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► **To cite this version:**

Claude Ménard, R. Maria Saleth. The Effectiveness of Alternative Water Governance Arrangements. Mike Young et Christine Esau. Investing in Water for a Green Economy. Services, infrastructure, policies and management, United Nations Environment Program/Routledge, pp.152-174, 2012, 978-0-415-50126-2. halshs-00624250

HAL Id: halshs-00624250

<https://halshs.archives-ouvertes.fr/halshs-00624250>

Submitted on 23 Sep 2011

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**« The effectiveness of alternative
Water Governance Arrangements.»**

In: **Mike Young** (ed.),

Towards a Green Economy

United Nations Environment Program

2011

7 The Effectiveness of Alternative Water Governance Arrangements

Claude Ménard and Rathinasamy Maria Saleth¹

7.1 Introduction

There is a consensus both in the literature and policy circles that “water crisis is essentially a crisis of governance” (Global Water Partnership 2000). This fact applies equally to both the water sector as a whole as well as its main subsectors, i.e. urban water supply and irrigation. Given the economic, social, and environmental costs associated with ineffective water governance arrangements, there is an urgent need to evaluate the effectiveness of existing water governance arrangements and their alternatives. Such an evaluation requires a clear, operationally applicable and commonly understood definition of water governance and its alternative forms and their key features and indicators of effectiveness applicable at various scales. Such an operational and analytical understanding can form the basis for evaluating alternative water governance arrangements in terms of their ability to meet the efficiency, equity, and sustainability goals. It can also form the basis for the evaluation of ongoing and proposed reforms that might improve the effectiveness of water governance in specific contexts.

Given the strong and positive association between effective governance and better development outcomes (Kaufmann, Kraay and Zoido-Lobaton 1999), many countries have been trying to improve the effectiveness of water governance through various forms of institutional reforms and technical modifications over the past two decades. Although such reforms are neither uniform across countries or across water subsectors, there are certain common trends and patterns. While countries with institutionally advanced water sectors are going for high level institutional changes, in other countries, there is a gradual move away from state-centric and centralized forms to more user-centric, market-based, and inclusive forms of governance. There is an increasing tendency towards basin-based decentralization, better cost recovery, water demand management, and user and private sector participation (Saleth and Dinar 2000; Tropp 2007). The changes brought by reforms have changed the governance structure in the water sector in general and water subsectors in particular.

A comparative approach, based on numerous experiences of water governance reforms in many different countries (see Shirley (ed.), 2002; Saleth and Dinar 2004, 2005, and 2006), suggests that there is no optimal answer to the problems of urban water and irrigation governance problems. There is no particular arrangement that would be effective in all contexts. This is because the success of a specific arrangement, its implementation, and its monitoring depends on its relationship with the suite of institutional arrangements within which it sits. At a general level, this means that there is the need for a collection of polycentric governance systems to meet the goals of efficiency and equity in different contexts. As a result, and this is what we commonly observe most of the time, we have a

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mix of systems. This raises a difficult problem for decision makers because selecting effective governance requires identifying its feasibility, which depends on different considerations including the efficiency, equity, and sustainability dimensions in specific circumstances.

This chapter aims to provide some answers using both theoretical considerations as well as practical illustrations at the sub sectoral levels of urban water supply and irrigation as well as at the water sector as a whole. It examines different possibilities to deal with governance issues appropriately using several criteria, particularly feasibility, performance efficiency, transparency of the process, and accountability of decision makers. It also derives certain guidelines and principles that can be used to enhance the effectiveness of water governance in sub sectoral and the general water sector context. The chapter is organized as follows. Section 7.2 discusses the concept and analytics of water governance. Section 7.3 examines alternative modes of organization that can be implemented in urban and/or rural water supply and in irrigation. Section 7.4 refers to past and ongoing reforms to review requirements and trends in changes in water governance. Section 7.5 summarizes lessons drawn from general governance considerations with regard to the effectiveness of utilities generally and the water sector as a whole more specifically. Section 7.6 identifies principles and proposes guidelines for accompanying reforms motivated by the search for more effective arrangements. Section 7.7 concludes with some recommendations to policymakers.

7.2 Water governance: concept and framework

Like the general concept of governance, the concept of water governance also has different definitions. While Franks (2004) discusses the historical evolution of the concept of water governance, Rogers and Hall (2003) and Tropp (2007) have provided a review of different definitions of governance in general and water governance in particular. The Global Water Partnership (2002) defines water governance as the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society.

According to Rogers and Hall (2003), the concept of water governance,

“encompasses laws, regulations, and institutions but it also relates to government policies and actions, to domestic activities, and to networks of influence, including international market forces, the private sector and civil society. These in turn are affected by the political systems within which they function. National sovereignty, social values or political ideology may have a strong impact on attempts to change governance arrangements related to the water sector, as is the case for example, with land and water rights or corruption.”

This looks to be a very general definition of water governance but, from an institutional economics perspective, it sheds light on the two analytical dimensions of governance: “governance framework or environment” and “governance structure”, including their main institutional components (North 1990; Saleth and Dinar 2004)

Figure 7.1 and Figure 7.2 summarize relationships between the environment and water governance (Saleth and Dinar 2004 and 2005). From the perspective of water, the governance environment covers the elements of the general governance system in the country, including the constitution, political arrangements, resources potential, development stage and population among other considerations. In the water sector, institutional performance is affected by the interaction of all these arrangements. The interaction process is influenced by factors that are both exogenous and endogenous to the water sector and its institutional arrangements. A change in any of these factors can, therefore, affect not only the process of institutional change but also the performance of the water sector. The governance structure, on the other hand, captures the institutional basis of water governance and covers essentially the water-related legal, policy, and organizational elements (Ostrom 1990; Saleth and Dinar 2004)

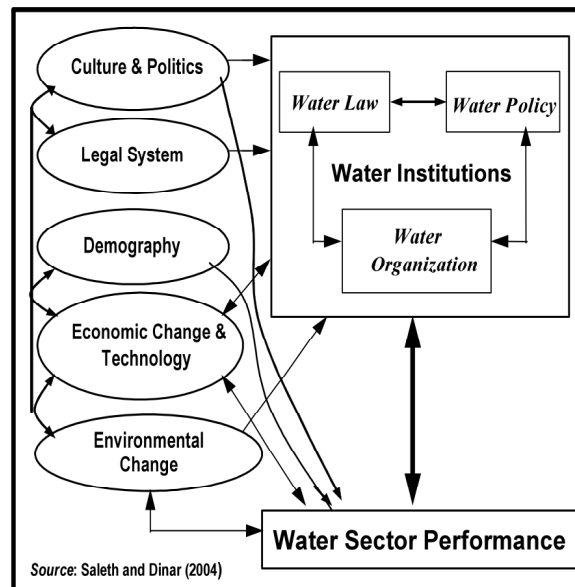


Figure 7.1 Arrangements influencing institutional performance in the water sector
 Source: Saleth and Dinar (2004).

