

# Concepts and approaches for effective water governance in the Arab region

*This chapter discusses three main issues: water security, the ultimate goal in efforts to achieve sustainable development; effective water governance, the way forward in achieving water security; and cost-effectiveness, an appropriate tool for guiding effective water governance.*

Because water affects all human activities, water security has a wide-ranging definition. Water security is inseparable from social, economic, environmental and health security.

Water security refers to the “availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.”<sup>1</sup> Water insecurity “can arise from physical scarcity, resulting either from climatic or geographical factors, or from economic water scarcity, or from unsustainable consumption or overexploitation. It can also have economic origins, with poor infrastructure or capacity preventing access to the water resources available, or occur where pollution or natural contamination renders water resources inaccessible.”<sup>2</sup>

Some argue that the definition of water security varies depending on water use and water user status. We will follow the definition established by the Food and Agriculture Organization (FAO) and the United States Department of Agriculture, but expand it to include socio-economic, environmental and political requirements, following Janabi (2009; Box 3.1).<sup>3</sup>

## Water security, poverty alleviation and sustainable human development

Sustainable human development, according to the Human Development Reports of the United Nations Development Programme, includes knowledge, health and income, as well as equity, freedom, equal opportunity, gender equality, access to resources and ability to choose. Water security, essential for livelihood, underpins all of these dimensions.

The need for water security is particularly acute in rural and poor communities. Water is critical for economic growth and social well-being, so improved water governance requires understanding the social, economic and institutional links between reducing poverty and ensuring access to safe water.<sup>4</sup> The Organisation for Economic Co-operation and Development states that “poverty encompasses different dimensions of deprivation that relate to human capabilities, including consumption and food security, health, education, rights, voice, security, dignity and decent work.”<sup>5</sup> Unlike privileged people, for whom water is never scarce, poor people and marginalized groups have limited

**Water security in Iraq comprises:**

- Accessibility of water resources. Irrigated agriculture requires water for seasonal crops.
- Use of water resources for economic development. Water security is essential for economic growth.
- Ability to manage water resources sustainably and ensure quality and quantity. Water security requires sustainable management.
- Ability to balance and satisfy competing water demands. Integrated water resources management principles will help meet competing domestic, industrial and agricultural water demands through fair allocation, pricing and governance.
- Long-term water-sharing agreement with stakeholder participation. The Euphrates River and the Tigris and most of its tributaries cross the borders of more than one country. Iraq, the most downstream country, is vulnerable to upstream countries' water resource management practices. Lack of a long-term water-sharing agreement presents a direct threat to water security.
- Environmental protection from pollution and degradation. Iraq must protect its environment and restore the southern marshlands drained by the former regime. Maintaining Iraq's wetlands and protecting its biodiversity are preconditions for sound water management.

Source: Janabi 2009.

access to water, often because rich people can buy their way out of shortage. Lack of access to adequate, sustainable water is thus a cause, a result and an indicator of poverty. As water receives more recognition as a fundamental human right, the need to ensure equitable access and participation in decision-making is driving change in water governance.<sup>6</sup>

Poverty is also linked to food insecurity, malnutrition and hunger. The World Food Summit of Rome held by FAO in 1996 considered four dimensions of food security: (1) availability of sufficient food of appropriate quality, (2) access to sufficient resources to acquire nutritious food, (3) proper conditions—such as adequate diet, clean water, sanitation and health care—to use food for nutritional well-being that meets all physiological needs, (4) stable access to adequate food at all times. Several conditions are necessary to ensure food security. The first key condition is to

better protect and manage water resources for irrigated and rain-fed agriculture. The second key condition is to raise public awareness of rural challenges and empower stakeholders with the means to ensure food security.<sup>7</sup>

Most Arab countries pronounced their commitment to sustainable development at the 1992 Earth Summit and confirmed this commitment in the 2012 Earth Summit—Rio+20.<sup>8</sup> In its original formulation, sustainable development was defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.”<sup>9</sup> The new paradigm of sustainable development implies a multigenerational vision that seeks to harmonize socio-economic and environmental goals. A prerequisite is to recognize that sustainability is a common problem and that all parties must sacrifice some needs for the common good (Box 3.2).

More than half of the Arab population is urban; by 2050 almost three-quarters will be. Rapid urbanization has contributed to the growth of large cities such as Algiers, Alexandria, Amman, Baghdad, Cairo, Damascus, Jeddah and Riyadh, and governments have expressed concern about how to provide services to mounting populations.<sup>10</sup>

The water situation in the Arab region is precarious. Water demand rises as populations grow, threatening sustainability. Demand management will become more important where scarcity and sector competition are increasing. Supply management will remain a priority where populations are more vulnerable. Calls for sustainable use of resources are gaining momentum, but water sustainability requires better water governance, more capacity and greater public awareness.

