WATER GLOBAL PRACTICE

Status of Water Sector Regulation in the Middle East and North Africa

Yogita U. Mumssen and Thelma Triche, Editors

with support from Norhan Sadik and Ali O. Dirioz

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Abbreviations

ACWUA	Arab Countries Water Utilities Association
AIR	Annual Information Return
AWC	Aqaba Water Company
BCM	Billion cubic meters
BOT	Build-operate-transfer
CAPMAS	Central Agency for Public Mobilization and Statistics
CAPWO	Cairo Alexandria Potable Water Organization
CMWU	Coastal Municipalities Water Utility
COSIT	Central Organization for Statistics and Information Technology
DHS	Demographic Health Survey
DIWACO	Disi Water Company
DMF	Delegated Management Framework
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
EWRA	Egypt Water and Wastewater Regulatory Agency
HCWW	Holding Company for Water and Wastewater
IUWM	Integrated urban water management
JICA	Japan International Cooperation Agency
JISM	Jordan Institution for Standards and Metrology
JVA	Jordan Valley Authority
JWC	Joint Water Committee
JWSC	Joint Water Service Councils
JWU	Jerusalem Water Utility
KPI	Key Performance Indicators
LGU	Local government units
M&E	Monitoring and evaluation
MARS	Monitoring, analysis and reporting system
MCHMPW	Ministry of Construction Housing, Municipalities and Public Works
MCM	Million cubic meters
MHUUC	Ministry of Housing, Utilities and Urban Communities
MIS	Management information systems
MOB	Mayoralty of Baghdad
MoE	Ministry of Environment
MoF	Ministry of Finance
MoH	Ministry of Health

MoI	Ministry of the Interior
MoLG	Ministry of Local Government
MoP	Ministry of Planning
MWI	Ministry of Water and Irrigation
MWRI	Ministry of Water Resources and Irrigation
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NPEC	National and Provincial Environment Councils
NWC	National Water Company
NWRP	National Integrated Water Resources Management Plan
O&M	Operation and maintenance
OECD	Organisation for Economic Co-operation and Development
PA	Palestinian Authority
PCBS	Palestinian Center Bureau of Statistics
PER	Public expenditure review
PMU	Program management unit
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public-private partnerships
PSP	Private sector participation
PWA	Palestinian Water Authority
RSB	Regulatory Service Bureaus
RWU	Regional Water Utilities
SPC	Samra Wastewater Treatment Plant Company
SWLRI	Strategy for Water and Land Resources in Iraq
UNICEF	United Nations Children's Fund
UNRISD	UN Research Institute for Social Development
WAJ	Water Authority of Jordan
WBWD	West Bank Water Department
WDI	World Development Indicators
WHO	World Health Organization
WICS	Water Industry Commission for Scotland
WRM	Water resources management
WSAU	Water Sector Audit Unit
WSC	Water and Sanitation Companies
WSRC	Water Sector Regulatory Council
WSS	Water supply and sanitation
WSSA	Water Supply and Sanitation Authority
WSSDP	Water Sector Strategic Development Plan
WUA	Water Users Associations
YWC	Yarmouk Water Company

Chapter 1 Introduction

Thelma Triche and Yogita U. Mumssen

Abstract

This chapter presents an overview of economic regulation of the water supply and sanitation (WSS) sector, briefly describes regulation of WSS in seven countries around the world, explains why regulation of WSS is relevant to the Middle East and North Africa, and outlines the objectives and methodology of this study.

An Overview of Economic Regulation of Water Supply and Sanitation Services

Objectives of Economic Regulation

Economic regulation generally refers to the laws, regulations, enforcement mechanisms, incentives, and processes that are employed by governments to ensure that essential services such as water supply and sanitation services (WSS) are available to the population at reasonable prices. Regulation is necessary because WSS are natural monopolies and there is no competition in the market.[1] As a result, there is little pressure on service providers to maintain service quality, operate efficiently to keep prices down, and serve marginal and less profitable areas. This is true whether service providers are public or private, but the formal regulation of WSS became a topic of international interest in the late 1980s when the rising cost of infrastructure needed to serve expanding populations and protect the environment led policy makers to seek private investment.

The problem of low coverage levels, particularly among poor and marginal communities, is of particular concern in developing countries and those with rapid rates of population growth and migration. The essential nature of WSS and their benefits for public health and economic productivity make it imperative that all households have access to service, including those in neighborhoods that are difficult to serve or where the cost of basic service might exceed what households are able to pay. Another major concern for developing countries is to ensure that WSS are financially viable. This is essential to ensuring that investment finance for the costly infrastructure can be attracted, that services do not become an unmanageable drain on public funds, and that they are technically and financially sustainable over the long term.

The main objectives of economic regulation of water supply and sanitation services[2] are thus to ensure that:

- All households have access to services at reasonable prices that reflect the cost of efficient services.
- The quality of service for households and other customers is appropriate: service is reliable, water for human consumption meets drinking water standards, effluents meet standards for reducing pollution, and so on.

- The services are financially viable and sustainable, do not pose an excessive financial drain on public funds, and can attract necessary investment funding.
- Services are managed and operated in an efficient and technically effective manner.
- Tariffs (supplemented, if necessary, by other predictable and reliable sources of funding) reflect the cost of providing efficient services and provide incentives to both operators and customers to reduce waste, and processes to set tariffs are transparent and predictable.
- Operators are responsive to customers' complaints and inquiries, and customers have a voice in the planning of services and access to an appeals process to resolve conflicts.
- Information about the quality of services, the full cost of providing services, and the performance of operators is available.

A few comments on these objectives are warranted. The main challenges faced by a country and the objectives it needs to pursue may differ significantly from those faced in other countries, and they may differ over time within the same country. Thus regulators must determine which objectives are most important at any one time and design regulatory approaches and efforts to address them. The examples presented in the second section of this chapter illustrate how different countries have addressed their different challenges.

The affordability of services for low-income households presents a dilemma for regulators. The general view is that economic regulators should focus on ensuring the financial viability of the services, while governments should provide guidance on how to achieve social policy objectives, such as affordability, in a transparent manner that does not undermine the financial viability of services.

Finally, the basic list of objectives of regulation are the same, regardless of whether services are provided by a public or private service provider, but achieving the objectives may require different regulatory approaches. Experience has shown that ensuring universal access to services is a challenge in both public and private services. However, depending on whether the provider is public or private, the challenge of capturing efficiency improvements to benefit customers differs. Private operators generally have an incentive to improve efficiency in order to increase profits for the owners. In that case, the regulator's challenge is to capture some of the cost savings for customers. Public companies are typically not motivated by profits and financial penalties are likely to hurt customers, so other incentives such as rewards and mechanisms such as the publication of performance indicators to create social pressure are needed to promote efficiency improvements.

Regulatory Functions and Processes

Although institutional arrangements and approaches may vary from one country to another, regulation of WSS typically includes the specification of rules, standards, and procedures, and enforcement of rules and standards and decisions about market structure.

Rule-making includes the specification of *regulations* governing matters, such as:

- Principles, rules, and formulas governing tariff levels and tariff structure
- Procedures and conditions governing formal tariff reviews and automatic tariff adjustments (for example, to take into account price inflation or movements in exchange rates)
- Service access and service quality standards and targets
- Technical and efficiency performance standards and targets
- Consequences (rewards or penalties) for achieving or not achieving standards or targets
- Requirements for operators to submit reports and publish information on service quality and performance, and for independent audits of such information
- Customer rights and obligations
- Requirements governing customer contracts, customer relations, and resolution of complaints
- Market structure and rules governing the tendering of operational contracts.

Enforcement activities may include:

- Formal tariff reviews and approval and publication of tariff levels and tariff structure
- Review and verification of reports on service access, service quality, and operator efficiency
- Imposing consequences for performance or specifying actions to be taken by the service providers to improve performance
- Resolution of conflicts between service providers and customers
- Comparison of operator performance with similar operators or benchmarks
- Publication of information about service access, service quality, customer satisfaction, and operator performance
- Rulings on proposed mergers or the award of operational contracts, and the issuing (or revoking) of licenses.

Two Different Approaches: Regulation by Agency and Regulation by Contract

Regulation by agency is the approach in which a regulatory body is given discretionary powers by government to control tariffs and service standards, subject to existing law and the regulatory body's mandate. This is the approach that was adopted in the United Kingdom when WSS services in England and Wales were privatized in 1989.

Regulation by contract is the approach whereby a public entity and a service provider agree on contractual clauses that determine how tariffs and service standards are controlled, also subject to existing law. Under regulation by contract, an oversight institution (and sometimes independent auditors, mediators, or arbitrators) may be responsible for monitoring performance and making regulatory decisions. However, the mandate of these institutions should be governed by the contract, and should be altered only through the agreement of both parties (Castalia Strategic Advisors 2006, 2, 8, 9). Regulation by contract has long been used in France, where private companies operate a large portion of the WSS services.

The Enabling Environment and Reality on the Ground

The term *regulatory framework* usually refers broadly to both the enabling environment that supports accountability, transparency, and the achievement of regulatory objectives as well as the specific regulatory rules, mechanisms, and procedures that are applied as part of the regulatory process. The enabling environment includes: the broad economic and legal foundations, political economy, and prevailing cultural attitudes in a country or service area; specific laws, policies, and strategies for the development and regulation of water resources and WSS services; and the institutional structure of the sector and relationships among actors. All these elements are important and weakness or barriers in any one part of the enabling environment can undermine the effectiveness of regulation. Figure 1.1 illustrates the enabling environment for water sector regulation. The regulatory framework and the enabling environment are situated within a physical and economic environment—the "reality on the ground," which also influences regulatory priorities and choices.

Legal and economic foundations. A country's legal and economic foundations and conventions must be taken into account in designing a regulatory framework. Aspects of the political economy (such as the role that government and other interests play in the allocation of resources, the level of transparency of government actions, the ability of regulators to act independently of political interference, confidence in public authorities, and concerns about the political impact of tariff increases) play a role in whether a regulator can function effectively. Cultural attitudes, historical traditions, and public solidarity are also important. For example, in some countries, there is an established expectation that WSS should be managed like businesses. In others, the expectation that they be provided as social services outside the sphere of business is stronger. For example, in many countries in the Middle East and North Africa, all residential customers benefit from highly subsidized tariffs for the first block (or blocks) of consumption. Thus, the introduction of principles such as transparency, cost recovery, and financial viability must be tailored to the local context and, as discussed later in this chapter, strategies may need to be formulated to improve the enabling environment and reduce barriers to effective regulation.

WSS laws, policies, and strategies. Laws, policies and other instruments that establish basic principles and objectives, such as universal access to services, financial viability, the sustainable management of water resources, and the autonomy of service providers, provide a foundation for good regulation. Policies (whether stated in law or in separate policy statements) that specify funding sources, the extent to which costs will be recovered through tariffs, how service providers are governed, the independence of regulators, how they are appointed, and the like, constitute the next rung in a good foundation. Finally, strategies, plans, and directives that specify how the policies will be implemented are equally important. However well drafted they are, laws, policies, and strategies can be undermined by the reality on the ground, and aspects of the political economy and cultural attitudes already discussed. These must be taken into account. For example, if tariffs are extremely low and high-cost investments are needed immediately to secure

FIGURE 1.1. Enabling Environment for Regulation of the Water and Sanitation Sector

Note: WSS = water supply and sanitation.

water resources, plans to achieve full cost recovery must be realistic and will need to be phased in gradually. In addition, mechanisms for improving the enabling environment—for example, to protect the autonomy of service providers and regulators, promote transparent regulatory decisions, and build public confidence—may need to be incorporated into legal and policy reforms and strategies.

Institutional structure plays an important role in promoting efficiency and creating the conditions for accountability and effective regulation. *Institutional separation* refers to the separation of operational entities from political and regulatory entities. Separating these

functions reduces conflicts of interests and makes the cost of service more transparent. Autonomy enables service providers to make decisions based on technical and financial criteria and makes it possible to hold them accountable for results.

Market structure is another aspect of institutional structure.[3] For example, market integration, either horizontally or vertically, may be used to promote economies of scale, especially in small markets. Disaggregation may be used to attract investment in production or treatment, or to improve the responsiveness of operators to customers at the local level, to make the cost of each activity more transparent, or to make it possible to introduce competition *for* the market or comparative competition.[4] For these reasons it may be desirable for an economic regulator to play a role in determining market structure, especially if there is no other agency, such as a competition authority, charged with doing so.

Reality on the ground. In addition to the enabling environment per se, another important component of the context is the reality on the ground—including factors that are outside the immediate control of the government, such as the availability of water resources, the strength of the economy, the capacity of public institutions, the current physical condition of WSS services, and the percentage of the population that is able to pay full cost. In some situations, the best strategy—both technically and politically—might be to increase capacity and promote technical improvements and efficiency before increasing tariffs significantly. In some cases, very simple regulatory approaches such as the collection and analysis of information on operators' performance and quality of services combined with public awareness campaigns about the value of water may be more appropriate as an initial step—and more likely to succeed. In others, more complex regulatory approaches may be appropriate and effective.

Desirable Features of Regulation

In addition to the importance of a strong legal framework and enabling environment, economic regulation is most likely to be successful when it is characterized by:

- *Cost-effectiveness.* The cost of regulation is reasonable and does not exceed the benefits. It should not impose a costly burden on either the regulated entities or the regulator.
- *Transparency.* The reasons for regulatory decisions are made public. Transparency builds trust in the system and engages stakeholders. When stakeholders can see that decisions are based on fair and objective criteria (such as improving service quality, financial viability or efficiency), they are more likely to accept the decisions and support enforcement. A lack of transparency may lead to suspicions that special interests are being favored.
- *Predictability.* Rules are clearly specified in adequate detail, and the regulator reliably abides by and enforces the rules and does not arbitrarily change them without warning and consultation.
- *Fairness.* The rules and regulatory decisions aim to balance the interests of customers, service providers, and investors (whether public or private).