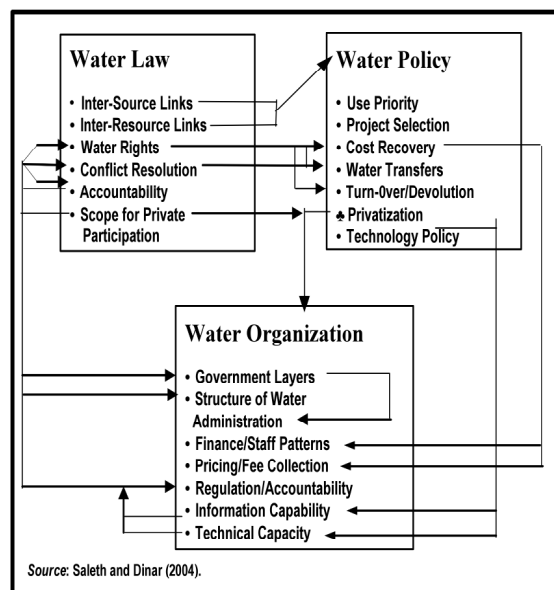


Figure 7.2 Water governance structure
Source: Saleth and Dinar (2004).

To see these elements, one can follow the following unbundling exercise. Initially, water governance structure is unbundled to identify its three main components - water law, water policy, and water organization. Then each of these components is unbundled further to identify the key institutional aspects (see Figure 7.1). The main advantage of this exercise is that it is possible to trace the structural and functional linkages evident both within and across institutional components.

Figure 7.1 indicates the embedded nature of water governance within the overall socio-economic, political, and resource context. In other words, water governance system functions within the general governance system of the country, indicating also the sources from which reform pressures can originate. While Figure 7.1 and Figure 7.2 deal with water governance at the overall sectoral level, water governance systems can also be identified in different sectoral and spatial contexts. They will have unique characteristics depending on whether the water is required for drinking, irrigation or other purposes and whether or not the scale involves local urban, rural, national, basin, region, watershed or city use. But, these context specific governance arrangements are hierarchically or vertically intersecting due to inter sectoral and inter regional water dependence. Thus, the nature of the alternative governance arrangements and their effectiveness depend clearly on the context or the unit of analysis (Ostrom 1990). There is also an important issue of the governance scale and forms (Huitema and Bressers 2007; Tropp 2007). While evaluating the effectiveness of alternative governance arrangements, there is a need for a distinction between governance forms in terms of centralized versus decentralized, single state actor versus multiple actors and stakeholders, top-down versus bottom-up, and bureaucratic versus market-centric. Connected with this, especially in the context of decentralized governance, is the issue of “poly-centric” and “distributed” governance (Kooiman 1993; Keohane and Ostrom 1995;

Ostrom and others 1999), where there are parallel but related governance arrangements functioning side-by-side in different levels and contexts.

There are at least, three different dimensions or levels of governance that need to be aligned. At the **physical and/or technical level**, the set of feasible solutions is already restricted by different constraints that need to be taken into account including the geology of the region, its hydrogeology, the density of population and its distribution over the relevant territory, the existence (or not) of urban planning, the characteristics of the existing water network, and so forth. At the **organizational level**, the choice of a specific arrangement is also conditional on several factors including the existence of expertise among local or regional authorities, the availability of adequate financial resources, the possibility of private sector participation which in turn depends on the status of financial markets and the risks at stake; and, last but not least, the existence and availability of competent management. At the **institutional level**, the combination of policy making and the political process that provides its backbone, which in water systems always involves local and regional authorities, and of the existence of more or less efficient dispute resolution mechanisms (including courts), also condition the type of arrangement that will be feasible. Three major consequences result from this complexity. First, because of the diversity of situations at these three levels, we necessarily need a **poly-centric** approach that can meet this diversity, an issue of particular significance in water systems that differentiates it from other infrastructures, e.g. electricity or telecommunications. Second, a key issue for the implementation of successful governance as a whole is that the feasibility of a solution and its success will depend on its capacity to **appropriately align** the three levels of governance identified above. Third, reforming and monitoring water governance is necessarily a **team exercise** involving different experts, policymakers and concerned populations. In that respect, the capacity to build consensus is a decisive aspect of effective governance.

How does one evaluate the effectiveness of governance arrangements? This issue can be addressed both from a qualitative and quantitative perspective. The indicators of effective governance suggested by Rogers and Hall (2003) capture essentially the desirable features of effective governance such as: (a) transparency, (b) accountability, (c) participatory, (d) communicative, (e) integrative, (f) efficiency, (g) incentive-compatibility, (h) sustainability, and (i) equity. One can also add feasibility and replicability, given the technical, social, and information conditions present in many developing countries. Although some of these features can be assessed quantitatively in a specific context (e.g., efficiency and equity), others can be evaluated largely from a qualitative perspective. But, the effectiveness of particular elements of governance (legal, policy, and organizational aspects) can be evaluated more closely using specific economic and technical variables such as those based on pricing, cost recovery, use efficiency, conflict reduction, supply adequacy and coverage, and the reduction of unaccounted for water. The variable-based indicators are particularly effective in evaluating water governance at the regional and sub sectoral levels. While evaluating different water governance arrangements in this paper, both the quantitative indicators as well as qualitative features that are listed above will be used.

7.3 Alternative water governance systems

Different forms of governance are available for managing water in urban water supply and irrigation sectors. They are easier to identify and evaluate for their performance in specific sectors and contexts. Although they are treated as alternatives in specific context, from a general perspective, they are complementary in the sense that they can operate side-by-side to meet the specific sectoral and regional water requirements. This is illustrated in this section in the specific contexts of water supply and irrigation sectors.

7.3.1 Water governance arrangements in urban supply

There is a variety of possible arrangements for providing drinkable water in an urban environment. The main arrangements are now relatively well known and have been implemented in many different environments. They can be identified through the allocation of property rights (and the associated decision rights) and the allocation of risks (and the associated incentives) (see Figure 7.3).

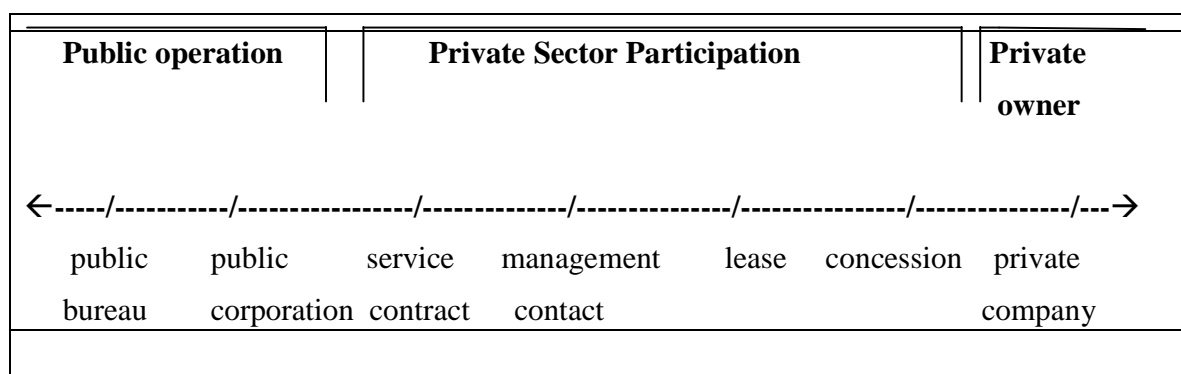


Figure 7.3 Allocation of rights that defines different institutional arrangements for the supply of water

Source: Ménard (2009).