### **Water scarcity: a major determinant for water security**

Scarcity can be expressed in various degrees: absolute, life-threatening, seasonal, temporary or cyclical. Water scarcity exists when water is not available in proper quantities and quality at the proper place, time and cost. Populations

with normally high levels of consumption may experience temporary scarcity more keenly than other societies accustomed to using much less water. So it may be more useful to define water scarcity as a point where imbalance between availability and demand triggers water stress. Determining scarcity would thus be more qualitative than quantitative: the point where water scarcity occurs may vary widely from one situation to another.<sup>11</sup>

The UN defines scarcity as “the point at which the aggregate impact of all users impinges on the supply or quality of water under prevailing institutional arrangements to the extent that the demand by all sectors, including the environment, cannot be satisfied fully,” whereas the European Commission defines water scarcity more simply as “a situation where there is insufficient water to satisfy basic needs.”<sup>12</sup>

The causes of water scarcity can be physical or socio-economic. Physical scarcity—that is, limited access to water can arise from climate conditions (water shortage) or unsustainable management (overabstraction). With sufficient financial and technical resources, physical scarcity can be addressed through structural measures, such as water transfers, storage reservoirs and desalination. Physical scarcity is often followed or aggravated by socio-economic scarcity, a society’s economic inability to develop additional water resources or social inability to adapt to the conditions imposed by physical scarcity.<sup>13</sup> Water sectors must tackle both types of scarcity to reduce water management problems. In addition, a third type of scarcity characteristic of the region is forced scarcity due to occupation and political conflict (for example, Darfur and the Jordan River basin).

Water scarcity poses dramatic threats to the livelihoods of countless people, particularly in rural and poor communities. Remote areas where food production is at the mercy of climate variability and where water and sanitation are inadequate are especially vulnerable. But water scarcity also affects urban dwellers, particularly in less developed countries.

Physical scarcity will present massive challenges for developing countries in semi-arid

Sustainability has biophysical and socio-economic dimensions.

Biophysical sustainability seeks to maintain ecosystems and natural resources for human development. Socio-economic sustainability, a moral imperative, seeks to achieve basic social goals.

Socio-economic and environmental sustainability are highly interdependent. If a society allows excessive environmental deterioration, it undermines its citizens’ economic welfare, its political systems’ legitimacy and its institutions’ endurance. If a society suffers from social tension and instability, it will neither prioritize the environment nor be able to implement sustainable development. Sustainability’s socio-economic and biophysical dimensions must accordingly be addressed together.

Water sustainability presents one of society’s major challenges. Fresh water is critical for human needs, economic activity and ecosystem preservation. The natural hydrological unit for water assessment is the river basin, but national water stress indicators can illuminate the global situation. A widely used measure of water stress is the use-to-resource ratio: national annual withdrawals/annual renewable resources. There is no firm relationship between values of this measure and degree of water stress, but a use-to-resource ratio exceeding 0.4 indicates a high water stress level. Signs of imminent competition between user groups, or between human and environmental requirements, can begin when the ratio is as low as 0.1.

In principle, a valid sustainability goal would be decreasing water pressure in all areas where water scarcity threatens development. In practice, water demand growth is unstoppable and nonlinear. While population in the 20th century tripled from 1.8 billion to 6 billion, water withdrawal increased sixfold. The continuing momentum of expanding populations and food requirements implies continuing growth in water demand.

Source: World Bank 2009b; Daly 1996; Raskin and others 1997.

regions with rapidly growing populations and expectations for improved quality of life and poverty eradication. This is the case in many Arab countries, where agriculture is a major activity and water the main element of development. To what degree will water scarcity hinder socio-economic development? A country’s economic diversification and social adaptive capacity can be more important than water availability.<sup>14</sup> And while physical availability is largely the

product of climate, demand is the product of a water-dependent population, competing sectors and water productivity. Water scarcity requires an integrated, multidisciplinary, multidimensional approach. An issue not solely for water technicians and specialists, it should be integrated within national social and economic planning.

### Effective water governance: the vehicle for achieving water security

The so-called water crisis is a crisis of governance practices.<sup>15</sup> Water governance deficiencies include failure to provide sufficient water for poor and marginalized areas, lack of attention to water legislation and infrastructure, and inability to balance competing demands between socio-economic needs and the environment (Box 3.3).

Water governance refers to political, social, economic and administrative systems to develop and manage water resources and water services delivery.<sup>16</sup> The United Nations Development Programme stressed that water governance comprises the mechanisms, processes and institutions that allow all stakeholders, including citizens and interest groups,

