

## MENA Countries Can Meet the Water Management Challenges of the Twenty-First Century

This report argues that potential solutions to the region's water problems are well known but have often not been implemented because of constraints in the broader political economy. A wealth of technical reports gives investment plans, financing strategies, legal analysis, and policy recommendations for each country in MENA and for the region as a whole. However, most of them remain in documents on the shelf of the water minister, because they are not politically feasible. Policy makers have perceived the costs of reform as greater than the benefits, at least in the short term. However, as chapter 3 shows, the political dynamics are changing in ways that might open up political space for reform. Policy makers inside and outside the sector can analyze these opportunities and adjust their policy reform agendas accordingly. Both groups can implement policies that can actually affect the drivers of the political economy. Strengthening external accountability at the country level involves a broad set of actions that are beyond the scope of this report. Within the water sector, however, specific policies and actions can help strengthen accountability within the existing frameworks and improve water management at a local level as well as change the local political climate for broader water reforms in the future.

Policies that help strengthen accountability can be feasible within current political environments and can affect the political economy of additional reforms. Measures that improve accountability for water planning and services tend to push the political economy toward more sustainable

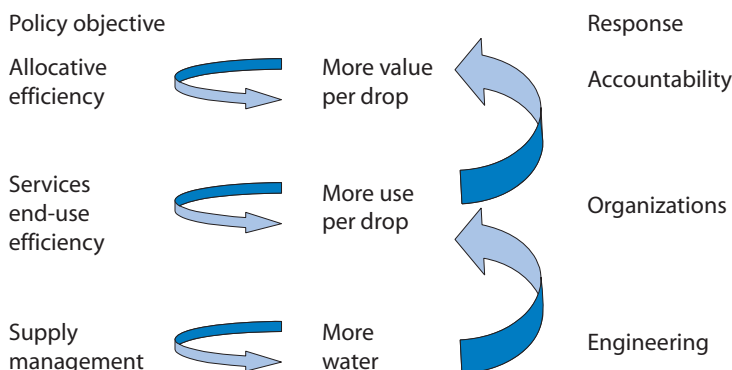
water management. These measures add information to the decision-making process, give service providers incentives to improve performance, and reduce the chances that small groups will benefit disproportionately from particular circumstances. People do not comply with rules they do not understand or accept. Nor do they cooperate with agencies they do not trust. And they do not pay for services that fail to meet their needs. In addition, strengthened accountability in the water sector fosters trust and social engagement. As people develop trust in the service providers, they individually become more willing to use water and related infrastructure responsibly. This trust and accountability based on the two-way flow of information in the long-term transforms the behavior of service providers and individuals.

Accountability measures become more important as the management challenge becomes more complex. As mentioned in chapter 1, the objectives of water management in MENA have changed over the past few decades, moving in three phases of increasingly complex management challenges. Figure 5.1 shows the policy objectives and responses for each phase. At the bottom of the figure, the first response to scarcity of water resources (first-level scarcity) was to make supplies reliable. This approach led to a focus on technical and engineering solutions. As affordable options to increasing supply began to dwindle, an additional concern arose, shown in the middle of the figure: how to get the most out of water for each use. This meant providing water services and improving end user efficiency. It led to a focus on organizations that could plan, establish, and enforce rules to protect the resource and provide services, thus beginning to address the second level of scarcity. As it became clear that this approach would not be sufficient, a third concern arose, shown at the top of the figure: allocating water to the most beneficial use. This involves a planning process that weighs all competing claims to the resource. It also involves understanding the type of water services that individual users need and organizing agencies to provide those services. Accountability mechanisms provide that information to policy makers and increase the public acceptance of the decisions.

This chapter first addresses feasible actions outside the water sector that would improve water outcomes, and then discusses the issues that water professionals can implement. Given the widespread availability of solid recommendations for improving water management and services, this report does not seek to duplicate them. Rather, it suggests ways in which would-be water reformers can respond to the political processes that govern water. The chapter recognizes that most problems have no single “right” solution, but that a number of options are possible. The choice is made through the political process. The sections that follow suggest actions that can affect the drivers of change for water reform

**FIGURE 5.1**

**Policy Objectives and Responses to the Three Stages of Water Management in Arid Regions**



Source: Adapted from Ohlsson and Turton 1999.

and outlines some basic principles that apply, regardless of the option chosen. The actions—clarifying objectives, establishing rules and responsibilities for achieving those objectives, and understanding the trade-offs between different options—are divided between those that affect actors outside the water profession and those that water professionals can undertake.

**Options for Nonwater Policy Makers to Affect Political Opportunities**

Nonwater policy makers can affect the political economy of water in several ways. The most basic involves understanding the effectiveness of public spending on water. Another involves establishing clear goals for public spending on water. Too often at present, public spending tries to meet unclear, multiple, and even mutually inconsistent objectives. A third option involves considering water outcomes when evaluating major changes in nonwater policies. A fourth would involve calculating the full costs (economic and social) of the status quo. Each of these options is discussed below.