At one extreme the water entity providing water is government owned and operated, either as a **bureau** or agency that is part of a ministry, or as a **publicly owned corporation** operating with greater autonomy. At the other extreme, the **water entity is sold** and the provision of water services controlled by a private firm that is usually highly regulated. Between these polar cases we find a whole range of public-private arrangements, based on contracts in which property rights and or decision rights are shared and risks more or less supported by one party (most of the time public authorities as a last resort).

Service contracts are cases where a private firm is paid for delivering specific services in response to a purchase order, e.g. fixing leaks or collecting bills. The private operator carries almost no risk, beside default of payment from public authorities.

Management contracts transfer some decision rights to a private operator, who has on-going responsibility for managing most or all daily operations, usually for a management fee. However, property rights and risks remain with the authority.

Lease contracts give the private operator full responsibility for management and maintenance. The Government is in charge of major investments and the operator is usually paid in part or entirely from the profits of the company.

Concessions, often identified as the “French model,” are contracts that transfer investment, maintenance decisions and risks as well as management to a private operator for a relatively long period of time, where the operator is in principle² paid entirely from profits.

Choosing the right duck for the right pond remains a controversial issue. Recent reforms in urban water systems have been motivated mainly by two different, although often complementary, goals. First, to reduce the gap between supply and demand which remains a major issue for a substantial part of the world population and raises problems of effectiveness as well as of equity. Second, to reach that goal efficiently in a context of increasing environmental and financial constraints.

Three main solutions, each one with its own problems, seem to prevail in developed as well as developing countries. First, there has been a shift from bureaus to corporatization for those water utilities that remain under full public control. Corporatization gives autonomy to decision-makers, essentially the management and the capacity to control investment cycles without being entirely captured by political cycles. However public corporations are often faced with incentive problems and remain at risk of political interference. Second, full privatization has been implemented in some countries, although this solution is uncommon due to the political sensitivity associated with the use of markets to manage water. Specification of water rights to the degree necessary to enable the use of market mechanisms to manage water is difficult. Nevertheless, it is being tried with varying degrees of success in Australia, the United Kingdom, the United States of America and Chile.³ Third, private sector participation became highly fashionable in the reform of water sector in the 1990s, mainly through management or lease contracts, with mixed results (Gassner, Popov and Pushak 2009). Some problems that have plagued these solutions relate to the risk of political opportunism and the reluctance of private operators to support financial risks associated with the long term investments that prevail in the urban water sector. Others include the difficulties of adequate regulation. Public authorities frequently find themselves squeezed between operators and users when fixing and regulating water prices and they must also balance the need to control operators efficiently without undue interference.

A controversial alternative that has existed in rural areas for a long time and has surfaced in some large cities recently, is the concept of a local self-sustained system. Self sustained systems rely on collective actions for example when inhabitants of a neighbourhood

² There might be subsidies, for example, to allow low income population to benefit from connection to the system.

³ Competition in the market remains extremely limited so far. See recent and difficult effort in the UK to develop common carriage, cross-border supply, and competition on vertical supply. In developing countries, privately delivering water by trucks introduces some competition in the market ... at very high costs.

organize themselves to pump and deliver water from an underground reservoir. However, these solutions have limited capacities to provide drinkable water in large cities and raise important environmental problems. Table 7.1 summarizes some characteristics and problems of these leading organizational arrangements.

Table 7.1 Urban water governance: Characteristics and problems of major arrangements

Particulars	Public Corporation	Management contract	Lease contract	Privatization
<i>Property Rights</i>	Public	Public	Infrastructure: public Equipment: Private	Private
<i>Autonomy of decision rights</i>	Partial (Political control in last resort)	Limited. Strategic decisions remain in public hands	Extended, but also dependent on decisions of public authorities	In theory: total. But: highly regulated
<i>Risk sharing</i>	None: public	None: public	Very limited for lessee	Total (but can be limited by contractual clauses)
<i>Incentives</i>	Weak	Weak (cost plus system)	Intermediate	Strong
<i>Mode of Regulation</i>	Command-and-control	Combination of public bureau and contract	Through contracts	Regulatory agency or competition laws
<i>Political interferences</i>	Significant	Significant	Mostly on strategic decisions (through control over major investments)	In principle: none In practice: through regulator

7.3.2 Water governance arrangements in the irrigation sector

The alternative water governance arrangements in the urban sector are distinguished and evaluated in terms of the different forms of public and private roles in asset ownership, operational management, and contractual arrangements, regulations and mutual responsibilities. Similar principles apply to an even greater extent in the irrigation subsector. For instance, irrigation governance arrangements can be differentiated in terms of their water property right regime such as open access, common property, private property, and state property (Rogers and Hall 2003). From an organizational perspective, since irrigation governance systems vary in terms of their key features and coverage, they can also be differentiated in terms of their regional structure such as those based on basins, projects and administrative regions as well as their focus such as those based on quantity and quality and, also, whether or not they are surface water and groundwater based. Since the irrigation sector is spatially vast and physically diverse, all these forms of governance can co-exist and be designed to fit different regional, agronomic and socio-economic requirements. From a governance perspective, they can also be classified as ‘hierarchical’, ‘poly-centric’, ‘distributed’, and ‘market-centric’ (Kooiman 1993; Keohane and

Ostrom 1995; Ostrom and others 1999; Roger and Hall 2003). There are also some new forms of governance arrangements such as those which involve irrigation companies (as in Australia, and the United States of America) as well as those based on the formation of irrigation water development corporations as is being trialled in India (see Box 7.1).

Box 7.1: Emergence of water corporations in India

The creation of autonomous water corporations in several Indian states represents a new development in irrigation water governance.

These corporations aim to mobilize private funds through water bonds for development irrigation projects. For instance, Karnataka has formed the Krishna Bhagya Jal Nigam Limited (KBJNL) in 1994 under the Companies Act. With a high return (about 17.5 percent) and government guarantee, the water bonds issued by KBJNL fetched an unexpected sum of Rs. 23 billion (1\$=46.8 Rs) during 1995-99. Similarly, the Maharashtra Krishna Valley Development Corporation (MKVDC) floated by Maharashtra in 1996 mobilized Rs. 4.28 billion as against the target of only Rs. 1.5 billion for 1996.

As these corporations are expected to run on commercial principle, they are likely to enhance the financial viability and productivity of the irrigation sector. As these are public corporations, they are also likely to improve accountability and transparency in irrigation management.

Source: Saleth (2004).

Despite the diversity in their features and functional roles, the main forms of water governance that are observed in the irrigation sector can be broadly identified as no governance (open access), centralized bureaucratic systems, market or negotiation driven systems, and community and user-based arrangements (common pool resources). From a spatial perspective, these arrangements are also operating at different spatial scales such as basin, watershed and administrative regions. Although some forms of governance arrangements can be alternative (e.g. bureaucratic and market-based), in many contexts they can also be complementary in the sense that even within a centralized and bureaucratic system, user groups and market-based water allocation can operate. Obviously, a centralized system is better as it reduces the anarchy in resource use associated with the open access condition in terms of criteria such as efficiency and equity. However, when compared to a decentralized user-based or market-oriented system, a centralized system cannot be considered effective because it fails to meet the desirable features of efficiency, accountability, transparency, and participation. Then again, a market-based system, although efficient and transparent, may not be able to meet the equity and sustainability criteria which often requires some form of social control through some type of regulation. Similarly, decentralized arrangements are effective in terms of transparency and participation, from the view of the planning and coordination requirement of the goal of integrated water resource management but may not be that effective, unless they are functioning within an overall framework of centralized coordination. Community-based governance arrangements, although effective in addressing equity, participatory, and sustainability requirements, in view of a high degree of their context-specificity, can be difficult to upscale or replicate.