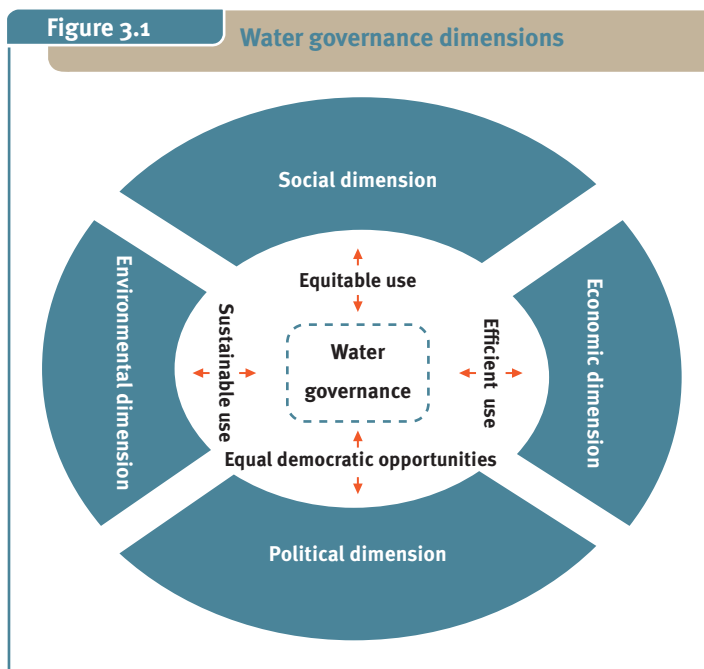
to articulate priorities, exercise legal rights, meet obligations and mediate differences.<sup>17</sup> Decisions in broader development areas also affect water governance.

Social, economic, environmental and political dimensions are the four pillars of water governance (Figure 3.1).<sup>18</sup> The social dimension refers to equitable water use. The economic dimension refers to efficient water use and water's role in economic growth.<sup>19</sup> The political dimension involves granting water stakeholders and citizens equal democratic opportunities to influence and monitor political processes and outcomes. It aims to ensure water equity for women and other socially, economically and politically weak groups. The environmental dimension involves sustainable water use and ecosystem services.<sup>20</sup>

Water governance depends not only on specific institutions but also on governance context. Key elements of good governance include transparency, accountability, participatory approaches, gender equity and access to information. Civil society and the private and public sectors must interact to ensure development in reforming and implementing water governance systems that allocate water. Governance needs continuous refinement and flexibility as new challenges arise. Even with general guidelines, one cannot set unique models. An IWRM approach would provide a framework of principles and good practices ensuring effective water governance (Box 3.4).

A recent review suggests a new definition of good water governance that addresses water management:

- Water governance consists of the decision-making processes and institutions that affect water. Water governance does not include outcomes or practical, technical and routine management functions such as modelling, forecasting, staffing and building infrastructure.
- Good water governance principles include predictability (rule of law); ethics (control of corruption); and open, transparent and broad participation.<sup>21</sup>
- Good governance requires appropriate conditions and an enabling environment.<sup>22</sup> A supportive context should include



Source: Adapted from Tropp 2005.



collective decision-making; effective institutions; and suitable policy, legal and political frameworks.<sup>23</sup>

### ***Improving water governance: An urgent task***

Improving water governance involves a wide range of skills, institutions and actors. In almost all Arab countries, the distribution of roles and responsibilities is often unclear. Although several government agencies provide water, none manages or governs it. Governance structures are undergoing reform to improve efficiency in water use and human resources.<sup>24</sup> This is becoming more necessary with rapid population growth.

After the supply management approach failed, most governments shifted to demand management.<sup>25</sup> But demand management requires many institutional and technological interventions, such as water tariffs, water metering, recycling approaches, regulation policies, improvements in water distribution networks, and water-saving and energy-saving irrigation technologies. All these interventions relate to the human dimension, where attitudes are shifting due to urbanization; rising educational levels; and social, economic and political transformations. The success of any long-term vision on water governance will depend on understanding the challenges and changes modernization presents.<sup>26</sup>

As water affects livelihood, water governance reforms can catalyse larger social change.<sup>27</sup> The ongoing political transitions in several countries in the Arab region could further water governance reform through increasing participation and accountability. But shifts in attitudes and behaviours take time and effort to yield the desired impact.

To meet water governance challenges, some Arab countries have initiated institutional reforms. In Morocco the government decentralized the water management system and tasked local authorities with ensuring service provision. In some countries, such as Jordan, governments have turned to privatization by empowering water user associations to use contractor skills and resources. But in several countries many factors impede reliable progress, including corruption, ineffective

#### **Box 3.3**

#### **Water decisions and governance systems**

Water decisions are anchored in governance systems across three levels: government, civil society and the private sector. Facilitating dialogues and partnerships among these levels is critical for water governance reform and implementation. Water governance includes:

- Allocating and distributing water equitably and efficiently, and integrating water management approaches.
- Formulating, establishing and implementing water policies, legislation and institutions.
- Clarifying the roles of government, civil society and the private sector and their responsibilities for owning, managing and administering water.

Source: UNESCO 2006.

regulations, unclear responsibilities and weak local capacity. The most important factors, however, are weak institutions, limited public awareness, decision-makers' lack of political will and the absence of leaders and skilled managers.