- *Independence*. The independence of the regulator (as a separate entity, perhaps with its own source of funding through fees paid by customers or the regulated entities) and the insulation of regulatory decisions from short-term political interests or other special interests ensure that regulation is based on clearly articulated rules and principles. However, the degree of independence of regulators depends on the country context. Moreover, experience has shown that regulation by political authorities may work quite well *if elected authorities are bound by a strong legal framework and if the other conditions listed are present*.[5]

In addition to these features, experience shows that several other themes are important, such as the following:

- *Decentralized services versus centralized regulatory agencies*. Developing countries with limited administrative capacity and budgetary resources face a dilemma. They may have no choice but to organize regulation at the national level, but the decentralized nature of service delivery requires decentralized monitoring and enforcement mechanisms, and, particularly, arrangements for assisting customers to submit and resolve complaints. Creative solutions for a decentralized regulatory presence, such as those adopted by Mozambique, are needed.
- *Multisector and regional regulators*. Countries, especially small countries or provinces, may choose to create multi-service regulators, as in the United Arab Emirates and states of the United States, as a means of reducing costs by sharing certain functions across sectors and to promote regulatory consistency. Very small states such as island states may choose to create regional regulators to serve several countries, or the regulator in a larger country could be engaged to provide regulatory services to a very small nearby country.
- *Consistency of regulatory arrangements with service provider contracts*. Regulation by contract requires an appropriate institution that has the authority and the capacity to effectively enforce the contract and resolve disputes, and its authority should be consistent with and not override the terms of the contract (Castalia Strategic Advisors 2006, 8–9).
- *Designing in politics*. Since political intervention may be inevitable, it may be best to explicitly include a role for elected authorities in the regulatory framework (whether regulation by contract or by regulatory agency). Ideally, this should be done in a way that ensures accountability and does not undermine the financial viability of services (Castalia Strategic Advisors 2006, 12). In practice, this seems to be difficult to achieve and political decisions are often not ideal, but designing in a political role may be better than the alternative of unpredictable and arbitrary political intervention.
- *Tools for dealing with crises*. Unexpected events such as a dramatic change in exchange rates or natural disasters can change conditions to the point that normal tariff rules and periodic adjustment formulas or service conditions cannot be enforced. It helps to specify procedures for addressing such exceptional situations in advance (Castalia Strategic Advisors 2006, 16–17).
- *Personal qualities of key individuals*. Success is more likely when persons appointed to regulatory positions are highly committed and professional and are trusted by all parties.

This is most likely to happen when appointments and promotions are linked to professional performance and proven trustworthiness.

- *Consultation with other important actors.* To promote confidence in the regulatory framework and ensure its effectiveness, regulators should consult with all stakeholders, for example, through the formal submission of opinions by other government agencies, independent professionals, or advocacy groups, and by surveys of consumers.

The Link with Water Resources Management

Water resources management (WRM) aims to ensure the sustainability and quality of water resources, manage water shortages and avoid the economic, political and national security risks associated with water shortages. Thus, effective WRM helps ensure the availability of raw water in acceptable quantities and quality for water supply. The complementarity between economic regulation of WSS and WRM is obvious.

Good economic regulation of WSS protects water resources by providing incentives for efficient use of water. In particular, water supply tariffs that reflect the cost of abstracting, treating, and delivering water promote the efficient use of water and thereby reduce the waste of water resources. Tariffs (or other sources of funding) that reflect the cost of collecting, treating, and disposing of wastewater make it possible for sewerage treatment operators to meet effluent standards that protect water resources for other users.

While economic regulation of WSS is concerned with market failure due to a lack of competition in the market and lack of access to services, WRM is concerned with a different type of market failure, the problem of *externalities*—costs imposed by overuse of resources or environmental damage for which users do not bear the costs directly. Correcting for externalities requires different regulatory tools and institutional structures altogether than those used to correct for lack of competition and lack of access. Thus the economic regulation of WRM is distinct from the economic regulation of WSS and should generally be carried out by a different entity. In addition, WRM applies to *all* users of water resources, including agriculture, industry, navigation, hydroelectricity and recreation in addition to WSS. A strong WRM regime generally requires that all users who abstract water from ground or surface sources (and even rainwater in some places) obtain abstraction permits from the WRM entity and they may be required to pay abstraction fees based on the volume of water taken. Regulation by a separate entity that has no links to any of the users helps to ensure objectivity and avoid conflicts of interest.

The importance of good economic regulation and its linkage to water resource management is probably most obvious in the Middle East and North Africa region, where countries are caught between improving access and service delivery at affordable levels and rapidly dwindling water resources that are becoming ever more costly to access. Chapters 2 through 6 present five case studies of regulatory approaches in the WSS sector in the Middle East and North Africa.

Examples of Regulation of WSS in a Variety of Countries

Countries in many parts of the world have introduced institutional reforms in the WSS sector that have included the separation of policy making from the operation of services. These reforms usually involve the creation of autonomous public service companies or the contracting of private operators, and the establishment of economic regulators for WSS. Others are considering doing so as part of a strategy to improve the quality and financial viability of services. A few examples will illustrate the variety of approaches and outcomes.[6]

Colombia

In Colombia, the 1991 Constitution decentralized responsibility for providing WSS services to municipalities while retaining sector policy and regulatory functions at the national level. A 1994 law specified that all WSS service providers must be set up as public services companies (ESPs) under commercial law, the stock of which may be owned entirely by the state or private parties or a mix of public and private parties. The law also created an independent regulator, the Commission for the Regulation of Water Supply and Sanitation (Comisión de Regulación de Agua Potable y Saneamiento Básico, CRA) with the responsibility to issue regulations and standards for WSS, including tariff methodologies, service quality parameters, methodologies to evaluate the efficiency of the providers, and rules governing competition and market structure. One of the objectives of the reforms was to attract private investors and operators and to ensure that they were regulated properly, but the legal and regulatory framework applies to all service providers, whether public or private.

While CRA issues the rules and regulations, a separate regulatory entity that was created by the Constitution, the Superintendency of Residential Public Services (Superintendencia de Servicios Públicos Domiciliarios, SSPD), is charged with enforcement and resolution of customer complaints. Its functions include monitoring and enforcing regulations; penalizing violations; enforcing agreements between public service companies and their users; establishing consistent information and accounting systems; overseeing the use of subsidies; and evaluating companies' financial, technical, and administrative management (World Bank 2010, 28-33).[7] In practice, it has proven difficult to impose financial penalties, particularly on state-owned companies (Foster 2005).

Tariff reform was introduced gradually, starting in 1996. The initial phase focused on standardizing basic accounting processes and calculating the cost of providing services under existing conditions. The next phase introduced efficiency parameters aimed at controlling costs. The third phase promoted the cost-effectiveness of investments in WSS, and improvements in service quality. This process has led to greater efficiency, full funding of operations, a significant increase in the funds available for investment, and significant improvements in coverage and quality of services. By 2007, it was estimated that national tariff revenues covered an average of 32 percent of investment costs. Additionally, the increase in tariffs—which were too low at the time the reform was introduced—generated price signals that were economically more efficient and resulted in significant decreases in consumption. This made it possible to

postpone investments in expanding the capacity of the systems, thus limiting the need to mobilize investment finance (World Bank 2010, 40, 44, 75). Surveys in 2006 and 2007 of customers of two private companies operating in three cities indicated that the vast majority of customers were satisfied and that customer satisfaction had improved significantly since the private operators and the regulatory reforms had been introduced (World Bank 2010, 105, 170). These findings are not necessarily representative of the country as a whole.

The reforms also introduced targeted subsidies and "solidarity" contributions, according to the economic strata of the users (which in Colombia are defined by a range of one to six, with one being the poorest). Strata 1, 2, and 3 customers receive maximum subsidies of 70, 40, and 15 percent, respectively; those in stratum 4 pay the full cost of the service, and those in strata 5 and 6, as well as industrial and commercial users, pay a "solidarity contribution" of at least 20 percent over the full cost (World Bank 2010, 49).

Local committees (Comités de Desarrollo y Control Social) may be created at the initiative of users of public services, including water, sanitation, waste collection, electricity, and gas, to collect information on customer satisfaction, lodge any complaints with the companies and the regulators, and make proposals for improving services or addressing problems (Foster 2005, 18). In 2013, the SSPD issued a detailed manual on the committees' formation, functions, and activities. Only customers and potential customers are represented on the committees. Neither the regulators nor the service providers may participate. No information was found on how many committees have been formed or their activities.

France

Regulation by contract is widely used in France, where WSS services are the responsibility of the communes (local government entities, of which there are about 37,000). Communes may either directly manage WSS or delegate them to a private company through a management contract, *affermage*/lease contract, or concession.[8] Private operators now participate in about 80 percent of the market and *affermage* is the most common form of contract. WSS remain public services to which all residents should have access. The infrastructure is the property of the communes, which are also responsible for investments, either directly or through concession contracts.

There is no national economic regulatory body for WSS. However, services are subject to the water quality regulations of the European Union (EU) and French laws regarding procurement, technical standards, and water abstraction and effluents. EU and national entities and their decentralized units enforce these standards and rules. The contracting of private operators is subject to national regulations governing both the contractual forms and the tendering process. French contracts do not include a great deal of detail because France uses civil law and most of the regulatory details are embedded in national laws and regulations. In countries that use common law, contracts must include a great deal more detail if they are to serve as a basis for effective regulation by contract.

French law requires that tariffs recover the full cost of operations and investments for WSS services, whether delegated to the private sector or operated by local authorities. However, in

the second half of the last century, an exception was made to achieve universal coverage in rural areas, and high levels of subsidies flowed from urban to rural areas. If services are delegated, the operator's remuneration (which is specified in the contract as either a portion of tariff revenues or all tariff revenues) is established by competitive bidding and negotiation. The tariff levels, tariff structure, formulas for periodic adjustment of tariffs, and targets for operator performance and service quality are also specified in the contracts, which are monitored and enforced by local authorities. The main enforcement mechanisms are termination or nonrenewal of the contract.

A 2012 report prepared for the Association of Water Service Providers (FP2E) found that overall satisfaction with services was high and that users generally believed that tap water was safe: 78 percent of the French reported that they drank tap water either daily or occasionally. In 2009, the Association of French Mayors, the Assembly of Communities in France, and the water companies joined forces to set up a water mediator. This mechanism constitutes a free and flexible alternative to legal proceedings in court. Its other stated objective over the long term is to improve the service offered to consumers (Demouliere and others 2012, 23-25). A 2007 study found that prices for services provided by the private sector tended to be higher than those provided by public operators because of higher fixed costs. The study also concluded that affordability remains a problem for some low-income households (Prasad 2007, 22-23).

Peninsular Malaysia

In 2003 the federal government of Malaysia initiated a sector reform in peninsular Malaysia (the part that is on the mainland) that aimed to make the sector more efficient, promote financial sustainability, and improve the customer orientation of service (Lee Koon Yew 2010).[9] WSS became a shared responsibility between the states and the federal government.[10,11]

The Water Services Industry Act of 2006 established a national Water Asset Management Company (PAAB in Malay) and a Water Forum to give voice to previously under-represented stakeholders such as consumers. The National Water Services Commission Act established a National Water Services Commission (known by its Malay acronym as SPAN). The acts separated the functions of policy making (by government), regulation (by SPAN), asset ownership (entrusted to PAAB), and service provision (by state water companies). The laws were enacted in 2008 after extensive public consultation. As part of the reform process, for the first time in Malaysian history, a draft bill was made available for public discussion before it was presented to Parliament (Lee Koon Yew 2010).

SPAN issues licenses for water operators, mainly state water companies, and sets and enforces standards and performance indicators. Licenses can theoretically be revoked if key performance targets or other standards are not achieved.[12]

In the long term, the federal government's policy is that state operators should achieve full cost recovery and attain financial independence. However, tariffs remain relatively low and there are hidden subsidies, though operating costs are covered by revenues. Capital costs are not yet being recovered. Government subsidies are funded primarily by revenues from the national oil company Petronas, which also provides revenues to some states.[13]

Mozambique

In 1998, the government of Mozambique introduced the Delegated Management Framework (DMF) for water supply services in five major cities. In 2009, the DMF was expanded to include water supply and sanitation services in all urban areas. The DMF introduced three key institutional reforms, including the separation of asset management from operations, operation of services by autonomous service providers (whether public or private) under delegated management contracts, and creation of an independent Water Regulation Council (Conselho de Regulação de Água, CRA) to regulate tariffs, service quality, and consumer rights.[14] There are two asset management and investment entities: FIPAG, which is responsible for primary water supply systems (generally in the larger cities); and AIAS, which is responsible for secondary water supply systems (generally in smaller cities) and all sanitation systems (Nathan Associates 2010, 3-6). All WSS assets are owned by the government or local authorities.

The regulatory activities and effectiveness of the DMF and CRA are still evolving. Where feasible, the asset management entities delegate operation of the water supply and sewerage systems to operators under contracts that include service quality standards and performance targets (in theory approved by CRA). Both longer-term lease contracts and shorter-term management contracts have been used. A fifteen-year lease contract with a private operator for the water supply system of the capital city of Maputo was not particularly successful and terminated in 2014 (World Bank 2009). Currently about 20 small systems are operated by local private companies. The remainder of the systems are operated by state or municipal companies or semi-autonomous ringfenced operating departments of FIPAG. Contracts for secondary systems can be introduced only gradually as investment funds become available to repair and upgrade the systems, most of which are in disrepair. It is anticipated that CRA and FIPAG or AIAS will sign a regulatory agreement for each system specifying performance targets, initial tariffs, and other regulated matters, and this regulatory agreement will be attached to the operator's contract for each system.

Tariffs for each system are reviewed and revised periodically by CRA and published in the official gazette. It is the government's policy that tariffs for water supplied by primary systems should eventually recover the full cost of service, including debt service. In 2009, tariff revenues in eight of the larger systems were approaching levels where they would recover all operating and maintenance costs, including depreciation, and would begin to contribute to debt service (World Bank 2009, 28). The policy for secondary water supply systems and sanitation systems is that tariffs should eventually recover the cost of operation, maintenance, and management, and provide for the repair and replacement of small equipment, while investments will continue to be subsidized by government. This goal will be achieved only gradually as the systems are upgraded.

CRA monitors and intervenes to resolve problems in the primary systems directly. To deal with the large number of secondary water supply systems and sanitation systems, CRA has developed a decentralized approach to monitoring and problem solving that engages local regulatory committees. This approach, which was designed in collaboration with local authorities, minimizes the cost of regulation and promotes local engagement and capacity building.

The agents are respected members of the community who volunteer their time. They are on duty only a few hours a week and are paid a small stipend to cover expenses. Initial and periodic training is provided by regular CRA staff and supported by CRA's international development partners. Local regulatory committees are being introduced gradually as systems are upgraded because regulation is practical only when the systems can operate in a relatively normal manner. This gradual approach also keeps the burden on CRA to a manageable level and allows CRA to take advantage of lessons learned. As of 2016, five local regulatory committees had been created and were functioning well. All enforcement decisions remain with CRA.

United Arab Emirates

Economic growth and population growth are placing unprecedented pressure on the scarce water resources and WSS providers of United Arab Emirates. The Emirates of Abu Dhabi and Dubai have encouraged private participation, particularly in the desalinization of water and production and transmission of electricity, while the local distribution of water and electricity is generally the responsibility of each emirate's respective water and electricity department and its subsidiary distribution companies. Both Abu Dhabi and Dubai have created Regulatory Service Bureaus (RSBs) to regulate water supply, sanitation, and electricity services.