There is a rich body of knowledge on the nature and features of water governance arrangements in the irrigation sector in a wide variety of countries around the world (Maass

and Anderson 1978; Keohane and Ostrom 1995; Ostrom 1990; Ostrom and others 1999; Saleth and Dinar 2000 and 2004). Broadly speaking, water rights centred and market-oriented governance arrangements are common in irrigation water management countries such as US, Australia, Chile, and Mexico. Similarly, community based governance arrangements exist in many developing countries such as India, Nepal, and Bangladesh as well as some countries in Africa.

In India, for instance, while community based governance arrangements were the dominant form in the pre-colonial era, with the development of large scale irrigation projects during the British period, they have been sidelined or replaced by centralized bureaucratic governance. Today, they are confined to few pockets, especially in fragile resource regions. This is also true of most British colonies in Asia and Africa as well. As a result, the dominant form of irrigation governance in most developing countries is centralized governance, with state playing the major role in water development, allocation, and management. However, with the promotion of irrigation management transfer (IMT) to outlet and system level water user associations and with the advent of the pump technologies, there has been some dilution in the centralized system. This dilution has not been uniform across developing countries and the extent of it depends on the degree of success of the IMT program. It has been quite effective in Mexico (see Box 7.2) and relatively successful in countries including Columbia, Turkey, Philippines, Indonesia, and India (Vermillion 1997). As far as the governance of groundwater irrigation, most countries lack any systematic governance arrangements, leading to anarchy in groundwater withdrawal and use. Although there has not been any formal and lawful water rights system, de facto rights within the open access system and groundwater markets have emerged, as observed widely in several countries such as India, Pakistan, China, and Bangladesh. A review of groundwater markets in India, for instance, suggests that they are quite effective in promoting efficiency in water use as well as equity in the access to water by small farmers (Saleth 2004).

Box 7.2: Irrigation management transfer in Mexico

The main plank irrigation reform in Mexico was the transfer of irrigation management to farmer associations. This program covered almost all irrigation schemes in the country. The evaluation of the program suggests that the outcomes were positive on all counts. As compared to the pre-reform period (1988), water fees paid by water users rose from 18 to 80 percent of the operation and maintenance (O&M) costs. The efficiency of water distribution rose from 8 to 65 percent. Along with a general reduction in O&M costs, there has also been a 50 percent reduction in the size of irrigation bureaucracy. A farmers' survey suggests that 80 percent of the respondent reported that the reform had improved water management. Although there are still financial difficulties and scarcity issues, the transfer from a centralized and state-operated system to water users has certainly improved irrigation and yield performance in Mexico.

The centralized bureaucratic arrangements observed in many developing countries are gradually evolving to accommodate user participation and market role as well as community decision-making within the irrigation sector. Considering the vast and diverse nature of the irrigation sector with millions of small farmers observed in many developing countries, the sudden introduction of governance arrangements centred on water rights and market-based

transaction may not be that easy. As the irrigation sector matures, such governance arrangements are expected to evolve, especially in areas with advanced and commercialized agriculture. Such an evolution is expected to be faster in countries such as China, Mexico, Chile, Spain, and South Africa but would be slower in countries such as India, Pakistan, Sri Lanka (Saleth and Dinar 2000). While different forms of irrigation governance have their own advantages and defects in terms of the desirable criteria of effective governance, in many contexts these forms are complimentary and can meet the requirements of different regional contexts. Although one cannot be dogmatic about the appropriateness of different governance arrangements, especially in the irrigation sector, it is still necessary to ensure some universally acceptable attributes of effective governance (Roger and Hall 2003).

7.4 Reforming water governance arrangements

For establishing more effective water governance, there is a critical need to create an enabling environment that can promote public and private sector involvement and wider stakeholder participation (Rogers and Hall 2003). The creation of an enabling environment requires various forms of reforms in the water institutional structure that provide the operational form for water governance in different contexts. The choice between the different possible arrangements described above is determined not so much by the search for the best feasible solution as by forces pushing towards changes in governance. In most cases, it is a combination of macroeconomic tensions, particularly in public finance, and subsector problems, which are distinct in irrigation and in drinkable urban water, that triggers the search for more effective governance. In that respect, environmental issues entered into the picture quite recently and permeate the debate about water governance very slowly.

7.4.1 Governance reforms in urban water: requirements and trends

In what follows, we discuss the nature and role of the main forces at work and their respective weight in engaging changes in the governance of water systems. Figure 7.4 depicts the factors that motivate reforms in urban water governance. The balance of these forces determine expectations with respect to: (a) accessibility, both in terms of connection and continuity of services; (b) affordability, which depends on pricing and its capacity to either provide enough resources to make adequate investments or to provide sufficient guarantee to borrow from financial markets; (c) safety, which relates to the continuity and quality of water delivered; and (d) sustainability, which concerns externalities in the short term (e.g., damages to the road system due to leakages or flood resulting from poor maintenance or insufficient investments) and the capacity to maintain the resource (and its quality) in the long term.

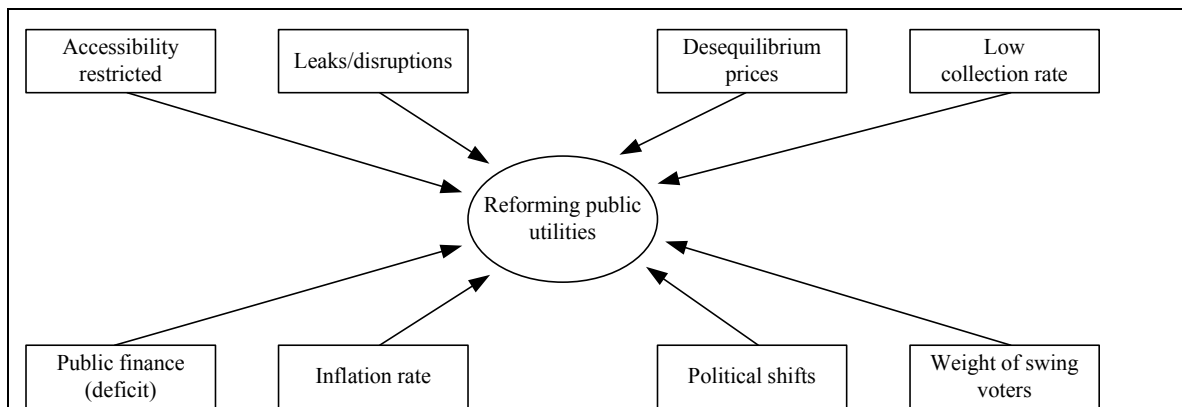


Figure 7.4 Forces pushing towards reforms in urban governance

Source: Ménard (2009).

