Water Governance in the Arab Region

Managing Scarcity and Securing the Future

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Report in Brief

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Foreword by the Regional Director, UNDP Regional Bureau for Arab States

A child struggles in the arid countryside for a drink of clean water; a family flees a drought and relocates to a city not ready; a community sees its social fabric stretched by competition for the essentials of life; a country swept by famine: The impacts of the water crisis facing the Arab world are dire.

These struggles are the human face of the statistics provided in this report: that the terrain of the Arab region is over 87 per cent desert; that the rainfall we receive is well below the world average; that the average person in the Arab region accesses one-eighth the renewable water that the average global citizen enjoys; and that 14 of the world's 20 most water-stressed countries are here.

Water challenges can and must be addressed if the Arab region is to achieve the Millennium Development Goals, attain shared prosperity, and reach a future of sustainable human development. Addressing water challenges now can also help strengthen resilience by managing the risk of potential crises that could result from inaction: such as unplanned migration, economic collapse, or regional conflict.

Resolving the crisis will require enduring progress towards political, social, economic and administrative systems that shape the use, development and management of water resources and water delivery in a more effective, strategic, sustainable and equitable direction.

As this report presents the issue, the need to improve water governance requires much more than efforts to increase the supply of water. Rather, addressing the crisis requires strengthening technical capacities and national institutions and developing mechanisms to increase the transparency and accountability of public water services.

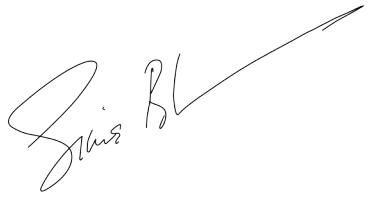
The task ahead is for all stakeholders —including government, civil society, and the private sector— to arrive at collective understandings of diverse needs and to develop approaches to water governance that yield the highest shared value of water resources.

Progress towards many of the solutions is already underway in different ways across the region. However the urgency of the current situation requires accelerated and improved collective effort. Already several Arab countries are on the verge of running out of renewable water. Droughts and famines have become more frequent and agricultural output is falling behind population growth.Moreover, the impacts of climate change and demographic and economic growth exacerbate the challenge. Current projections show that by the year 2025 the water supply in the Arab region will be only 15 per cent of what it was in 1960.

Progress requires integrated approaches to the water crisis that address the links between water and health, education, poverty alleviation, environmental protection, job creation, and food and energy security. It also requires increased political attention and commitment even amid the challenging political environment of the region today. The key right now is to more broadly disseminate knowledge, to bring more stakeholders into the dialogue, and to ensure that dealing with the water crisis remains a major priority even as the region continues to pass through difficult times.

My hope is that this report will serve as a vital tool in UNDP's cooperation with the Arab region, where we are on the ground in 18 countries working with governments and other stakeholders to develop national capacities and

achieve results in moving towards sustainable development pathways that reduce poverty and inequality, towards inclusive and effective governance systems that deliver results for people, and towards resilience to the risks of natural disaster and conflict. Water governance sits at the crossroads of these development objectives and I hope that this report fosters progress towards advances in human development across the entire Arab region.



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The Report in Brief

Water scarcity threatens the livelihoods of countless people in the Arab region. Rural and poor communities and urban dwellers in less developed countries are especially vulnerable. Twelve Arab countries have average per capita water availability rates below the World Health Organization threshold for severe scarcity. Urbanization, population growth and climate change exacerbate the region's natural water scarcity and widen the gap between supply and demand. Other threats to water security are rainfall variability, pollution, overexploitation and climate change. Most shared water resources also lack comprehensive international agreements, threatening water supply and political stability.

The water crisis is a crisis of governance. Many factors impede progress in water governance, including unclear and overlapping responsibilities, inefficient institutions, insufficient funding, centralized decision-making, limited public awareness and ineffective regulations and enforcement.