Many argue that effective water governance is anchored in five foundations: efficiency, environmental and economic sustainability,

#### **Box 3.4**

#### **Integrated Water Resources Management**

##### **IWRM goals include:**

- Improve institutional settings, boost reforms and enhance inter- and cross-sector coordination and coherence.
- Establish and enforce appropriate legal and regulatory instruments. Establish settings for water rights and permits and introduce environmental standards, including the "polluter pays principle." Establish inspection, monitoring and enforcement mechanisms and independent assessment, such as the "water police."
- Introduce and/or improve transparency and accountability.
- Enhance cooperation of riparian states on sustainable use and protection of transboundary water resources in harmony with the UN Convention on the Law of the Non-Navigational Uses of International Watercourses.
- Protect and safeguard natural ecosystems to ensure good water quality. Ensure and enhance the necessary biological and ecological goods and services they provide in accordance with the Convention on Biological Diversity.
- Align IWRM and integrated coastal zone management policies to tackle challenges in rapid coastal development and marine pollution.

Source: Union for the Mediterranean 2010.

The Iraq war and post-war insecurity, along with growing water scarcity, left a large part of the population vulnerable to health and hygiene problems and without safe access to water. Irrigation and drainage systems (canals and pumping stations) were also affected. As agriculture in Iraq depends mostly on irrigation, over-irrigation and drainage problems (silted canals, nonoperational drainage pumping stations, among others) have caused salinity and water logging in almost all irrigation schemes built between the Tigris and Euphrates rivers. The yields of major crops have fallen significantly, leaving large uncultivated areas and affecting farmers' income. Because of this, a large segment of the rural population has migrated to cities in search of employment.

Shortly after the U.S. invasion, renovating water infrastructure became a vital strategy. To reduce water loss, make irrigation more efficient and limit water logging and salinity, closed irrigation systems and pumping stations were used instead of lining and flumes for irrigation canals. According to the FAO Water Development and Management Unit in Rome, a 10 per cent increase in agricultural water efficiency could free up enough water to serve Iraq's urban population, and a 20 per cent increase could serve Iraq's industrial sector. But the electricity needed to operate these pumps made this alternative not cost-effective.

Costs greatly exceed the economic benefits of the current cropping system, largely dominated by low-profit cereals such as barley and wheat. Unless Iraqi agriculture shifts to added-value crops, water infrastructure cannot be rehabilitated.

Another alternative, under FAO's support, was to promote water user associations, involving farmers in water management and raising their awareness of high-tech, water-saving irrigation systems. But legislation in southern and central Iraq prohibits water user associations, unlike in northern governorates under the Kurdistan Regional Government. In the mountainous north, much smaller irrigation schemes are usually built by farmers themselves, facilitating the creation of such organizations.

Capacity building for water user associations was not well developed in the irrigation schemes rehabilitated by FAO in central and southern Iraq. This reflects a lack of interest in participatory governance. Schemes located in northern Iraq, however, had well-functioning water user associations, contributing to equitable and efficient water management.

Poor water governance, inexperienced water institutions, the absence of solid national water management policies and lingering corruption from previous dysfunctional regimes contribute to weak governance in a chaotic, post-conflict environment. Water management can be optimized by adopting appropriate legislation, facilitating water user associations and increasing agricultural productivity and water use efficiency.

Source: FAO-Iraq 2008; Romzek 2009.

responsiveness to socio-economic development needs, accountability before stakeholders and the public, and adherence to ethics and moral values. Openness, transparency, stakeholder inclusiveness and a participatory approach will lead to implementable policies and more flexible decision-making. It is critical to create an open forum with all stakeholders, including decision-makers, to discuss water issues. In Multi-Stakeholder Platforms—co-governance round tables where stakeholders of a watershed or region sit together—governance shifts from vertical command to horizontal coordination, easing problem-solving. This type of participatory, co-management organization forms the basis of Participatory Irrigation Management.

In the last twenty years many Arab countries have moved away from the state-led paradigm dominant from the 1950s to the 1970s. Today, governance entails decision-making and implementation processes involving levels of actors. Water governance is recognized as a political process whose changes reflect broader changes in governance structure.

Effective water governance in the Arab region confronts several challenges: lack of accountability, transparency, regulation and adequate stakeholder participation. The Arab region also suffers from inequity in water provision, a highly centralized decision-making process and inefficient responsiveness to escalating socio-economic development needs. Indeed, effective water governance is an urgent development requirement. The top-down approach to water governance has failed; the bottom-up approach, ensuring participation of all stakeholders, is the right one. The situation is more challenging in post-conflict countries facing severe water scarcity and potential water conflict. For countries in shambles emerging from a conflict, such as Iraq, it is critical to rebuild water institutions and destroyed infrastructure to support efficient provision of sustainable water services (Box 3.5).

There is no single model of effective water governance. To be effective, governance

systems must fit the social, economic and cultural particularities of each country. But some basic principles are considered essential. Building on these definitions, the Global Water Partnership identified ten criteria for effective water governance.<sup>28</sup> These ten principles were further refined by the World Water Assessment Programme to produce eight features of good governance (Box 3.6).

Water governance guides, directs, enables and enhances effective and sustainable water management and provision. Effective water governance becomes more important as water becomes scarcer; it must ensure that all sectors of society have equitable, reliable and sustainable access to water and are using water efficiently (Figure 3.2).

