the downstream water users, and the shareholders of the privatized utility (van den Berg, 2000, and Loftus and McDonald, 2001).

Starting in the early 1990s Argentina pioneered utility reforms in Latin America. The Menem government proposed the privatization of the water supply and wastewater system shortly after taking office in 1989. In retrospect there should have been no rush to privatize the system, but the dynamic of the economic crisis swirling around the new government (reminiscent of January 2002) pushed it to the

top of the agenda. Alcazar et al., (2000) give an excellent review of the political motivations for moving forward with the privatization. They show how the three major political forces—the military, the Radical Party (mainly middle class, and the mainly working class Peronist Party—were forced by economic deterioration of the country to unite behind a reformist government which pursued liberal economic ideas. By late 1989 the military were a discredited political force because of the ill-fated Malvinas war with Britain. This led moderate wings of both parties to form an informal coalition. This was only one of the reasons among others such the economical crisis (high rate of inflation), corruption and the political repression.

The government commenced in 1990 to liberalize trade, curb state spending, lay-off government workers, and to privatize state owned enterprises. As Alcazar et al., point out water usually has a low saliency in privatization, and both Peru and Chile who had been contemplating similar moves for Lima and Santiago delayed and ultimately abandoned their efforts. There are huge differences between the case of Lima and Santiago. In 1994, the Peruvian government tried to privatise the Lima water system, approved a new law and created a regulatory body, but the process was not successful. There are different reason for the failure, but there are two main ones: 1) private companies were not willing to accept the service's social risk and 2) scarcity of water resources. The Lima process was stopped at the very last moment.

The case of Santiago was different from the beginning (1980-84). Chile decided that the risk associated to the services was too high and the regulatory skills of the country needed to be developed. In the Chilean case they moved slowly, but during the last five years of the 90s Chile approved a new law and straightened the regulation institution. After that, they privatised Santiago services, it was not a concession, but it was a privatisation through the “venta de acciones” (stock selling) procedure.

Argentina pushed ahead because Menem sensed that he had been able to forge a win-win situation with regard to all of the major groups then active on the political scene. The politicians would be happy as this was seen as a reform move, the upper class urban dwellers would be happy with reduced water tariffs, and the two groups of his supporters—the labor unions and the urban poor—would benefit from extended water access for the whole urban population and the unions were promised a 10% of the shares of the new company. So politically it was a masterstroke, but as van den Berg (2001) pointed out, the economic and the economic distribution problems did not work out as the government and the concessionaire planned. Loftus and MacDonald (2001), Crenzel (2000), and Ferro, showed how from the viewpoint of social equity that the concession was not the great success heralded by the World Bank (Alcazar et al., 2000) and Suez-Ondeo (2001).

Public Accountability

The BA water concession, *Aguas Argentinas*, did not do very well in this category. The initial decision to create a private water concession was made without extensive consultations and was announced in a Presidential Decree in 1989. There was essentially no public debate on the subject and the first, and only, public consultation did not take place until 2000, seven years after the concession was put into place. Moreover, the independent regulator, *Ente Tripartito de Obras y Servicios Sanitarios* (ETOSS), has proven to be a weak reed subject to political and industry interference. The government intervened on several occasions to over-rule ETOSS in favor of the concessionaire. The labor unions that would have been expected to be demanding more accountability had been bought off by the grant of 10% of the equity in *Aguas Argentinas*.

Another issue related to public accountability is the fact that the initial conditions of the concession contract were never honored. This means that the initial rationale of the bidding process was very weak and that the competition process has important failures in protecting the users. From the beginning the concessionaire asked for the renegotiation of the contractual conditions (1994) and the changes in the contractual liabilities have been numerous and very important. The renegotiation process (until 2000) has never been the subject of public consultations, and most of the decisions taken were in favour of the enterprise, creating the idea of “oportunismo contractual.”

The consumers were not consulted at all during the first years of the concession, although the contract included hearings for public participation. During the 2000 review, consumers associations were invited to participate. At the end of the negotiation, A.Garcia, who was in charge of the final consumers report said:

“En definitiva, en el acuerdo aprobado es muy poco lo que se ha logrado obtener de la empresa en beneficio de los usuarios. Muy poco se ha tenido en cuenta de los cuestionamientos y propuestas que se realizaron en la audiencia pública. Pareciera que solamente se han contemplado algunos planteos realizado por las autoridades de la Provincia de Buenos Aires, de la Ciudad de Buenos Aires y de los Intendentes, que no necesariamente son coincidentes con las expectativas de la mayoría de los usuarios. Por el contrario, estos verán nuevamente afectados sus ingresos por la fuerte suba de las tarifas.”