RSB Abu Dhabi, the older of the two, was created in 1998. It has the authority to issue licenses to all service providers (including bulk water producers, and transmission, distribution, and waste water collection and treatment companies), make decisions regarding market structure, and promote competition. It establishes, monitors, and enforces compliance with standards and conditions governing technical matters, operator performance, safety, customer care, contracts for bulk water, consumer prices, and terms and conditions for the supply of services to domestic customers, and generally protects the interests of all customers. It is authorized to publish information about the performance of operators.

While Regulatory Service Bureaus are supposed to ensure the development of safe and efficient WSS and electricity sectors, they are not specifically charged with pursuing full cost recovery.[15] Thus far, tariff reform seems to have aimed primarily at discouraging excessive water consumption and secondarily to improving the financial viability of the distribution companies.[16] Bulk water tariffs paid by the distribution companies are controlled by the RSB and are adjusted annually with the objective of controlling customer tariffs. The difference between revenues generated by bulk water tariffs (paid by the distribution companies) and the producers' guaranteed revenues (as specified in their contracts) is made up by significant government subsidies to the producers. In January 2016, the residential tariff paid by national households (even for consumption in excess of the generous basic allowance) was less than 20 percent of the full cost of providing water. Tariffs paid by expatriates were about 57 percent of full cost for the basic allowance and 100 percent of full cost for consumption in excess of the basic allowance.[17]

United Kingdom

In 1989, faced with the need to raise about £28 billion (US$50 billion) over a ten-year period to upgrade WSS assets and comply with new European Community standards for drinking water and effluents, the U.K. government decided to privatize WSS in England and Wales. At that time, there were 10 public water authorities that provided WSS to customers in the two countries. In addition, there were numerous private "water-only" companies that provided water to about one-third of the residents. Shares in the 10 water authorities were sold through a public offering to create 10 publicly traded private WSS companies. All the companies, whether they provide water and sewerage services or water only, are responsible for financing and executing investments and operating and maintaining services in their contractually assigned territories (Triche and Skilling 1996, 2-3).

Before the privatization, water resources management and water pollution control had been the responsibility of the public water authorities. This meant that the water authorities were regulating themselves—and, as a result, environmental enforcement had been lax. At the time of privatization, these functions were transferred to a new entity, the National Rivers Authority, and a separate independent economic regulator of WSS services, the Water Services Regulation Authority, known by its acronym, OFWAT, was created.

OFWAT licenses or "appoints" WSS and water-only companies by means of a license that specifies each company's ownership of assets, geographic service areas, timing of tariff reviews, initial tariffs, accounting methods, levels of service, and other critical rights and obligations. For each company, OFWAT sets a price cap, or maximum tariff, that the company may charge its customers. Under this approach, if the utility exceeds efficiency assumptions incorporated into the calculation of the price cap, it is able to retain the additional profits as a reward until the next tariff review. Tariff reviews are conducted every five years and the U.K. regulator often relies on a form of "yardstick competition" whereby it compares the performance of a private utility operating in one area with the performance of others, setting benchmarks and expectations, as part of the tariff-setting process. This structure has incentivized the privatized utilities to improve service delivery over time.

Scottish authorities declined to go along with the privatization of the water authorities but later merged Scotland's three water authorities into a new public company, Scottish Water. A 2005 law allows private companies to compete to provide retail services (metering, billing, and customer service) while wholesale services (defined as providing water and removing wastewater) remain a public monopoly. In 2005, an economic regulator of the water and sewerage industry, the Water Industry Commission for Scotland (WICS), was created. Its role is similar to that of OFWAT.[18]

United States

Each of the 50 states of the United States has created a public utility (or public service) commission (PUC) to regulate utilities. PUCs typically regulate the tariffs and market structure of electricity, natural gas, telecommunications, cable TV, public transportation,

and privately owned WSS services. Only 11 percent of U.S. residents are served by private companies, with the remainder served by government-owned (municipal or county) water utilities—and very few of these are regulated by PUCs. Only 12 of the 50 states have laws governing the pricing of these services.[19] The drinking water quality and wastewater effluents of all systems are regulated by a federal agency, the U.S. Environmental Protection Agency (EPA), as well as affiliated state agencies. However, the recent occurrence of lead-poisoned water in Flint, Michigan that went unchecked and unacknowledged for months before public pressure forced the city and the EPA to take action demonstrates the potential risks of regulatory negligence and the importance of local engagement and vigilance. It is noteworthy that the Michigan Public Service Commission does not regulate any water supply services.

Unlike the United Kingdom, which uses a "price cap" approach, tariff regulation in the United States focuses on the "rate of return" of investors, ensuring that while the rate of return should be adequate to attract investment, it should not be excessive. For this reason, tariff reviews are referred to as "rate cases." The requests of utilities (whether regulated or not) for increases in tariffs are generally subject to public scrutiny at the local level. In the case of regulated utilities, public hearings in which all interested parties can participate are usually held before major decisions, such as those dealing with tariffs or mergers, are made. However, final decisions are made by the PUC, which is charged with balancing the interests of both consumers and utilities. The Pennsylvania PUC is presented as an example.

The Pennsylvania PUC regulates the rates and service of investor-owned water and wastewater companies, as well as municipal systems that serve customers outside their boundaries. It has the authority to control market entry and exit; approve mergers and acquisitions; establish just and reasonable rates (tariffs); maintain safe, adequate, and reasonable service; examine transactions between utilities and their affiliates; register securities; inspect records and facilities; impose civil penalties; and charge utilities for regulatory costs.[20] It responds to consumer complaints, provides utility-related information to consumers, monitors utility compliance with PUC regulations, and evaluates utility performance. Five commissioners, who are appointed by the governor, subject to confirmation by the State Senate, serve five-year staggered terms. In general, tariffs reflect the full cost of service and ensure the long-term financial viability of the utilities. However, utilities (and customers) may benefit from low tax rates, public financing at below-market rates, and occasional federal or state grants—for example, for improvements in wastewater treatment and disposal.

The PUC does not regulate the tariffs, service quality (other than water quality), and customer relations aspects of municipal WSS services that operate only within municipal boundaries and small community systems.

Why Regulation of WSS Is Relevant to the Middle East and North Africa

Two trends are affecting the water sector in the countries of the Middle East and North Africa, creating gaps between supply and demand. On the supply side, these countries are experiencing the highest levels of water scarcity and variability in the world. Both these

problems are likely to increase with climate change. On the demand side, as economic activity, population, and urbanization increase, demand for water is growing rapidly and some areas remain unserved or receive inadequate service. Low tariffs worsen these problems because they do not provide incentives to conserve water and undermine the ability of service providers to maintain, improve, and expand services. To meet the challenge, it is critical to use water resources efficiently, improve the efficiency and effectiveness of water and sanitation services, and set tariffs that reflect the cost of providing services. Effective tariff regulation would provide incentives for efficiency improvements and improve the financial viability and sustainability of services. In addition, the increasing dependence on nonconventional water sources such as desalinization points to the need for effective regulation of technical standards, private sector participation, and water quality standards.

At the same time, the region has experienced major socio-political change in recent years. Governments are wary of introducing reforms that may be negatively perceived by the population and be politically unpalatable. Nevertheless, countries of the region recognize their unique and critical situation regarding water, and stakeholders recognize that a new approach to managing water resources and services is required. Experience has shown that the introduction of transparent and independent regulatory frameworks based on technical and financial criteria, along with well-designed public relations and educational campaigns can help to make reforms such as higher tariffs palatable. Several governments have approached the World Bank's Global Water Practice requesting help to examine options for improving the institutional frameworks that govern the sector and new service delivery models—in addition to financing new ways of augmenting supply (such as desalination). The World Bank, for its part, is revising its regional strategy to put water at the very top of the priorities.

The countries in the Middle East and North Africa need appropriate support to design and implement economic regulation of WSS. The right type of support, if introduced in a measured manner taking into account the socio-political climate, could be catalytic: helping to improve efficiency, thereby moderating pressure on water resources and improving long-term financial viability and affordability. Strengthening regulation is also about increasing transparency, accountability, and voice—all of which have been important tenets of the demands for change on the ground in the region over the past four years. Finally, improving water sector regulation is a prerequisite for developing public-private partnerships (PPPs) and nonsovereign financing.

Although the Middle East and North Africa is a middle-income region, most countries in the Middle East and North Africa do not have the experience with regulatory reform that has taken place in other middle-income regions such as Latin America and Eastern Europe. Finally, despite the fact that the countries in the Middle East and North Africa share some common challenges, it is a highly diverse region, including fragile states, countries that are in the midst of conflict, and countries that are ready to develop more complex regulatory institutions and expand or introduce PPPs. The needs and challenges

of the World Bank's clients in the region vary widely. Strategies for introducing institutional reform and effective regulation must be considered in this light and will need to embody flexibility and resilience to adapt to the evolving political economy.

This Study's Objectives and Methodology

Objectives

The development of effective regulatory frameworks is increasingly salient to governments in the Middle East and North Africa as they address the challenges that confront their water and sanitation services. This study aims to collect information through a regulatory lens and present it in a format and typology that is consistent with World Bank practice so that it can serve as part of the foundation for WSS sector reviews and operations. It is not the objective of this study to analyze or critique the performance of WSS or the effectiveness of regulation in each case or to make recommendations. Thus, the approach is positive rather than normative.

This report is part of a wider World Bank initiative to provide government officials and other stakeholders in the Middle East and North Africa—including civil society, service providers, potential financiers, and development practitioners—with the resources to better understand current conditions and consider approaches to regulating WSS, taking into account the benefits that could result and challenges that might be encountered. This desk study is a first step intended to provide some basic information on selected countries that will serve as a foundation for determining where further study is required to fill in gaps and where support in the area of regulatory reform might be best concentrated. It takes a look at the status of regulatory institutions and practices in five countries and economies—the Arab Republic of West Bank and Gaza, Egypt, Jordan, Morocco and Iraq—which were chosen to include different historic and legal frameworks and fragile/conflict states, as well as more stable ones. On the basis of the information collected, some areas of further study are suggested for each country.

Methodology

The consultant and World Bank staff attempted to collect information in each country on the topics listed below.

- Statistics on population, economic growth, availability of water resources, access to services, per capita water consumption, and WSS infrastructure.
- Relevant aspects of the political economy and the impacts of migration.
- Key challenges that confront the country with regard to both WSS and WRM.
- Legal framework for WSS and WRM, including references in the Constitution (or other foundational instruments), laws, and official policy statements.
- Policy objectives and targets for WSS (including access, efficiency, financial viability, market structure, and promotion of PPPs).

- Policies regarding WRM (water rights, rules governing abstraction, protection of water quality, development objectives).
- Institutional structure for WSS (identification of ministries, agencies and regulatory bodies with responsibilities for WSS; description of the existing market structure for WSS; identification of entities responsible for water production, transmission and distribution, and collection and treatment of wastewater; the level of autonomy of service providers; and the role of the private sector and community-based service providers).
- Current practices and methods used to regulate WSS.
- Whether and how customers are consulted and protected.
- Institutional structure for WRM (identification of ministries, agencies, and regulatory bodies with responsibilities for WRM).
- Participation in international WRM bodies and agreements.

Information was collected in the first half of 2016 primarily through desk reviews of existing World Bank reports, other literature, and official websites. In addition, supplementary information was collected through interviews and phone calls with a few key official actors in Morocco, Iraq, and Palestine. Considerable effort was made to find reliable information. However, gaps remain because not all information could be found for every case within the available resources and methods used. In some cases, contradictory data were found in different sources. When that occurred, the authors relied on data reported by the World Bank or from official web sites, rather than from third parties. More formal consultation and country visits will be required to confirm data, collect missing information, evaluate the status of services and regulatory frameworks, and formulate recommendations.

The next five chapters present summaries of the status of WSS regulation in each country context. A final chapter summarizes the suggestions for further study.

Notes

1. In a market where there are many service providers, competition generally ensures that goods and services that meet customers' needs are available at reasonable prices. In contrast, piped WSS services are considered natural monopolies: because of the high cost of the infrastructure, WSS enjoy significant economies of scale; and the more customers that service providers have, the lower the cost of infrastructure for each customer. In addition, the public space and access required for networks make multiple networks impractical. For these reasons, it is generally desirable to have only one network in any given locality. As a result, there is no *competition in the market*.
2. The objectives listed here reflect the six key functions of WSS regulation and their various components identified in a 2006 discussion paper, "Explanatory Notes on Key Topics in the Regulation of Water and Sanitation Services," prepared for the World Bank Water Supply and Sanitation Sector Board by Eric Groom, Jonathan Halpern, and David Ehrhardt.
3. *Market structure* refers to the *vertical* integration or disaggregation of production, transportation, network management, and other functions, as well as the degree of *horizontal* aggregation of services in different locations or the aggregation of different types of public services, such as water supply, sanitation, and energy, under the management of a single operator.
4. *Competition for the market* exists when service providers must compete for the right to provide service in a particular location. *Comparative competition* refers to the comparison of the performance of several service providers that provide similar services in different locations under similar circumstances.

5. In fact, as the case of France (discussed later in this chapter) demonstrates, it is also possible to have a relatively effective regulatory framework without a formal regulatory body per se. This is also the case for many municipal services in the United States.

6. These short descriptions are not intended to be exhaustive. More detailed studies and comparisons of regulatory approaches are listed in the notes.

7. SSPD website, http://www.superservicios.gov.co/Institucional/Nuestra-Entidad, "¿Quiénes somos?" and "Misión."

8. Under an *affermage* or lease contract, the private operator pays a rental fee and is usually responsible for funding and implementing certain repairs and replacements to infrastructure. They last 7-15 years. Under a concession, the private operator is responsible for financing all new investments during the period of the contract, which generally lasts 15 or more years.

9. Cited in: https://en.wikipedia.org/wiki/Water_supply_and_sanitation_in_Malaysia#Sector_reform.

10. PAAB website, National Water Services Industry Restructuring Initiatives, http://www.paab.my/regulations/national-water-services-industry-restructuring-initiatives/.

11. In Eastern Malaysia (the part of Malaysia that is on the island of Borneo), water supply remains the responsibility of state governments, while sanitation is the responsibility of local governments.

12. PAAB website, National Water Services Industry Restructuring Initiatives, http://www.paab.my/regulations/national-water-services-industry-restructuring-initiatives/.

13. PAAB website, National Water Services Industry Restructuring Initiatives, http://www.paab.my/regulations/national-water-services-industry-restructuring-initiatives/.