Effective water governance entails legislative, organizational and administrative action, including practicing IWRM (Box 3.7). Responding to escalating challenges, many Arab countries are implementing IWRM plans and strategies with different approaches and varying degrees of success. Most attempts include water rights, multistakeholder participation, public-private partnership of water services, and decentralization reform.<sup>29</sup>

The water governance system must establish robust indicators to guide, monitor and assess reform. With information on reform's effectiveness and contribution to water security and sustainable development, stakeholders can contribute meaningfully to setting priorities and strengthen the responsiveness of institutions and processes to water needs. A Public Engagement in Water Management project initiated by the World Bank and the Arab Water Council in 2012 on public monitoring of water management in Egypt, Jordan, Lebanon and Tunisia established a series of such governance indicators.

With adequate indicators, water governance schemes can influence policy interventions by the government and the development community (Box 3.8). This is a challenging task because indicators can vary widely among countries. Each country must develop its own indicators and evaluate progress and drawbacks in water governance programmes.

### Box 3.6

### The World Water Assessment Programme principles of good governance

- **Participation:** All citizens, both men and women, should have a voice—directly or through intermediate organizations—representing their interests in policy- and decision-making. Broad participation hinges on national and local governments following an inclusive approach.
- **Transparency:** Information should flow freely within a society; processes and decisions should be transparent and open for public scrutiny. Right to access this information should be clearly stated.
- **Equity:** All groups in society, both men and women, should have equal opportunities to improve their well-being.
- **Accountability:** Governments, the private sector and civil society organizations should be accountable to the public or the interests they are representing.
- **Coherence:** Because of the increasing complexity of water issues, policies and actions must be coherent, consistent and easily understood.
- **Responsiveness:** Institutions and processes should serve all stakeholders and respond properly to preferences, changes in demand or other new circumstances.
- **Integration:** Water governance should enhance and promote integrated and holistic approaches.
- **Ethics:** Water governance must be based on the ethical principles of the society where it functions—for example, by respecting traditional water rights.

Source: Rogers and Hall 2003; IRG 2009.

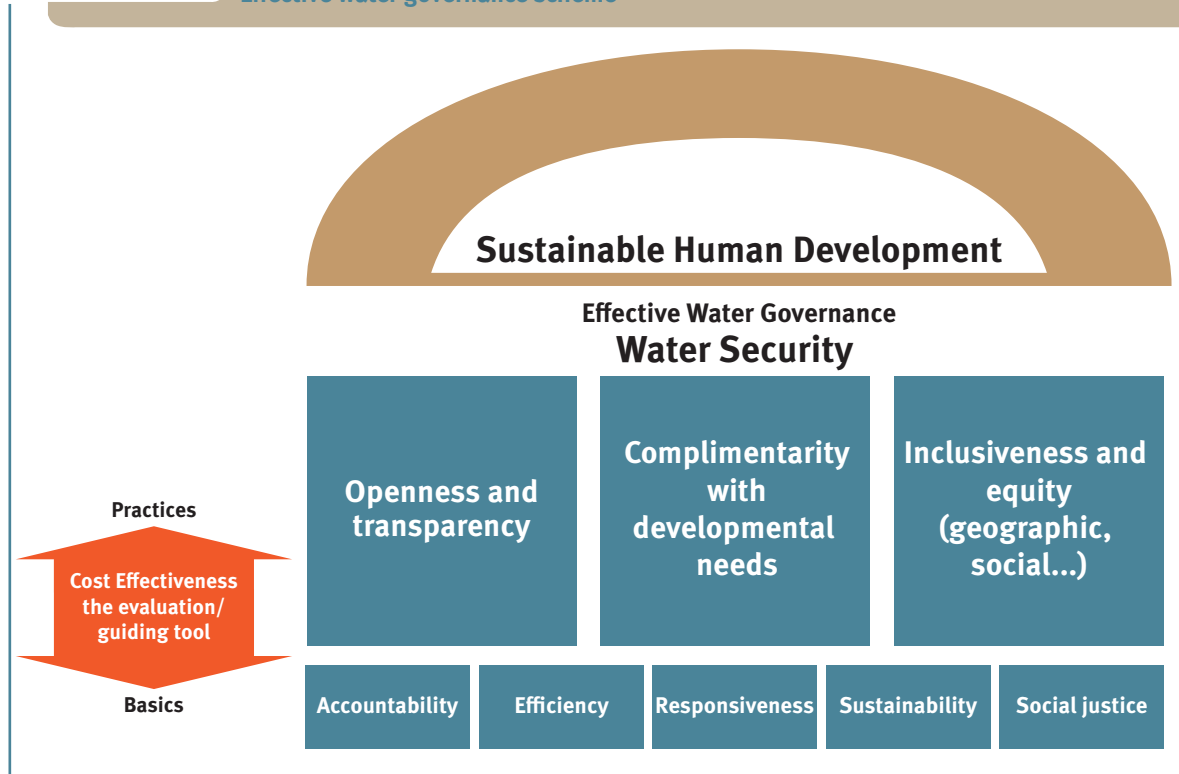
### Cost-effectiveness analysis: an important tool for guiding effective water governance

Decision-makers in the Arab region's water sector continuously face water scarcity. Often they base decisions on ways to increase water quantity and quality, using financial assessment as the major determinant. Unfortunately, these financial assessments often neglect economic and environmental costs, particularly in efficiency and effectiveness.<sup>30</sup> Cost-effectiveness analysis — as long as it considers economic, social and environmental perspectives—can help planners and decision-makers identify the most effective strategies to address water governance problems.