**Evaluate the Level and Efficiency of Public Expenditure on Water**

Ministries of finance, economy, planning, trade, and agriculture need to know how much public money is spent on water and whether it is spent efficiently. As discussed in chapter 2, water absorbs a large share of

MENA's public expenditures, and those expenditures are increasing, for three reasons. First, because the most feasible options for increasing supply have already been exploited, new investments in supply augmentation are more expensive. Second, maintenance costs are increasing. The nature of much water infrastructure involves large up-front capital costs, with maintenance costs that can be deferred for the first decade or so. Because much water infrastructure in MENA was constructed 10 or 20 years ago, the maintenance costs are now increasing sharply. Third, because most urban consumers receive subsidized water supply and sanitation services, and because urban populations have been growing rapidly, the subsidies for urban utilities are growing. Yet, until recently, most governments had only partial information on public expenditure on water. This lack of information resulted from spending being spread between (a) different levels of government—central ministries, provincial and local governments, river basin agencies, off-budget funds, and so forth, depending on the country; (b) different sectors, including agriculture, housing, energy, environment, health, and education; and (c) different types of organizations, for example, government, water utilities, user associations, and community groups. However, as mentioned in previous chapters, in the last few years, some countries, including Algeria, Egypt, Morocco, and Saudi Arabia, have begun a thorough analysis of the scale and efficiency of these public expenditures and found considerable room for improvement.

Calculating the scale of public spending, or the cost of the status quo, can have a powerful effect on policies. Since 2002, local and international experts, in collaboration with the Mediterranean Environmental Technical Assistance Program and the World Bank, have calculated the costs of environmental degradation in several MENA countries, combined them, and expressed them as a share of each country's GDP. They presented these results to the Ministries of Finance and Economy as well as relevant line ministries (see figure 4.4 for a summary of the costs of degradation of water). These simple but powerful messages have been one factor catalyzing important changes. After seeing these figures, the government of Algeria increased its budget for environmental protection by US\$450 million and revised its environmental investment priorities. The data on the costs of water pollution have fueled a major push by the government of Morocco to accelerate investment in wastewater collection and treatment. The government of Lebanon has increased its planned investment in protecting the environment and managing natural resources, and the government of Egypt has also used this data to justify investments of \$170 million in air and water pollution control. Similar information on different aspects of expenditure on water and its effectiveness—expressed in economic or budget terms—is likely to have

an important influence on the relative priority central policy makers assign to water as well as on their understanding of the role their agencies play in water policy (box 5.1).

### **Define Goals for Public Spending and Cost Recovery**

Governments, through the political process, determine the level of public spending on water that is appropriate for their circumstances. Governments can reduce public expenditure without reducing investment or services while recovering the costs from the beneficiaries. In addition, the price of some services can affect demand for water, thus, having control over a predictable revenue stream often gives incentives to service providers to increase operational efficiency. However, determining the appropriate level of cost recovery for different investments and services is difficult because accurately apportioning benefits from each part of the network is usually not possible. The choices will vary from country to country, depending on social preferences, government financing, levels of investment, and other factors.

#### **BOX 5.1**

### **Changing the Priority Given to Water through Economic Analysis in Ethiopia**

Ethiopia has highly variable rainfall, both across the country and over time, and experiences regular droughts that devastate parts of the country and ripple through the economy. However, policy and macroeconomic decisions are based on growth models that assume rainfall is at historical average levels. In 2005, a study set out to estimate the magnitude of the impacts of high water variability on growth and poverty so that the government can better manage water and other parts of the economy (trade, transport) to reduce the impacts of water shocks. The study found that considering the effects of water variability reduced projected rates of economic growth by 38 percent per year and increased projected poverty rates by 25 percent over a 12-year period. The study found that the variability of rainfall increased the value-added of water investments, such as irrigation, that reduce vulnerability to rainfall. It also found that lack of transport infrastructure played a major role in the inability of local economies to adjust to localized crop failures because without it, areas with food surpluses could not sell to areas in food deficit. This analysis, undertaken in cooperation with the Ethiopian government, helped to make the issue of water resource management a central focus of the government's national poverty reduction strategy.

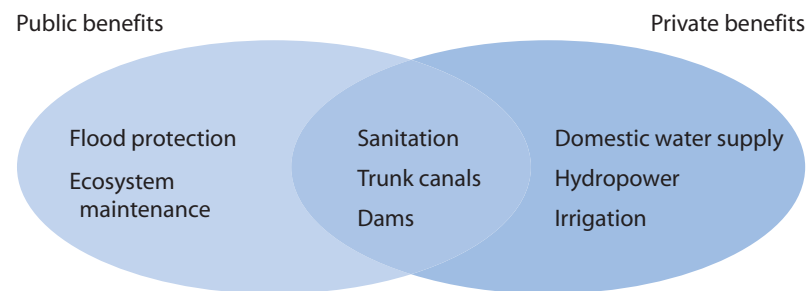
*Source:* World Bank 2006d.

Untangling the public and private benefits of water infrastructure is far from straightforward. One rule of thumb for cost recovery is that users should pay the full cost of services from which they benefit directly, and that the government should finance services that bring benefits to society as a whole. Benefits are public when it is impossible to exclude potential beneficiaries and when consumption by one beneficiary does not affect the amount available for others. Benefits are private when the opposite is the case. There is no dispute that public funds should be used for services that bring pure public benefits. International good practice suggests that users should pay at least for the operation and maintenance of infrastructure that brings private benefits. However, determining the share of benefits that is public is difficult, thus complicating the task of apportioning the costs of the infrastructure to individual users. As shown schematically in figure 5.2, some areas of water management provide clearly public or private benefits, whereas other areas are mixed. Sanitation provides both public and private benefits, as does shared infrastructure, such as dams. If a country decides to recover costs for urban water supply, it may determine that the users should pay for the costs of local level service. But should they also pay their share of the cost for storing the water and bringing it to the city? And if so, how much should urban users pay, given that the infrastructure is also used to generate electricity and to irrigate agriculture? Should people pay different amounts depending on their incomes? Individual countries will apportion public and private benefits in their own ways, depending on local circumstances and preferences.