14. Decree No. 72/98 dated December 23, 1998. See also World Bank 2009.

15. Law 2 of 1998 as amended Concerning Regulation of Water and Electricity Sector in the Emirate of Abu Dhabi.

16. UAEinteract.com, http://www.uaeinteract.com/docs/Water_experts_at_International_Water_Summit_call_for _water_consumption_demand_guide/73539.htm.

17. http://rsb.gov.ae/en/sector/new-water-and-electricity-tariffs-structure.

18. http://www.watercommission.co.uk.

19. The fact that municipal utilities must finance investments through the bond market imposes some financial discipline and promotes efficiency in investments, but not necessarily in day-to-day operations. Public resistance to tariff increases may result in inadequate funding for maintenance and replacements.

20. Pennsylvania Public Utility Commission website, http://www.puc.pa.gov/assets/downloads/PUC_History.pdf.

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Chapter 2 Status of Water Sector Regulation in West Bank and Gaza

Iyad Rammal

Abstract

West Bank and Gaza faces enormous challenges related to water and sanitation access and services. Resource and implementation issues are exacerbated by the political challenges and related constraints facing the Palestinian people. Yet despite or maybe because of these challenges, the Palestinian government has embarked upon what some may view as the most ambitious program of regulatory and institutional reform for the water sector in the Middle East and North Africa region. However, the reforms are at an early stage, and it may take up to 15 years putting the new structure in place. A key challenge is the delay in the transfer of regulatory functions from the PWA to the WSRC which have left a governance gap as a result. Nonetheless, the series of staged reforms are attempting to provide more accountable service delivery in a sustainable manner.

Introduction to the Water Supply and Sanitation Sector and the Country Context

The Palestinian water supply and sanitation (WSS) sector is confronted with a number of political, technical, economic, financial, and institutional challenges that jeopardize sustainability of service delivery. The sector is characterized by the continuous political turmoil experienced in the territories, resulting in a general environment of conflict, insecurity, and instability. Political challenges and interventions in the form of blockades, severe restrictions to freedom of movement, and lack of sovereign control over water resources and infrastructure have all significantly hindered development of the WSS sector, which faces interrelated challenges in terms of access and quality of WSS service delivery, availability of water resources because of increased demand pressures as well as high levels of water contamination, and lack of access to financing.

Access to water resources for Palestinians is severely restricted. Palestinians have access to 11 percent of total water endowments. This has ultimately led to inadequate and unreliable quality of WSS services, particularly in Area C[1] of West Bank, where over 100,000 of the approximately 300,000 Palestinians do not have access to tap water.[2] Moreover, an estimated 96 percent of water resources are unfit for use by Gaza's 1.88 million inhabitants due to saline water intrusions and untreated sewage infiltrations; salinity and nitrate concentration are significantly higher than the World Health Organization standards, and thus the water resources available are practically undrinkable.[3]

Access to sanitation and wastewater treatment also faces challenges. The percentage of households that enjoy direct access to network sewerage systems is 53.9 percent (35 percent in West Bank, compared to 73 percent in Gaza). Wastewater treatment is very limited (48 million cubic meters [MCM] in Gaza and 9.6 MCM in West Bank) and limited reuse for irrigation (1700 dunums in Gaza). Low levels of access to sanitation have further exacerbated already sizeable challenges related to water quality and availability. About 30,000 cubic meters (m^3) of raw sewage is dumped daily into open pools, resulting in contamination of the aquifer (World Bank 2016). According to a United Nations report published in August 2012, "The aquifer could become unusable as early as 2016, with the damage irreversible by 2020."[1] Rapid urbanization and an increasing population are expected to complicate these challenges as increased water demand and pollution further deteriorate the quality of already scarce water resources. Table 2.1 provides an overview of the basic sector data on water supply and sanitation.

TABLE 2.1. Basic Data on the Water Supply and Sanitation Sector in West Bank and Gaza

Total population	4.8 million[a,b]
West Bank	2.94 million
Gaza	1.88 million
Total annual water endowment (2014)	302.3 million M^3/year.[c,d] Palestinian water resources, including those shared with Israel, are estimated to be 2,989 million cubic meters (MCM) per year. Of this total, Palestinians use around 271 MCM, or 11 percent.
Percentage of water usage by sector	
Domestic	57%
Agricultural	43%
Percentage of population with access to improved water services (2015)	93.3% (but reportedly, only 10.4% of the Gaza population of 1.8 million that have "access to improved water services" can drink this water due to high salinity and nitrate concentration)[e]
Percentage of population with access to improved sanitation (2015)	99.2%
Percentage of population with household water connection	93.3%[f]
Percentage of population with household sewerage connection	53.9%

Source: Palestinian Water Authority (PWA) database, unless indicated otherwise.
a. Palestinian Center Bureau of Statistics (PCBS), http://www.pcbs.gov.ps/site/lang_en/881/default.aspx#Water; for West Bank and Gaza, World Development Indicators, World Bank, http://wdi.worldbank.org/table/2.1.
b. Urban population is approximately 3.2 million. Rural population is approximately 1.1 million (http://data.worldbank.org/indicator), 2016.
c. This figure apparently does not include Area C, which is controlled administratively and security-wise by Israel. Without Mekerot (the Israeli Water Company), 62.98 M^3/year per capita as of 2014, multiplied by 4.8 million. Both figures were supplied by World Bank staff, with calculations based on PWA data.
d. ACWUA 2014, Water Utilities Reform in the Arab Region.
e. West Bank and Gaza, Palestinian Central Burro of Statistics. 2014. Multiple Indicator Cluster Survey (MICS) 2014.
f. PCBS data, http://www.pcbs.gov.ps/site/lang_en/881/default.aspx#Water.

The widespread nature of these challenges requires well planned and concerted efforts for sustainable resolution. Unfortunately, actions are often based on ad hoc emergency. Efforts to lead more strategic forms of planning are inhibited by a political environment characterized by continuous uncertainty. As a result, infrastructure development is delayed. Furthermore, the sector faces financial challenges, including significant WSS infrastructure deficits and inefficiencies. According to the Water Sector Strategic Plan for 2012-22, an estimated total of US$7 billion worth of investments is required to improve the WSS sector (PWA 2013). Because of these challenges, the government has embarked upon an ambitious set of reforms. The WSS sector is currently in transition toward a reformed institutional structure introduced by the 2014 Water Law. The move is characterized by a number of policies to improve sector performance, including aggregation of service providers, introduction of an independent regulator, and enforcement of full cost recovery tariffs to enhance sector financial sustainability.

Structure and Organization of the Water Supply and Sanitation Sector

Currently, the water sector is centralized in terms of strategy development, policy making, and identification and development of bulk water projects. However, in terms of service delivery, the sector is significantly decentralized to the point of fragmentation (PWA, UFM, and GWP 2015, 14). From 1995 until reforms were introduced in 2014, significant roles and responsibilities were implemented by a single public entity, the Palestinian Water Authority (PWA). The PWA's responsibilities included policy making, investment planning, regulation, and project implementation and execution. Bulk water supply has been handled by several actors. The West Bank Water Department (WBWD) operates some wells owned by the PWA and receives bulk water from the Israeli Water Company (Mekerot) and provides it to a number of service providers. In addition, numerous municipalities and private and agricultural operators operate their own springs and wells.

Three regional WSS utilities operate in West Bank and Gaza: the Coastal Municipalities Water Utility (CMWU), which serves about 200,000 inhabitants in Gaza; the Water Supply and Sanitation Authority (WSSA), which serves about 12,399 customers in Bethlehem and neighboring towns; and the Jerusalem Water Utility (JWU), which serves 59,195 customers. In addition, 226 small water service providers operate at the local level within West Bank and Gaza (World Bank 2015, 8-9).[5] These include municipal water and wastewater departments and joint water service councils. Currently, 11 joint water service councils serve about 39,733 customers.

Due to the large number of service providers relative to the total customer base, economies of scale are unexploited. Water service providers are commercially weak, with poor service quality, mostly intermittent supply, and high levels of nonrevenue water (reported as in the range of 30 percent to 40 percent by the Arab Countries Water Utilities Association, 2014). Revenues are insufficient for proper operation and maintenance and capital investments.

Service providers are overstaffed, yet have inadequately skilled staff. The sector reforms of 2014 aim to aggregate the many water service providers at the local level and to consolidate and centralize the water sector. Annex 2.1 lists the major current service providers in the Palestinian territories.

Reforms in the form of a new Water Law were led by the PWA in 2014 to address the various existing sector challenges. The reforms seek to achieve water security and implement integrated water resources management by building institutional capacity and enhancing sustainability; accelerating infrastructure development based on Palestinian water security needs and updated sector development strategies; and regulating service provision to enhance quality, efficiency, and cost recovery. The 2014 Water Law enforces a reformed institutional framework that separates roles and responsibilities accordingly.

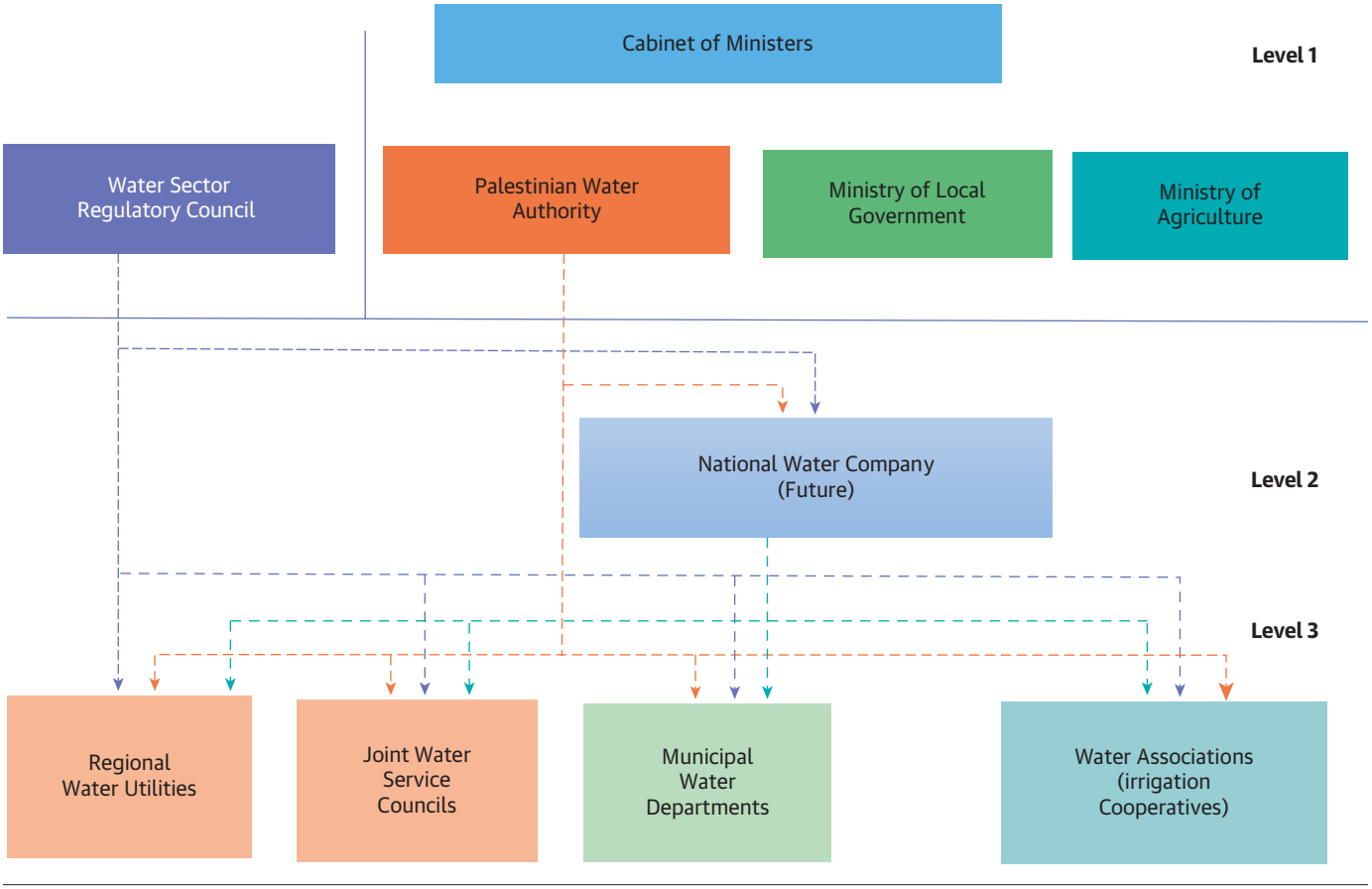
Palestinian Water Authority (PWA). The PWA was first established by Law No. 2 of 1996[6] and is responsible for the overall policy making for the water and wastewater sector. The PWA drafts sector laws and regulations submits them to the Cabinet of Ministers for approval. As the 2014 Water Law is implemented, the PWA will be transformed into the sole institution responsible for overall policy making in the sector. In addition to its policy role, the PWA is responsible for managing water resources in an integrated and sustainable manner, including the issuance of licenses for water extraction, overall sector strategic development and investment planning.[7]

Water Sector Regulatory Council (WSRC). The 2014 reforms established the WSRC. It is an independent legal entity that reports directly to the Cabinet of Ministers and is responsible for overall monitoring and regulation of all matters related to the operation of water and sanitation service providers. The WSRC is still developing its institutional arrangements and completing staffing. It is managed by its own Board of Directors.

National Water Company (NWC). Within the restructured institutional framework, the NWC will be established to assume responsibility for extraction of water and transmission of bulk water supply to the JWSCs, RWUs, and other local authorities and associations. The NWC will also be responsible for the extraction of water. Figures 2.1 and 2.2 show the NWC as the new bulk water company, rather than West Bank Water Department (WBWD), which is now functioning with a limited mandate. In keeping with the Water Sector Strategic Development Plan of 2017-22, it is expected that the NWC will be established and fully functional and will eventually merge or replace the WBWD.