Because of their very nature, which is that water systems are local or regional, potential benefits of a reform in the governance of water are quite modest for national politicians. Hence, what might change political preferences? With the exception of rivers that raise geopolitical issues (e.g., the Jordan or the Nile), pressures are mostly on local and regional politicians and reach higher levels of government largely through their influence. Therefore, it is primarily at that level that pressures for change come, or should be put. Unsatisfied demand and service problems play a major role in that respect since reforms implemented to increase both efficiency and effectiveness create a significant pool of beneficiaries. Environmental issues are also increasingly part of unsatisfied demand. The main indicators signalling problems include:

- (1) Low rates of connection for households in urban water and/or limited availability for households (e.g. only a few hours per day) or farmers.
- (2) Unaccounted for Water so that only part of the water produced reaches users, which has a negative impact on availability, prices, and quality (leaks can be a source of pollution).
- (3) Pricing, since the demand for water is quite inelastic; this makes users, and above all the poorest segment of the population, very sensitive to price issues. It should be noted that very often this difficulty is bypassed by plunging water bill into the general bill for local services, which generates lack of transparency and reduces accountability for the operators, whether public or private.
- (4) Related to prices, cost coverage is also an issue since it determines investments as well as return on investments, therefore determining the sustainability (and quality) of effective water systems in the long run.

However, part of these sector problems can be hidden if local and or central governments have soft budget constraints, so that they can, for example, subsidize the systems or maintain overstaffing. This explains why most changes in governance happen at times of hard budget constraints generated by:

1. Growing public deficits;

2. Accumulated public debt that makes recourse to debt or equity very costly or even hazardous; and
3. Inflation that can cause costs to rise quickly and outpace opportunities to increase water charges.

Finally, the combination of sector problems and macroeconomic tensions need to be transformed into policy-making oriented towards more effective governance. This is the political economy of water. If we simplify an issue that is quite complex, we can argue that:

1. Substantial changes in water governance happen when there is a regime change or coalition shift that brings to power a governing group perceiving net political benefits from reform. Potential winners must exceed losers.
2. Since water is rarely a top priority on the long term agenda of politicians, the window opening for reforms is usually relatively short and comes immediately after political change happens, or, alternatively, right before an election in which constituencies concerned by water issues become an important target.

A comparative study of reforms in several major cities in Africa and Latin America illustrates the weight of these factors and how they push with varying intensity towards reform of water utilities. This is shown in Figure 7.2.

Taking into account the powerful forces pushing for changes in water systems, a striking fact at the empirical level is the slow rate of reforms in water governance and the ambiguous results. In an extensive review of urban water and sanitation systems that prevail in developing countries⁴, Gassner and others (2009) identified a sample of 977 utilities.

⁴ The sample covers 71 countries, spanning the years from 1973 to 2005. Most of the data are actually concentrated in 1992-2004

Table 7.2: Combination of factors motivating urban government reform

Particulars	Buenos Aires	Lima	Mexico-DF	Santiago	Abidjan	Conakry
Sector Crisis:						
Not connected Service	30% poor	25% very poor	3% poor in some areas	1% relatively good	40% relatively good	60%+ very poor
Macro conditions:						
Inflation	2,314%	3,393%	27%	19%	2%	37%
Deficit/GDP	0.4%	5.2%	2.5%	0.9%	0.2%	3.5% ^f
Public debt/GDP	25%	152% ^c	46%	56% ^d	low ^e	high ^g
Political Change	Regime change	Regime change	Coalition shift	Change earlier	Increased opposition.	Regime change
Nature of change in governance	Shift to PSP (concession)	Failed attempt at PSP	DF split in distinct areas, with limited PSP in each	Corporatisation (relatively minor changes at the time)	Renewal of concession (with relatively minor changes)	From public entity to introduction of PSP (leasing in distribution)

Notes: ^aNational annual averages for third year before reform. ^bEnd of year, 1990=100. ^cTwo years before. ^dOne year before. ^eNo data, but sources describe it as low. ^fOne year after reform; Guinea was in fiscal crisis in period before reform. ^gNo data, but sources describe it as very high. Source: Adapted from Menard and Shirley (2002).

Most of them (85 per cent) maintained a state-owned enterprise, the main change being in corporatization of the utility, while the adoption of arrangements involving Private Sector Participation (PSP) remained limited in percentage (15 per cent) as well as geographically (67 per cent of the PSP were in Latin America and the Caribbean, and actually mostly concentrated on a very small number of cases), with significant fluctuations over time. The market share of PSP in developing and emerging countries increased from about one per cent in 1997 to seven per cent in 2007 but still remains low since PSP supplies only about 160 million people in these countries (Marin 2009). According to the PPI database, there was a peak at the end of the 1990s, followed by an abrupt decline, a new trend upward between 2003 and 2005 and again a decline.⁵ Even more disturbing are the ambiguous results of these changes along the criteria identified above, particularly when it comes to

⁵ See <http://ppi.worldbank.org/> (note 23 from June 2009) and Marin (2009), p. 24

PSP.⁶ According to Perard (2009), who reviewed systematically 27 econometric studies covering up to hundreds of water utilities, 8 of them concluded that private operators were more efficient than public ones. Of the others, 16 found no substantial difference in efficiency and three concluded there were some advantages on the side of public entities. This is in line with studies on developed countries (see Ménard and Saussier 2002; Wallsten and Kosec 2008).

7.4.2 Governance reforms in the irrigation sector: requirements and trends

Countries are increasingly recognizing the importance and urgency of reorientating their irrigation governance arrangements in line with the emerging realities and requirements of their irrigation sector. Despite the political challenges and practical difficulties, many countries have indeed undertaken significant reforms in an effort to create irrigation governance arrangements that will be more responsive to their current and future economic and environmental requirements. These reform initiatives are visible both at macro level (e.g. declaration of water laws and water policies, preparation of national and regional water plans, and administrative reorganizations) and at the micro level (e.g. IMT, corporatization and private sector participation, revision of irrigation water pricing, and the spontaneous emergence of water markets as well as rental markets for irrigation wells and pump sets). Specific reforms observed in many countries include the creation of basin organizations, promotion of user organizations, and management decentralization to promote stakeholder and/or user participation, privatization of urban and irrigation water supplies, establishment of water rights system, promotion of inter and intra-sectoral water markets, reorientation of water prices, and water quality regulations (Saleth and Dinar 2000 and 2006).