Another major dimension in water governance is water's proper valuation. Efficiency can be achieved when an economic activity's social net benefits (social benefits minus social costs)

Figure 3.2

## Effective water governance scheme



Source: The Report team.

are at their maximum, but identifying the social cost is not easy. The real value might not be calculated properly, so one might end by overvaluing or undervaluing components. This is particularly true for the water sector. Economists and environmentalists believe that water misuse and overexploitation and inadequate governance are due mainly to ignoring water's real value. Economic efficiency that takes water's real value into account would prevent excessive water use and quality deterioration.<sup>31</sup>

#### *Assessing water governance options: Cost-benefit versus cost-effectiveness analysis*

##### *Cost-benefit analysis*

This approach assesses costs and benefits of investing in a particular action, reflecting its overall social impact. The cost-benefit analysis methodology can be employed either to decide if an activity is economically feasible or to select alternatives with the highest net benefits. Rather than focusing only on financial implications, the analysis incorporates all tangible and intangible costs and benefits. The most common

use of cost-benefit analysis in the water sector is to justify investment needs and water quality improvements.<sup>32</sup>

Cost-benefit analysis is among the most powerful tools available for policy-makers deciding between alternative project structures the "with and without" scenario. The usefulness of cost-benefit analysis is limited, however, by the ease and reliability of identifying, quantifying and assigning a monetary value. These limitations are magnified in water governance. In addition to the traditional difficulties related to externalities and social costs, severe water shortages leave decision-makers with few alternatives. Choosing the most cost-effective way to address the major problems of water governance might be the only choice.<sup>33</sup>

##### *Cost-effectiveness analysis*

Cost-effectiveness analysis can be used to compare alternatives (Box 3.9). Unlike cost-benefit analysis, cost-effectiveness analysis does not depend on an absolute standard for accepting or rejecting any action, policy or programme.<sup>34</sup> Rather, it selects the least-cost alternative that



can attain the intended objective. Considering the cost and consequences of alternatives, cost-effectiveness analysis can be used as a decision-orienting tool for water management, especially in urban areas. Cost-effectiveness analysis evaluates not only different alternatives and policies but also the least-cost and marginal (incremental) alternatives. For example, it can assess drinking water or sewerage systems to provide services in phases, giving the opportunity to choose the least-cost alternatives in each phase.<sup>35</sup>

Assessing alternatives through cost-benefit analysis or cost-effectiveness analysis requires knowledge of direct and indirect costs and benefits. The difficulty, as with many water-related variables, is that some of these costs and benefits are not related to goods or services traded in the markets and thus have no prices. Markets also sometimes fail to determine the real prices of some goods and services. Cost-effectiveness analysis can provide a viable alternative to cost-benefit analysis because it can save money, effort and time. Cost-effectiveness analysis can also reduce the chances of relying on estimates marred by bad information and data prejudices.

### Cost-effectiveness analysis and achieving effective water governance in the Arab region

Despite continuous efforts, the gap between water supply and demand has been widening continuously. Approaches to this problem have varied from enhancing supply to controlling demand by using pricing tools, raising awareness and enforcing water-rationing measures. In several cases, community-based, participatory approaches to demand management proved to be critical in achieving sustainability. Incentives, institutional reforms, awareness campaigns, appropriate technology transfer, public health and hygiene training, and cost recovery schemes based on a more appropriate valuation of water have demonstrated effectiveness. But no Arab country has achieved the desired balance, not only because of rising demand and scarcity, but also because of governance obstacles such

#### Box 3.7

#### Elements of sustainable water governance

##### For sustainable water governance, Arab countries could:

- Integrate policies in all water categories, including groundwater, coastal water and transboundary waters.
- Establish management organizations at appropriate levels.
- Enhance and facilitate stakeholder participation, emphasizing gender balance.
- Increase citizen awareness of water's value and culture.
- Support the media to play a more systematic and constructive communication role on water issues.
- Build capacity of water management and environmental protection administrations—address training needs (including training trainers) and facilitate knowledge and expertise exchange at the local, national and transboundary levels.
- Collect and monitor water data, using indicators that adhere to international standards.
- Support water research.
- Link research outcomes with policy development, application and monitoring.
- Establish and support fair and socially sensitive valuation and cost recovery.

Source: Lannon 2010.

as weak institutional arrangements, unequal water access and allocation, and inefficient and discriminatory enforcement of rules and regulations.