Regional Water Utilities (RWUs). In a bid to improve overall sector efficiency, the PWA has adopted aggregation policies to optimize benefits from economies of scale. The reform seeks to establish RWUs in the larger municipalities. The PWA will begin to implement its aggregation policy by expanding the three existing RWUs to include small service providers that are nearby. Additional utilities will be established at the big

FIGURE 2.1. Medium-Term Water Sector Framework Established by the 2014 Water Law



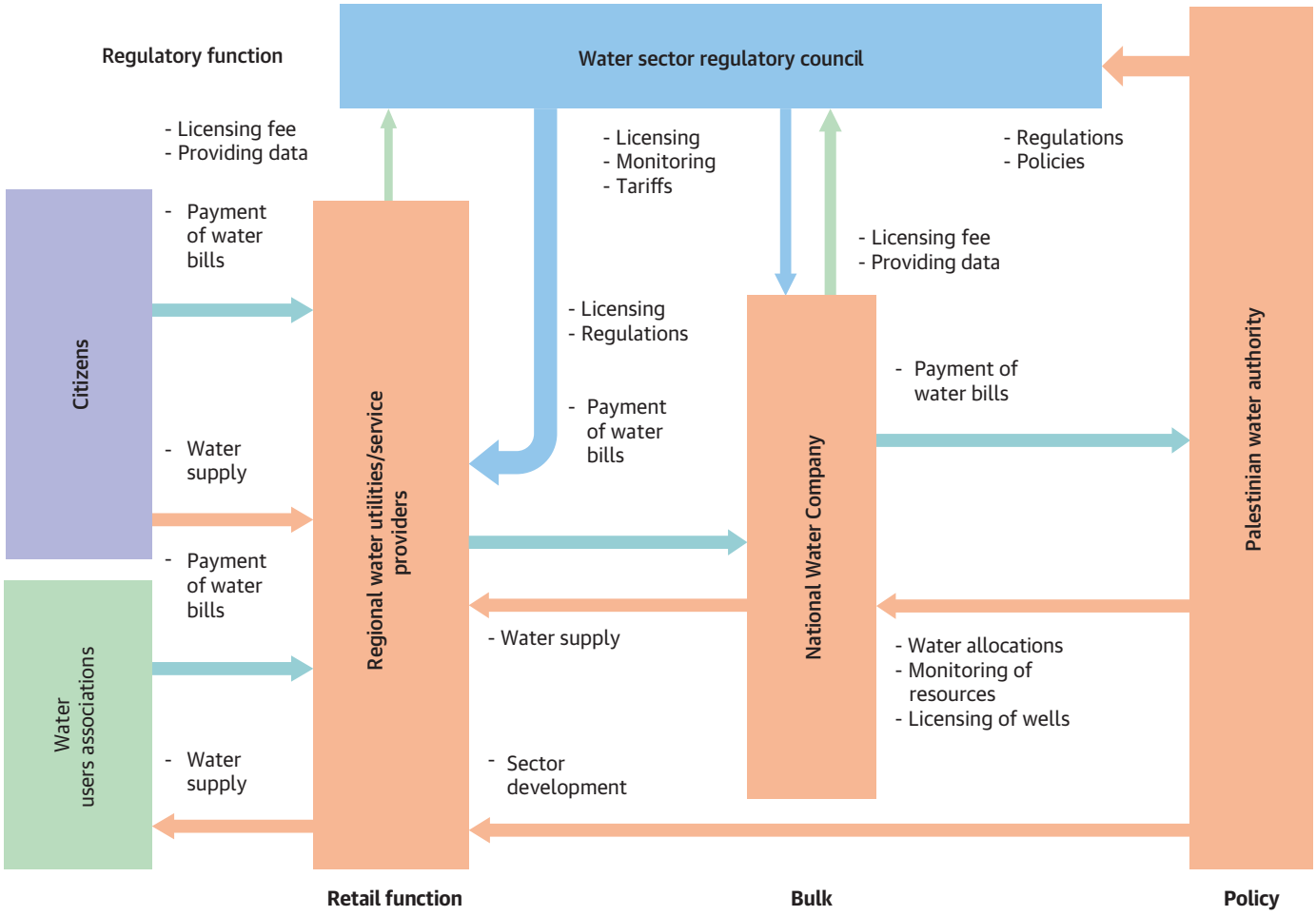
Source: Palestinian Water Authority.

Note: The figure does not show the Israeli system connected to the Palestinian system as indicated under Article 40 of the 1993 Oslo Agreement. Article 40 describe the water resources management in West Bank, where a Joint Water Committee (JWC) should be established to manage and monitor the water resources for the interim period of five years from the date of signing the agreement. However, the JWC has not function effectively since 2013. The Israeli Water Company (Mekerot) supplies about 65 million cubic meters of water per year to the Palestinians through the West Bank Water Department (which is currently functioning as the main bulk water supplier in West Bank for the Palestinian communities). Level 1: Government Level: Apply legislation, policies, and strategies and monitoring of service delivery; Level 2: Manage water resources and responsible for bulk water distribution. The West Bank Water Department is now doing this job, but would be reformed in the near future, according the water law, to the national Water Company; Level 3: Retail water supply for domestic and other uses.

municipalities and then enlarging them by joining smaller neighboring ones, while also working with small villages to establish joint water services. Although it is not certain how many RWUs there will ultimately be, the long-term vision appears to be to separate responsibilities between West Bank and Gaza and establish one RWU to serve Gaza and three RWUs to serve West Bank, divided into the North, Middle, and South areas. Eventually, the RWUs would be responsible for all retail WSS services under the reformed framework.

Joint Water Service Councils (JWSCs). In the transition period toward implementing the reform strategy, the PWA will seek to establish Joint Water Service Councils, which are an

FIGURE 2.2. Functional Structure of the Water Sector Entities as Envisioned by the New Water Law of 2014



Source: World Bank.

aggregation of small village councils in rural areas where political or geographical constraints exist. JWSCs are an interim step before their eventual absorption into RWUs.

Local Government Units (LGUs). The Water Law supports the aggregation of the existing small service providers (LGUs) into RWUs to enhance sustainability of service delivery level by exploiting opportunities to benefit from economies of scale.

Water Users Associations. The Water Law establishes Water Users Associations responsible for management of irrigation services.

Figure 2.1 depicts the institutional arrangement of the WSS sector in the medium term. In the long term, the municipal water departments will be integrated under the JWSCs or RWUs. It is important to note that the reform process is under way, even though the National Water Company (NWC), Regional Water Utilities (RWUs), and Water Users Associations have not yet been established. In addition to the 2014 Water Law, table 2.2 summarizes the main law and strategy documents which govern the sector.

TABLE 2.2. Main Laws and Strategy Documents Governing the Water Supply and Sanitation Sector in West Bank and Gaza

Title of strategy/policy	Summary
Water service delivery	
Water Law	The Water Law was enacted in 2014 with the following provisions:[a] • Separates and clarifies institutional roles and responsibilities, including policy and regulatory functions, which were previously carried out by the PWA. This is with the expectation of improving sector coordination mechanisms.[b] • Establishes the Water Sector Regulatory Council independent from the PWA. • Provides directives to transform the West Bank Water Department into the National Water Company that will be owned by the Palestinian authorities. • Mandates the PWA for establishment of Regional Water Utilities and Water User Associations.
Local Government Law	The Local Government Law requires the municipalities to provide water and wastewater services.
Other relevant laws	Other supporting laws include:[c] • Environment Law No.7 of 1997 • Local Authorities Law No. 1 of 1997 • Internal Regulation of the PWA, Decree No.66/1997 • Agriculture Law No. 2 of 2003 • Environmental Assessment Policy, approved 23 April 2000.
Water Sector Strategic Development Plan (WSSDP)	The WSSDP for 2012–22 was developed by the PWA and issued in 2013. The strategy aims to:[d] • Enhance sector coordination, reinforcing the Palestinian Authority's approach to sustainable water resources management and ensure that all arms of government work together in the pursuit of shared water resources management goals. • Clarify institutional roles and responsibilities through the establishment of a framework that will promote the financial sustainability of WSS services and improve the management, rehabilitation, and maintenance of water systems.
Sanitation service delivery	
Sanitation	Prior to the sector reforms in 2014, according to Bylaw No. 3 of 2002 and previous Water Law issued in 2002, the PWA was responsible for regulation of the Palestinian wastewater services, including collection, treatment, sludge handling, and reuse. This is no longer applicable under the new Water Law, which transfers regulatory responsibility to the WSRC.
Draft laws and policies	
Draft Bylaw for Operator Licensing	A draft water and sanitation facilities and operators' license bylaw has been submitted to the Cabinet of Ministers for approval.
Policy for Capacity Development	A new policy document entitled "Capacity Development Policy and Strategy (2017–77) of the Water Sector" was recently completed.
Additional regulations under development	For example, regulations concerning wastewater treatment and reuse policies, institutions, and infrastructure.

Source: PWA = Palestinian Water Authority.
a. Palestine Water Sector Reform: July 2015 Marseilles WSP.
b. Capacity Development Policy and Strategy (2017–77) of the Water Sector (PWA 2016), 6–8.
c. ACWUA 2014, 20–21.
d. National Water Policy and Strategy 2013, 10–11.

Regulation of Water Supply and Sanitation Services

Enactment of the 2014 Water Law led to the establishment of an independent regulator, the Water Sector Regulatory Council (WSRC), responsible for regulating service quality and monitoring performance of water service providers. It is responsible for the following:

Licensing

Licensing is to be administered by the WSRC for service providers and by the PWA for the water resources. However, in order to complete the transition process and clarify the licensing procedures, a draft water licensing bylaw has been drafted and submitted to the Cabinet of Ministers for approval. The draft bylaw is referred to as the "Water and Sanitation Facilities and Operators' License Bylaw."

Standard Setting

The PWA and the WSRC are both responsible for setting operational, administrative, technical, and financial standards. Generally, the PWA is responsible for setting the right policies, laws, and regulations that create the suitable enabling environment for utilities to operate and perform in a sustainable manner. The WSRC is responsible for setting service delivery standards, as well as the operational, technical, financial, and administrative performance of the service providers.

Main objectives include improving financial viability by reducing costs (for example, by improving technical efficiency and reducing water losses), and providing service providers with the tools necessary to monitor their performance and report back to the WSRC. The reduction of illegal connections is an additional technical challenge that is crucial to address to ensure sustainability of utilities.

Tariff Setting

Tariff-setting responsibilities are to be split between the PWA and the WSRC (Gerlach 2010).[8] The PWA is responsible for setting the tariff policy, and the WSRC is responsible for reviewing and approving tariffs. Prior to the 2014 reforms, the Ministry of Local Government (MoLG) was mandated to review and approve the proposed tariff structure, since municipalities are required to submit their budgets to the MoLG for approval. Under the new Water Law, the MoLG will continue to review municipal budgets in general, but without intervening in tariff setting.

The financing policy adopted within the sector is the water-pays-for-water principle, where operation and maintenance (O&M) as well as capital costs (capex) are totally financed by the water tariff (full cost recovery), rather than through taxes or transfers, in order to guarantee that the water operators have a sound and stable funding mechanism at all times.[9] According to Article 3 of the Water Tariff Regulation for the

TABLE 2.3. Jerusalem Water Utility Tariffs in Ramallah and Al Bireh, December 2015

Water	Consumption per month (US$/m³)		
	15 m³	50 m³	100 m³
Fixed charge	0.09	0.03	0.01
Variable charge	1.16	1.44	1.60

Source: Palestinian Water Authority.
Note: m³ = cubic meters.

Year 2013, the tariff policy objectives prioritize the following goals for both water and wastewater services:

- Ensuring cost recovery through revenues that cover O&M, capex, and interest on loans;
- Ensuring social equality by guaranteeing that low-income consumers' basic needs for water and wastewater will be met; and
- Ensuring economic efficiency by setting prices for the higher consumption groups to promote water conservation.

However, implementation to meet these stated objectives is to take place in a gradual, phased manner. Tariffs should, at a minimum, cover O&M costs and gradually cover depreciation and interest on loans and investments.[10] (It is not clear to what extent the government will subsidize services to fully fund operations until tariffs reach full cost recovery).

Table 2.3 presents the tariffs implemented by the Jerusalem Water Utility in the cities of Ramallah and Al Bireh as of December 2015.[11] The average annual water bill per household in West Bank and Gaza (consuming an average of 6 m³ of water per month) was US$101.11 as of 2010, according to the IBNET (*International Benchmarking Network for Water and Sanitation Utilities)* Blue Book (Danilenko and others 2014, 137).

There is a clear disparity in the prices of water between West Bank and Gaza.[12] Disparities also exist between the governorates of West Bank itself. It is difficult to make meaningful comparisons because the different areas use different billing cycles and data are limited.

A number of factors pose major challenges for service providers to achieve full cost recovery. The sector suffers from significantly high levels of non-revenue water. Cost recovery in the wastewater sector is also a challenge because most cities that have no wastewater treatment have not implemented the tariff for sewerage. The only city that has applied the sewerage tariff is Al-bireh. Its tariff is US$0.50/m³, which is less than the O&M cost by US$0.47.[13]

Next Steps

The main focus is currently on the establishment of the reformed institutional framework, especially establishing the National Water Company (NWC) and Regional Water Utilities (RWUs) and further strengthening the capacity of existing institutions, including the Water Sector Regulatory Council (WSRC). The WSRC has now started issuing

monitoring reports on the performance of the service providers. At the same time, the WSRC is developing a set of indicators that is compatible with the World Bank's IBNET platform to monitor service levels. It is also developing its own database and management information system to maximize the efficiency and effectiveness of data collection, processing, and reporting. Furthermore and very important, the WSRC is planning to develop an incentive system for rewarding good performance.

Two roadmaps are under study to figure out the way forward in the establishment of the NWC and the RWUs. The NWC is expected to be established and operational by 2019, while the RWUs need a longer process, which may take several years, because many small service providers at the municipal and local level must be amalgamated.

In addition to completing the sector transformation of water sector service providers, the government is considering a wide range of actions to encourage performance improvements, including:[14]

- *Sector coordination and citizen engagement.* Citizen engagement is a crucial element to improve overall sector performance. It includes a wide range of issues from raising awareness of water efficiency, sanitation, and hygiene practices to managing customer relations and improving service quality. Other governments in the region have made significant progress with regard to citizen engagement. For example, in the United Arab Emirates, the National Environment Education and Awareness Strategy (NEAS) 2015-11 consists of a set of policy objectives to increase environmental awareness, including on water usage.[15]
- *Human resources and staffing.* An important element of performance improvement is staffing. The new retail and bulk companies will consider the issue of overstaffing and hire staff with appropriate technical skills.
- *Private sector participation (PSP).* Greater capital investment in the sector is needed to maintain and replace aging infrastructure. Increased private sector participation can help meet this need. While delegation to private management is a one way to address the need for investments (as in Morocco, with delegated management in Rabat, Casablanca, Tanger, and Tetouan), PSP can also address issues concerning capacity building. In both Oman[16] and Jordan,[17] private company managers were embedded for certain periods of time into the companies with the principle of training staff and/or "ring fencing" the company. The multi-donor Public Private Infrastructure Advisory Facility (PPIAF) has provided a grant to the Palestinian authorities to help assess the options and viability of PPP in the Palestinian context.

