

Several Factors That Drive the Politics of Water Reform Are Changing

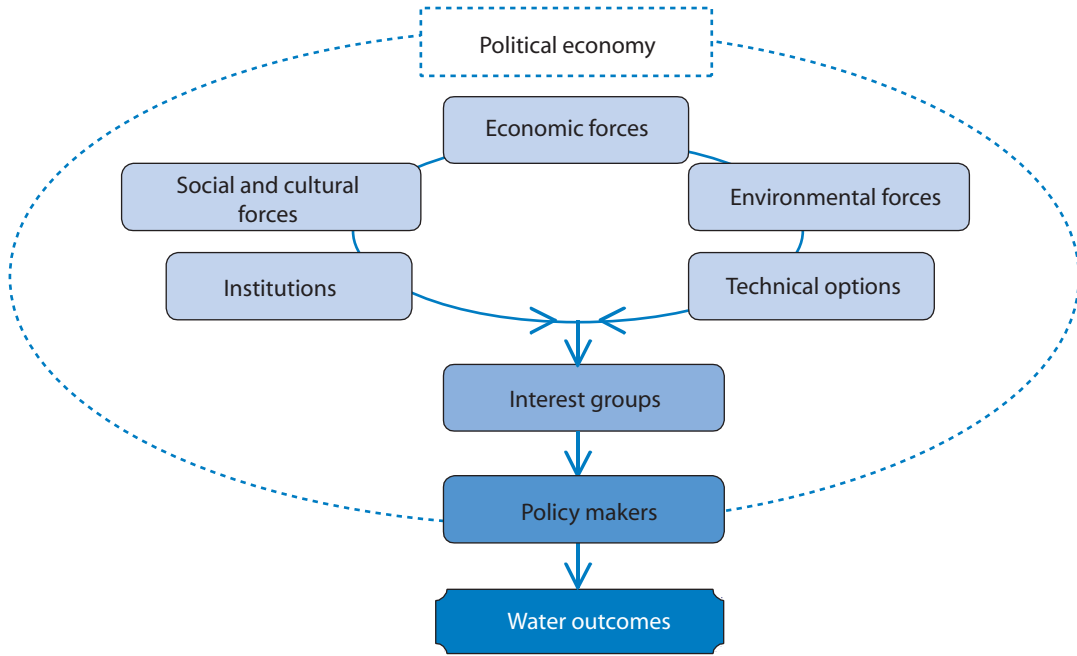
Although political considerations have blocked important water reforms in the past, the factors that determine the political feasibility of water reforms change over time. The positions and relative influence of various interest groups relating to water have the potential to change in the near future, which could improve or worsen water outcomes, depending in large part on the strength of accountability mechanisms. When accountability is strong, changes in the political economy could provide “political space” for reforms. But without accountability, the changes may worsen MENA’s water situation, if a small elite is able to capture the benefits.

Interest groups determine the politics of reform. The political economy model introduced in chapter 1 (reproduced here as figure 3.1) is a simplified representation that aims to give a structure to the complex, untidy interactions of a number of economic, technical, environmental, and social factors that influence the decisions that affect water outcomes. The figure will be used as a *leitmotif* to illustrate the discussion in the rest of this chapter. Water users or interest groups—households, industries, irrigated farmers, fishing communities, tourist resort operators, or environmentalists—may oppose water reform if they believe that the change will undermine their interests, or may lobby for reform if they perceive the opposite to be the case. Some interest groups have more access to the relevant policy makers and to information than do others. Little information is available on some issues because of the uncertainty surrounding the interaction of human, economic, and biophysical processes. As a result, much lobbying takes place on the basis of convictions rather than on data about the effects of particular changes.

Yet, these groups form fluid alliances that coalesce or disintegrate as incentives change. When new economic opportunities emerge, members of some interest groups might find more attractive forms of livelihood, either raising their income levels and affecting their ability to pay for water services or making them less dependent on water services. These positive economic forces are a natural, noncontroversial way for opposi-

FIGURE 3.1

Political and Social Forces Acting on Interest Groups



Source: Authors.

tion to water reform to decline. Alternatively, the voice of powerful interest groups opposing reform may be weakened by the emergence of a new set of stakeholders with an alternative viewpoint. Thus, the political obstacles to water reform can change, providing opportunities that may not have been possible before.¹

The strength of accountability mechanisms is a key factor that translates interest groups' agendas into political decisions and thus determines whether countries will be able to take advantage of these potential opportunities. Mechanisms that promote accountability to the public increase the chances that these shifting alliances represent the widest set of interests and get access to relevant information to make choices that lead to sustainable water outcomes. Accountability determines how interest groups influence policy makers; it incorporates the concepts of transparency (how interest groups know about the decision-making process) and inclusiveness (the range of interests that are involved), and determines how interest groups ensure that policy makers and service providers experience consequences for good and bad performance. The more inclusive, transparent, and accountable systems are, the more likely it is that the changing political circumstances will lead to opportunities for water reform that is beneficial for all.

Economic Forces Driving Change

When economic sectors open up or grow, the type of water services the economy demands can change. For example, tourism is generating demand for clean beaches and reliable water supply in some MENA countries. As the region's principal service export, tourism's share of total exports is more than twice the world average (WDI database). The constant dollar value of tourism receipts has increased in Algeria, Bahrain, Egypt, Iran (until 2000), Morocco, and the United Arab Emirates. Tourists require their beaches to be clean, and clean beaches depend on reliable collection and treatment of sewage and of municipal solid waste. In addition, water supply services must be reliable for the tourist entrepreneurs. If public systems are not providing adequate services, a cost will be imposed on small tourist facilities. Large hotels may opt out of the public network and build their own infrastructure. This will be more expensive on a unit basis and will deprive the utility of a potentially large-volume customer. These two factors imply that parts of the tourist industry will join the interest groups lobbying for increased investment in sanitation and improved water supply services.

However, because agriculture plays such a dominant role in water use and in employment, potential changes in agriculture are likely to affect the political economy of reforming water allocation.

Agricultural Transformation

Structural economic change has the potential to transform agriculture in some MENA countries. At present, several interrelated policies and rigidities in many MENA economies reduce employment opportunities outside agriculture and discourage farmers from diversifying into other crops. This leaves large populations farming—and using water—inefficiently. Agriculture accounts for a large share of employment in MENA (28 percent in Egypt, 44 percent in Morocco, 50 percent in Yemen) (WDI database). As countries in the region begin the process of economic reform, they are likely to follow the pattern seen across the world in which increased economic activity draws labor out of full-time agriculture and the farming sector becomes more efficient. This transition will fundamentally change the nature of political pressure for water allocation to agriculture and the types of irrigation services that farmers demand and are willing to pay for.

The transformation of the agricultural sector is already taking place in some small areas of the MENA region. Domestic markets for agricultural products in most MENA countries are growing quickly, even as the global economy expands and becomes increasingly integrated. In MENA, trade

with Europe is particularly important because the European Union (EU) absorbs over half the region's agricultural exports. Over the past few decades, markets in the EU have been expanding, as higher incomes and changing lifestyles raised demand for Mediterranean fruit and vegetables. During that period, MENA countries gradually received more favorable access to EU markets (Cioffi and dell'Aquila 2004).

MENA countries have strong advantages in certain products, particularly during the winter months. Tunisian farmers are competitive in tomatoes, melons, potatoes, olives for oil, citrus, dates, apples, and pears (World Bank 2006i). Iran's strong or growing presence in world markets for pistachios, almonds, dates, walnuts, cotton, potatoes, and tomatoes suggests a competitive advantage in those commodities (Salami and Pishbahar 2001). Egypt has potential in horticultural products and cotton (World Bank 2001). Jordan, Lebanon, Syria, and West Bank and Gaza have a potential competitive advantage in most horticultural produce, partly because their harvest seasons are two months ahead of the western Mediterranean (Muaz 2004). These factors combine to create significant export opportunities in MENA, particularly for certain products at certain times of year.

The ongoing revolution in food marketing is raising the stakes. Between 70 and 90 percent of food sales in the EU pass through supermarkets, whose high-volume, centralized purchasing systems allow them to scour the world for high-quality, reliable, and timely suppliers. To manage uncertainty, they develop private quality standards, preferred- or sole-supplier arrangements and centralized procurement (Shepherd 2005). Experience from other countries in the region shows that supermarkets will try to reduce uncertainty by centralizing procurement and shifting from market-based to contract-based purchasing (Codron et al. 2004). As food markets undergo this transformation, the financial rewards for quality, timeliness, and reliability of irrigation services will become much more valuable to the farmers who can meet the new challenges than will water subsidies.

Fruit and vegetables offer higher returns to land and water than field crops such as the cereals that have historically dominated MENA agriculture. Table 3.1 illustrates the scope for increasing the return to water use by shifting from the irrigation of cereals to horticultural crops in the MENA region. Another source² estimates that value-added per cubic meter of water from vegetable cultivation is US\$0.37, rising to US\$0.75 for fruit cultivation, and that these figures can be increased by over 107 percent and 48 percent, respectively, by the adoption of high-efficiency irrigation systems.