To meet escalating demand, Arab countries must develop a responsive governance framework to better manage their vulnerable water resources, both conventional (surface water and groundwater) and non-conventional (desalinated water, treated wastewater, rainwater harvesting, cloud seeding and irrigation drainage water). All sectors—agricultural, industrial and municipal—and users must have equitable, reliable and sustainable access to water and must use water efficiently. Water security is inseparable from social, economic, environmental and health considerations. Food security, the water-energy nexus and the impacts of climate change require particular attention.

Key elements of good water governance include equity, transparency, accountability, environmental and economic sustainability, stakeholder participation and empowerment, and responsiveness to socio-economic development needs. Cost-effectiveness analysis can establish water's proper value and identify the most socially, economically and environmentally cost-effective policy options. By reorienting policy, reforming institutions, promoting education and awareness, increasing stakeholder participation, establishing international agreements and linking policy to research and development (R&D), governance can ensure efficient water management practices. Effective governance must be flexible, able to adapt to climate change and incorporate the social and political changes accompanying modernization. The region's current political and economic transformations can advance water governance reforms, while effective water governance systems can in turn catalyse region-wide aspirations for overall governance reform.

Managing and adapting to water scarcity

Water scarcity has physical and socio-economic causes. Physical scarcity arises from climate conditions (water shortages) and unsustainable management (overuse). The Arab region's low and variable rainfall, high evaporation rates and frequent droughts reduce water reliability and availability. With more than 5 per cent of the world's population and about 10 per cent of its area, the region receives only 2.1 per cent of average annual precipitation and contains 1.2 per cent of annual renewable water resources. Renewable groundwater supplies are limited, and non-renewable supplies are threatened by unsustainable use patterns.

Overexploitation and pollution of renewable and non-renewable water resources jeopardize their availability. Using groundwater resources beyond their natural replenishment rates is rapidly depleting aquifer reserves and degrading water quality due to seawater intrusion. Groundwater resources in most Arab countries are also threatened by pollution from agricultural, industrial and domestic activities.

Urbanization and population growth are further straining already scarce resources. The population of the Arab countries, estimated at 360 million, is projected to reach some 634 million by 2050, and the urban share of the population is expected to swell from 57 to 75 per cent, putting more pressure on water infrastructure. Rising living standards and a large youth population pressing for faster economic growth will further boost water demand. The gap between water supply and demand, estimated at more than 43 cubic kilometres in 2009, is expected to reach 127 cubic kilometres a year by 2020–2030.

Climate change has disproportionate consequences for the developing world. Greater climate variability and more frequent and severe droughts and floods will exacerbate already precarious water conditions. The Arab region is home to five of the top ten countries at risk from the impacts of climate change, and many other Arab countries are extremely or highly vulnerable. By 2030 the effects of climate change will have reduced renewable water resources by another 20 per cent as declining precipitation reduce water supplies, climbing temperatures boost water demand, and rising sea levels and continuing groundwater overexploitation increase seawater intrusion into coastal aquifers. Women and poor and marginalized communities are especially at risk.

A society's adaptive capacity—a complex function of infrastructure, wealth, economic structure, and physical, human and institutional resources—determines how scarcity affects it. Socio-economic scarcity arises from an economic inability to develop additional water resources or a social inability to adapt to conditions of physical scarcity. Forced scarcity arises from occupation and political conflict. To strengthen adaptive capacity, water governance must address all types of scarcity.

Augmenting water availability

Conventional water resources comprise surface water and groundwater. The Arab region contains 23 major watersheds with perennial rivers or ephemeral streams. Several countries with highly variable rainfall and transboundary waters have invested in water storage and conveyance networks to bolster water availability and sustainability and reduce the risk of water-related disasters. Other countries, especially in hyper-arid areas, have built dams. Although dams have yielded economic and social benefits, they have also reduced water levels and soil fertility.

Even countries fairly rich in surface water are relying more on groundwater to meet steadily rising demand. Shallow and deep groundwater resources, within or across national boundaries, are recharged by precipitation and by rivers. Vast areas, spanning many Arab countries, contain non-renewable groundwater resources, or fossil aquifers. These resources are being used mainly for agricultural expansion and without integrated planning. Groundwater

overexploitation is not only depleting resources but also damaging the environment. Water salinization has dried natural springs and degraded or destroyed surrounding habitats and ecosystems.