The government is fully embracing water sector regulatory reform in West Bank and Gaza and progress is underway, however not without its challenges. Putting the new structure in place may take up to 15 years, given that the wide range of service providers must contend with political, socioeconomic, and cultural factors that could jeopardize the reform from achieving its objectives. A key challenge is the delay in the transfer of regulatory functions from the PWA to the WSRC which have left a governance gap as a result. Although the MoLG is not mandated, nor has the capacity to supervise activities of the LGU service providers, it

carries out a somewhat minimal level of supervision. However, there is currently no functional regulatory authority responsible for tariff approval, and licensing of service providers.

Furthermore, a challenging element of the reforms is to secure accountability relationships that diminish the gap between de jure and de facto sector organizations during the transition period that is expected to be a prolonged period. The Water Law only reflects the de jure institutional arrangement of the restructured sector of Regional Water Utilities. Without a Water Law that specifically addresses the institutional arrangement under the transition period, much of the service provision responsibilities will remain with the LGUs or JWSCs for an extended period. Therefore, creating adequate arrangements during the transition period for regulation bulk water planning and investment planning and financing will be necessary (Ghosheh 2017, 70,76). However, because the reforms are supported by the political and top management levels of different stakeholders, they are moving forward steadily, accompanied by participation from different levels and stakeholders and influenced by knowledge transfer from different national and international experiences.

ANNEX 2.1. Main Water Service Providers

Service provider	Abbreviation	No. of staff	No. of active water connections	Population served with water services	Length of water network (km)	Population served with wastewater services
Jerusalem Water Undertaking	JWU	250	55,703	330,000	1,300	No wastewater services
Hebron Municipality-Water Supply and Sanitation Department	HWSSD	104	18,000	270,000	244	150,000
Gaza Coastal Municipal Water Utility-Rafah	CMWU-Rafah	125	17,772	203,861	291	149,217
Nablus Municipality Water Supply and Sanitation Department	NWSSD	391	38,416	195,255	488	190,440
Water Supply and Sewerage Authority of Bethlehem, Beit Jala, and Beit Sahour	WSSA	77	12,058	110,000	370	88,000
Tulkarem Municipality Water Supply and Sanitation Department	TWSSD	122	12,683	76,981	285	61,584
Northwest Jenin Joint Service Council	JnJSC	30	5,843	60,000	500	No wastewater services
Jenin Municipality Water Supply and Sanitation Department	JnWSSD	67	8,869	55,000	230	40,000
Qalqilia Municipality Water Supply and Sanitation Department	QWSSD	24	8,427	50,106	142	48,000
Tubas Joint Water Service Council	Tubas JWSC	18	6,200	45,000	140	No wastewater services
North Jerusalem-Joint Service Council	NJ-JSC	15	5,000	40,000	127	No wastewater services
Dura Municipality-Water Supply and Sanitation Department	DWSSD	6	3,000	30,000	84	No wastewater services

table continues next page

ANNEX 2.1. continued

Service provider	Abbreviation	No. of staff	No. of active water connections	Population served with water services	Length of water network (km)	Population served with wastewater services
Mythaloun Joint Service Council	Mythaloun JSSC	8	3,773	27,570	132	No wastewater services
Jericho Municipality Water Supply and Sanitation Department	JWSSD	45	5,652	21,225	113	No wastewater services
Salfit Municipality Water Supply and Sanitation Department	SWSSD	7	2,315	15,000	70	6,600
Anabta Municipality-Water Supply and Sanitation Department	AWSSD	7	1,783	8,141	51	3,256
West Bank Water Department	WBWD	236	381[a]	Bulk Water Supply	525[b]	No wastewater services

Source: PWA database.
Note: — = not available.
a. Number of bulk connections.
b. Length of transmission mains.

Notes

1. Based on Oslo Agreement 1993 between the Palestinian Liberation Organization and Israel, West Bank was classified into three areas. Area A is controlled administratively and security-wise by the Palestinian Authority (PA). Area B is controlled administratively by the PA and security-wise by Israel. Area C is controlled administratively and security-wise by Israel. It appears that the 93.3 percent figure for access to improved water in table 2.1 does not include Area C.
2. Population of Area C from March 6, 2014 article in the *Jerusalem Post*, "297,000 Palestinians living the Area C of the West Bank in 2013 according to a report published Wednesday by the UN."
3. Average chloride concentration in Gaza is between 250-5000 ppm while the WHO limit is 250ppm. Average Nitrates concentration in Gaza is 50-300 ppm, while the WHO limit is 50ppm. Palestinian Water Authority Sources. October 2015.
4. Gaza in 2020 A livable Place, A report by the United Nations Country Team in the occupied Palestinian Territory, August 2012.
5. Summary of Keynote Speech by Honorable Minister Mazen Ghunaim, Minister of Water, Palestine, and Head of the Palestinian Water Authority.
6. ACWUA 2013, 83-96, on Palestine.
7. Water Law, July 2014.
8. The overlap is mentioned on the chart on page 24.
9. National Water Policy and Strategy.
10. World Bank staff, May 2016.
11. "Jerusalem Water Undertaking-Ramallah and Al-Bireh(West Bank and Gaza)-IBNet Tariffs Database," accessed May 11, 2016, https://tariffs.ib-net.org/ViewTariff?tariffId=2082&countryId=157.
12. ACWUA 2013, 92-93. See pages 83-95, for a discussion of Palestine (West Bank and Gaza).
13. Information verified with PWA and municipalities.
14. ACWUA 2013, foreword and pages 85, 89.
15. National Environmental Education and Awareness Strategy 2015-2021, Ministry of Climate Change and Environment, United Arab Emirates, http://www.moew.gov.ae/assets/b4a14e05/national-environmental-education-and-awareness-strategy-2015-2021-en.aspx.

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Chapter 3 Status of Water Sector Regulation in Egypt

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Abstract

Egypt is one of the few countries in the Middle East and North Africa that has established a specific water sector regulator dedicated to monitoring service provision. However, institutional challenges remain, including some overlapping responsibilities and the need to clarify and strengthen the role of the regulator. Since 2015, the government has made positive efforts to set up the necessary institutional arrangements that would improve overall sector performance, including the establishment of a dedicated management team within the Ministry of Housing, Utilities and Urban Communities (MHUUC), as well as efforts at tariff reforms designed to enhance financial sustainability. Moreover, a new Water Law providing clearer mandates and strengthening the regulator and the regulatory framework has reportedly been reviewed by a Council of Ministers and will be reviewed by Parliament. A capacity-building program for the regulator is under way. Therefore, the status of regulation in Egypt may diverge from some of the accounts described in this chapter—at the very least, de jure*—in the coming year.*

Introduction to the Water Supply and Sanitation Sector and the Country Context

Egypt has one of the fastest growing populations in the world. Between 2000 and 2014, Egypt's average population growth rate was 1.92 percent, compared to the world average of 1.24 percent.[1] Around one-quarter of Egyptians lived under the poverty line in 2012-13 (CAPMAS 2014a),[2] with large regional disparities. Poverty in Egypt is a rural phenomenon. While an estimated 57 percent of its total population reside in rural villages,[3] more than 67 percent of the poor live in rural areas (CAPMAS 2013).

Water resources in Egypt are under pressure, fueled by a rapidly growing population and increasing activity in the industrial and agricultural sectors spurred by surges in public investment. Meanwhile, water resources are under threat because of climate change and development in upstream countries. The main source of water in Egypt is surface water from the River Nile. In addition, Egypt relies on groundwater resources, and to a lesser extent desalination and wastewater reuse. Water generated from nonconventional resources such as seawater desalination constitutes a negligible percentage of 0.76 percent of the total aggregate water supply and is used entirely for Red Sea resorts (UNEP, CEDARE, and MoSEA 2014).

Water consumption increased 15.6 percent between 2002 and 2010, from 66.6 billion m^3 to 77 billion m^3. The agricultural sector accounted for 86 percent of total water consumption in 2010, with domestic and industrial sectors accounting for 11 percent and 3 percent of total consumption, respectively (FAO, 2010). Yet according to a 2014 study

on "Water Resources and Rationing its Use in Egypt" by the Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt is below the water poverty threshold, with an average use of 663 m^3 per capita. By 2025, CAPMAS predicts that the share will fall below 582 m^3.

Significant progress has been made to improve access to water supply and sanitation (WSS) across Egypt (table 3.1). Access to piped sources of drinking water increased greatly between 1990 and 2012,[4] with 100 percent and 93 percent of urban and rural households enjoying access to piped water through household connections, respectively (WHO and UNICEF 2014). However, among rural poor households, children are 8.7 times more likely to drink from unsafe sources of water than children who live in urban households.[5] In 2015, improved sanitation facilities were available to 95 percent of Egypt's population.[6] However, in terms of

TABLE 3.1. Basic Data on the Water Supply and Sanitation Sector in Egypt

Population: Total (2016)[a]	90.4 million
Urban (2013)[b]	43%
Rural (2013)[b]	57%
Total annual water endowment (2010)[d]	78 billion m^3
Percentage of water usage by sector	
Domestic	11%
Agricultural	86%
Industrial	3%
Percentage of population with improved water supply service (2015): Total[c]	99%
Urban (2015)[c]	100%
Rural (2015)[c]	99%
Percentage of population with improved sanitation (2015): Total[c]	95%
Improved sanitation Urban (2015)[c]	97%
Rural (2015)[c]	93%
Household water connection Urban	100%
Rural	99%
Household sewerage connection (2010) Urban	84%
Rural	26%

Source: Water Supply and Wastewater Sector: Improving Performance of Service Providers, World Bank, unpublished.
Note: m^3 = cubic meters.
a. CAPMAS 2016.
b. Calculations from Egypt Poverty Map (CAPMAS 2013).
c. WHO and UNICEF 2015.
d. FAO, 2010: http://www.fao.org/nr/water/aquastat/countries_regions/EGY/.

piped access to sanitation,[7] while 84 percent of urban households have access to sewers, only 26 percent of rural households do (World Bank 2010).

Egypt also faces challenges regarding the quality, efficiency, and sustainability of WSS service delivery. Efforts in this regard have focused on increasing the number of metered connections and reducing levels of non-revenue water. High staffing ratios coupled with low bill collection rates and low tariffs remain issues (World Bank 2010). Furthermore, the continuity and quality of water supply are a challenge. An estimated 30 percent of households in Egypt experienced interrupted supply in 2008, 37 percent of which were households in rural upper Egypt.[8] Although drinking water quality standards are reported to have been met in the overwhelming majority of cases (World Bank 2010), quality is affected by ageing networks, deterioration of water reservoirs, and leakages in groundwater and sewer systems, among other factors.[9]

Structure and Organization of the Water Supply and Sanitation Sector

Egypt's WSS institutional framework is currently centralized.[10] Key functions concerning WSS infrastructure and service delivery such as policy making, regulation, planning, and investment are carried out by national-level institutions. Decision-making is centralized within the Ministry of Housing, Utilities and Urban Communities (MHUUC). Responsibility for works planning and implementation of infrastructure investments across Egypt is under the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the Cairo Alexandria Potable Water Organization (CAPWO), which operate under the supervision of MHUUC. The operation and management of assets, including the billing and collection arrangements, is performed by the Holding Company for Water and Wastewater (HCWW) through its local subsidiaries, the Water and Sanitation Companies (WSCs). The HCWW is a public sector company and provides its 25 WSCs with administrative, technical, and financial support to deliver WSS services. The HCWW is currently responsible for the development of master plans implemented by the WSCs, as well as for monitoring their performance. The Egypt Water and Wastewater Regulatory Agency (EWRA) also operates under MHUUC and is mandated to regulate quality of WSS service delivery, monitor WSS tariffs, and undertakes consumer protection responsibilities.

In 2015, the MHUUC established the Program Management Unit (PMU) by Ministerial Decree No. 154 of 2015. The PMU is a service delivery unit housed within MHUUC mandated to oversee implementation of all investments under the WSS sector and to ensure that universal access to sustainable WSS services is achieved. The PMU is also responsible for formulating WSS sector policies and strategies. The long-term vision of the sector appears to be to eventually decentralize service delivery and transfer full responsibility for planning and implementation of WSS investments to the WSCs at the local level and to develop fully autonomous utilities that are accountable to citizens for their mandated service delivery responsibilities. To this end, MHUUC intends to put in place a suitable policy and institutional framework that will incentivize WSCs to take responsibility for the

planning and implementation of capital investments as well as to manage the assets created, leading to better service delivery at the local level. As part of this policy intention, the responsibility for implementation of some small-scale water projects, as well as projects funded by other donors, has been transferred to the WSCs. Table 3.2 describes the roles of the various key stakeholders in the WSS sector. Figure 3.1 illustrates the structure and relationships.

Public WSS services are formally provided within the government institutional framework outlined above. The informal private sector addresses some of the market demand for WSS services unaccounted for by the state, which includes demand for WSS services from informal settlements. According to a survey conducted by the Center for Development Services published in 2009, 18 percent of households in slum areas stated that their water supply is through informal or illegal connections to public sewer networks (UNICEF 2009).