High value export crops also generate more employment than do traditional crops such as cereals. Cereal crops tend to have low labor re-

TABLE 3.1**Returns to Water Use in the MENA Region, by Crop**

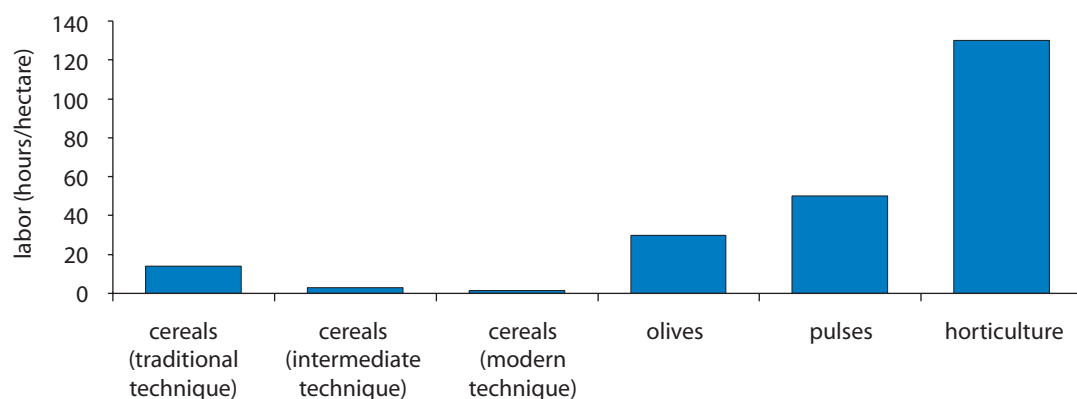
Product	Water (m ³ /ton)	Revenue (US\$/ton)	Return to water use (US\$/m ³ water)
Vegetables	1,000	500	0.50
Wheat	1,450	120	0.08
Beef	42,500	2,150	0.05

Source: World Bank 2003d.

quirements, particularly when modern farming techniques are applied. Fruits and vegetables, however, have far higher labor requirements. Figure 3.2 shows that horticulture in Morocco requires nine times more labor than traditional cereal farming.

However, most MENA countries are not yet achieving their export potential. Under the EU-Morocco trade agreement, for example, Morocco had the potential to ship up to 175,000 metric tons of fresh tomatoes duty-free to the EU in 2004. The quota from November to May increases by 10,000 metric tons a year until it reaches 220,000 metric tons in 2007. The country is, therefore, in a position to dominate total EU tomato imports, which, excluding intra-EU trade, were 170,000 metric tons in 2000 (FAOSTAT database). In 2005, however, Morocco exported only 60 percent of the available quota, which amounts to lost revenue of US\$44 million, with resulting effects on rural livelihoods.

In practice, although farmers are growing increasing quantities of high-value crops, the export value is falling. MENA's total output of fruit

FIGURE 3.2**Labor Requirements of Moroccan Agriculture**

Source: Ministry of Agriculture, Rural Development and Fisheries.

and vegetables increased from 29 million metric tons in 1990 to 71 million metric tons in 2003, their share of total agricultural output by weight rising from 20 percent to 26 percent and their share of cropped area from 10 percent to 13 percent. As table 3.2 shows, however, the region's 4 percent annual growth in fruit and vegetable production translates into real growth in export earnings of only 0.1 percent per year since 1980; this figure drops to negative 1.5 percent per year if Iran is excluded from the calculations. This is not because production is shifting toward the domestic market, but probably because harvests are not meeting quality standards for high-value exports, and thus can only generate the lower prices associated with low-grade exports. For example, Tunisia is unable to export high-quality citrus fruits to the EU. Many citrus orchards are old and unproductive. Yields are low and fruit are too small to get good prices. Harvest and wholesale practices further reduce quality, because fruits that are tree-harvested and those collected on the ground are often mixed together, and, in the market, fruits of all quality levels and sizes are mixed and sold together (World Bank 2006i).

The fall in unit prices reflects problems throughout the supply chain. Although the rapid transformation of food markets is creating new opportunities, MENA governments' agricultural policy interventions discourage farmers from responding to them. For example, until recently, the Egyptian government used farmers' cooperatives to prescribe cropping patterns (Pohlmeier 2005). A recent study of Tunisia's agricultural sector found that "the state's heavy presence in supply chains hampers their responsiveness" and that "the prevailing logic is for Government to give top-down prescriptions e.g. for farmers organizations, credit packages, land tenure. Government could facilitate the private sector more

TABLE 3.2

Fruit and Vegetables' Annual Growth Rates, 1980–2000

(annual percent change)

Country	Cropped area	Production volume	Volume of domestic demand	Export volume	Export value
Algeria	2.0	3.3	3.1	-2.8	-1.1
Egypt	3.1	4.2	4.2	3.0	-2.1
Iran	2.9	5.5	5.4	11.0	7.7
Jordan	1.3	3.7	4.1	-1.0	-3.0
Morocco	5.6	3.5	4.8	-0.6	-2.8
Syria	-2.2	-0.3	-1.2	11.3	5.9
Tunisia	2.2	3.8	3.5	9.2	-0.3
Yemen	3.7	3.9	2.2	14.1	7.3
Aggregate	2.4	4.0	4.0	3.4	0.1

Sources: FAOSTAT Food Balance and Production data 2005; World Bank WDI database 2005.

effectively by seeking to understand and respond to its perceived needs” (World Bank 2006i, p. viii).

By maintaining agricultural policies that are unresponsive to supply chains’ needs, MENA governments are discouraging the emergence of high-value farming as a political constituency for water sector reform. There are, however, signs that farmers perceive the need for a change. According to a recent newspaper article, the lack of flexibility associated with rigid irrigation water allocations is frustrating farmers in the Tadla region of Morocco. On December 15, 2005, the farmers organized a demonstration to protest the policy of the regional irrigation office that gives priority water allocations to sugar beet and fodder crops, and leaves any water remaining after those priority crops for those with other types of cultivation. The demonstrators requested more certainty about the allocations that they would receive and flexibility to choose the type of crop to cultivate (*Al Abdath al Maghribia* 2005).

Economic models suggest that, if farmers take advantage of progressive trade liberalization, the rural economy will be transformed. Within the Euro-Mediterranean Partnership and the EU’s New Neighbourhood Policy, several MENA countries will continue negotiating toward progressive liberalization of trade in agricultural products. The impact of this policy has been analyzed for various MENA countries (Lofgren et al. 1997; Radwan and Reiffers 2003; and Roe et al. 2005). The research concludes that:

- Liberalization will raise MENA’s domestic prices and exports of fruit and vegetables, while lowering domestic cereals prices and stimulating cereals imports.
- This process will generate both winners and losers. The winners will be consumers and larger, more modern, and better-capitalized farmers. The immediate losers are likely to be small farmers and labor, representing a major fraction of the agricultural population—in Tunisia, for example, 53 percent of farms account for 9 percent of the land area.
- Farmers who have the choice will use more water for fruits and vegetables and less for cereals.

Agricultural development may transform political resistance to irrigation reforms. The changing face of agriculture in several countries is likely to affect the nature of users’ demand for irrigation services. They will require reliable services, with water delivered at precise times depending on crop needs and, if they are to meet quality standards for export, they will require good quality water. Export crops need irrigation water of the right quantity, timing, and quality, not only to maximize

yields, but also to meet the sanitary and phytosanitary requirements of importing countries.³ Irrigation water in the region may contain high levels of pathogens, farm chemicals, or heavy metals. Farmers exporting fruit and vegetables are becoming increasingly aware of the effects that the quality of irrigation water can have on their ability to access export markets. This awareness may in the future translate to user demand for improved water quality, through investments to treat human wastes, policies to limit pesticide and fertilizer runoff, and improved enforcement of environmental discharge standards. Pockets of farmers with high-value export crops in Egypt, Jordan, Tunisia, and elsewhere in the region are beginning to exert pressure on service providers for improved service reliability and better water quality and are indicating that they are willing to pay for good-quality services.

The changing face of agriculture does carry the risk that rent-seeking strategies may emerge. Irrigation service providers may increasingly find themselves serving small cliques of high-value producers rather than large numbers of farmers, many with relatively low incomes. The smaller number of high-value producers may push to secure the same quantities of water and to maintain the subsidized rates prevalent in existing surface water schemes. And the smaller numbers of better-off farmers may be more able to organize themselves to lobby governments. Indeed, Organisation for Economic Co-operation and Development data on producer support for agriculture support this. Figure 3.3 shows that, as the share of the workforce employed in agriculture falls, state support for agriculture often rises.

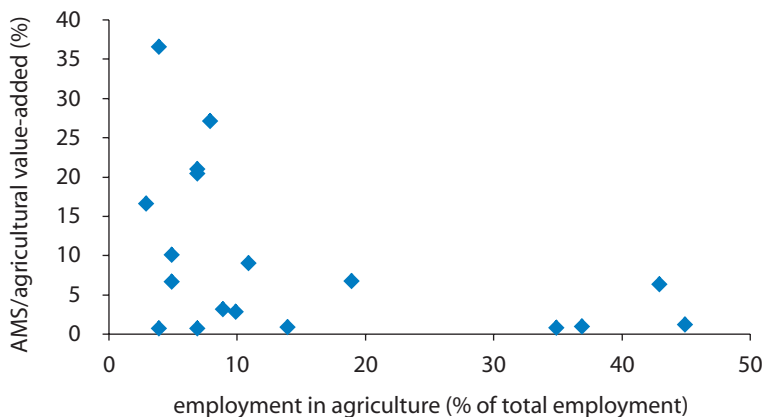
This means that a shift toward a more concentrated, high-value agricultural sector will not necessarily reduce the political pressure to subsidize irrigation water. While some of the more water-abundant countries in figure 3.3 may be able to continue such subsidies, water-scarce MENA countries can ill afford to continue subsidies that encourage inefficient use of water, given that agriculture uses nearly 90 percent of the water.