Securing and managing funding for the water sector is another major issue. Due to water and sanitation sector characteristics, such as natural monopolies; network infrastructure; large-scale delivery; large sunk investments; high technological needs and expertise; and high abstraction, distribution and transportation costs, effective water governance involves tremendous financial resources that very often exceed government capacity. Cost recovery is a major related issue, mainly because tariffs do not cover the total costs (investment and operational cost) of delivery, treatment and infrastructure maintenance. Over the last two decades private sector participation has emerged as a strategy to fill the funding and capacity gaps. Decisions are traditionally based on financial feasibility. The willingness to pay by end-users is frequently used as a guiding determinant, but this option is highly inadvisable for poor people. Despite

In 2010 the United States Agency for International Development (USAID) conducted a water governance benchmarking initiative to evaluate water governance capacity and performance in Egypt, Jordan, Morocco and Oman. These countries have organized their water sectors well in setting policy goals and assigning responsibilities. Egypt and Morocco were more effective in applying good governance and decision-making practices. The water sector is highly centralized in Egypt, Jordan and Oman, where the government is playing a dominant role. Morocco succeeded in decentralizing water governance by involving agricultural water user associations and creating hydrological river basin agencies.

But accountability, integrity and transparency need substantial improvement. The water sector lacks strategic legal planning due to the absence of comprehensive water laws. A systematic, in-depth assessment of water governance in these countries would help monitor their evolution.

Water governance benchmarking can assess the state of water resources and the effectiveness of water policies or plans through performance indicators. These indicators can be formulated to measure and evaluate:

- Modifications in legislation and regulations.
- New, sustainable organizations and institutions.
- Diagnosis of water bodies: pressure-impact analyses.
- Cost recovery analyses by sector and/or river basin district.
- Environmental objectives for watersheds.
- River basin and groundwater management plans.
- National water plans.
- New water pricing policies
- Involvement of local communities and stakeholders in decision-making.
- Dialogue forums between stakeholders.
- Coordination between water agencies.

Source: Adapted from USAID 2010.

their limited financial capacities, poor people usually end up paying tariffs that go beyond their willingness and ability to pay. They are also charged for less effective water systems.

Cost-effectiveness analysis can help decision-makers achieve a balance between demand and supply (Figure 3.3) by presenting options in a clear and comprehensive manner that encompasses social and environmental as well as financial issues. Cost-effectiveness analysis can bring together supply, demand and effective water governance using a “unified lens and yardstick.” It can evaluate the least-cost

options for enhancing water quantity and quality, while taking social and legal dimensions into account. It can also apply to demand management, with attention to equity and justice. For effective governance, cost-effectiveness analysis can weigh participatory approaches and responsiveness to development needs. The positive impacts of this “unified lens and yardstick” extend beyond unifying economic and financial approaches to establishing consensus, a determining factor for success.

#### *Major prerequisites for applying cost-effectiveness analysis in water governance*

Applying cost-effectiveness analysis in water supply and sanitation projects requires specific conditions, including an estimation of social benefits based on the cost of the most probable alternative, and ability of water authorities, agencies or companies to provide similar output in the absence of alternatives.<sup>36</sup> Also, cost-effectiveness analysis cannot yield the required water governance results by itself. Decision-making mechanisms should incorporate water governance principles in designing, appraising, building, executing and implementing water and sanitation projects to achieve optimal use of resources, sustainable development and ecological sustainability.

Guaranteeing transparency, integrity and accountability is fundamental to successful and peaceful implementation. Water and sanitation projects should be made transparent to all stakeholders through stakeholder dialogue, access to information and environmental impact assessments. They must involve stakeholders from the beginning and ensure a system in the project management structure whereby individuals, NGOs, civil society and the private sector can ask questions and gain information that explains actions and decisions. They must also secure participation of all stakeholders, including vulnerable and marginalized groups, from conception to execution and allow input in deciding how water is used, protected, managed and allocated. Involving stakeholders can enable a deeper understanding of water governance.

Another criterion in comparing alternative actions is equity in allocating and using water.

All project areas have an equal right to water, so legal frameworks must provide solutions that enable users to demand their rights. This requires not only an effective legal framework, but also well-functioning institutions. Drinking water and sanitation are basic rights for all citizens. Irrigation is one water subsector where projects take social and economic criteria into account.

Water governance and cost-effectiveness analysis in the Arab region are complicated by international boundaries. Many countries must manage transboundary water—some of which carry run-off from other countries—and often rely on fragile, sometimes non-renewable aquifers, as in Jordan, Libya, Saudi Arabia and Yemen. Current groundwater management practices often neglect environmental considerations.

Water allocation between municipal and other water sectors is another challenge facing Arab countries. International pressure to reallocate from agriculture, with low value-added per cubic metre, to other, high value-added sectors such as industry, tourism and service fail to consider sovereignty for strategic crops, the fragile water trade balance and social and economic dimensions such as rural poverty and internal migration.