TABLE 3.2. Main Institutions in the Water Supply and Sanitation Sector and Their Roles and Responsibilities

Organization	Main roles and responsibilities
Financing	
Ministry of Finance (MoF)	• Allocation of capital investment grants for WSS sector investments, as well as O&M subsidies. • The Public Private Partnership (PPP) central unit of the MoF established under Law No. 67 of 2010 sets national guidelines for implementation, standardizes PPP contracts, provides technical/advisory support to infrastructure line ministries, and monitors the implementation of PPP projects.[a]
Policy making	
Ministry of Housing, Utilities and Urban Communities (MHUUC)	• MHUUC was established by Presidential Decree No. 164 of the year 1996. The ministry provides the overall leadership for the WSS sector. MHUUC sets sector policy and coordinates the overall investment program for the sector and oversees a number of specialist agencies and public service companies including: EWRA, HCWW, NOPWASD, and CAPWO.[a] • MHUUC established a PMU by the Decree No. 154 of 2015, which is responsible for establishing the sector vision and key policies, including the National Water Supply and Sanitation Strategy, and overseeing their implementation.[a]
Ministry of Water Resources and Irrigation (MWRI)	• MWRI sets standards for effluent discharges into the receiving waters of the Nile basin. It is responsible for issuing permits for abstraction for potable water supply, as well as water for industrial and irrigation purposes.[a] • MWRI is in charge of development, distribution, and management of water resources, and development and O&M of the associated water works. The ministry is also responsible for collection and disposal of agricultural drainage water, monitoring and assessment of water quality of the various water sources, and protecting coastal lakes and the shoreline.[b]
Ministry of Health (MoH)	• MoH undertakes monitoring of municipal water quality and is also involved in monitoring and regulating municipal effluent discharge.[b]
Ministry of Environmental Affairs (MoEA)	• MoEA is responsible for environmental planning, policy setting, and legislation. It is also responsible for environmental monitoring and overseeing enforcement of environmental legislation. The Egyptian Environmental Affairs Agency (EEAA) is the executive arm of the MoEA.[b]

table continues next page

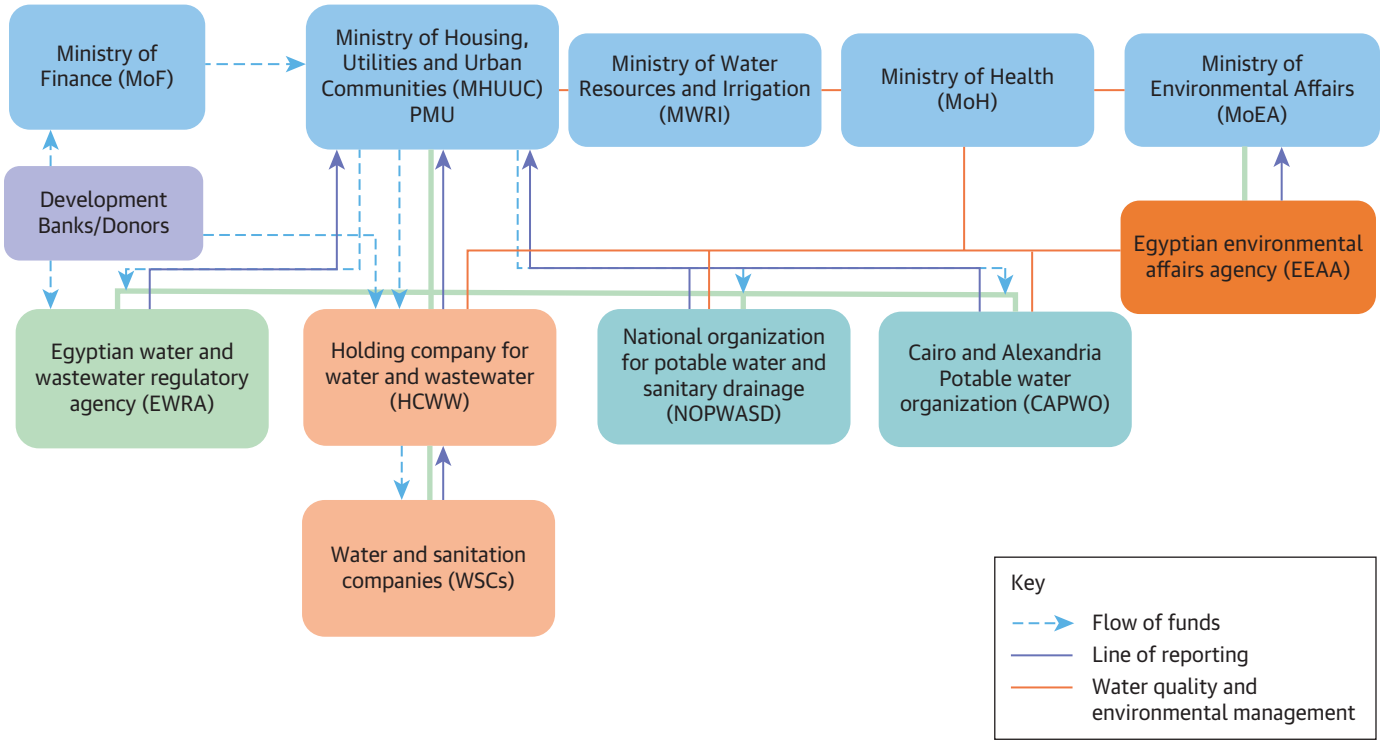
TABLE 3.2. continued

Organization	Main roles and responsibilities
Infrastructure delivery	
National Organization for Potable Water and Sanitary Drainage (NOPWASD)	• NOPWASD, established by Presidential Decree No. 197 of the year 1981 (later amended by Presidential Decree No. 96 of the year 1994), is responsible for the planning, design, and construction of new WSS infrastructure in all governorates excluding Cairo and Alexandria. It is under the jurisdiction of the MHUUC.[b]
Cairo and Alexandria Potable Water Organization (CAPWO)	• CAPWO is responsible for investment planning, design, and supervision of construction of water and sanitation infrastructure in Greater Cairo and Alexandria.
Service delivery	
Holding Company for Water and Wastewater (HCWW)	• HCWW and the WSCs were established by Presidential Decree 135 for the year 2004.[b] HCWW is a public company owned by the government and was created as the vehicle for commercialization of water and wastewater utilities in Egypt. It is mandated to help improve performance of the WSCs and introduce modern management practices across the sector. HCWW currently holds the ownership of the assets of and oversees all water and wastewater utilities.[b]
Water and Sanitation Companies (WSCs)	• WSS services in Egypt are provided by 25 state-owned and managerially autonomous WSCs based at the governorate level. They have the sole mandate to provide drinking water and waste water services within their area of jurisdiction. They are charged with becoming financially independent.[b] • WSCs carry out maintenance work, repairs, and minor extensions using their own financial resources, including subsidies provided by the central government[b] and may build, operate, and maintain plants and networks to provide for potable water and safely dispose of wastewater. • Reporting directly to the HCWW, the WSCs operate under the Public Business Sector Companies Law No. 203 of 1991. Each WSC is established as an Egyptian joint-stock subsidiary affiliated with the HCWW. Each WSC is a joint stock subsidiary subject to provisions of Law No. 203 of 1991.[b] • The HCWW is the sole shareholder of the WSCs. The boards of the WSCs are composed of the chairman (appointed by HCWW), four persons elected by the staff of the company, and four other persons appointed from the local government (often the Secretary General of the Governorate), as well as NOPWASD; a university; and a technical body, usually either MWRI or HCWW[b].
Regulation	
Egyptian Water and Wastewater Regulatory Agency (EWRA)	• EWRA was established by Presidential Decree No. 136 of 2004 with the mandate to "enable and encourage projects to achieve the highest level of performance to ensure the sustainability of the service at the required level of quality and efficiency and provide the services to the consumers in a satisfactory mode and at the most reasonable prices." EWRA regulates and monitors all public and private activities related to water and wastewater.

Source: World Bank compilations.
Note: O&M = operations and maintenance.
a. http://www.pppcentralunit.mof.gov.eg/Content/Home/Pages/ChairmanWord.aspx.
b. MWRI 2005.

Because access to sanitation services is limited in rural areas, the informal private sector is large and active in the sanitation market. However, it is unregulated. Many villages have attempted to improve the sanitation situation themselves through the informal private sector, which constructs septic tanks, installs informal sewerage networks that are privately operated, and offers maintenance services. However, while the private sector collects the wastewater, it does not provide safe disposal. Where groundwater-lowering systems have been installed, households have connected their wastewater to the system. There are many examples of spontaneous collective action through community development agencies or other structures, which have resulted in informal sewer network systems. (World Bank 2015a). Involvement of the formal private sector

FIGURE 3.1. Institutional Framework of Egypt's Water Supply and Sanitation Sector



Source: Authors.

is limited to competition for concession and management contracts. The MHUUC's Water and Wastewater Sector Strategy document (2010) promotes the implementation of public-private partnerships (PPPs) as an alternative source of financing investments in the WSS sector. Currently, there are only two cases of successful large-scale, formal PPP projects in Egypt: Abu Rawash Wastewater Treatment Plant and the New Cairo Wastewater Treatment Plant.

Legal, Policy, and Regulatory Framework

Table 3.3 summarizes the main legal instruments, policies, and strategies that are relevant for WSS service delivery and regulation in Egypt. It should be noted that a seminal new Water Law has been drafted to strengthen the role of the regulator and clarify institutional mandates. The draft is under review and may be enacted in 2017, superseding or enhancing some of the arrangements described next.

Regulation of Water Supply and Sanitation Services

The Egyptian Water and Wastewater Regulatory Agency (EWRA)

Establishment of EWRA and Its Regulatory Functions. The EWRA, is the sole agency responsible for regulation of WSS services and reports directly to the Minister of Housing.[11] Established in 2006 under Decree No. 136 of 2004, EWRA is mandated to "regulate, monitor, and follow

TABLE 3.3. Main Laws and Strategy Documents Governing the Water Supply and Sanitation Sector

Title of strategy/policy	Summary
Water resources	
Constitution of the Government of Egypt (2014)	Article 44: The Nile "The state commits to protecting the Nile River, maintaining Egypt's historic rights thereto, rationalizing and maximizing its benefits, not wasting its water or polluting it. The state commits to protecting its mineral water, to adopting methods appropriate to achieve water safety, and to supporting scientific research in this field. Every citizen has the right to enjoy the Nile River. It is prohibited to encroach upon it or to harm the river environment. The state guarantees to remove encroachments thereon. The foregoing is regulated by law." Article 45: Seas, Beaches, Lakes, Waterways, Mineral Water and Natural Reserves "The state commits to protecting its seas, beaches, lakes, waterways, mineral water, and natural reserves. It is prohibited to encroach upon, pollute, or use them in a manner that contradicts their nature. Every citizen has the right to enjoy them as regulated by law."
National Integrated Water Resources Management Plan (NWRP) (2005)	The NWRP aims to develop new supplies (such as desalination); strengthen measures for demand management (for example, through reuse); enhance water quality control; and ensure institutional and financial sustainability. A technical secretariat within the MWRI is responsible for following up on implementation of the strategy, as well as coordination and communication with WSS sector stakeholders.
Laws for Protection of Water Resources	Protection and management of Egypt's water quality are defined by the following laws:[a] • Law 12/1984 governs and regulates the use of water for irrigation as well as the operation and maintenance (O&M) of the irrigation and drainage systems. • Law 48/1982 regulates water quality of discharges into the Nile River and other waterways to control pollution. • Law 27/1978 regulates water resources and treatment of water. • Law 213/1994 defines the use and management of public and private sector irrigation and drainage systems.
WSS service delivery	
Constitution of the Government of Egypt (2014)	Article 176: Empowerment of Administrative Units "The state ensures support for administrative, financial, and economic decentralization. The law organizes empowering administrative units in providing, improving, and managing public utilities well, and defines the timeline for transferring powers and budgets to the local administration units."
Selected laws governing WSS service delivery	• Presidential Decree No. 135 of 2004 establishes the HCWW and WSCs. • Law No. 458 of 2007 sets the standards and specifications of drinking water.
Laws governing wastewater management	• Decree 169 of year 1997 establishes the Egyptian Code for Wastewater Treatment Works. • Decree 44 of year 2000 for the condition for discharging in public drains. • Decree 134 of year 1968 provides specifications of cesspits or septic tanks and evacuation procedures. • Decree 135 of year 1999 describes sanitation works for small communities, isolated buildings, and necessary treatment stages. • Decree 334 of year 2002 establishes the Egyptian Code of Practice for Sanitary Works in Buildings, • Specifications of sanitary works and wastewater disposal in isolated areas • Specifications for septic tanks, cesspits, and oil/grease traps.

table continues next page

TABLE 3.3. continued

Title of strategy/policy	Summary
Regulation of the WSS sector	
Presidential Decree No. 136 of 2004 (WSS service delivery)	• Presidential Decree No. 136 of 2004 establishes a regulatory agency for water, wastewater, and consumer protection, the Egyptian Water and Wastewater Regulatory Agency (EWRA), which was established in 2006.
Law No. 67 of 2010 (public-private partnerships, PPPs)	• Law No. 67 of 2010 and its executive regulations apply to all partnership contracts with the private sector, as well as related advisory contracts concluded by administrative authorities with the private sector to execute infrastructure projects, services, and public utilities. It also stipulates all regulations regarding PPP contracts with the government of Egypt across all sectors, including WSS.

Source: World Bank compilations.
Note: HCWW = Holding Company for Water and Wastewater; WSC = Water and Sanitation Company; WSS = water supply and sanitation.
a. World Bank 2012.

up on all activities related to the Potable Water and Wastewater Sector…in a manner that would enable and encourage the concerned projects to achieve the highest performance levels, that ensure the continual availability of services in the required quality and efficiency, and provide satisfactory service to consumers, and with the most suitable prices."[12] Ministerial Decree No. 124 of 2006, issued by the Minister of Housing, established a subcommittee tasked to draft a Water Sector Law that would provide EWRA with the necessary authority to regulate the sector. MHUUC later agreed that the Water Sector Law should be developed within an overall WSS sector policy and legal framework. As mentioned, the new Water Sector Law is in draft form, to be reviewed by Parliament, and expected to be issued as early as 2017.