Will a shift away from rural areas change demand for water? The answer is not clear. The populations in MENA are increasingly urban—the rural share of the total population in the region fell by 0.8 percentage points per year in the 1960s, 0.6 points per year in the 1970s, and 0.4 points per year over 1990–2003. If these rates continue, in another 40 years the rural population's share of total population will be the same as that in high-income countries.⁴ This trend, however, is too long-term to affect the positions of the interest groups in the short term.

The movement of labor out of agriculture depends upon overall economic growth. In many countries passing through the transition from an agrarian to an industrial society, labor productivity in agriculture lags behind that of the economy as a whole. This gap reflects the emerging pro-

FIGURE 3.3

Farm Employment and the Aggregate Measure of Support (AMS) for Agriculture, 2000



Sources: USDA database; World Bank WDI database.

Note: Countries included are Chile, the Czech Republic, Estonia, Hungary, Iceland, Indonesia, Japan, Rep. of Korea, New Zealand, Norway, the Philippines, Poland, Romania, the Slovak Republic, Slovenia, Turkey, Uruguay, and the United States.

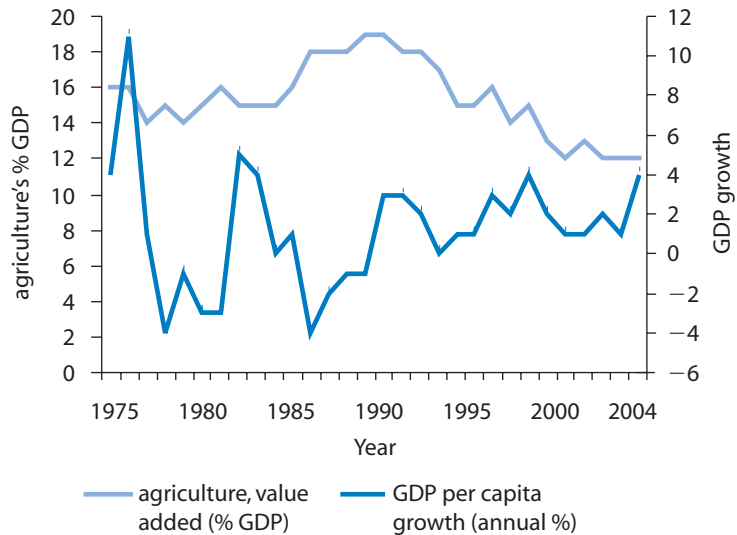
ductive opportunities in the urban sectors and serves as a market signal to attract labor from agriculture into other sectors. In middle-income economies as a whole, on average, GDP per worker is 5.5 times as high as value-added per worker in agriculture (World Bank WDI database). But in MENA, the incentive for labor to shift out of agriculture is weaker: GDP per worker overall is only 3.3 times as high as value-added per worker in agriculture.

Strong macroeconomic growth can reduce the weighting of agriculture in the national economy. As figure 3.4 shows, MENA’s economic instability in the late 1970s and 1980s meant that agriculture’s share of GDP was going up rather than down. In the 1990s, however, the trends reversed: better growth performance was accompanied by a rebalancing of the region’s economy away from agriculture.

The implications of agricultural transformation on the political economy of water are not yet clear. The downward pressures on the incomes of the mass of low-income agricultural households coming from liberalization likely will strengthen political demands for the subsidization of agriculture through water and other commodities. Localized concentrations of high-income, modern, exporting horticultural producers, such as those already present in Tunisia’s Cap Bon, Egypt’s Western Delta, and the Jordan Valley are equally likely to grow, organize, and exert strong collective influence over policy, as have their counterparts in Andalusia and California.

FIGURE 3.4

Change in Agricultural Value-Added and GDP per Capita Growth, MENA, 1975–2005



Source: World Bank WDI database, MENA aggregate, weighted by population.

Improved accountability and other governance mechanisms inside and outside the water sector will be crucial for allowing the transformation to lead to improved water policy and broadly based growth. Strong governance in agriculture will enable a broad set of interests to compete on equal terms to take advantage of new opportunities. The enhanced quality requirements and premium on direct negotiations with purchasers associated with modern export markets certainly risk marginalizing smallholders further (Cacho 2003). Yet, in several developing countries that have undergone the agricultural transition, smallholders have successfully managed to supply supermarkets and exporters with specialty products and enhance their livelihoods.⁵ Mechanisms that promote transparency, inclusiveness, and accountability will help ensure that the best producers have the best chance to access new markets. Without these mechanisms, the risk that a small group of well-connected farmers will dominate increases. Within the water sector, accountability mechanisms will determine how well water services respond to changing demands from producers. If the sector is transparent and accountable to a broad range of interest groups (taxpayers, urban water users, as well as farmers), the emerging farmer lobbies have less of a chance to become successful rent seekers. Which force will outweigh the other is unclear. Overall, the rural political economy will certainly change. It will possibly, but not necessarily, be more conducive to

reforms that include reducing the quantity of water consumed by agriculture.

Macroeconomic and Fiscal Shocks

Macroeconomic factors and fiscal austerity influence the context of water reform. Analysis of middle-income countries that have undertaken major water reforms indicates that those initiatives are often part of an overall package of reforms in areas such as trade, government structures, banking, agricultural support, and public services. In many cases, reforms took place at a time of change in the overall macroeconomic climate, following acute fiscal crisis. In other cases, extreme environmental events stimulated reform. Because water use in agriculture accounts for at least 85 percent of water use in MENA, and increased provision of water to growing urban populations is likely to have to come from reduced consumption in agriculture, this section focuses on how reforms of irrigation and agricultural water use are stimulated by shocks. Analysis of irrigation reforms in two arid middle-income countries, Mexico and Turkey, indicates that macroeconomic factors, combined in Mexico with trade reforms, played a decisive role in catalyzing political leaders to reform the water sector.

Water policy changed at a time of trade reform and fiscal crisis in Mexico. In the 1980s, Mexico's irrigation sector exhibited characteristics familiar in the MENA region today, such as low irrigation service fees, deteriorating infrastructure, limited participation of water users in maintenance tasks, centralized administration, and a large irrigation bureaucracy. Water reform began as part of a larger package of agricultural and land reforms undertaken in the late 1980s when the government realized that modernization was essential for the country's agriculture to be competitive in international markets. The need for reform became particularly acute as Mexico prepared for the North American Free Trade Agreement (Fraser and Restrepo Estrada 1996). A fiscal crisis in the late 1980s compounded the pressure for reform because it undermined the ability of the Mexican government to subsidize irrigation. Politicians justified subsequent efforts to reform rural policies less in terms of the interests of the rural poor and more in terms of the economic benefits of efficient capital and resource use. Despite intense opposition from the water users and the former water bureaucracy, who were affected in the short run, the reforms gradually gained political support.

The fiscal crisis created a situation in which the governance of the water sector was radically transformed. Before the crisis, the government owned large amounts of land that it had distributed to communal farms (*ejidos*) as part of a deliberate social policy. The *ejidos* received generous public subsidies. The crisis led to considerable public scrutiny about the fairness and

effectiveness of these subsidies, making the ejido sector no longer just responsible to a narrow group of farmers and agricultural bureaucrats. It was now being held to account for its subsidies by a much broader range of interests, including nonagricultural ministries, the business community, taxpayers, and the urban population who had alternative claims on the public funds. In other words, new lines of accountability had been drawn.⁶

Over subsequent years, the initial reforms laid the foundations of a governance structure that promoted water use for economic growth. Notable accomplishments include the development of a water-rights market between 1992 and 1994, transfer of the majority of irrigation schemes to joint ownership by water users and the *Comisión Nacional del Agua*, and outsourcing of operations and maintenance through service and management contracts. A new modern water law was approved by all parties in Congress and public investments, cofinanced with users, were undertaken to increase water productivity and modernize the network. In 1992, the government overturned a 1910 settlement that had limited the rights of ejidos to sell or lease land and water. Income from water tariffs, which had covered only 20 percent of operations and maintenance costs in the 1980s, and water fees, increased 57–180 percent over a space of two years (Johnson 1997). In the Mexican case, broader macroeconomic and fiscal trends had rebalanced the political forces acting on decision makers in favor of far-reaching reforms in the water sector.

Turkey also reformed its irrigation sector in response to a fiscal crisis. After major devaluation of its currency and deep economic recession in 2001, the government adopted a broad package of reform measures, including farm subsidy reform, and accelerated an ongoing policy of transferring irrigation management to water user associations. The change in agricultural support is saving the government about US\$4 billion per year (World Bank 2005k). In the future, Turkish irrigation investment policy is likely to be conditioned by EU accession negotiations and pressures to harmonize Turkish policy with the EU Water Framework Directive (WFD). The WFD will require Turkey to shift its emphasis from increased diversions and interbasin transfers toward more efficient water-basin management (World Bank 2005k). The economic and other benefits of joining the EU are likely to provide the political and administrative impetus for these reforms and outweigh any political resistance to such changes.⁷

The pressures that drove reform in Turkey and Mexico may not be strong in MENA at present. In both Turkey and Mexico, fiscal crises created new momentum for sectoral reforms by making deficit reduction a higher political priority than the recurrent subsidies for irrigation. Similar fiscal preconditions for irrigation sector reform are not now present in the MENA region: table 3.3 shows that the magnitude of fiscal im-

balances in the MENA region are not comparable to those experienced in both Mexico and Turkey in the run-up to their irrigation sector reforms (perhaps with the exception of Lebanon, where the political economy of public spending is somewhat atypical because of the complex political environment). This reduces the likelihood of massive macroeconomic imbalances impelling such reforms, with the exception of energy pricing policies. In the past, however, fiscal crises did spur reform in several countries in MENA, as follows:

- Reforms to Tunisia's irrigation and water supply sectors were adopted in 1990, a time of fiscal pressure, with the government's cash deficit peaking at 5 percent of GDP in 1991. Tunisia's current irrigation policy delegates management and financing to Collective Interest Groupings, which led to a total recovery rate of 115 percent of operations and maintenance costs by 2000 (Bazza and Ahmad 2002).
- Morocco's 1984 irrigation water pricing review brought in the current formula-based system, in which volumetric tariffs are directly linked to supply costs. The government also relaxed crop pattern regulations to induce more efficient water use. These reforms were one element of a broader macroeconomic stabilization package, agreed with the international financial institutions after the foreign exchange crisis of March 1983 (Doukkali 2005; Kydd and Thoyer 1992).
- Urban water supply reforms in Morocco were stimulated by pressure on the public budget and assisted by banking sector reforms. The de-

TABLE 3.3

The Fiscal Context of Irrigation and Water Supply Sector Reforms

Country	Overall budget balance ^a as percentage of GDP in 5 years preceding irrigation sector reforms
Mexico (1987–91)	-5.4
Turkey (1995–9)	-8.2
	Overall budget balance as percentage of GDP (2001)
Algeria	+4.0
Egypt	-2.0
Iran	-0.6
Jordan	-2.5
Lebanon	-16.2
Morocco	-2.5
Syria	+0.7
Tunisia	-2.6
Yemen	-3.5

Sources: World Bank Global Development Indicators 2005; World Bank 2004f.

a. Overall budget balance including grants.

cision to give private sector concessions for water supply and sanitation services in four major cities in 1997 was made because the government recognized the need for major additional investment in sanitation and considered private investment a way to reduce pressures on the public purse. The initiative was helped by the successful financial sector reforms of 1993. The ensuing sophistication of the local financial markets enabled private firms, especially foreign ones, to undertake large acquisition and investment operations in the infrastructure sector while avoiding the exchange rate risk that had slowed the development of private sector participation in many other developing countries (Bouhamidi 2005).

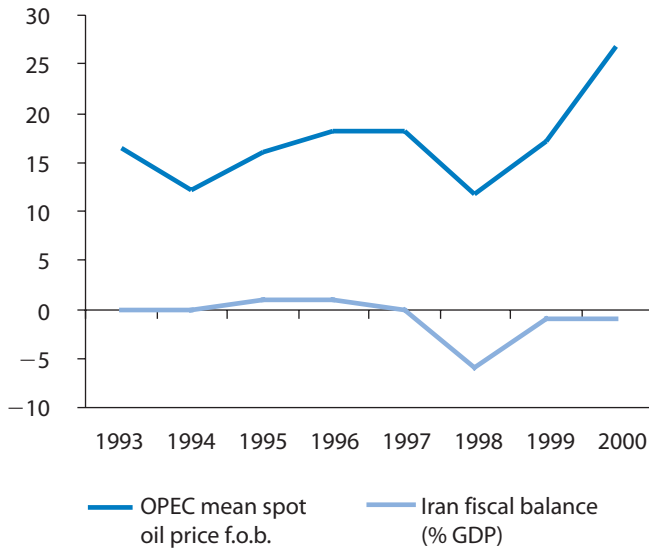
- Jordan's irrigation water pricing policies were adopted in 1996, during a period of rapid fiscal deterioration: the government's cash surplus of 5 percent turned into a deficit of 2 percent by 1996, and to a deficit of 5 percent by 1998. The new policy involves metered water supplies and a progressive block tariff.
- Lebanon reformed its municipal water sector to reduce pressure on public finances. In 2000, the country passed law 221, which consolidated the 22 Regional Water Authorities into 4, responsible for municipal and industrial water, irrigation, and wastewater (World Bank 2003c). This provision was implemented in 2002. Service contracts were let for municipal supplies in Tripoli (2003) and Baalbeck (2004).

Oil and gas prices are major determinants of some MENA countries' fiscal balances. Fiscal balances drive water management reforms, and oil and gas prices are major determinants of some MENA countries' fiscal balances, as figure 3.5 illustrates for Iran. As oil prices rise, government revenues from energy sales increase, and reduce the fiscal pressure on water decision makers to implement reforms involving cost recovery and the decentralization of management responsibility.

There is some evidence of a correlation between oil production and water pricing policy in the MENA region. As figure 3.6 indicates, high levels of per capita energy production are broadly associated with subsidized water supply and wastewater services: the only MENA countries that recover their water supply costs are ones without oil. The current prognosis is that, while the current spike in oil prices will subside, oil prices will remain firm over the medium term (World Bank Prospects for the Global Economy Database), and could reduce the pressure on oil-producing MENA countries to implement water sector reforms.

FIGURE 3.5

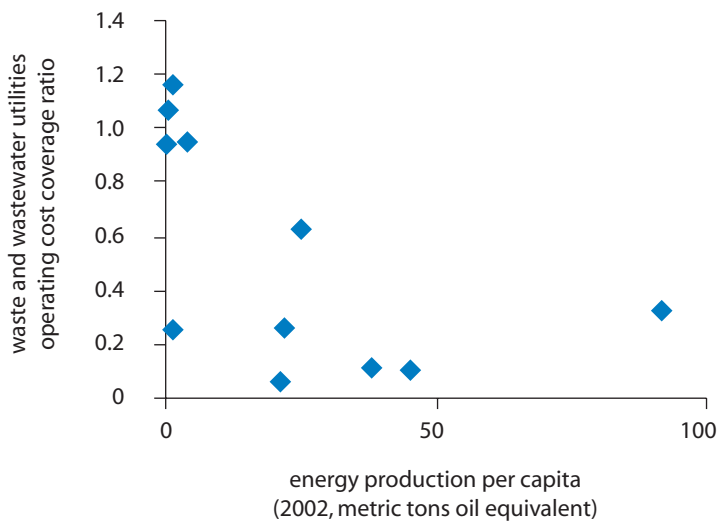
Oil Prices Drive Budget Balances



Sources: U.S. Energy Information Administration database; World Bank World Development Indicators database.

FIGURE 3.6

Energy Production and Water Cost Recovery in 11 MENA Countries



Sources: World Bank World Development Indicators database; World Bank country studies.

Environmental Forces Driving Change

Major changes in the physical environment also drive change in the water sector. Environmental problems—droughts, floods, deforestation, or human-induced climate change—are often shock factors that change political dynamics. Extreme environmental events have always been and remain an important factor in MENA economies, particularly in the high variability countries (Algeria, Djibouti, Iran, Morocco, Tunisia), where rainfall is closely correlated with GDP growth.⁸ Extreme events can cost livelihoods and lives. Shock associated with high social costs can galvanize those affected to lobby policy makers for water reforms. Crisis can also reduce the opposition of those interest groups that oppose changes if it makes them accept that a more flexible system of allocation is necessary. Riots and protests in front of state buildings across Algeria in the summer months of 2002, 2003, and 2004 as a result of severe water shortages were a major stimulus for the ongoing water sector reforms in that country (Control Risks Group 2005; World Bank and FAO 2003). Successive severe droughts in the early 1980s in Morocco were one factor that stimulated major water policy reform that culminated in the new Water Law of 1995 (Doukkali 2005).

Other shocks, such as floods, can provide the impetus for reform. In Morocco, floods in Casablanca in 1996 were a major factor accelerating the process of awarding concessions for water supply and sanitation to the private sector. The floods, which affected 60,000 people (IFRC 1996) and left 25 dead, highlighted the deficiencies of the extent, the condition, and the operation of the sewer system. The government embarked upon the concession (which they had been planning since 1994) in 1997, as a means of bringing in private capital and international know-how to upgrade sewerage service (Bouhamidi 2005).

Problems resulting from deforestation can also stimulate reform at the water basin level. Deforestation increases flow variability because forests release rainwater more slowly than bare land; deforestation exposes dams to sedimentation and deprives water reserves of natural protection. Deforestation has been common in MENA over the last century, particularly in Iran, Iraq, and Yemen. Serious deforestation in Iran has boosted initiatives that address first-, second-, and third-order scarcities. Government estimates show that the country's total forest area declined from 19.5 million hectares to 12.4 million hectares between 1944 and 2000, with resulting effects on land quality and water resources (reduced land quality, upstream dam sedimentation leading to increased flooding downstream, and change in flow regimes of the river). This has affected the livelihoods of people living in the catchment area (World Bank 2005e). In response, the government of Iran is creating institutions at the basin level in Mazandaran province through which local stakeholders

and government agencies work collaboratively for sustainable management of the entire catchment.

In the future, droughts may become more frequent and prolonged. Climate change models indicate that the region will become increasingly arid and that extreme weather events will be more frequent. Evidence shows that temperatures have increased throughout the MENA region and, though less certain, climate models predict decreases in precipitation. Climate models also predict an increase in amplitude and frequency of extreme weather events such as droughts, floods, and storms. A 2002 study (Bou-Zied and El-Fadel 2002) analyzed the relative socioeconomic implications of climate change impacts on water resources in six Middle Eastern countries (table 3.4), and estimated that GDP could be reduced by 1 to 7 percent depending on the country. If these predictions are correct, the overall result will be that the demand for water goes up while less water is available overall and its timing becomes more erratic.