Nonconventional water resources include desalination, treated wastewater, rainwater harvesting, cloud seeding and irrigation drainage water. The Arab region leads the world in desalination, with more than half of global capacity. Desalinated water is expected to expand from 1.8 per cent of the region's water supply to an estimated 8.5 per cent by 2025. Most of the anticipated increase will be concentrated in high-income, energy-exporting countries, particularly the Gulf countries, because desalination is energy - and capital-intensive. Technological advances are reducing production costs, however, and investments in infrastructure and R&D, in solar and other renewable energies can lower them further and make desalination more sustainable. While desalination plants reduce pressure on conventional water resources, they have harmful environmental effects, including pollution and greenhouse gas emission.

To meet escalating demand in urban areas, Arab countries are using more treated municipal wastewater. Estimated at 4.7 billion cubic metres a year and rising, treated wastewater offers many advantages. It lacks the uncertainties of surface water resources and can meet a substantial share of the rising water demand from urbanization and population growth. Many factors prevent the expansion of water reuse, however, including social barriers, technical obstacles and institutional and political constraints. Regulations are needed to protect human health and the environment.

Several Arab countries are experimenting with water harvesting and cloud seeding. Improving water harvesting requires a long-term policy to support national research centres and extension services; adequate institutional structures and beneficiary organizations (associations, cooperatives); and training programmes for farmers, pastoralists and extension staff. Cloud seeding experiments have shown positive results, but potential cloud ownership disputes are a concern. Arab countries, especially Egypt and Syria, also draw heavily on reused irrigation drainage water. A long-term policy and comprehensive monitoring are needed to improve the efficiency of

Table 1 **Water dependency ratio in the Arab region**

Country	Water dependency ratio (%)	Country	Water dependency ratio (%)
Kuwait	100.0	Qatar	3.4
Egypt	96.9	Palestine	3.0
Bahrain	96.6	Lebanon	0.8
Mauritania	96.5	Morocco	0.0
Sudan and South Sudan	76.9	Djibouti	0.0
Syria	72.4	Oman	0.0
Iraq	60.8	Yemen	0.0
Somalia	59.2	Saudi Arabia	0.0
Jordan	27.2	Libya	0.0
Tunisia	8.7	UAE	0.0
Algeria	3.6	Comoros	0.0

Note: The water dependency ratio refers to surface water only. Many of the countries with zero water dependency ratio share transboundary groundwater aquifers with other countries.

Source: FAO 2013.

drainage water reuse and limit its polluting impact.

As populations have grown and food demand has escalated, Arab countries have been forced to acquire water by importing agricultural commodities requiring large amounts of it. Because the Middle East and North Africa imports half of its grain, virtual water trade is necessary. The amount of virtual water imported in the region doubled from 147.93 billion cubic meters in 2000 to 309.89 billion in 2010.

Water governance that focuses on sustainability, energy efficiency, investment and R&D in water technology is essential to maximize water supply. International coordination and agreements in managing shared water resources are also imperative to ensure their sustainability. More than two-thirds of surface water resources originate outside the region, and large groundwater systems extend between neighbouring Arab countries and beyond them. Almost every Arab country depends for its water supply on rivers or aquifers shared with neighbouring countries (Table 1), but comprehensive international agreements are lacking.

Challenges to effective governance

Water governance faces multiple challenges.

Balancing multiple water uses

Although agriculture contributes only a small share of GDP, it consumes more water than industrial and municipal users. Reallocating water to more productive sectors such as industry and tourism would make increase dependence on food imports and leave millions of unskilled labourers jobless. Rising domestic water consumption will also reduce the water available for agriculture. Countries will have to increase irrigation efficiency, use more nonconventional water, manage crops better and help agricultural workers find jobs.