Cost-effectiveness in the water sector is becoming vital for Arab countries because of rapid population growth, increasing urbanization, rising food demand and a steady increase in the standard of living. Population growth is faster than the increase in water resources: per capita renewable internal freshwater resources fell from 573 cubic metres in 1992 to 374 in 2009.<sup>37</sup>

Cost-effectiveness analysis can help decision-makers and planners identify the most effective water governance options in administration, environment and demand management policies. In Arab countries that depend on desalination, for example, cost-effectiveness analysis can assess the efficiency of allocating quantities of desalinated water to domestic users. It can also identify the most effective desalination technologies, implementation modalities, funding and cost recovery strategies and other relevant approaches.

**Box 3.9**

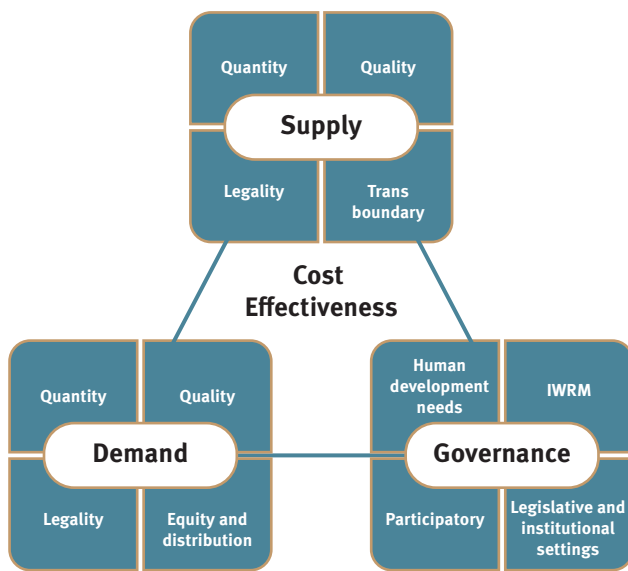
**Cost-effectiveness analysis**

Cost-effectiveness analysis (also known as least-cost analysis) is used to identify the most cost-effective way to achieve an objective. The most cost-effective option meets the same objective at the lowest cost. “Cost-effectiveness analysis is a tool that can help to ensure efficient use of investment resources in sectors where benefits are difficult to value, or when the information required is difficult to determine or, in any other cases, when any attempt to make a precise monetary measurement of benefits that would be tricky or open to considerable dispute. It is a tool for the selection of alternative projects with the same objectives quantified in physical terms. It can identify the alternative that, for a given output level, minimizes the actual value of costs, or, alternatively, for a given cost, it maximizes the output level.”

Source: EC 2009.

**Figure 3.3**

**The cost-effectiveness analysis and effective governance triangle**



Source: The report team.

## Endnotes

- <sup>1</sup> Grey and Sadoff 2007.
- <sup>2</sup> Mileham 2010.
- <sup>3</sup> As defined by the Food and Agriculture Organization (FAO), food security is achieved at “the individual, household, national, regional and global levels when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 1996). The United States Department of Agriculture defines food security at the household level as “food access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing or other coping strategies” (USDA 2009).
- <sup>4</sup> UNDP 1996.
- <sup>5</sup> OECD 2001.
- <sup>6</sup> Moriarty and others 2007.
- <sup>7</sup> ICID 2012.
- <sup>8</sup> UN 2012.
- <sup>9</sup> WCED 1987.
- <sup>10</sup> Mirkin 2010.
- <sup>11</sup> Winpenny 2006.
- <sup>12</sup> UN 2006; EC Water Scarcity Drafting Group 2006.
- <sup>13</sup> Turton and Ohlsson 1999.
- <sup>14</sup> Allan 2001.
- <sup>15</sup> UNDP 2004.
- <sup>16</sup> GWP SAS 2002.
- <sup>17</sup> UNDP 2004.
- <sup>18</sup> Tropp 2005.
- <sup>19</sup> World Bank 2003.
- <sup>20</sup> Miranda, Hordjik, and Torres Molina 2011.
- <sup>21</sup> Lautze and others 2011.
- <sup>22</sup> Tiihonen 2004.
- <sup>23</sup> Kooiman 2003; Rhodes 1996; Tiihonen 2004.
- <sup>24</sup> Varis 2007.
- <sup>25</sup> UNEP 2010a.
- <sup>26</sup> Varis and Tortajada 2009.
- <sup>27</sup> Vairs 2007.
- <sup>28</sup> Rogers and Hall 2003.
- <sup>29</sup> GWP SAS 2003; CEDARE and AWC 2007.
- <sup>30</sup> Gerasidi and others 2003.
- <sup>31</sup> Birol, Karousakis, and Koundouri 2006.
- <sup>32</sup> Mitchell and others 2007.
- <sup>33</sup> Chong, Kazaglis, and Giurco 2008.
- <sup>34</sup> COAG 2007.
- <sup>35</sup> NWRI 2003.
- <sup>36</sup> Aulong and others 2008.
- <sup>37</sup> World Bank n.d.