Governance reforms are motivated both by factors that are endogenous from the water sector as well as those that are exogenous from the water sector (Saleth and Dinar 2004). The endogenous factors include water scarcity, water conflicts, financial crisis, drought, floods and water quality problems. The exogenous factors, which relate mainly to aspects defining water governance environment (see Figure 7.1), include macro economic crisis, political reforms, international agreement, and pressures from donors and or aid agencies. It is also important to note that although there can be sector-specific factors, most factors triggering governance reforms in the irrigation sector are more or less the same as those that lead to reforms in the water sector as a whole. The configuration and relative importance of the major factors behind the reforms in six countries are shown in Table 7.3. While the factors are identified with a diagnostic use of the transaction cost framework, their relative importance is established through subjective evaluation. Although water scarcity and conflicts remain the underlying force for reforms in all the sample countries, there is variation in the factors that trigger reform. For instance, in Australia, the first reform trigger came from recognition of a need to make the Australian economy as a whole more competitive. The second involved recognition of the need to resolve tensions between irrigators who wanted access to more water and environmentalists concerned about the

⁶ Gassner and others (2009, pp.4-5) concludes that PSP resulted in gains in labour productivity (due to relatively small reduction in staffs), with no clear investment gains, no significant changes in prices, and mixed efficiency gains.

declining health of several river systems. The need to impose water restriction on residents in all major southern and eastern cities acted as a third trigger and made dramatic water reform possible. The dominant trigger for water reform in Mexico was economic crisis. In Chile and South Africa, dramatic political change provided the necessary trigger for water sector reforms. In Morocco, the main trigger behind reforms was physical scarcity of water due to a near-exhaustion of freshwater. In Sri Lanka, the major stimulus for reform came from the macro economic crisis of 1983 that occurred during successive droughts between 1980-85. Water institutional reforms in Namibia resulted from the economic and political reorganization that has occurred since the country's independence in 1990 (see Table 7.3).

Table 7.3 Configuration and role of factors behind water institutional reforms

Particulars	Australia	Chile	Morocco	Namibia	South Africa	Sri Lanka
Water scarcity/conflicts	**	*	**	**	**	*
Financial crisis	*	**	**	***	*	***
Draughts/salinity	***	-	***	*	**	-
Macro economic reforms	***	**	***	-	-	***
Political reforms	-	***	-	***	***	*
Social issues	*	-	*	**	**	-
Donor pressures	-	*	**	*	-	***
Internal/External agreements	***	-	-	*	*	-
Institutional synergy/pressures	**	***	*	*	*	*

Note: The number of *s signifies the relative importance of the factors in the context of each country. ‘-’ means the aspect in question is ‘not applicable’ or ‘not evaluated’.
Source: Saleth and Dinar (2000)

Despite country-specific differences in the extent and intensity of reforms in irrigation governance, there are certain commonalities as to the central focus and trends in these reform initiatives. The change in the thrust and focus of reforms are changing the old forms of water governance into new forms with certain distinguishable characteristics (see Box 7.3). Based on a cross-country review and comparison of the governance reform initiatives in 43 countries and regions around the world, Saleth and Dinar (2004) have identified five common aspects of the ongoing reform initiatives at the international level.

First, there has been a paradigmatic shift from water development to water allocation with the concurrent reorientation of water governance structure. Second, concurrent with an increasing focus on water allocation, there has been a definite shift from engineering approach and supply side management to economic approach and demand side management. Third, the trend towards decentralization is also strong, although it occurs through a variety of routes including the creation of various forms of basin organizations (e.g. watershed committees in Brazil, water conservancy commissions in China, basin councils in Mexico, and hydro-geological federations in Spain), as well as the promotion of IMT and the development of irrigation privatization. Fourth, there has also been an

increasing commitment to an integrated approach to irrigation management necessary to use water from both surface and sub-surface resources as well as the efficient use of water in rainfed regions. Fifth, there is unanimity among countries that a phased improvement in cost recovery is the first step to salvage the water sector from both financial crisis and physical degeneration. While better financial health can facilitate the physical health of water distribution and drainage infrastructures, the physical sustainability of water sector cannot be ensured without controlling the pollution and water quality problems. The common approach in this respect involves water quality grading, quality standards and pollution control regulations.

Box 7.3: Water governance: old and new forms

- Government and bureaucracy to civil society and markets
- Centralized power to diversity of actors and diffused power
- Hierarchical control to horizontally shared control
- State enforced rules and regulations to inter-organisational relations and coordination
- Centralized/top-down to decentralisation/bottom-up governance
- Formal institutions to informal institutions (network or distributed governance)
- Bureaucratic allocation to voluntary exchange, self-governance, and market mechanisms.
- Unilateral and centralized decision to dialogue and partnership as well as participation and negotiation.

Source: Tropp (2007: Table 1).

The general thrust of water reforms suggest that while they are certainly very positive from a long-term historical perspective, they are still far from adequate in meeting the efficiency, equity, and sustainability requirements of the irrigation sector in many developing countries. Many reforms amount to empty promises that take the form of declared policies that are not implemented or nominal increases in water charges that have very little real value or cosmetic changes such as new names for existing organizations. Substantive reforms such as the enactment of new water laws, conversion to a volumetric allocation system, the establishment of a new water rights system or the reorganization of a water administration system is much rarer. Too often significant initiatives are undertaken tentatively more as a crisis-response than as part of any comprehensive reform package (Saleth and Dinar 2006). As a result, there have been considerable variations in the effectiveness of governance arrangements both within the irrigation sector as well as in the water sector as whole.

Globally and as scarcity problems emerge with increasing intensity, there is recognition of the benefits of moving to volumetric allocations systems. Some countries (e.g. Australia and Chile as well as regions like California and Colorado in the United States of America) already have the capability to implement the allocation paradigm. Others (e.g. Spain, Mexico, Chile, South Africa, Brazil, and China) are moving quickly to develop the institutional potential necessary for effective governance whereas the remaining countries (e.g. India, Pakistan, and Sri Lanka) have a long way to go before being in a position to create the necessary institutions for efficient water allocation and demand management.

7.5 Governance of the water sector as a whole: issues and effectiveness

Just as water sector governance is embedded within the overall governance arrangements in a country, those at the sub sectoral levels are also embedded within overall water governance. In this sense, the effectiveness of the governance arrangements at the sub sectoral level depends critically on the effectiveness of governance systems at the water sector level as a whole. The sector level governance issues that are important to address relate to the overall planning and management of the resources, meeting environmental water needs, water quality and related environmental pollution, and inter-sectoral water allocation and conflict resolution. Obviously, these issues are closely related to the implementation of integrated water resource management (IWRM) principles. In fact, the sector level governance provides the institutional context within which IWRM principles are operationalized (Rogers and Hall 2003).

Sector level governance arrangements include water law, water policy and water organization involved in the overall planning and management of the resource. As in the case of sub sectoral governance arrangements, the macro or sector level governance also has alternative forms. These macro level arrangements in countries such as Australia, US, Mexico, or Chile are confined to overall water planning and management, leaving most of the allocation decisions to the basin level bodies and market-based arrangements. Such a division of the sphere of influence between the state, private users, and water companies is possible due to the existence of well-developed volumetric water rights systems. The water rights system also enables market or negotiation-based water allocation across sectors and regions with minimum conflict. Although it is commonly held that market-based governance arrangements are weak in addressing environmental problems, the experience of Australia shows that there are possibilities to explore in that direction (see Box 7.4). In other countries such as India, Pakistan and China, the state-centred governance arrangements provide scope for the role of private groups and stakeholders, especially at the local level involved in water development, allocation, and management within a centralized organizational structure. Since volumetric water rights are weak in these countries, sectoral allocation (including the allocation for environment) has to be performed through bureaucratic means with very little stakeholder involvement. Lack of individual and sectoral water rights and entitlements also leads to sectoral and regional water conflicts. Such conflicts are resolved through centralized non-market mechanisms such as arbitration by central government or other state-based technical agencies, tribunals, courts, and water resource courts as in South Africa and Spain for instance.