Water equity

Rural areas, women, poor people and other marginalized groups generally lack access to clean drinking water and improved sanitation, reflecting social and political exclusion of poor people from opportunities and services. Although access has expanded, progress has been slow in many countries. In 2010, about 18 per cent of the Arab population still lacked access to clean water and around 24 per cent lacked access to improved sanitation. Most underserved people live in lower income, occupied or conflict-ridden countries. Disparities are particularly large between rural and urban areas. Ensuring equity requires that all stakeholders, especially poor people and women, participate in water management so that that all people can have access to safe drinking water. Effective water governance is essential to development. The top-down approach to water governance has failed; the bottom-up approach, ensuring participation of all stakeholders, is the right one.

The World Water Council, the Third World Water Forum, the Global Water Partnership, the Dublin Statement on Water and Sustainable Development and the United Nations have endorsed the view that the "human right to water is indispensable for leading a life in human dignity." In September 2010 Human Rights Council Resolution A/HRC/RES/15/9 affirmed that rights to water and sanitation were part of international law, confirmed that these rights are legally binding on states and called on states to develop tools to ensure access to safe drinking water and improved sanitation for all.

Water-related conflict

Because water allocation often reflects social, political and economic inequities, it can generate social and economic strains that lead to conflict or exacerbate it. Competition over transboundary waters is at the heart of regional political conflicts. Inadequate governance of shared water resources continues to threaten the region's stability and impose uncertainty on water resource planning in downstream countries.

Water's connection to food security and energy

Water security is inseparable from food security and energy. Competition over increasingly limited water resources severely challenges Arab countries' ability to feed growing populations. Futile attempts to achieve food self-sufficiency are behind much of agriculture's overexploitation of water and have not slowed rising food imports. Grain imports have more than doubled since 1990 and now account for almost 60 per cent of grain consumption (Figure 1). To achieve national food security, governments can encourage agricultural productivity, maximize water productivity, increase trade in virtual water by expanding food imports, and work towards regional agricultural integration.

Effective water governance requires understanding the interdependence of water and energy. For example, any future expansion in desalination capacity should be linked to investments in abundantly available renewable sources of energy, such as wind and solar. Arab countries must also enhance coordination and investment in R&D in water technologies, most of which are now imported. Acquiring and localizing these technologies will make them more reliable, increase their added value to the economy and reduce their cost and environmental impacts.

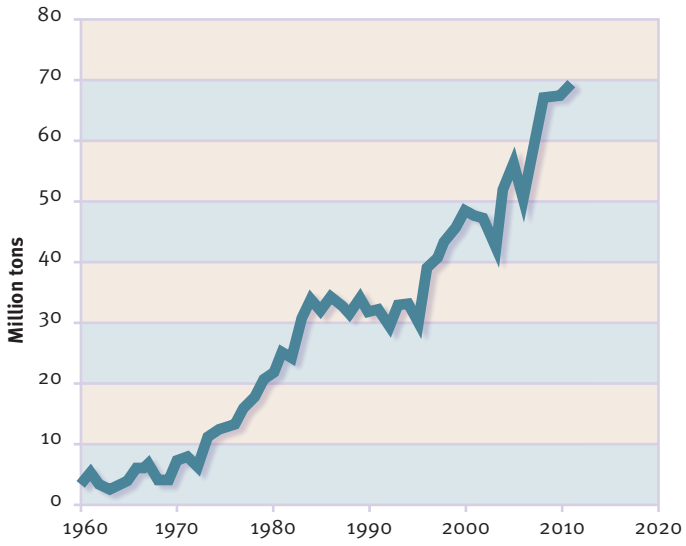
Environmental degradation

Water governance must also balance socio-economic needs and environmental protection. Overexploitation and pollution have led not only to lower water quality and quantity, but also to ecosystem degradation, which has both economic and social costs.

Privatization

Despite some reforms to water governance, impediments remain, including unclear responsibilities, lack of coordination, inefficient institutions, limited public awareness, highly centralized decision making and ineffective regulation and enforcement. One outcome is that the predominantly publicly owned water sector has amassed a large funding gap: Arab countries may need to invest as much as $200 billion in water-related infrastructure over the next ten years. While most Gulf oil-producing countries can afford to invest in water-source solutions, many other Arab countries cannot.