Because of the difficulty of apportioning the benefits of water services to individuals, policy makers have considerable discretion in pricing water services, which makes it all the more important to set clear objec-

**FIGURE 5.2**

**Types of Benefits from Services Derived from Different Water Investments**



Source: Authors.

tives and establish good accountability mechanisms. Policy makers may decide that the state will finance all water services, or that users should pay the full costs of services (with protection for low-income users), or they may choose partial cost recovery. There are trade-offs between these options. Full cost recovery, when combined with operational autonomy for the service provider, automatically gives an incentive to the utility to improve service. Any option that aims for less than full cost recovery would have to put in place additional mechanisms that would provide that incentive. Full cost recovery would involve extra costs for some low-income households. A targeted subsidy system can be designed to compensate low-income households, but the system would have to be very carefully designed and implemented to prevent missing some eligible households.

Involving a wide set of stakeholders in a debate about the advantages and disadvantages of each policy option can help lead to the most widely acceptable choice. Finance ministries, water ministries, users, and other stakeholders should understand the trade-offs between different policies. Users have the best information about the level of service they require and are willing to pay for. They also have the best information about how well services are actually provided. Involving them informs the process of determining the objectives of public spending. It also helps users accept the decisions made.

Once the objectives are established, clear rules and mechanisms to foster accountability must be set to give agencies and service providers incentives to improve services and meet the objectives. Currently, too many of them have little operational autonomy, see no rewards for improved performance, have inadequate revenue, and therefore depend every year on subventions from the state budget. However, even poor countries can set clear objectives and put in place good incentives to improve water service delivery, as illustrated in the case of Uganda (box 5.2). Good accountability mechanisms that are important for providing good service, independent of the cost recovery objective, include:

- Setting clear objectives that the users accept
- Managing services at the local level
- Creating mechanisms for user feedback
- Giving utilities operational autonomy
- Rewarding utility staff for good performance and
- Evaluating how well public funds are spent (Gurria and Van Hofwegen 2006).

**BOX 5.2****Accountability Mechanisms for the National Water and Sewage Corporation, Uganda**

National Water and Sewage Corporation (NWSC) is a government-owned corporation, with a Board of Directors appointed by the Minister of Water, Lands, and Environment. The company has operational independence, and a hard budget constraint. It also has the power to cut supplies for nonpayment of bills, even when the defaulter is a public entity. The Managing Director is appointed through competitive selection. NWSC has a clear set of performance indicators, which improved consistently if slowly between 2000 and 2002. The company is accountable to many different stakeholders:

- To its owner (the government) through a performance contract
- To its regulators through monthly reports on compliance
- To financial institutions, who require timely submission of audited accounts
- To consumer organizations and nongovernmental organizations (NGOs) through surveys, suggestion boxes, and client hotlines.

The staff have incentives to improve performance—they receive bonuses for achieving performance contracts and may forfeit salary for underachievement—and have operational autonomy at the field level.

*Source:* BNWP 2006.

**Consider the Impacts on Water When Evaluating Policy Options in Other Sectors**

As this report has shown, water outcomes are fundamentally affected by policies in other areas of the economy. Systems of social protection, dispute resolution, industrial promotion, and civil engagement all affect water demand, cost recovery, and quality and implementation of established rules. Public policies governing energy, agriculture, urbanization, land sales, inheritance, and other sectors all affect demand for water and related services. When these sector circumstances change or policies are altered, water outcomes will be affected. When calculating potential costs and benefits of options for policy change or government involvement, the impacts on water should be taken into account as one of the potential costs or benefits of the change.

Agricultural policy should take water availability into account. Agricultural policy determines farmers' growing decisions and thus deter-

mines demand for irrigation water. Because agriculture uses 85 percent of the region's water, effects on water use should be considered during policy discussion. Conversely, water policy may well reduce the amount of water available to agriculture or aim to promote more efficient use of irrigation water. Both of these changes could affect agricultural strategies.

### **Calculate the Social Costs of the Status Quo**

Conflicts over water destroy the social fabric and are a drag on economic growth. Analysis of local-level conflicts in the MENA region suggests that water is already a source of conflict with important social and economic consequences, particularly for the poor. The analysis shows that the conflicts frequently take place when rules are unclear, law enforcement weak, and where stakeholders do not trust the mechanisms available to resolve disputes. Understanding the extent of the social and economic impacts of these conflicts can help policy makers determine the potential benefits of reform (CEDARE 2006).

Given the extent of conflict over water, it will be important to develop fair and efficient mechanisms for resolving disputes. These mechanisms will include, but not be limited to, improvements in the judicial system. Indeed, multiple levels of rulemaking make multiple dispute-resolution systems necessary. These can be traditional, or formal; they can be arbitrated, mediated, or negotiated. Those who wish to take water can base their claims on a variety of allocation frameworks and appeal to different authorities. The key, however, is that the mechanisms must be impartial and trusted by the stakeholders.

### **Options for Improving Accountability within the Water Sector**

Within the water sector, several actions can be taken that will improve water management. Creating a flexible allocation system; clarifying roles of different actors involved; collecting, releasing and agreeing upon information; and increasing agencies' capacity for planning and management will all become increasingly important in the future.