Box 7.4: Meeting environmental needs: experience of Australia

Australia was able to start bringing over allocation problems under control by placing a cap or limit on the amount of water that could be diverted from the Murray Darling Basin in 1993-94. This was followed by the development of a salinity trading scheme designed to force states to offset the salinity impacts of any new development and address a legacy of existing salinity management problems. As pressures for water reform grew and public pressure for change mounted Australian governments have started buying back water for the environment and have agreed to transfer planning responsibility from states to an independent Murray Darling Basin Authority established under Federal legislation. Amongst other things, this has involved the referral of constitutional powers held by state governments to the Federal government.

The success of these reforms was possible only because of the existence of transferable water right systems maintained by user-oriented public agencies with effective regulatory capabilities and a high level of commitment from the federal and all state governments.

Source: Saleth and Dinar (2004); Young (pers. comm. 2010).

Although market-based approaches can be used, effective governance at this level requires some form of centralized system at the national level. Such system can be still more effective, if transparency and participation are added. Based on a review of reform experienced in several countries, Saleth and Dinar (2006) have developed few stylized facts as to the nature and characteristics of the ongoing water governance reforms process at the global level. First, although factors endogenous to water sector (e.g. scarcity, cost recovery, and salinity) remain an underlying force, the immediate trigger for reform comes mainly from exogenous factors (e.g. macro economic crisis and political reforms). Second, while countries including Chile, Mexico, and South Africa have successfully exploited the strategic context set by exogenous factors, this happened more by coincidence than by design. Third, there are fundamental links between the induced changes caused by formal reforms at the macro level and the autonomous changes occurring at the micro level. Fourth, impromptu approaches to reform dictated by political and financial expediencies can be counterproductive especially when the processes used are not thought through sufficiently well and can be therefore criticised by those opposed to the reforms. Fifth, in politically and fiscally constraining conditions, the best strategy is to have selective but sequentially linked reforms focused on institutional components, regions, and sectors with better prospects and quicker benefits. Finally, besides the country-specific reforms, there are also notable instances of transnational governance not only in trans-boundary river contexts but also in the context of a whole economic region such as the European Union (see Box 7.5).

Box 7.5: Water framework directive: A case of international water governance

Introduced in 2000, the Water Framework Directive (WFD) of the European Union represents the primary water policy legislation in the European Union. It aims to achieve effective water governance at the European Union level, including a coherent and effective legal and institutional framework, water-pricing policies, public participation and an integrated water resources management system. The key component of the WFD are: (a) protecting all waters, surface and ground waters in a holistic way, (b) good quality (“good status”) to be achieved by 2015, (c) integrated water management based on river basins, including the development basin plans, (d) combined approach of emission controls and water quality standards, plus phasing out of particularly hazardous pesticides, (e) use of economic instruments such as economic analysis and getting the prices right, and (f) participation of citizens and stakeholders involved

Sources: Barreira (2006).

7.6 Effectiveness water governance: principles and guidelines

The effectiveness of water governance arrangements has two complementary dimensions. During the design stage a specific mode of organization should be selected. Following completion of the project, conditions of implementation and enforcement of the selected arrangement must be assessed on a regular basis. Most of the theoretical literature and too many actual reforms of water governance have focused on the first dimension designing optimal contracts or focusing on the technical requirements. However, we argue that post implementation conditions matter as much and that their benign neglect often derails well-intentioned reforms.

7.6.1 How to select a governance arrangement?

The identification of the appropriate governance arrangements during the design stage requires a demarcation of different water-related activities such as planning, allocation, use and management. While governance elements with centralized features are required at the planning level as well as in the protection of water quality and environment, market or negotiation-based mechanism are ideal at the allocation level.

At this point, it is important to remind decision-makers that the choice of an arrangement is largely determined by institutional constraints. Conditions of embeddedness should therefore be considered closely. To illustrate, it might be desirable to consider major private sector participation for efficiency reasons or because of the financial constraints that a public authority faces; but an approach can encounter new problems such as a lack of institutional arrangements sufficient to protect investors. Private investors do not want to assume investment risks of this kind and, hence, when a tender is called there may only be one or even no bids.

At the most general level, there are four questions that must be satisfied before the domain of feasible governance arrangements can be identified.

- 1) Do we find an institutional environment, particularly when it comes to political guarantees, well designed regulation, and a performing judiciary that can provide

adequate support to alternative solutions? Note that this remains true even when a public entity is the preferred arrangement.

- 2) Water governance usually involves multiple principal agents (different ministries, different levels of government, different agencies, etc.). Is the institutional environment able to coordinate adequately these principal agents, able to simplify the decision process, and able to implement the choices that have been made?
- 3) Are there dispute resolution mechanisms that can efficiently arbitrate among the conflicting interests of the different stakeholders and enforce decisions made?
- 4) Last but not least, are the conditions judged by the parties involved as credible (e.g. between public authorities and private operators)? There are now institutional indicators provided by different organizations (The World Bank, Transparency International, Institutional Profiles Database, etc.) that can help to establish a relevant check list.

Box 7.6: Credible commitment and the problem of multiple principle agents

A major reform was initiated in Metropolitan Manila in 1996. The water system then run by a public operator was split in two zones (Manila Eastern zone and Manila Western zone) in order to facilitate benchmarking. Two concessions were awarded (Maynilad in the Western zone, Manila Water in the Eastern zone). The implementation of the contracts faced major difficulties from the very beginning. Analyses of these difficulties focused essentially on the impact of the Asian financial crisis. However, there is another dimension, of an institutional nature, that also played an important role, e.g. in adjusting tariffs etc. Based on two detailed empirical studies, we identified up to 32 principals (ministries, city hall, agencies, bureaus ...), often conflicting and simultaneously interfering with the regulator as well as with the two operators. This subverted commitments from public authorities and made adjustments for operators chaotic and unpredictable.

Sources: Castalia (2005), Wu and Malaluan (2008)

At a more specific level, the search for effective modes of governance must take into account constraints imposed by the characteristics of the water sector and of its subsectors. First, there are technical constraints that delineate the domain of possible solutions. Building a dam in order to provide water to the city or to farmers, for instance, imposes a centralized approach that differs from the possibilities an extended underground reservoir offers. Second, financial resources and their appropriateness to financial needs are also determining factors. The existence of a local or regional active financial market or the political credibility that makes foreign investments attractive might make effective a solution that involves private sector participation, which would otherwise be impossible or very limited. Third, there is the very sensitive problem in the water sector of social acceptability. There are two main issues at stake here, one that concerns users' participation in the very early stages of the decision process, the other that has to do with the consequences of solutions considered, particularly with respect to pricing.

A final issue to be taken into account, in the selection of a specific mode of governance, is the conditions under which the selected solution is actually played out. For example, let us assume that a contractual solution, e.g. a lease or concession, has been chosen as the most adequate solution for reforming and extending an urban water system and that it is decided

to proceed through open tenders to all interested operators. Let us also assume that there are several potential candidates, (which is often not the case in the water sector). We know both from experience and from the theory that there are different ways of organizing selection among bidders, e.g. selecting the best offer (which creates a bias described as “the winner’s cursor”, according to which some candidates overestimate potential gains and overshoot their offer in order to win) versus selecting second or even third rank bidders. Alternatively, a first round of open tenders may be followed by a second round of negotiations with operators who exhibited the most promising potential at first, a solution that involves high risks (of collusion and or of corruption) but also allows defining a better fitted solution when complex issues and or missing information are at stake.