Therefore, environmental shocks not only highlight the importance of developing a flexible and sustainable water management system, but also provide opportunities to realign the political economy of water. As discussed in earlier chapters, dealing with MENA's water challenge will require addressing all three levels of scarcity—physical resource, organizational capacity, and accountability. These changes will be politically sensitive because they will require rethinking water organizations, pricing, rights, and planning processes. The human and economic impacts of environmental shocks bring home the importance of improving water management. Their unpredictable nature particularly highlights the importance of developing flexible rules and organizations. However, the very magnitude of the impact of environmental shocks can open up political space for reform. Shocks can be a painful but clear indication to

TABLE 3.4

Socioeconomic Implications of Climate Change Impacts on Water Resources in Some Middle Eastern Countries

Impact	Iraq	Israel	Jordan	Lebanon	West Bank and Gaza	Syria
Increased industrial and domestic water demand	++	+	+	++	+	++
Increased agricultural water demand	+++	++	+	+++	+++	+++
Water resource equity decline	+++	++	+++	++	+++	+++
Flood damage	+++	+	+	++	+	+
Water quality damage	+++	+++	+++	+++	+++	+++
Hydropower loss	+	+	+	++	+	+
Ecosystems damage and species loss	++	++	+	+++	++	++
GDP reduction (%)	3–6	1–2	1–2	2–5	2–5	4–7

Source: Bou-Zeid and El-Fadel 2002.

Note: + = insignificant; ++ = moderate; +++ = high.

political leaders to think beyond the status quo, as well as a signal to interest groups that change may be unavoidable.

Social Forces Driving Change

MENA's population is becoming increasingly urban. This trend will have a slow but steady impact on water management in the MENA region through evolving patterns of political representation and accountability. The growth of urban commercial interest groups could reduce the relative influence of rural elites on central policy making. Where growing cities and farmland exist side by side, for example, in the Nile delta and the outskirts of most MENA cities—from Tunis to Sana'a, and from Casablanca to Tehran—peri-urban communities are emerging, with farmlands being converted to residential and commercial use, and with weakening agrarian social ties. If Egypt, for example, adopted India's definitions of urban and rural, it would classify 80 percent of its population as urban, and if it used the Philippines', the figure would be 100 percent (Bayat and Denis 2000).

Changing demographic trends will affect demands on water management in the future. New population structures will affect the politics of water management in two ways. First, changed populations will demand different water services. Demand for reliable water supply systems in urban areas will increase, as will demand for reliable irrigation services. Second, population shifts will change the relative size and political voice of the interest groups that influence water policy. The voice may be mediated through traditional elites, through a formal party hierarchy, or through clerical structures, but changing priorities will change demands placed on policy makers. Without accountable and inclusive governance structures, existing or emerging elites, whether tribal leaders, party officials, or well-connected public servants, have opportunities to exercise disproportionate influence on investment decisions on siting of hydraulic infrastructure, channeling of subsidies, and extracting rents from water scarcity. Improved governance structures that allow more, and more diverse, interest groups to have a voice in planning and implementation of policy allow more flexibility to deal with water decisions and adapt if the outcomes are not as expected. This is illustrated in box 3.1, which details how two countries—Jordan and Yemen—are dealing with groundwater depletion. Jordan had a wider range of economic interests in play, and was able to make more political adjustment than Yemen, where the nonagrarian interests were more limited and the private interests of traditional tribal leaders dominated water policy making.

BOX 3.1**Demographic Changes Drive Different Responses to Water Crises**

Jordan During the 1990s, Jordan experienced serious depletion of the aquifers of the Azraq basin to the north and east of Amman, thanks to extraction by influential farmers growing water-intensive crops such as bananas. It is estimated that the economic returns to water use in industrial and urban domestic consumption are, respectively, around 60 times and 6 times higher than in irrigated agriculture (Schiffler 1998). However, economic growth in Jordan has boosted urbanization; urban landowners and planners now stand as a new and increasingly powerful interest group. In contrast, agriculture represents only 2 to 3 percent of GDP, employs only 4 percent of the population and is in decline, with increased competition from Turkish producers and the collapse of the Iraqi market. Despite opposition from water user associations, the government responded to the crisis by strictly regulating the issuance of licenses for new wells in rural areas, and ensuring that 90 percent of wells are equipped with flow meters and that fines are applied for exceeding abstraction quotas. Due to its diversified economy, Jordan's post-agrarian political economy was able to cope with the crisis of the 1990s by taking these drastic actions. This is not to say that the decline of Jordanian agriculture is a good thing; the point is that the existence of robust non-farming sectors helped decision makers find a partial political solution to a water crisis.

Yemen Yemen is one of the most water-scarce countries in the world; per capita, it has no more than 2 percent of the world's average (World Bank 2005m). Agriculture employs 3 million people out of a workforce of 5.8 million, and uses over 90 percent of water supplies. Overabstraction of groundwater, encouraged by fuel subsidies and demand for the mildly narcotic crop qat had created an acute first-level water availability crisis. While estimates vary, it is believed that in many of the highland basins, where a significant share of the population is concentrated, stocks of water are at crisis levels, and some villages are already being abandoned. A new comprehensive water law gives the government some tools to crack down on drillers but, in practice, the effects have been negligible because the only actors with effective control over water use, sheikhs and other traditional community leaders, are closely implicated in agrarian patronage and political representation structures. The Yemeni political system is therefore unable to adapt to the crisis effectively.

Source: Schiffler 1998; World Bank 2005m.

Several factors affect a population's concern for and ability to influence water outcomes. Box 3.2 illustrates how some of these factors combined to affect the relative influence of different groups concerned with water management in Spain and the United States. The most important include:

- *Increased education levels.* Average years of schooling over the age of 15 in MENA increased from 1.2 years in 1960 to 5.4 years in 2000. Less than a quarter of the region's adults could read and write in 1970; more than two-thirds could by 2001. Women have benefited particularly. In 1970, 24 percent of literate adults were women; by 2000, this had risen to 42 percent.⁹ A more educated population is better able to understand the impacts of water issues on their health and livelihoods and is better able to find effective ways to communicate their concerns to policy makers.
- *Improved access to information.* The populations of the region are increasingly able to access information about issues that concern them. Factors that influence this include more widespread availability of information technology, release of official information such as household surveys and public expenditure reviews to the public,¹⁰ growing independence of the region's press,¹¹ and information flows based on migration of family members. These trends mean that citizens and governments are increasingly able to obtain information on public spending, on forms of public service provision and on resource quantity and quality. Users can determine whether public spending is appropriate, and benchmark the services they receive against international best practice. They can also monitor pollution levels and the state of key resources such as groundwater.
- *Gender influence.* Women's responsibilities within the household for family health and the provision of potable water may heighten their concern for water conservation (Lipchin et al. 2004). Any strengthening of the political representation of women in MENA may therefore be a driver of improved water services or water management.
- *Concerns for water quality.* According to survey responses from Palestinians, Jordanians, and Israelis, although concern for the quantity of water available actually declines as incomes rise, concern for water quality appears to increase (Lipchin et al. 2004). This may be because better-off households have access to private sources of potable water, and are less likely to depend upon agricultural sources of income.
- *Decentralization and empowerment of users.* A trend toward moving responsibility for providing water services to the users themselves has

begun in several countries of the region for both irrigation and water supply (AWC 2006). Empirical evidence in many countries indicates that community management does improve performance of irrigation and water supply systems, and that community-managed systems tend to work better than government-managed schemes (Kähkönen 1999). When responsibility for service delivery and allocation decisions is closer to those affected, those decisions tend to accommodate the perspectives of the entire community. This may affect the politics of water reform in different ways. Empowering users may increase opposition to changing existing allocation levels or subsidized services. Alternatively, it may ensure that the needs of a broader coalition of interests are served.

New social forces can provide stimulus for change when appropriate accountability mechanisms are in place. Without mechanisms that ensure transparency, inclusiveness, and accountability, the emerging groups can be engulfed by prevailing interests that favor the status quo. When service providers are judged on the basis of the quality of service, when

BOX 3.2

Changing Social Priorities Affected Water Lobbies in Spain and the United States

When water shortages and intensive pumping of aquifers in some areas of Spain and the state of California in the United States became serious enough that farmers realized they had to find an alternative water source, influential farmer groups in both cases lobbied for subsidized surface water transfers from other basins. This brought the farming groups into direct confrontation with environmental groups. The outcomes, however, varied widely. Farmers in California began their efforts in the 1950s, continuing through the 1970s, and successfully obtained large water transfers subsidized with federal funds at a time when conservation lobbies remained weak. Later, however, the conservation groups managed to stop or reduce additional dams and transfer schemes and to divert a share of the transferred flows for environmental purposes. In 2001, the Spanish government passed a law approving a transfer from the Ebre River as part of an overall water resources management plan. At this point, however, environmental lobbies had become powerful in Spain. Huge demonstrations of groups both in favor and against the transfer scheme (300,000 people strong) took place in several cities. Eventually, environmental lobbies influenced the newly elected government to reject the transfer in 2004.

Source: Llamas and Martinez-Santos 2005.

information is available, and when groups are empowered to use that information, new interests can emerge and push for reform.

International Drivers of Change

Some 60 percent of MENA's surface water is shared across international boundaries, and countries cooperate to share and manage those resources. Indeed, most of the renewable water used by Egypt, Iraq, and Syria originates in other countries. In addition, some of the world's major international aquifers characterize the region (UNESCO-IHP 2005).

Many stakeholders see sharing of transboundary water as a zero-sum game. Because the demand for water exceeds the quantities available in most transboundary water, riparians have historically based their actions and negotiating tactics on the implicit assumption that water used in one country will not be available elsewhere. This has led to a focus on the allocation of specific quantities of water, with little regard to how that water would be used.

The MENA region has a striking absence of inclusive and comprehensive international water agreements on its most significant transboundary water courses. While some sort of arrangements concerning transboundary waters exist for the Helmand, the Jordan, the Kura-Araks, the Nahr El Kebir, the Nile, and the Tigris-Euphrates basins,¹² these arrangements are generally not inclusive in their scope and do not deal with optimization or planning, nor do they have at their core established principles of international water law, such as equitable and reasonable utilization and the obligation not to cause significant harm. This is in contrast to other regions where international relations have evolved to a point that initiatives to establish formal, inclusive legal frameworks can be articulated.