### **Create a Flexible Allocation System**

The heart of the water management challenge in MENA is to reduce water consumption to a level consistent with long-term availability and sustainable environmental management, and to distribute it fairly and ef-

ficiently, so as not to suppress economic growth. Governments have two basic levers for achieving this: increase the price of water, or restrict the quantity available for use. International experience indicates pricing mechanisms can be effective at reducing urban demand but does not work in irrigation. To affect demand, the price of irrigation water would have to increase to levels far above the cost of providing the service (Perry 2001). One study estimates that the price required to induce a 15 percent decrease in demand for water in Egypt would be equivalent to 25 percent of average net farm income, which would be politically infeasible (Perry 1996). A study in Mexico suggests that to reduce demand to sustainable levels, the water tariffs would have to increase more than fivefold (World Bank 2006f). International experience indicates that the solution inevitably requires stable and well-specified access rights to water, in combination with institutions that have the capacity to manage the water access regime, and cost recovery sufficient to ensure the long-term operation of the infrastructure.

Water rights involve a process of deciding who should receive how much—a process that must take place in some form wherever water is used under conditions of scarcity. Rights are distinct from distribution, which involves delivering water in accordance with allocations.<sup>1</sup> Water rights may be permanent or may be temporary, and may be renewable on a regular basis to adjust for variations in the overall quantity available. They might be transferable to others by sale or by inheritance. They might be codified through the legal system but can also be managed by traditional institutions, federations, and even NGOs, as long as the “owners” can defend their rights against competing claims (Meinzen-Dick and Bruns 2000). Rights relate to quantity and timing of water. They assume, but usually do not specify, the quality of the water. Rights exist in formal codes and titles, customary patterns, and social norms. Even within formal legal systems, different national, provincial, and local laws regulate water (Burchi 2005; CEDARE 2006).

Water allocation is a negotiated process. Systems of water rights are not determined by technical and legal specifications, but by interaction between different claimants that continues over time. Negotiations require claimants to work together to establish formal agreements. They also involve local-level struggles as individuals contest water use by state agencies or by other users. The process entails dialogue, but also results sometimes in obstruction, protest, and sabotage, which continue even after the parties have concluded formal agreements. The conflicts over water seen across the region are essentially struggles over water rights where peaceful means of negotiation are insufficient. For these reasons, developing institutions and adequate processes for resolving disputes is a

fundamental prerequisite to improving the allocation process (Meinzen-Dick and Bruns 2000).

Eventually, when dispute resolution systems are in place and rights are clarified, countries may choose to allow users to trade water, which could help reallocate water to the highest-value use. Establishing clear, equitable, and environmentally sustainable water rights is fundamental to improving water management, whether water rights are traded or not. Water markets are a mechanism to encourage efficient allocation and to compensate those who choose to give up their water. However, as discussed earlier, establishing water markets requires a long lead time and requires strong, well-governed institutions. Water can be traded across local borders most feasibly when water rights are codified in national law (Easter, Rosengrant, and Dinar 1998). Although water rights have existed for centuries in some parts of the world (Spain, for example), they are not widespread. Box 5.3 shows the case of the Murray-Darling Basin in Australia.

In some local areas of MENA, small, unregulated water markets have developed. In Bitit, Morocco, farmers trade water rights, and have done so for several decades. This is possible because water allocation rules are clear and transparent, based on the *Jrida*, a detailed, publicly available list of all

### BOX 5.3

#### **Tradeable Water Rights Can Promote Efficiency, Sustainability, and Voluntary Reallocation of Water**

In the Murray-Darling Basin of Australia, total water use is limited to the amount that is environmentally sustainable through a complex system of water rights, defined in terms of volumes and security of supply. In drought years many users may receive far less than their “normal” entitlement, and the restrictions are enforced entirely through water rights (that is, quantities) rather than through pricing mechanisms. This is a long-term process. Formally codifying these property rights—in a country with strong institutions and good governance, where customers were educated and accustomed to following rules, and where allocation rules were already broadly in place and enforced—took a number of decades. Once this process was complete, it was possible to introduce a system of water rights trading, with as much as 80 percent of water delivered traded in some years. Charges for water services are quite separate from the sale and purchases of water rights, and exist to ensure that the income of water supply agencies is adequate to cover ongoing maintenance and projected major capital replacements.

*Source:* Blackmore and Perry 2003.

shareholders and their water rights expressed as hours of full flow. However, farmers are not able to generate full benefits from the practice because the system is not properly regulated. This customary practice contradicts more recent, modern water legislation. For example, Morocco's water law (Law 10/1995) prohibits selling irrigation water for nonirrigation purposes. This stops farmers that irrigate with high quality spring water from selling that water to urban utilities or to water bottling companies for much higher returns than they receive from using the water in irrigation (CEDARE 2006). In Ta'iz, Yemen, farmers may purchase water from nearby well owners, or purchase tanker water from farther afield to apply to the highest value crops, such as qat. The cost is huge, and farmers are charged more—more than \$1/m<sup>3</sup>, if the crop is qat. For Ta'iz city, a large fleet of private tankers lines up at the wells around the city that have been converted from agriculture to water supply, generally because of their proximity to the road. Domestic and industrial consumers or the numerous bottling shops around town then pay the tanker owners for supplies delivered to their doors (CEDARE 2006). These opportunistic informal markets have several problems. They are small and therefore have a limited number of potential buyers and sellers. They are not transparent, so price gouging and windfall profits are possible. Water quality is not regulated. Formalizing and enforcing water rights would help expand the local-level water markets and allow such markets to make some of the allocation decisions that policy makers currently struggle with.