It should be emphasized here that all these solutions involve significant transaction costs. In the trade-offs among alternative modes of governance, which go far beyond the initial trade-off between public and private solutions, these costs are too often neglected by international donors and decision makers. To put it bluntly, complex arrangements may not make sense because they are too costly to monitor and or because the required expertise is not available and or because it becomes too obscure to users.

7.6.2 Conditions of effectiveness in implementing new water governance

The difficulty is that many of these problems are revealed only after the new governance regime has been implemented. Therefore, the effectiveness of selected water governance should also incorporate the conditions of implementation and enforcement of the solution selected. The accumulated experience of the last two decades suggests that at the management level, especially at the local level which is central in the water sector, user and community-based systems are more effective than the bureaucratic ones that are currently operating. Similarly, basin-based and stakeholder-oriented systems of governance will be more effective than administrative unit-based systems. In that respect, two series of conditions to success should be emphasised. These are often neglected or underestimated in the approach to water governance.

First, decision-makers as well as theoreticians have become increasingly aware of the key role of institutions. However, they have mostly focused on the general institutional environment, for instance, the implementation of adequate laws and regulations at the national level and the creation of central regulatory agencies. When it comes to water governance, whether in an urban environment or in relation to irrigation, we would argue that micro institutions implemented at the local and/or regional level matter at least as much as the global ones and play a decisive role in making new governance sustainable. Among these micro institutions, the role of regulatory bodies embedded in local and or regional governments is worth noting, since they are directly in charge of designing the agreements (and or the conditions of their implementation) and in monitoring the arrangement. Basin agencies are good examples of the significance of these micro institutions in the water sector. Important functions of these bodies concern the information they can collect on alternative solutions implemented elsewhere and the way this information is used to establish benchmark indicators of performance. The other function concerns the mechanisms of control and sanctions they can activate. In that respect, an active role for

users and adequate modalities of this participation in order to avoid capture by specific groups of interest, are key issues.

Second, human capital makes the difference.⁷ This is a much under estimated component of effectiveness. Building adequate human assets often makes the difference, as so many reforms in the governance of water illustrates, whether it is through a public entity, as illustrated by the urban water system in Phnom-Penh (see Araral, 2009; and Marin 2009), or with private sector participation, as with the *Société de Distribution d'Eau de la Côte d'Ivoire* (SODECI) in Abidjan (Ménard and Clarke 2002). Four conditions particularly matter here:

- (1) adequate training for all personnel, particularly the management;
- (2) well aligned incentives, so that the entire personnel benefits from improved performance and motivation to pursue results;
- (3) delegating responsibilities at the local level so that there is more room for management to interact with community representatives and develop local solutions;
- (4) promoting leadership, since successful reforms all substantiate the key role of a leader or a leading team capable of convincing the decision-makers and stakeholders of the necessity to radically reform or improve water governance and capable of implementing changes needed.

Box 7.7: The role of human capital: the case of Phnom Penh

The reform of the public utility in charge of water and sanitation in Phnom Penh is considered a success story. Its causes were summarized as follows: “To achieve this, the concerned governments have had to make choices. These include putting in place sound tariff policies, refraining from interference in operations, and putting in place professional management that is held accountable for results.” (Marin, 2009, p. 146). However, this last factor is left undeveloped in this review and is ignored in too many reports and case studies. In the case of Phnom Penh, building adequate human assets was a key to success. It involved two dimensions: an intensive training program for all the staff, and the existence of a strong leadership that could provide internal cohesion and dynamism and simultaneously convince political leaders of the value of choices made and maintain their stamina in that respect. Triche, Requena and Kariuki (2006) rightly emphasized the key role of training, consultation and promotional activities, including communities’ involvement, at the time of reform in Cambodia. But they also identified the lack of training and support in the long run, when difficulties in implementing contracts emerged. This is where a motivated staff and a strong leadership become really central, as illustrated by the case of Phnom Penh.

Source: (Araral, 2009)

The many elements outlined above that are required for an effective governance of the water sector exhibit the difficulty of selecting a particular governance arrangement that can fit all contexts. A mix of governance systems—both state, market, and user and or community-based ones—are needed to achieve the efficiency, equity, and sustainability goals within the

⁷ For instructive discussions and data on this issue, see the series of reports for ILO on “Social Dialogue” in the reform of water and sanitation (e.g., Fajana 2008, on Nigeria; and Masanjala 2009, on Malawi)

irrigation sector. Choosing the right mode of organization for the right project requires taking into account these different dimensions and weighting them accordingly. Our analysis provides a framework that must be followed according to the context, in order to guarantee that solutions adopted are properly aligned with technical and/or physical requirements, organizational capacities and the institutional environment. Appropriate alignment is the key to success.

7.7 Concluding remarks and policy implications

As far as the effectiveness of alternative water governance arrangements both at the sub sectoral and at the sectoral level is concerned, there is no silver bullet that fits all conditions and requirements. A more realistic approach is to promote different governance forms to suit different contexts, a mix of such systems may be the best solution. For effective water governance, neither state-centric nor market-centric governance are going to be of much help. Co-operative relationships between various institutions, representing complementary logics and functions will provide a more durable solution (Blatter and Ingram 2000). This clearly suggests the need for a comparative approach in building local and or regional institutions that can fit well the requirements of the urban water utilities and irrigation sector. There is no foolproof water governance arrangement but some arrangements are relatively more effective than other alternatives in specific contexts. Suitability of governance arrangements depends on specific contexts. Some are good for efficiency while others are good for equity. Similarly, for some functions such as planning and water quality, centralized forms may be better for scale-economy and technical considerations, but for others such as allocation and management, more decentralized and market or negotiation-based arrangements are better in terms of flexibility.

From the perspective of both urban water supply and the irrigation sector, the identification of the appropriate governance arrangements requires a demarcation of different water-related activities such as planning, allocation, use and management. This is also applicable to the governance question at the water sector as a whole. While governance elements with centralized features are required at the planning level as well as in the protection of water quality and environment, market or negotiation-based mechanisms are ideal at the allocation level. At the management level, especially at the local level user, community-based systems are more effective than the bureaucratic ones that are operating at present. Similarly, basin-based and stakeholder-orientated systems of governance will be more effective than administrative unit-based systems. As a result, it is difficult to select a particular governance arrangement that can fit all contexts. A mix of governance systems—both state, market, and user and or community-based ones—are needed to achieve the efficiency, equity, and sustainability goals within the irrigation sector. However, we have identified three key issues:

- (a) feasibility on the supply side depends on the appropriate alignment between technical conditions, organizational possibilities, and institutional frame;

- (b) acceptability on the demand side depends on users' perception and needs as well as the capacity for operators and public authorities to implement and maintain open channels of communication; and
- (c) the need for capacity building and technical upgrading of the organizations involved in water management.

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7.9 Acronyms

IMT	Irrigation Management Transfer
IWRM	Integrated Water Resource Management
PSP	Private Sector Participation
RBO	River Basin Organisations
SODECI	<i>Société de Distribution d'Eau de la Côte d'Ivoire</i>
SOE	State Owned Enterprise
WFD	Water Framework Directive