The lack of international agreements reflects in large part the weak political and multilateral engagement among the countries sharing the water. In the absence of agreements to allocate water, the region has witnessed a race for "facts on the ground": countries establish infrastructure and seek to claim resulting acquired rights. The countries that have had the financing available to make these investments are, to a large extent, the countries that have had stronger economies and greater political and military clout (Allan 2001).

Most of the published literature on transboundary waters in the MENA region addresses transboundary rivers. However, transboundary groundwater is also a significant issue. In reviewing shared groundwater in the region, it is useful to distinguish between two distinct types. The first, shallow alluvial aquifers, are generally replenished through either

surface river flows or through rainfall. The second type are deep rock aquifers of sedimentary origin, usually sandstone and limestone. These are often confined systems, sometimes of considerable area, and store water that can be many thousands of years old (Murakami 1995). The shared aquifers of the region include the Nubian Sandstone Aquifer (Chad, Egypt, Libya, Sudan), the North Western Sahara Aquifer System (Algeria, Libya, Tunisia), the Mountain Aquifer (Israel, West Bank), Disi Aquifer (Jordan, Saudi Arabia), Rum-Saq Aquifer (Jordan, Saudi Arabia), the Great Oriental Erq Aquifer (Algeria, Tunisia), and Al-Kabeer Al-Janoubi (Lebanon, Syria). While some form of project-related arrangements exist on a number of these aquifers (including the Nubian Sandstone, the North Western Sahara Aquifer System), they deal largely with monitoring and exchange of information established under external project support. None of the transboundary aquifers in the MENA region is managed and exploited under a multicountry cooperative framework. The absence of such frameworks has further intensified the drive by the countries most economically able and politically powerful to exploit these finite water resources, establishing “facts on the ground.” Schemes such as Libya’s Great Man-Made River and irrigated agricultural production in Saudi Arabia illustrate the enormous scale of these efforts.

Outdated or unrealistic policies of food self-sufficiency continue to drive investments, often with severe implications for the countries that share the water resource. Some of the most ambitious water development investments made in the MENA region were made as a way to capture and store sufficient water to be able to irrigate staples and promote domestic food self-sufficiency. As discussed in chapter 1, from early civilizations, rulers of the region have had three key objectives in their water policies: (a) water storage and distribution, (b) flood and drought protection, and (c) food production and self-sufficiency through irrigation and drainage. With the existing infrastructure stock, giant steps have been made in the first two objectives. However, rising populations and incomes, as well as integration into world trade markets, have made the last objective increasingly unrealistic. MENA is a net importer of food on a large scale, yet, stated policies of food self-sufficiency still serve to justify investments in megaprojects, often drawing on transboundary water resources, with scant recognition of the impact these investments have on downstream countries that rely on the same water resource.

Given the overwhelming share of the region’s water devoted to agricultural production, the pressure on transboundary waters will not ease until the countries in the region willingly engage in reassessing the principles that drive water allocation, not just between nations, but also between sectors, users, and uses. In making such a reassessment, planners,

investors, and decision makers will need to see incentives in the political economy paradigm in which they operate. These incentives could be manifold. For some countries, the incentive may be a desire to align with international law and standards as practiced by groups of countries under established legal and international agreements; others may address the problem through water pricing and markets; while in yet others, economic diversification and growth might reduce the relative size of the agriculture sector, commensurately reducing the scale of its water allocations, and meeting food requirements through trade.

However, in the absence of cooperation, unilateral actions are perfectly rational. Most countries plan large water-related investments at the national level. When operating on the premise of a shared, scarce water resource, countries will plan on a unilateral basis in the absence of a cooperative arrangement to which the countries that share the water resource have committed, and that clearly assigns benefits (and costs) to each country. While the “winner-takes-all” approach can lead to temporary gains in agricultural production and water security, the long-term scenario is likely to be “lose-lose,” because unemployment, migration, instability, poverty, and tension will likely build up in the countries that were denied what will be perceived as their share of the transboundary water.

In the MENA region, some promising initiatives are under way to develop cooperative agreements for international surface and groundwater bodies (see Krishna and Salman 1999; Macoun and El Naser 1999). Engaging at a national level in agreements about transboundary waters not only helps manage the water but can also lead to broader benefits for all parties. The 10 Nile Basin countries, for example, have agreed to work together to identify cooperative development and investment opportunities (box 3.3).

Changes in international relations can have knock-on effects on domestic water management. As cooperation opportunities begin to take root, the political relationship between countries tends to ease up, thereby opening more opportunities for trade, efficient investment, and reduced uncertainty about supplies.

Institutional Changes That Can Reduce the Social Impact of Reform

Governments often justify delaying reforms because of the potential negative impacts on the poor, but other policies can better help reduce the shock of change to those negatively affected. Carefully designed social protection policies can soften the blow of reforms on those poten-

BOX 3.3**Water as a Vehicle for Cooperation: The Nile Basin Initiative**

A positive example of cooperation in the management of international river basins is evolving in the Nile River Basin. The Nile, at almost 7,000 km, is the world's longest river. The basin covers 3 million km², and is shared by 10 countries: Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda. Tensions, some ancient, arise because all riparians rely to some extent on the waters of the Nile for their basic needs and economic growth. For some, the waters of the Nile are perceived as central to their very survival. The countries of the basin are characterized by extreme poverty, widespread conflict. This instability compounds the challenges of economic growth in the region, as does a growing scarcity of water relative to the basin's burgeoning population. About 150 million people live in the basin today, with growing water demand per capita. Over 300 million people are projected to be living there in 25 years. The pressures on water resources will be great. The countries of the Nile have made a conscious decision to use the river as a force to unify and integrate rather than divide and fragment the region; they have committed themselves to cooperation. Together they have launched the Nile Basin Initiative (NBI). The NBI is led by a Council of Ministers of Water Affairs of the Nile Basin, with the support of a Technical Advisory Committee, and a Secretariat located in Entebbe, Uganda. The initiative is a regional partnership within which the countries of the Nile Basin have united in common pursuit of the sustainable development and management of Nile waters. The NBI's Strategic Action Program is guided by a shared vision "to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources" (Nile Basin States 1999, Article 3). The program includes both basinwide projects designed to lay the foundation for joint action, and two subbasin programs of cooperative investments that will promote poverty reduction, growth, and improved environmental management. The Nile waters embody both potential for conflict and potential for mutual gain. Unilateral water development strategies in the basin could lead to serious degradation of the river system and result in greatly increased tensions among riparians. Conversely, cooperative development and management of Nile waters in sustainable ways could increase total river flows and economic benefits, generating opportunities for "win-win" gains that can be shared among the riparians. The NBI provides an institutional framework to promote this cooperation, built on strong riparian ownership and shared purpose and supported by the international community. Cooperative water resources management might also serve as a catalyst for greater regional integration beyond the river, with benefits far exceeding those that could potentially be derived from the river itself.

Source: Authors.

tially impacted. Furthermore, dispute-resolution mechanisms can reduce conflicts over diminishing benefits or resource availability.

Social Protection

Governments often use water subsidies to protect poor and vulnerable populations. Given the arid climate and cultural importance of water in the region, providing below-cost water services has been justified as a way of aiding the poor. However, the objectives are often implicit rather than explicit and the subsidies often do not reach the intended beneficiaries. Service providers are not properly accountable for the service they provide and social protection goals are not well defined or evaluated.

An opportunity to assess the effectiveness of water subsidies at reaching and protecting the poor may arise when countries reevaluate their social protection policies. Some countries in MENA are now reassessing their means of protecting the poor. In that context, they may study whether subsidies for water services do, in fact, reach the poor and examine the other effects of those subsidies. In addition, when countries are launching broad changes in social protection, removal of subsidies on water may be politically possible.

Social protection and irrigation. Agricultural policies that protect water-intensive crops or public provision of cheap irrigation water are, in many countries, maintained for social reasons. These policies are usually intended to benefit the poor and changing them is expected to harm the poor disproportionately (Baroudy, Lahlou, and Attia 2005). However, evaluating these claims is often difficult because information about distributional benefits is not readily available for most MENA countries. Detailed studies carried out in Morocco and Tunisia indicate that using water and other agricultural policies as a means of protecting the rural poor is distortionary and inefficient and that more targeted social protection programs could produce better antipoverty results at lower cost, without the externalities to water management.

In Morocco, agricultural and water policies do provide benefits to the poor in rural areas, and studies show that removing them without tailored social protection schemes would increase poverty. Tariffs on cereal imports are as high as 100 percent in Morocco and, combined with low-cost irrigation water, provide strong incentives for farmers to continue farming water-intensive crops. While removing those tariffs would benefit the economy in the long term, many wheat producers would be hurt in the short term. Because poverty is generally rural—poverty rates in rural areas were 28 percent in 2000–1, compared to less than 10 percent in urban areas—many argue that removing protection

for water-intensive wheat production would harm the rural poor. Indeed, partial and general equilibrium analyses indicate that total deprotection of cereals would increase poverty rates in rural areas 28 to 30 percent (Ravallion and Lokshin 2004).¹³ This illustrates the nature of the political difficulties of changing agricultural and irrigation policies.