In MENA at present, the systems for allocating water rights are not leading to sustainable and peaceful outcomes. The sum total of all implicit and explicit rights that users have or believe they have is larger than the water available within safe environmental limits. This leads to economic hardship and conflict as discussed in earlier chapters.

Reducing the overall quantity of water available for allocation will inevitably be politically and institutionally challenging; yet, by making the process evidence based, participatory, and transparent, governments can reduce the political "heat." Throughout the world, competition for water in water-scarce environments is intense, and reducing water allocations to any sector is a political problem. Yet, experience with participatory water planning in many countries indicates that bringing stakeholders into a legitimate forum to debate and come to a consensus about the current situation and to discuss potential solutions can lead to a convergence of views about the way forward.

### **Clarify Roles and Responsibilities of Different Actors**

Determining who is responsible for what is essential for improving accountability, which is a key step for improving water management in

MENA. As chapter 2 described, institutional analyses of the water sector showed in country after country that problems arise when roles are unclear or have perverse, built-in incentives. When the same agency is responsible for both providing services and ensuring the good quality of those services, as in most MENA countries, one key internal accountability mechanism is removed. At present, the governments in MENA countries undertake a wide range of tasks associated with water management. Some of these are legitimate tasks for the state, while others would probably be better managed if river basin agencies, users, or independent service providers were responsible for them. The suitability of the institutional design depends on how well it meets the test of acceptability by society as the legitimate and transparent means of managing the various aspects of water resources.

International good practice suggests that water is best managed at the lowest appropriate level. That appropriate level varies from case to case but depends on the function being exercised. Table 5.1 summarizes where responsibility for different water functions can lie. For example, for irrigators, the organizational level is field canals, where collective action is often required to ensure delivery of water at the appropriate time to farmers. For engineers and planners, the appropriate level is at the branch canal or river basin, where integrated management of water is feasible. Ministries are responsible for the entire sector, so the whole country may be the appropriate level for them.

Private sector involvement may be a useful option—but not necessarily. For many years, some sector professionals viewed private sector participation as the best way to turn performance around. After a series of disappointments with purely private models over the last decade, the pendulum may now be swinging in the other direction, with too much reliance on public sector fixes. In reality, as chapter 2 shows, ownership of utilities and irrigation service providers matters less than the policy and accountability environment in which they operate. Public or private models can work equally well and provide services comparable to the best-run utilities—when governance and accountability mechanisms are strong. When the same individuals are fulfilling multiple and often conflicting roles, accountability tends to be unclear. Systems of internal controls, operational compliance, and financial audits are needed, regardless of the ownership structure. The sooner the focus shifts toward fundamental reforms in the water sector, the sooner real improvements will be achieved for either public or private models.

Institutionally, the preferred solution is to separate a number of functions within the water utility sector, as well as to break up roles and responsibilities within the organization itself. For example, in the utility sector, splitting regulatory responsibilities from service provision, and

establishing separate oversight boards, are perhaps the more important actions. It may also be important to separate the lending functions from ownership, and the ownership function from service provision. Once functions are clear, it may be possible to attract private operators, if that is the chosen policy.

The profile of transactions with private operators appears to be changing. Conventional build-operate-transfer organizations or concessions are much less common today, in MENA and worldwide. The large, dominant international operators are playing a much smaller role, at least in direct financial placements. These operators prefer options that transfer the financing risk to the public partner (as in management contracts, and leases); it is far from clear that these investors can be led back to assuming project financing risks. Conversely, local operators appear to be entering the market in greater numbers, even as risk investors. However, their financing capacity and interest appears generally aimed at systems in provincial capitals and smaller urban towns that have generally not attracted the larger international operators.

Decentralization of service delivery responsibility to lower tiers of government is also changing the dimensions of the market. Local governments are becoming key stakeholders and financing partners in the water sector and other local infrastructure, though financing and risk-taking capacities of local governments are often limited. Thus, private domestic banks, primarily in middle-income countries, are increasingly interested in entering this market segment, not only as financiers of local infrastructure but also to tap into the increasing general business that can be generated by local governments. Finally, with the increased risk aversion of private investors, risk allocation schemes appear to be shifting toward greater focus on transaction models that blend financing from both public and private sources. Hybrid financing schemes have emerged to accommodate the paradigm shift in the appetite for risk and to take advantage of the comparative strengths that each party, public and private, brings to the infrastructure finance market.

### **Collect, Agree Upon, and Release Information**

Accurate, reliable data are crucial for good policy making. Good management of water resources requires information about how much water is available, how much can safely be extracted, and how much pollution a water body can absorb. To provide good water services, utilities need to know the quality of service their users want and are getting, and whether they are paying the agreed price for the water they use. Reliable information, clearly presented, can be a powerful stimulus for change, as seen in water utilities in Syria (box 5.4). Gath-