Figure 1 Net grain imports to the Arab Middle East and North Africa, 1960–2011



Source: Rasmussen 2012.

International donors and lenders have promoted privatization of water management and distribution to achieve full cost recovery and improve distribution efficiency. But privatization is controversial. Proponents argue that private corporations can better manage and distribute water and that allowing market forces to establish true water prices will force water users to adjust consumption and constrain waste. Opponents argue that treating water as private property creates the possibility of excluding others from access to a life-sustaining element and that a small group of capital owners will exploit a public good without regard for the environmental consequences.

Achieving effective governance

The water crisis requires a multidimensional approach incorporating social, economic, political and environmental concerns. The social dimension demands equitable use of water. The

Box 1 **The World Water Assessment Programme principles of good governance**

- **Participation:** All citizens should have a voice in policy and decision-making, either directly or through intermediate organizations that represent their interests
- **Transparency:** Information should flow freely within society; processes and decisions should be transparent and open to public scrutiny. Right to access this information should be clearly stated.
- **Equity**: All members of 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 people or to those representing their interests.
- **Coherence:** Water issues, policies and actions, though inherently complex, 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.

economic dimension demands efficient use of water and attention to water's role in economic growth. The political dimension demands equal democratic opportunities for all stakeholders and water equity for socially, economically and politically weak groups. The environmental dimension demands sustainable water use to ensure continuing ecosystem services.

Civil society and the private and public sector must cooperate on effective water governance, ensuring continuous refinement and flexibility as new challenges arise. Each country requires its own model, though general guidelines can be identified (Box 1).

Establishing water's real cost—including

Table 2 **The expected cost and benefit of action and estimated rate of return on investment in improved water and sanitation provision for 2010-2020**

Country	Required investments in provision of water and sanitation services ($ million)	Potential benefit ($ million)[a]	Rate of return (%)	Average annual rate of return (%)
Algeria	3,622.3	19,303.3	432.9	39.4
Comoros	218.7	400.9	83.3	7.5
Djibouti	284.4	320.9	12.8	1.2
Egypt	4,484.4	11,073.6	146.9	13.4
Iraq	8,217.1	22,653.3	175.7	16.0
Jordan	135.3	1,635.5	1108.7	100.8
Mauritania	2,146.3	1,772.9	–17.4	–1.6
Morocco	8,484.2	9,608.4	13.3	1.2
Oman	259.7	1,756.0	576.1	52.4
Sudan	30,187.1	18,634.3	–38.3	–3.5
Tunisia	1,461.9	2,438.0	66.8	6.1
Yemen	12,722.4	9,767.5	–23.2	–2.1
Total	72,224.0	99,364.5	37.6	3.4

a. Avoided total cost attributable to low quality or no provision of improved water and sanitation

Source: Authors' estimates.

environmental and social as well as operational and construction costs—is essential. By properly valuing water and identifying the most socially, economically and environmentally cost-effective policy options, cost-effectiveness analysis can help decision-makers narrow the gap between supply and demand. Assessing policy options with attention to all variables helps establish consensus among stakeholders. Cost-effectiveness analysis can weigh the costs of action against the costs of inaction, revealing the health, political and environmental benefits of providing improved water and sanitation. The goal should be to identify the intervention with the highest rate of return to achieve universal water and sanitation coverage (Table 2).

Building blocks of effective water governance include reorienting water policy, enforcing legislation and regulations, adequately financing the sector, developing organizational capacities, monitoring and evaluating programmes, managing data and information, coordinating regional and international cooperation, educating and raising awareness, promoting stakeholder participation and empowerment, ensuring water rights and social equity, increasing water use efficiency and improving links between research and management. In particular:

- Policies must shift from managing supply to managing sustainable demand and from crisis management to long-term planning. In water-stressed Arab countries, expanding supply while neglecting use and allocation efficiency has led to unsustainable use and has failed to deliver water security.
- Most Arab countries have the institutional and legislative frameworks for good water governance but lack the legislative instruments to support implementation. New challenges require innovative tools, such as decentralization, a participatory approach, strengthened local technical and financial capacities, dialogue and consensus, effective enforcement and compliance and better water institution performance.
- Good governance requires coordination and cooperative relationships among organizations with individual water mandates and responsibilities. As competition for water increases, so do the challenges of clarifying mandates, coordinating agencies, collaborating across sectors, managing disciplinary and administrative boundaries and planning multisector and multistakeholder consultations.
- Deficiencies in human resources are a key contributor to water scarcity. Remedying that requires capacity building, training, and organizational development.
- Monitoring is a vital link between policy reform and implementation, allowing the fine-tuning of policies and reallocation of financing across reform priorities. Each country should develop indicators for monitoring water reform progress and impacts, including indicators for monitoring and assessing the enabling environment, institutional framework and management instruments. A regional monitoring system could improve problem identification and promote solutions, particularly for transboundary waters.
- Ensuring compliance and enforcement of water legislation requires updating legislation through a participatory approach, disseminating information and providing technical assistance and economic incentives, and developing inspection and monitoring capacities to investigate and penalize violations.
- Financial sustainability requires a clear water financing scheme that identifies financing sources and economic instruments for ensuring optimal funding allocation. Private sector participation in the water sector is growing in response to governments' inability to raise adequate capital to finance, operate and maintain infrastructure. Plans for privatization should be weighed for effectiveness, efficiency, equity and other elements of good water governance.
- Good data are needed to allocate water efficiently by supporting decision-making at every scale, from local crop decisions to larger planning efforts for balancing water demand across sectors. Data can also improve the equity and transparency of decisions and support water quality monitoring.
- High dependence on shared water

Box 2 **Gender mainstreaming in water governance**

Good governance can help decrease gender inequalities by:

- "Ensuring that poor women's and men's human rights and fundamental freedoms are respected, allowing them to live with dignity.
- Introducing inclusive and fair rules, institutions and practices governing social interactions to improve outreach to the vulnerable, such as poor men and women, and the younger and older generations.
- Ensuring that women are equal partners with men in decision-making over development, use, technology choice, financing and other aspects of water management.
- Ensuring that the environmental and social needs of future generations are reflected in current policies and practices.
- Focusing water development policies towards eradicating poverty and improving the livelihoods of women and men."

Agriculture and the water sector must become gender aware, beginning with training programmes for water professionals and the community on gender approaches and methodologies. Reforms are also needed at the local level to effectively integrate gender-aware and participatory approaches into local and regional businesses, especially to empower women in conflict zones and agricultural and poor communities.

Source: UNDP 2003.

resources makes regional cooperation essential. Arab countries should leverage their socio-cultural solidarity into a unified political strategy that supports the rights of all riparian countries to fair, just and equitable shares in international water resources. High-level cooperation with neighbouring non-Arab countries on joint management of water resources is also vital.

- Social equity should anchor policy choices. Policies should allow meaningful participation of all stakeholders, regardless of social status or power. All social groups should be able to voice their claims and concerns in an open, transparent environment. Incorporating social and gender equity concerns in policy formulation and programmes is a prerequisite for effective water governance (Box 2). To realize the goal of inclusiveness, countries must go beyond legislative arrangements and staged participatory processes to work towards cultural change.
- Public awareness is the foundation of meaningful participation and tangible action. A long-term awareness programme needs to take local and regional socio-economic and ecological dimensions into account.
- Research and innovation are critical to ensure sustainability, efficiency and equity in access to and use of scarce water resources. Water research organizations require adequate human and financial resources and strong national science and technology policies. In particular, the links between R&D and production require strengthening.

To succeed, any long-term vision for water governance requires a solid understanding of the social and cultural changes brought by modernization. As lifestyles evolve with rising education levels, accelerating urbanization and ongoing political and social reform, governance must evolve in tandem. The region's ongoing economic and political transformation could advance water governance reform by increasing participation and accountability, while water governance reforms can in turn catalyse larger social change through water's effects on livelihoods and other socio-economic activities.