Analysis of household data indicates that specific targeted mechanisms would be a more efficient way to protect the rural poor. Using agricultural and water policies to protect the poor can be very expensive. In Tunisia, public sector protection of cereals and legumes and pulses is estimated to cost four times per capita GDP every year for each job protected (World Bank 2005j). Rural development programs targeted to provide long-term opportunities for the poor (such as health and education services and expanding water supply and sanitation to poor areas) and social safety net programs that provide income-generation opportunities are generally more effective means of protecting vulnerable populations (World Bank 2004c).

Social protection policies could allow countries to change agricultural and water policies while minimizing the impact on poor communities. Specifically designed social protection policies could shield low-income rural households from the distributional effects of opening up rural economies to international markets and from changes in agricultural water policy. Box 3.4 indicates the overall positive impacts of a similar change in agricultural support, irrigation policy, and social transfers in Turkey.

Greater accountability would also improve the efficiency of this form of social spending. Societies, particularly the wealthier countries in the region, may consider subsidies for water services an acceptable way to support vulnerable populations. However, the choices available are a reasonable topic for public debate. Generating such a debate would require governments to make their social objectives for water policy explicit, then to rigorously evaluate how effectively the policies actually achieve those objectives, and finally to disclose the results of that evaluation. Only then can policy makers and stakeholders compare water subsidies to other social protection options. Similarly, increased inclusion of a broader set of interest groups would reduce the risk of elite capture. Governments that are accountable to a cross-section of the population are less likely to be captured by the land-owning lobby. Finally, increased accountability in public spending would help because reducing any corruption in public procurement reduces the incentive to provide subsidized infrastructure.

Social protection and urban water supply and sanitation. Consumers of domestic water supply services, rich and poor, pay only a fraction of the cost. Connection to the network, or water consumption, or both, are

BOX 3.4**Changing Agricultural Support in Turkey**

Agriculture supports 35 percent of the Turkish workforce directly. Some 60 percent of the country's poor households live in rural areas, and rural poverty rates are almost twice those in urban areas. Government support to agriculture has historically been strong. In 1999, fiscal subsidies to agriculture, mostly credit subsidies and debt write-offs, amounted to 3 percent of GDP. The country could no longer afford expenditure on this level. In 2000–1, the government abolished this form of assistance to agriculture and switched to direct income support, which provided cash transfers to farmers based on the area cultivated. This system reduced the fiscal cost of agricultural support from US\$6.1 billion in 1999 (3.1 percent of GDP) to US\$2.4 billion (0.8 percent of GDP). Evaluations of direct income support show that it is efficient, equitable, transparent, and nondistortionary and has effectively compensated farmers for almost half the losses they incurred by the abolition of the earlier system of support to agriculture. Irrigation policy changes accompanied the major changes in agricultural support mechanisms. A policy of transferring management responsibility to user groups, begun in the 1990s, accelerated, and user contributions to operation and maintenance increased sharply.

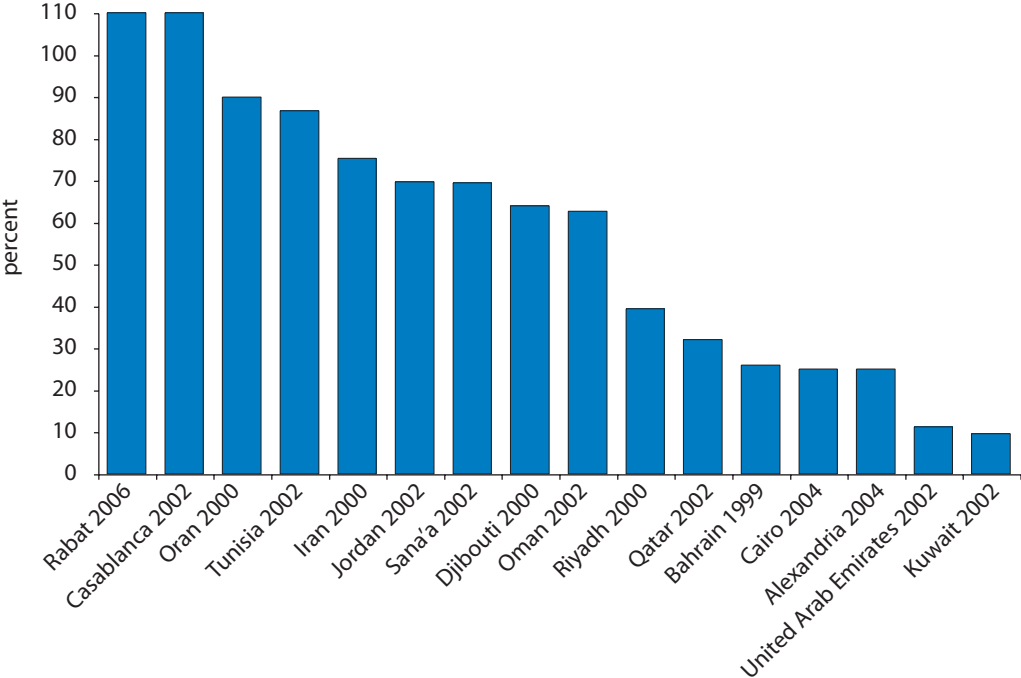
Source: World Bank 2005k.

subsidized. Figure 3.7 shows that almost every city in the region collects insufficient revenue to cover even operations and maintenance costs, let alone depreciation of assets. According to one survey, 58 percent of utilities in MENA have tariffs too low to cover basic operations and maintenance costs (Komives et al. 2005).¹⁴ In most countries of the region, therefore, water supplies are subsidized, with the practice justified implicitly or explicitly by concerns about affordability.

Ensuring that the poor can afford the cost of basic services is important in any country, but subsidizing service directly often leads to service deterioration. When services are subsidized, the utility is dependent on the government to make up revenues and has little incentive to increase its revenues by improving services. Whenever production costs increase, utility managers must either persuade governments to increase prices, adapt to lower revenues, or lobby for transfers from the government. Usually governments are not willing to raise prices, but prefer to encourage the utility to make efficiency savings, and to transfer funds if the savings do not materialize. Without sufficient accountability to the public, consumers, rich and poor, travel down a negative spiral of poor service, unwillingness to pay, reduced cost recovery, deferred maintenance, and further worsening of services.

FIGURE 3.7

Operating Cost Coverage Ratio for Utilities in Select Countries and Major Cities in MENA



Source: WB database (see appendix 2).

Note: Ratio includes depreciation for all countries except those of the Gulf Cooperation Council. Data for the Islamic Republic of Iran, Jordan, Casablanca, Rabat, Riyadh, Medina, and Tunis include wastewater collection and treatment.

Subsidies for domestic water supply based on consumption volumes are not a good mechanism to transfer resources to the poor. Understanding the incidence of water supply subsidies in the MENA region is difficult because reliable household survey data are not readily available to researchers. A recent study shows that in 14 low- and middle-income countries, the poor who are connected to the networks consume roughly the same quantity of water as the nonpoor; thus, rich and poor pay the same for water. Because the subsidies apply to almost everyone, therefore, the study concludes that tariff levels based on volumes consumed are not an effective way to target low-income households. The study also found that subsidized water supply was less effective at reaching the poor than were other forms of social protection (Komives et al. 2005).

Dispute Resolution

Conflicts relating to water allocation occur because existing conflict resolution mechanisms fail. In the twentieth century, governments built large

water storage and distribution infrastructure, took over the rights to the water, and managed water allocation and distribution as well as dispute resolution. However, this system does not meet the needs of users often remote from national or provincial capitals. Most disputes are settled locally, often through traditional mechanisms, and those that cannot be resolved often result in violent conflict. Water users need immediate solutions to water disputes and cannot wait for lengthy arbitration through formal systems; they often do not trust the formal dispute resolution processes. Individuals across the region report perceptions that the formal dispute resolution process would not hear them fairly, would cost too much, or take too long, leaving them little choice when disputes arise but to enter into conflict (CEDARE 2006). Interviews with farmers in the Sana'a basin in Yemen indicated that 96 percent of conflicts pass through the tribal dispute resolution processes. Farmers were reluctant to go to the formal court system because the costs were high and the process was time consuming, they feared that judges might be corrupt and decisions would be poorly enforced, and they generally distrusted the government (Al-Hamdi 2000).

Modern technology often disrupts traditional arrangements without replacing them with a better option. Traditional institutions were often complex and flexible, and administered by local people who maintained the respect of the community (see box 3.5). Where modern and traditional systems exist in close proximity, as they do throughout the region, the different rules lead to lack of clarity and can undermine the effectiveness of each system (Burchi 2005). This generates conflicts within communities, and between communities and state agencies responsible for the upkeep of the infrastructure. In some spate irrigation systems in Yemen, water flows were traditionally governed by an unwritten, customary principle that gives priority to the upstream users (*al a'la fal a'la*). However, only 60 to 70 percent of farmers in these areas receive spate flow when it is their turn. This is partly because large landholders reclaim lands around the wadi and take more water, at the expense of small landowners downstream. In addition, the cropping pattern has dramatically changed the equitable water allocation system because farmers upstream are cultivating fruit crops (bananas and mango) that require frequent irrigation. Furthermore, some well-off farmers violate the customary rules and do not complete their share of maintenance. The channel master is unable to enforce the rules. Finally, customary practices can undermine government initiatives to regulate water use. The sheikhs are usually farmers themselves and draw their prestige and popularity from the local population. As a result, they often oppose government actions to control groundwater extraction (Bahamish 2004).

However, redesign of conflict resolution mechanisms can be an essential part of smoothing the transition toward lower water allocations in

the future. Several countries of the region are working on this. Table 3.5 illustrates how Egypt, Iran, and Yemen are developing traditional and modern institutions to reduce risks of conflict; appendix 4 gives details of additional cases.