**TABLE 5.1**

**Institutional Responsibility for Water Management**

Appropriate level	Task	Current politics of management	Potential mechanism to improve external accountability	Who should ideally manage?
International	Plan water investments; water use and environmental protection for international basins and aquifers	Formal negotiation of water allocations	International forum or agency that builds trust and focuses on sharing the benefits generated by the water rather than the water itself	International forum
National	Pass legislation on water allocation, institutional responsibility, water quality. Make decisions about major hydraulic investments.	Decisions based on non-transparent criteria to achieve multiple objectives	Clear criteria for decision making that maximizes water's potential to generate growth and jobs	Legislative process sets policy. Relevant ministries implement
National	Set transparent rules for targeting subsidies to achieve social and environmental objectives	Strategic importance of water drives inefficient public expenditures on cross subsidies	Criteria based on policy framework aimed at achieving social and environmental equity	Economic ministries (planning, finance)
Within-country hydrological boundaries	Decide water allocations between competing uses (urban and rural), monitor quality, enforce compliance with allocation rules, collect water use and pollution charges, and compensate losers of water resources	Nominally ministries of water or environment but actually powerful economic interests (farmers, urban real estate developers, and the like)	Basin-level committee of stakeholders (government, economic interests, and community with balanced representation), and financial autonomy	Overall regulation at national level, implemented by basin-level organization
City, town	Provide water supply and sanitation services and maintain infrastructure	Utility managers often with total dependence on government budget support	Utilities managed on commercial principles, with tariffs that recover costs and clear performance standards	Overall water services regulation at national level, from water service and sanitation utilities deriving revenues from cash flow
Groups of farmers	Manage allocations between plots, maintain infrastructure	Irrigation engineers with total dependence on government budget support	Utilities and water user associations managed on commercial principles, with tariffs recovering costs below secondary network level. Water trading allowed if conditions are right.	Community-based user associations

Source: Authors.

ering data for water services is important and requires effort, but is relatively straightforward. Data for water resource management are far more complex, being subject to considerable uncertainty and disagreement.

**BOX 5.4****Use of Data to Stimulate Change in Water Utilities in Syria**

A study of Syrian water utilities indicated that domestic water meters were causing losses in revenues of more than 30 percent of total income (1 million Syrian pounds [US\$20,000] per day). The meters, which had been supplied by a single, state-run, domestic manufacturer to 2.8 million customers registered in 14 water utilities, were unreliable, inaccurate, and often broken. As a result of this economic assessment, the Syrian government gave the go-ahead to halting the state monopoly on the supply of domestic water meters, and to allow the importation of water meters.

*Source:* Kayyal and Shalak 2006.

Setting up monitoring systems to collect good water resource data is time-consuming and expensive. Once monitoring systems are established, they must be continuously monitored because both inflows and extractions change constantly. Monitoring is particularly important for groundwater, because it is not visible (UNESCO-IHP 2005).

It can be important to generate data in advance of major policy decisions or organizational changes. The case of West Bank and Gaza illustrates this point. Years before the 1993 Oslo agreements, water professionals began gathering data in preparation for the expected establishment of the Palestinian Water Authority (PWA) and a nationwide water resources planning exercise. Most of these experts worked in NGOs and academia and included the Palestinian Hydrology Group, created in 1987, and the Applied Research Institute of Jerusalem, created in 1990. They worked primarily with secondary data, but did collect new data and conduct surveys. They shared this information with the PWA, once it was established in 1995. Similarly, the West Bank Water Department, a bulk water company, shared its data with the PWA.

Stakeholders need to agree on the data they will use. Determining how much water of what quality is available can be extremely contentious, in part because the level of uncertainty is intrinsically high and in part because users may make decisions with real economic effects on the basis of that data. The case of the North Western Sahara Aquifer, shared by Algeria, Libya, and Tunisia, demonstrates how long it can take to agree upon data. With support from UNESCO and other bi- and multi-lateral donors, scientists from two of the countries have been working together since the 1960s to develop a common database and to agree on the impacts of different use scenarios on the resource. Libyan experts joined the cooperation in 1998. This case also illustrates the ad-

vantages of processes to agree on datasets and plan use and build consensus before large-scale exploitation gets underway, since it is hard to establish water rights under any circumstances, but even harder to reduce allocations once the resource has become overexploited (Benblidia 2006b).

In addition, disclosing information can increase public pressure for improved performance. To improve environmental quality, several countries have established systems to disclose information to the public. Some countries (Australia, Canada, the European Union, Japan, the Republic of Korea, Mexico, and the United States) report emissions of a wide range of toxins, leaving the interpretation of the health and environmental implications to others. Other countries (China, India, Indonesia, the Philippines, and Vietnam) rate the environmental performance of companies on a scale up to 5, thus interpreting the significance of the emissions as well as disclosing them. This second approach is appropriate in circumstances where corruption and weak enforcement have made it difficult for regulatory measures to control pollution and where communities cannot easily interpret the results.

Disclosure tends to increase pressure on polluters from communities, regulators, and the market. Disclosure can also stimulate within-firm and across-firm technical innovations for reducing the pollution intensity of production.<sup>2</sup> Income, education, level of civic activity, legal or political recourse, media coverage, NGO presence, the efficiency of existing formal regulation, local employment alternatives, and the total pollution load faced by the community all affect the effectiveness with which communities can pressure nearby polluters.

Evidence indicates these schemes do have an impact on environmental performance. In the decade after beginning its public disclosure program, the U.S. government reported an overall 43 percent decrease in national releases of toxins reported in the system, although it is not demonstrated that the program caused that decline. After implementation of performance ratings, compliance with prevailing environmental regulations increased by 24 percent in Indonesia; 50 percent in the Philippines; 14 percent in Vietnam; 10 percent in Zhenjiang, China (from a high base); and 39 percent in Hohhot, China. In light of the evident regulatory problems in all four countries, these improvements suggest that performance ratings had a very significant effect on polluters.