Economic Efficiency

The concession appears to have been fairly successful on this score, depending upon how one keeps score! From the beginning there was a 27% reduction in tariff in 1993, but subsequently due to allowed price rises and surcharges Lotus and McDonald report that the price in real terms may have increased as much as 20% since 1993, and considering the last review of the contract in 2000, Corrales estimates the increase has reached 47%. Critics also point out that the initial 27% reduction was bogus because the government had raised the price just before the concession was sought so that the privatization would look better.

Social and Environmental Equity

The government was certainly a winner in this decision. Aguas Argentinas has invested over US\$1.6 billion in the system since inception at a rate 18 times that prior to 1993. In addition to shedding the responsibility for raising this amount of capital, the government has also benefited from receiving corporate income tax, which was hitherto not available, and to pass the cost of regulation onto the concessionaire.

The downstream users of the water have not benefited despite the commitment of the concession to expand wastewater treatment, 90% of the wastewater is still disposed of without secondary treatment into the rivers leading to serious contamination to the surface and ground waters in the region.

Existing customers (mainly middle class) have fared pretty well under the concession receiving the benefits of the improved efficiency and lower tariffs. The new customers (mainly poorer households), however, have fared less well. The connection fee has remained high and is unaffordable to low-income households. The connection cost also includes an infrastructure charge, which finances not only the connection itself, but also the incremental expansion of the water and sewer system. This means that the existing customers have gotten a free ride because their infrastructure was largely financed by government subsidies to the old water system.

Social Equity

The group of stakeholders who have been doing well are the shareholders of Aguas Argentinas. According to Loftus and McDonald, Aguas Argentinas has been making record profits on its concession;

as much as twice the international average and three times the UK water company averages. The connection fee has been one of the crucial problems in the Buenos Aires concession. The original contract did not include a sound and efficient subsidies program for low-income households. The connection fee was too high in relation to the income level of the population and was unfair because the existing customers have obtained a free ride and the new ones, mainly poor people, had to pay for it.

The chosen way to solve this problem had been the inclusion of the SUMA concept and the elimination of the connection fee. This means that all users have to pay a rate for financing the investment associated to “Servicio Universal y Medio Ambiente”. The low coverage situation (drinking water, sewerage and treatment) is still a big problem. The coverage situation of Buenos Aires, ten year after the concession, is not very good; the level of drinking water coverage is 74% and sewerage is only 50%. Those levels are too low when compared with other countries with the same, or lower, per capita income. Of course, there are large differences between the Federal Capital and the shantytowns of Conurbano.

Outcome from the Point of View of Governance

The decision to change the style of water governance in Argentina has to be placed in the context of the overriding economic crises of the late 1980s in that country. It is clearly a result of what we called earlier, *exterior governance*, meaning that the water governance outcomes have to be the results of a set of governance conditions outside of the water sector itself. So, once the disposal of state assets was deemed appropriate by the body politic (including the politicians and civil society) it was one short step for the government to dispose of the water concession in Buenos Aires as it had done other sectors such as electric power and telecommunications. The actual manner in which the water concession was made appears to follow the *interest group theory* of governance whereby the government formed a coalition of powerful interest groups (the governing party and the major opposition party, and industrial and trade union leaders) and, once it had gotten their tacit support, moved ahead with making the concession as rapidly and expeditiously as they could. At no point was there broad participation of other civil society stakeholders. As was noted above, that despite the fact that the government was successful in passing on to industry major capital investments and performance improvements in the water and wastewater system in its largest city, the consequences for the stakeholders missing from the original discussions were quite severe.

in Buenos Aires. The third lesson is that one excludes interest groups and stakeholders at considerable risk to the overall success of the project or program.

Case V

Sustainable Development Plan for Yojoa Lake, Honduras

Based upon and abstracted from :

AMUPROLAGO, *AMUPROLAGO's Sustainable Development Plan: Fortifying the Municipality, Fortifying the Community*, Association of Municipalities for the Protection of Yojoa Lake and its Area of Influence, Honduras, January 2002.

Monterroso, Tulio, *personal communication*, February 4, 2002.

History

The Association of municipalities for the protection of the Yojoa Lake and its area of influence, (AMUPROLAGO), was founded in 1995. It was made up of thirteen municipalities (by 2002 there were 16), all interested in the protection of the Yojoa Lake as well as the uniform development of the municipalities involved in the association. The overall goal is to promote the Sustainable Development of the AMUPROLAGO region through a community effort from the municipalities, and a secondary goal is strengthen the institutional capacity of AMUPROLAGO both at the level of the Board of Directors and the Technical Unit. AMUPROLAGO is to elaborate and launch a Regional Plan for Development expressed as the sum of the strategic plans of each member municipality and launch priority programs for the members.