Trade Facilitation

Trade is crucial for cushioning MENA countries' food production as their per capita water availability declines. It is also vital for moving toward higher-value agriculture. Therefore, measures that enhance trade at all levels will be important. Such measures would be important under any conditions but become even more important in the dynamic, integrated world markets that now prevail. Terms of trade are likely to change, often in unpredictable ways, with changes in energy prices, climate change, rising demand from countries such as China and India, global security, and other factors. This dynamism puts an even higher premium on flexible, competitive systems of agricultural production, trade, and market access. Adapting to these new transformations will mean steps such as encourag-

BOX 3.5

Complex Rules for Ensuring Equitable Distribution of Water in the Oases of the Western Desert of Egypt

Wagbat el Tarda: An additional allocation of water given to tail-enders to compensate them for weak and unreliable flows. It is deducted from all users close to the source, in contrast to all of the other rules, to which all users contribute.

Wagbat el Nafl: An additional allocation to compensate those whose turns fall early in the morning, to compensate them for low flow at that time.

El Eideya: An additional allocation given to those who accept an irrigation turn during religious holidays. It takes place from sunrise to noon.

Ywm El Hadr: An allocation equivalent to one day's discharge to compensate for any malfunctioning of the system or other unforeseen problem.

Sabim el Hawa (wind share): An amount of water used to compensate users for losses due to wind action and also to irrigate wind breaks.

Sabim el Herassa (guard share): An amount of water given to the guard to irrigate his land.

Source: CEDARE 2006.

ing institutional and regulatory reform to improve the efficiency of customs and ports and airports, to streamline paperwork, to improve quality certification, to reduce policy distortions in domestic markets coupled with increased access to developed countries' markets, to improve marketing and market organization, to create a framework that encourages the private sector to offer risk management tools, and to encourage integration of smallholder farmers into commercial supply chains.

Conclusion

Countries that have introduced or accelerated water reforms have often done so as part of broader economic and structural changes. This has far-reaching implications. First, fundamental reforms in water management are more likely to result from policy change in the areas of trade, social protection, and international diplomacy than from changes under the control of water ministries. Where broader economic changes are under way in MENA, would-be water reformers will need to capitalize on those changes to improve water management wherever possible. Where they are not taking place, the scope of "within the sector changes" is likely to be more limited. Second, where broad structural changes lead to economic diversity, the increased employment opportunities outside agriculture are likely to be an important factor helping countries deal with their water challenges. As per capita water availability falls over time and water crises become more frequent, MENA countries with diverse economies will find it easiest to weather shocks, absorb changes, and therefore summon up the political momentum for reform. At the same time, countries with flexible water management arrangements will be able to protect the water needs of the urban, industrial, and service sectors when water is short, and thus support continued growth.

The political economy is changing in ways that will affect water management in MENA. The structure of the economy is changing, with some new sectors opening up and particularly important changes in agriculture under way. This will change the type of water services users want, and will change their willingness to pay for those services. Any restructuring of agriculture will change the political economy of water allocation for irrigation but will not necessarily weaken demands for maintaining current high allocations. Strong mechanisms of external accountability for water allocation processes will be important to ensure that allocations are made according to broad social priorities rather than based on the needs of small special-interest groups. Societies are being transformed through changes such as increased education, urbanization, more open access to information, and decentralization of decision mak-

TABLE 3.5

Mechanisms for Resolving Conflict over Water: Tradition versus Modernity

Name of system	Country or region	Characteristics of the system	Status of person in charge of water distribution	New environment	New conflict resolution mechanisms	Comment
1. Saqya (water wheel used to lift water from canals into fields)	Egypt (Nile Valley and Delta)	Saqyas were widely used until early 1980s. Farmers shared O&M costs and collaboration was necessary. Conflicts resolved through customary mediators with strong kinship ties.	Saqya leaders (sheikhs) determined irrigation turns, settled disputes, and collected money for maintenance of saqyas.	Diesel pumps replaced the saqya. Engineers from Ministry of Water Resources manage water allocations and schedules.	The government has empowered water user associations to manage field level infrastructure, to manage allocations, and to prevent and resolve disputes. Appropriate legislation has been drafted.	The Egyptian government plans physical changes to the irrigation system to give continuous flow to water user associations below the secondary canal level, which will give greater flexibility for allocation among WUA members.
2. Informal Tribal Councils	Highland water basins of Yemen	The councils comprise the beneficiaries and a respected local Sheikh Water Point Chairman. It determines the well site, and allocation and distribution of water shares (by time) among beneficiaries. Tribal conventions used to resolve conflict.	The Sheikh is respected, and often holds the largest share or has high experience in the work.	Modern systems exist side by side with traditional systems leaving uncertainty about rules and dispute resolution. Increased demand from urban areas lead to water "sales" to urban areas with elite capture and little compensation to others.	New legislation established a regulatory body responsible for data collection on aquifer health and communication to communities. Participatory management of aquifers beginning.	Combination of regulatory instruments and data collection on state of aquifer required. Conflicts can be limited through a participatory oversight system perceived as fair by community.
3. Qanat (underground aqueduct) Irrigation Organizations	Iran	A head, a "water boss" or Mirab, a well driller and a watchman. Transparent water distribution process. Time-based irrigation turns are supervised by Mirab. Change-over times announced publicly. Conflicts resolved through customary mediators.	The head, who usually has the largest land and water shares, supervises the activities of other members; determines workloads and tariffs, and settles disputes. The Mirab (who is experienced and trustworthy) supervises distribution.	Qanats still operating but widespread groundwater extraction lowering water tables and drying up the springs that feed many of them. Large numbers of new dams and related irrigation infrastructure managed by Ministry of Agriculture and Ministry of Water and Energy.	The government is testing the idea of water user associations to manage water allocation, infrastructure and resolve disputes. It is also piloting water resource planning at the basin level.	The Qanat informal organizations proved successful means of managing the irrigation process and preventing conflicts among the shareholders. In the large-scale irrigation systems financed by the government, new institutional mechanisms for managing conflicts need to be developed.

Sources: Bahamish 2004; CEDARE 2006; Cenesta 2003; Wolf 2002. See appendix 4 for similar cases from Tunisia, Morocco, Djibouti, and the oases of Egypt.

Note: O&M = operations and maintenance.

ing. Furthermore, MENA countries may experience economic or environmental shocks that can have a powerful effect on decision making in water. And changes in social protection schemes and conflict resolution can protect the poor and ease transitions toward a lower per capita water endowment.

However, while the recent changes represent a potential opportunity to create political space for reform, whether they will actually lead to better water outcomes is far from clear. The changes could give policy makers political space to make water management more environmentally sustainable, to make allocations more flexible, and to make public spending on water more efficient. The changes could, however, provide wind-fall benefits for small subsets of the region's societies or increase the strength of opposition to change. As the next chapter will show, the extent to which the changes contribute to improving water management will depend on the effectiveness of external accountability mechanisms.

Endnotes

1. The classic work on bargaining with interest groups to reach a superior outcome is Gary Becker's "A Theory of Competition Among Pressure Groups for Political Influence" (Becker 1983). See also Mancur Olson, *The Rise and Decline of Nations* (Olson 1984).

2. Staff estimates, based on data from Tunisia's National Programme for Water Saving.

3. These requirements are technical barriers designed for protection of human health or control of animal and plant pests and diseases.

4. Country economies (in 2004) were divided according to gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are low income, US\$825 or less; lower middle income, US\$826–US\$3,255; upper middle income, US\$3,256–US\$10,065; and high income, US\$10,066 or more.

5. www.regoverningmarkets.org.

6. "While the ejido sector showed strong production performance through the 1960s, principally based on extensive programs of public investment in large scale irrigation projects, multiple state-imposed constraints on community and individual initiatives gradually brought production to stagnation and welfare to poverty. In addition, democratic opening eroded the ruling party's monopolistic control over the ejido and undermined effectiveness of the ejido as an instrument of political control. The costs of economic stagnation and extensive public subsidies could no longer be justified by political gains for the ruling party" (de Janvry et al. 2001, p. 3).

7. It also became apparent that, for some cases, supranational organizations such as the World Bank and the European Union had been influential in the development or modification of basin management programs or institutions. Accession to the EU also provided a stimulus for the countries to switch to a basin-level water management approach (Blomquist, Dinar, and Kemper 2005).

8. See, for example, "Morocco: 50 Years of Human Development," <http://www.rdh50.ma/Fr/index.asp>.

9. UNESCO Institute for Statistics through EdStats and WDI central databases. Data cover Algeria, Djibouti, Egypt, Iran, Iraq, Jordan Lebanon, Libya, Morocco, Oman, Syria, Tunisia, West Bank and Gaza, and Yemen.

10. For example, Egypt plans to release a review of public expenditures, including in the water sector, to the public, and Algeria and other countries have similar plans; West Bank and Gaza has made household survey data available to the public.

11. Freedom House indicates that the MENA region has the least free press of any region of the world. Between 2003 and 2005, however, the region did see modest increases in press freedom overall, particularly in Lebanon, whose private media market developed over the period. Improvements were also seen in Egypt, Oman, and the United Arab Emirates as a result of increased Internet access and the explosive growth of pan-Arab satellite TV stations. Press freedom in Yemen and Iraq, by contrast, deteriorated over the period.

12. http://www.transboundarywaters.orst.edu/publications/atlas/atlas_html/treaties/asia.html.

13. Other studies (for example, Lofgren et al. 1997; Radwan and Reiffers 2003) arrive at consistent conclusions.

14. The phenomenon is far from unique to the MENA region. A survey of 132 utilities around the world indicates that 39 percent operate with tariffs that do not cover operations and maintenance costs (Global Water Intelligence 2004).