Disclosure of information about performance can also help improve the operational performance of water supply and sanitation utilities. A study of the performance of 246 water utilities in 56 countries compared utilities in developed and developing countries (Tynan and Kingdom 2002). The study found a wide gap between the two groups—developing country utilities absorbed significant amounts of scarce public resources

to produce services that did not meet consumer expectations. Why have consumers in developing countries not protested and agitated for change? The reasons are many, and are compounded by lack of knowledge about performance and about reasonable benchmarks of performance.

Disclosure need not be fully public if information is sensitive; however, sharing comparable information across similar organizations can generate healthy competition to improve performance. This was seen in the Baltic States—five cities in Estonia, Latvia, and Lithuania established a database in 1998 to share information among their water supply and sanitation utilities for a range of performance measures, with a limited set of this data available to the public. The initiative was based on a successful experience in 1995 among six cities in Scandinavia. Senior management of the utilities in both groups held regular meetings to discuss the benchmarking data and analyze discrepancies and look for ways to improve performance relative to the others in the group.

New information and communication technologies can help with data collection and dissemination and serve as powerful tools for improving water management. Recent breakthroughs in remote sensing have enabled the quantification of water consumption and crop production without agro-hydrological ground data (Bastiaanssen 1998). These measurements provide a vehicle for assessing farm management through land productivity, water productivity, irrigation efficiency, environmental degradation, and farmer income. These technologies give policy makers data that can reduce the uncertainty that, as argued here, clouds decision making in this sector in some cases. In addition, if the data are released publicly, they can be used to improve external accountability and help accelerate progress in reform and improved water management.

### **Actions to Improve Capacity and Water Planning**

The water ministries of the region are staffed by excellent technical professionals trained at elite universities both within the region and around the world. However, as these professionals recognize, creating a system that can meet the challenges of the twenty-first century will require a multidisciplinary approach. Water, the related infrastructure, and its use must all be *managed* on a continual basis. Water users, social preferences, and climatic conditions all change continually, and will require constant attention. The countries of the region need a system of continuing education on water that focuses on the management challenge (AWC 2006).

Improving accountability in water allocation and services will require a new skill set among water professionals. Some of the reforms needed to achieve demand management are technical. However, many of the

measures needed to provide economic security for the region's peoples are not related to engineering. The systems need to become financially sustainable. New projects must attract financing. Water laws have to be drafted. Countries need stronger oversight bodies to regulate service providers and to protect environmental quality. Professionals managing water services have to engage with, or at least understand, the social and political dimensions of change and reform. They also need to understand water economics and the role of financial viability through cost recovery. And they have to incorporate and manage unfamiliar and politically contentious standards of environmental sustainability as routine. Yet, these skills have not been part of the education nor of the normal job descriptions of staff in departments and agencies that have managed water services for the past century or more.

One important way to accelerate the adoption of the necessary new approaches is to appropriately educate new entrants to the water services professions. New curricula that are adapted to the needs of MENA countries are necessary. In contrast to the economies of Europe and North America, most Arab economies are still very much dependent on livelihoods in irrigated farming. In these circumstances, irrigation management in the region, and water management more generally, need to be the best in the world. Centers of excellence, motivated by local scientists and water policy professionals from the region, need to inspire new emphases in higher education in the water sector.

Water planning will continue to be important. Given the broad scope of water issues, and given the uncertainty about the quantity and quality of the resource, water planning will remain a crucial function. Strong agencies able to adapt to changing circumstances in the natural environment, the economy, and the political economy will play a vital role in establishing, enforcing, and managing improvements in the water management system. A ministry responsible for water resources management will be involved in water allocation, water regulation, and analysis of the relationship between the spatial and the economic aspects of water.

The most effective water agencies will conduct analysis in a form accessible to central decision-making bodies and use planning tools to engage stakeholders. Examining returns on water investments, efficiency of public spending, and costs of continuing the status quo will be important. Water agencies must also understand the likely effects of changes in nonwater policies (such as trade liberalization) on the water sector. One option would include developing a means to evaluate policy alternatives that shows the impacts of different decisions on growth, on poverty, and on water. Tools that link physical parameters (rainfall, flow, water quality) with economic variables (trade, economic growth, cropping patterns) have proved very effective at influencing central decision makers (in

Mexico, for example) and at engaging the public in a consultation process that leads to consensus about the reform path to take (in India, for instance) (World Bank 2006f, 2006h).

## Applying the Approach in Practice

How can the approach advocated in this paper improve water policy in practice? This report suggests several changes in policy making that will lead to better water management in MENA.

- Planning and policy proposals should explicitly consider the political nature of many decisions about water management and water services. Politicians, therefore, need to work together with technical professionals in the early stages of planning processes. Technicians need to cultivate champions from the political spheres.
- Policies should not forget the multisectoral dimensions of water: its problems cannot be fixed by the technical professionals from one line ministry, but involve many aspects of the economy. Trade, finance, agriculture, industrial, and energy policies will affect and be affected by water management decisions. Water has to be seen beyond the boundaries of the water-related ministries.
- Improvements in accountability are just as important as more technical water policies and investments. Measures to improve accountability can come from the central level (for example, a law to improve public access to information) or be implemented locally (involving users in decision-making about use of water in a small subbasin, for instance). Both are taking place in the MENA region right now, but the processes can be accelerated, even in the absence of broader water sector changes.