The founding of the Association of municipalities for the protection of the Yojoa Lake and its area of influence (AMUPROLAGO) and its subsequent management must be seen as a sign of the regional need for a true decentralization which would enable a full development of the municipalities and especially those in the area of influence of the Yojoa Lake and those located south of the Valley of Sula. Attesting to the strength of this community is the fact that the number of members has increased from thirteen to sixteen today, including municipalities that are not part of the basin itself, but have a real interest in protecting this national heritage and developing the region.

The municipalities that are members of this community are: Santa Cruz de Yojoa, San Francisco de Yojoa, San Antonio de Cortés, San Manuel y Potrerillos, from the Departamento de Cortés; Taulabé, Meámbar, San José de Comayagua y Siguatepeque del Departamento de Comayagua; and the

order of priorities (reprogramming). This would happen either because the goals had been obtained or because there had been changes in the environment.

Institutions

The board of Directors will be responsible for the Project that will be executed by the Technical Unit of AMUPROLAGO. The association will coordinate the different sources of support from the municipalities, the personnel of the collaborating organizations and consultancy firms.

For strengthening of AMUPROLAGO, the Board of Directors will hire personnel for the Technical Unit: an Executive Director, an assistant, a secretary, 6 resource guards and a driver. The Technical Unit will be in charge of the coordination of all the tasks delegated by the Board and of reporting to it and to the donors on the progress of the project. This team will be responsible for the equipment of the office and its proper operation as well as for the coordination of the strengthening activities of the Board.

With regards to the elaboration of 16 **strategic municipal plans**, the Technical Unit will carry these out. A whole week will be dedicated to each municipality in order to work with the municipal corporations and their personnel, members of the civil society, and members of other governmental entities. The methodology will be 100% oriented towards participation with the goal of collecting the best information possible from the citizens of the municipality. This week of work in each municipality will consist of a 3-day workshop with the municipal corporation, employees of the municipality, teachers, church representatives, NGOs and any other institution with a presence in the municipality (40 people); and two days of interviews and visits to institutions present in each municipality.

Along with the fieldwork there will be time for study (approx. two days per municipality) and analysis of information and the writing up of one document per municipality. Once the 16 documents are completed, AMUPROLAGO's Regional Plan for Sustainable Development will be produced.

With regard to the **Management Plan of the Lake**, a specialized consultancy firm will be hired with the goal of designing a plan that complies with all of SERNA's and AFE-COHDEFOR's requirements with the proposition that the lake can be managed like a national park. The technical unit will carry out a program for environmental protection and extension with the help of the resource guards and the communities' environmental brigades which will have been formed. The working-out of this Management Plan will take approximately 6 months.

With regards to the problem of contamination by black waters, gray waters, and solid waste, technical and financial support will be negotiated before international organizations.

The elaboration of the **Communication Plan** will be designed by the Director of the Technical Unit along with the Board of Directors and will consist of the design and production of written and graphic material as well as of a strategy to collect funds. It will be complemented by activities of the Board of Directors such as visits to collaborators and exchange trips. An awareness and training program for the community will be designed.

The **Program for Municipal Strengthening** will be executed through continual training on topics such as: Planning, Legislation, Tributary Civic Culture, Land Registry, Land Management , Urban Planning, Environmental Services, Micro Basins, and Disaster Prevention among others. From each strategic plan a concrete listing of the AMUPROLAGO required actions to strengthen each municipality. AMUPROLAGO's new headquarters will be used as a training and orientation center for the members.

What Happened?

The beginning stage ended with two extraordinary assemblies, several meetings of the Board of Directors as well as the technical assistance of a law expert for the legal proceeding of the Statutes. The Association's Statutes were approved by the Government Ministry, giving the association its judicial legality in October 2001.

Also at this stage cooperation agreements were signed with the VIDA Foundation, the National Electric Energy Company (ENE), the Secretariat for Tourism, the Secretariat for Natural Resources and the Environment (SERNA), the organization Local Project of Barcelona, Spain, the School for Forestry Science (ESNACIFOR), and others, all with an interest in supporting the efforts of AMUPROLAGO.

Among other results obtained during this stage were the following:

The acquisition by the Secretariat of Tourism of a building on the shores of the lake for the headquarters of the association and which will serve as a technical office and meeting place for the Board of the Assembly. This infrastructure will serve as the orientation and training center for the associates and members of the different communities.

The financing on the part of the VIDA Foundation for the placing of signs at the headquarters of the association and on the shores of the lake, the printing of a first bulletin, as well as the payment of the legal services and legal proceedings of the judicial personnel of