Technical strategies and planning documents often overlook these broader issues in the search for strong recommendations within the sector. Yet, at this stage in the development of water management in almost all MENA countries, these beyond-the-sector and political economy factors determine the outcomes. The remainder of this section gives examples of how taking this approach has given would-be water reformers more traction in advocating change in recent developments from the region.

*Taking political trade-offs into consideration in the planning process and involving political decision makers in the reform.* Water reform in Morocco has gained important new momentum recently, a decade after the country passed an innovative water law in 1995. The government is

increasingly focusing on water management, water quality, inclusive services, and improved governance of the sector—marking a shift from the supply-driven approach of the past. The push for reforms to improve water management arose in a context of increased trading opportunities, including for agricultural products; a drive for increased economic growth and employment; tightening fiscal pressures; and recurrent drought. The reformers, and the donors who supported them, took an approach that explicitly involved key political and technical nonwater decision makers. They made a strong case for the impact of water shortages associated with recurrent droughts on economic growth. They also analyzed the fiscal impact of continuing with the status quo. They made presentations to the King, the Prime Minister, and the Finance Ministers. The Prime Minister outlined the change in approach at a major public conference (the World Water Forum in Mexico City in March 2006). The government asked the World Bank to make water one of four central themes in its assistance program.

*Recognizing the multisectoral nature of water and its importance throughout the economy.* Finance ministries in countries such as Algeria, Egypt, Iran, Morocco, and Yemen are beginning to recognize the fiscal burden associated with current investment and operating cost subsidies associated with water management and services. They are also acutely aware of the economic and social impacts of droughts, floods, and other water-related phenomena. They have analyzed the fiscal costs of the current situation, and those analyses reveal the scope for increased efficiency without compromising the welfare of vulnerable communities. Finance ministries in these countries are beginning to demand that public spending on water become more closely aligned with long-term goals of improved water management.

*Focusing on improving accountability in the water sector.* Developments such as water users associations, water boards for local drinking-water infrastructure, transparent basin-level planning processes, and others highlighted earlier in this chapter implicitly improve accountability over water and empower communities to extend their activities to other areas (water user associations becoming involved in solid waste management, for example).

## Conclusion

This report makes a case for healing the “soul” rather than just the “body” of water. Technical solutions to keep water bodies healthy are no

longer enough. Water management must be seen holistically as part of a larger overall system, in three ways:

- Water is not an isolated “sector” but an integral part of a wider economic system. The changes in the wider system will have more impact on water management than actions within the sector.
- Water reforms must be planned and implemented with full understanding of the changing realities of the political economy.
- The water management challenges themselves are changing as populations grow, urbanize, and become more educated; as economies integrate with world trade and customers demand increasingly complex services; and as environmental conditions worsen. The prescriptions for improved water management in most sectoral strategies (resource pricing, cost recovery for services, devolving responsibility to users, utility restructuring, integrated water resources management, enforcement of environmental regulations) are important but will only have their desired effects when water reform is planned as part of a more holistic set of economic changes (that include agriculture, industrial development, tourism, accountability, and public finance).

MENA has much to be proud of in its water management. The countries of the region have made great progress improving water policies and institutions. They can learn from their own and their neighbors’ successes, and other regions can also learn from them.

Now is the time to make water everybody’s business. And given the scale of the problems, involving a wide range of disciplines and stakeholders is not a luxury, it is an obligation for the region. This can be seen as a national-level compact—involving water, agriculture, finance, social development, education, the environment, municipalities, interior, and citizens—that should be promoted at the highest level.

Any agenda for reform of water policy in MENA must respond to the realities of the political economy. Because they involve mediating competing claims for natural and financial resources, and because the natural systems are subject to considerable uncertainty, policies that affect the management of water resources and the provision of water services are highly political in any country. They are all the more so in the water-scarce countries of the MENA region. Any would-be reformer can work to sequence proposals in line with potential political opportunities. The reformer can also undertake specific actions that might affect the position or voice of the interest groups that influence policy makers.

Actions outside the sector will be important. No matter what changes are made within water ministries, service providers, and interest groups, if forces outside the sector encourage inefficient water use, unsustainable

water will prevail. Understanding and evaluating public expenditure on water and setting clear policies for that expenditure will be an important element in reform. In addition, changes in nonwater policies might help shift the balance of incentives from bad water outcomes to a water system that facilitates, rather than slows, economic growth.

Inside the water sector, clarifying the allocation principles, organizational responsibilities, and lines of accountability will be fundamental. Clear rules, responsibilities, and mechanisms for enforcing those rules are fundamental to improving water management, so that citizens and users and their governments can evaluate the trade-offs between the various policy options. Many of the features of user participation, equity, and transparency seen in traditional water management systems in the region can be reapplied to modern infrastructure and production systems.

This is a challenge the countries of the region can meet. The agenda outlined above is ambitious but necessary. It is also politically charged. However, so is the current situation, and the problems of the status quo are likely to intensify. With the right accountability mechanisms in place, water management in MENA can become more equitable, efficient, and environmentally sustainable and thus contribute to the region's prosperity.

## Endnotes

1. Users who take water from infrastructure such as urban networks and irrigation canals are usually considered to have some sort of contract with service providers rather than water rights, and public investment in water infrastructure usually extends the water rights to the state (Hodgson 2004).

2. This is widely documented, as described in Dasgupta, Wang, and Wheeler 2005.