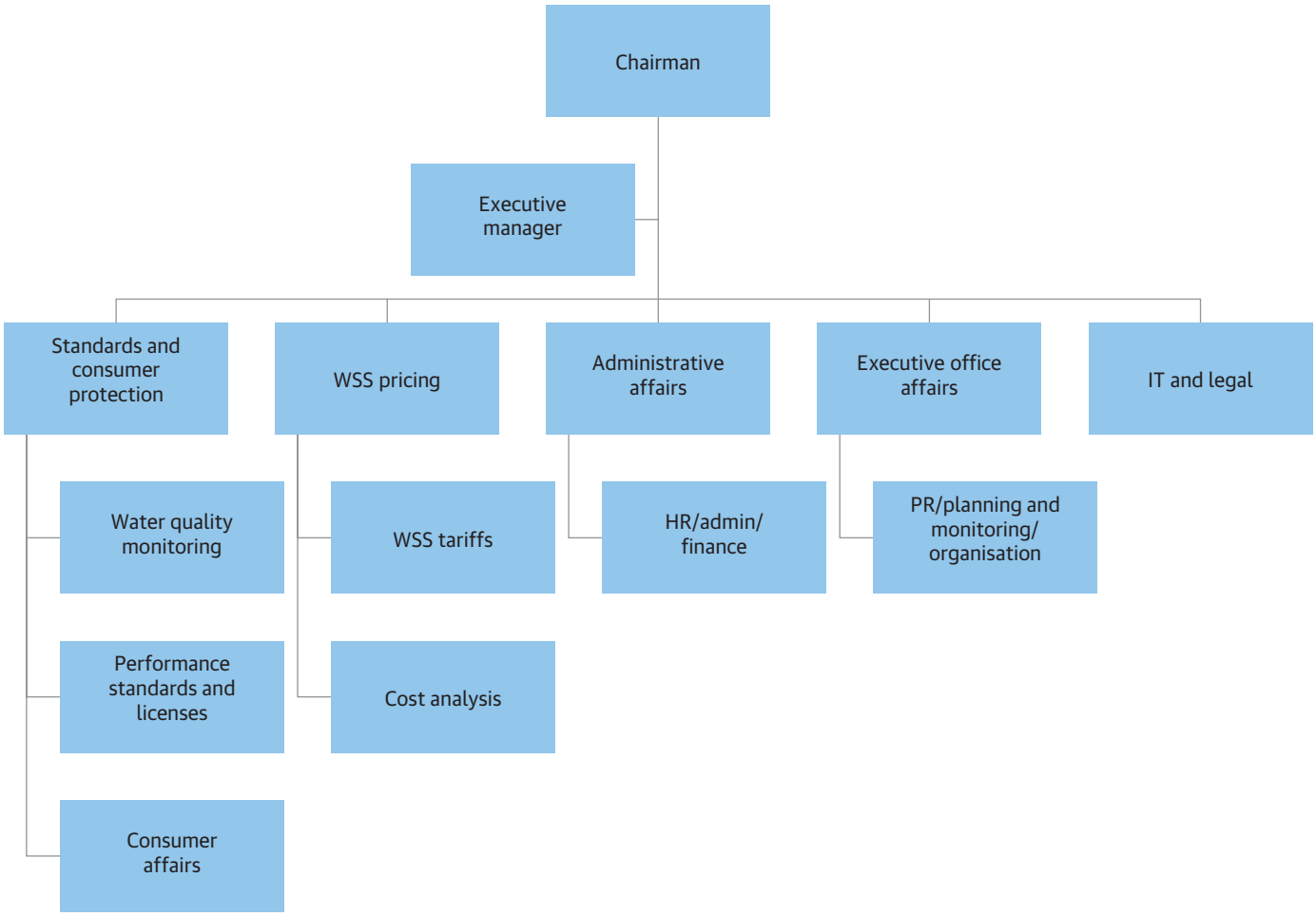
EWRA's organizational structure is illustrated in figure 3.2. By 2009, EWRA's workforce totaled 60 employees.[13] EWRA staff were provided training on a number of topics, including technical training to perform water and wastewater treatment plant assessments, and were also provided training on financial planning, cost accounting, tariff analysis, and water and wastewater technical aspects (USAID 2009). A capacity building assessment is being planned, with further staffing requirements to be identified.

Management Information Systems (MIS) have been developed to allow EWRA to carry out performance monitoring, benchmarking, and utility certification. Benchmarking studies incorporating performance indicators and existing utility variables and data were developed and establish reasonable standards for utility performance. In addition, five-year financial planning, performance indicators, and cost accounting systems have been established at the WSC level that would provide EWRA with the information it needs to perform its regulatory role effectively (USAID, 2009.

EWRA was provided technical support to develop a financial planning and tariff analysis model for the WSCs to use as part of the EWRA tariff application process. These plans provided insight into tariff needs because they highlighted the gap between costs and revenues in each WSC. Training was provided to support EWRA in developing tariff rate studies and in reviewing and evaluating utility tariff applications (EWRA 2009).

EWRA is to assume the responsibilities listed below as specified in Decree No. 136 of 2004. The Decree clarifies the objectives and role of EWRA. The agency is not yet mandated to

FIGURE 3.2. Organizational Structure of the Egypt Water Regulatory Authority (EWRA)



Source: EWRA, 2009.
Note: Admin = administrative; HR = human resources; IT = information technologies; PR = public relations; WSS = water and sanitation services.

determine revenue requirements for WSCs and set tariffs; issue licenses for WSCs; resolve disputes between customers and service providers; or set service standards for utilities, despite having established the Annual Information Returns (AIR) system (USAID 2013). Although the decree mentions that "all projects operating in the field of WSS shall be committed to submitting to [EWRA] all requested reports, data, statistics and information relevant to its activities," it is not clear that this always takes place in practice, and whether there is a formal coordination mechanism between EWRA and other sector institutions that might allow for such information sharing. These discrepancies apparently will be rectified through the new draft Water Law soon to be reviewed by Parliament. The list that follows depicts the current status of regulation:

- *Enforcement of regulatory legislation.* EWRA is legally responsible for ensuring all activities related to purification, desalination, conveyance, distribution, and selling of potable water, and the collection, treatment, and safe disposal of domestic and industrial wastewater; that

either public or state-awarded concessions are implemented in accordance with the relevant laws; and that water and wastewater units established by donor-funded and private projects are all implemented within the context of compliance with the applicable law and regulations of the government, especially regarding quality control and environmental regulations. In practice, these responsibilities are also mandated to, and carried out by, other sector institutions, including the HCWW, MHUUC, MoH, MWRI, MoEA, and MoF, as described in table 3.2. Within this context, EWRA's activities have been confined to information and data collection on sector activities related to potable water and wastewater that is used to produce an Annual Information Report (AIR) and is presented to the MHUUC. The AIR includes recommendations from EWRA to enhance enforcement of sector legislation and overall sector performance.

- *Investment planning.* As stipulated in Decree No. 136, EWRA should review plans for potable water consumption purification, desalination, conveyance, and distribution, and plans for collecting, treating, and safely disposing of domestic and industrial wastewater on a regular basis, including investment plans to ensure their availability in line with the state policies. PMU now assumes complete responsibility for overall investment planning for the sector. Before PMU was established, most investment planning responsibilities were carried out by NOPWASD (before the establishment of the HCWW in 2004), HCWW, and the MHUUC. For example, the national and governorate rural sanitation master plans were developed by the WSCs with support from the HCWW and consultants(USAID, 2009);
- *Technical standards and assistance.* EWRA is mandated to provide technical assistance to governmental projects or PPPs within the WSS sector, in accordance with the law, including water and wastewater units established by donor-funded and private projects; and preparing studies on technical, economic, and financial standards to be determined. Multiple institutions within the sector provide technical assistance. Overall technical support to the WSCs, including preparation of feasibility studies, has been carried out mainly by the HCWW, with expertise from consulting firms. In addition, the PPP unit housed within the MoF is responsible for providing technical and advisory support to line ministries for all PPP projects carried out in Egypt. This support includes the development of PPP proposals, which must be approved by the MoF. The PPP unit also supervises the tendering process and manages the transaction. The establishment of technical, economic, and financial standards of WSS service delivery has traditionally been led by the MHUUC, in coordination with the relevant ministries and authorities (USAID, 2009).
- *Financial monitoring.* According to Decree No. 136, EWRA has responsibility to follow up about and verify costs of inputs of purifying, desalinating, conveying, distributing, and selling potable water and collecting, treating, and safely disposing of domestic or industrial wastewater and compare them to prices paid by consumers (tariff schedules). Legally, the WSCs are mandated to set their own tariffs and achieve full financial autonomy. In practice, the HCWW has often carried out financial planning and monitoring of the WSCs and provided support to each WSC in developing its five-year financial plan. The HCWW consolidates the individual WSC five-year financial plans into one national plan. In addition, the HCWW and

WSCs have financial models and systems in place to monitor financial operations of the WSCs. The HCWW carries out assessments of the required revenues and tariff scenarios and demonstrate the case for tariff increases and subsidies from the MoF. The WSCs generate periodic reports on key financial management indicators, including budgeting, cash flow, income, and balance statements. The HCWW develops the annual financial statements of all WSCs in accordance with Public Business Sector Law No. 203 of 1991 (USAID, 2009).

- *Tariff review and setting.* EWRA is responsible for studying tariff applications to ensure financial and economic balance and develop consumption classes for the approval of the Cabinet of Ministers. Accordingly, EWRA has prepared a detailed tariff study and proposal for consideration of the Cabinet that would allow for full cost recovery of O&M expenses within the first three years of implementation and O&M plus depreciation costs within five years of implementation. The HCWW currently also plays a de facto role in reviewing tariffs by reviewing the total costs of WSS service provision vis a vis the existing tariff levels and submits requests to the Cabinet to increase tariffs to a level appropriate that would enable WSCs to recover O&M costs (USAID, 2009).
- *Licensing.* Currently, EWRA is not mandated to license WSCs. This authority is expected to be mandated to EWRA upon issuance of the new Water Law under review. A licensing system has been developed with donor support, along with the necessary administrative, technical, financial, environmental, and consumer protection regulations. Pilot WSCs were selected to test the process, which was completed in 2013 (USAID 2013).
- *Private sector participation (PSP) and approval of contracts.* Decree No. 136 mandates EWRA to review and approve contracts under the sector. Currently, in practice this is typically carried out by the implementing institutions: HCWW and NOPWASD and the MHUUC. In the case of PPPs, contracts are approved by the MoF. A study of Cairo Alexandria Potable Water Organization, and WSCs in Sharkeya, and Kafr El Sheikh found that a number of WSC functions were outsourced to the private sector, including equipment maintenance, security, and software development. With support from the U.S. Agency for International Development (USAID), HCWW developed a database of 177 local companies interested in providing services to the WSCs. In addition to pre-qualification, bidding, and contracting documentation, methods for prioritizing capital investments were developed to allow the HCWW to provide contracting support to the WSCs (USAID 2009).
- *Performance monitoring.* EWRA is mandated to monitor the sector's technical, financial, and economic performance and efficiency. Further, the HCWW currently plays a significant role in monitoring performance of the WSCs using the Monitoring, Analysis and Reporting System (MARS), which is available to all WSCs. Performance data submitted by the WSCs to the HCWW through the MARS are assessed on a quarterly basis by the HCWW's Economic Analysis Department, which covers 65 performance indicators on WSS service delivery (annex 3.1). This information is presented to the HCWW Chairman, who communicates areas of performance improvements to be made to each respective WSC (USAID 2009);

- *Information dissemination.* EWRA is mandated to publish and disseminate information, reports, and recommendations that support the projects described and provide consumers with knowledge of their rights and obligations, and generally raise awareness of EWRA's role.
- *Consumer protection.* EWRA is mandated to investigate customer complaints to ensure the protection of their interests.

Funding of EWRA. In accordance with Presidential Decree No. 136 of 2004, EWRA is funded through the following sources:

- Annual allocations from the State General Budget
- Service payments from state and private projects in the water and wastewater sectors
- Grants, donations, and contributions in line with the objectives of EWRA
- Interest and/or profits gained from EWRA's invested funds
- Any other revenues, in accordance with the law.

EWRA's Board of Directors. The Board of Directors of EWRA is formed under the chairmanship of the Minister of Housing, and is comprised of the following (OECD 2010):

- EWRA Executive Director
- NOPWASD Chairman
- Members nominated by the Minister of Housing representing the water and wastewater sectors, special expertise,and consumersRepresentatives of the Ministries of Finance, Health, and Environment.

The Board of Director's functions are to:

- Develop EWRA's organizational structure to ensure the achievement of its objectives and execute its responsibilities
- Ensure that governmental projects working in the WSS sector comply with required technical performance standards, and inform relevant project implementation entities about these standards before they commence work
- Approve the technical, commercial, and economic performance standards to enhance sector performance and ensure safety and protection of consumer interests
- Investigate complaints presented by consumers, assess the responses to consumer complaints, and adopt required measures
- Approve bylaws relevant to EWRA's financial, technical, and administrative affairsDetermine fees in return for services that EWRA provides to the sector.

Tariff Setting

Egypt water and wastewater tariffs are among the lowest in the world, at US$ 0.08/m^3, and cover only 25 percent of the cost of water supply service and 10 percent of the costs of providing sewerage service (HCWW 2014). Wastewater tariffs are charged as a fixed percentage

of the water bill and remain very low at (35 percent in most governorates). Cost inefficiencies in the WSS sector (in terms of fiscal transfers to cover operating inefficiencies, below-cost tariffs, and excessive infrastructure and financing costs) amount to an estimated US$ 1.25 billion per year—the equivalent of 1.25 percent of Egypt's GDP (World Bank 2010). Consequentially, per capita water consumption is quite high, increasing pressure to build more systems to meet the high demand (World Bank 2010).

The Water and Wastewater Sector Development Policy of 2010 recognizes the need for the WSCs to achieve financial independence by improving investment and operational efficiency, as well as by increasing tariffs and reducing subsidies (World Bank 2015b). Under the current tariff structure, prices increase by two piasters every two months (World Bank 2015b). WSCs are failing to cover their O&M costs, and bills, including those for electricity, are partially unpaid (World Bank 2015b). Hence, O&M costs are heavily subsidized by the central government. The government is currently subsidizing the operations of the sector by LE750 million per year (US$84.5 million) (2014). Reducing this subsidy by improving cost control and ultimately by increasing the tariff is a high priority for the government (World Bank 2015b). Water supply consumers pay tariffs that are about 20 percent of the delivery costs (including treatment and delivery costs) (Ministry of Finance 2005). Until recently (before the HCWW was established), governors had the authority to set water prices up to a ceiling of LE0.23 per cubic meter. Although this ceiling is below actual production costs by a factor of 3 to 4, not many governors used this authorization. The O&M subsidies to the subsector are estimated at LE3 billion to LE4 billion per year (US$ 340 million to US$450 million), or 2.0-2.5 percent of total public recurrent expenditures (World Bank 2015).

The authority to adjust or revise tariffs lies with the Cabinet of Ministers, not EWRA (World Bank 2015). EWRA, as well as the HCWW which submits tariff requests to the Cabinet of Ministers, have made several attempts to introduce higher tariffs. Some progress has been made in raising the tariffs of industrial and large-scale users and in making small gradual increases in the water and sanitation tariffs. A tariff study and proposal being put forth by EWRA would allow WSCs to recover O&M costs within the first three years of implementation, and then balance depreciation of their infrastructure with revenue within five years. In fact, an increase had been made in early 2016, but was soon eroded by the increase in energy prices. EWRA would review this tariff structure in the first three years of implementation, and then every five years thereafter. There would also be a pro-poor element to the tariff structure that would subsidize the first two consumption blocks (using 0-20 m^3 of water per month) (World Bank 2015).

There is growing consensus that the following principles should be incorporated in the future tariff structures (World Bank 2015):

- *Cost recovery.* Tariffs should generate revenues that would allow to fully cover operation and maintenance (O&M) costs, and eventually a portion of capital costs.
- *Economic efficiency.* Tariffs should send correct signals to customers so that water is allocated optimally, minimizing waste and inefficiency.

- *Fairness, equity, and affordability.* Tariffs should result in water and sewer bills that are proportionate to the costs imposed on the utility.
- *Simplicity.* Tariffs should be transparent and relatively simple so that customers can easily understand how their water bill will change based on water consumption.

Consumer Protection and Citizen Engagement

There are a number of channels for receiving complaints related to WSS services. One of the formal grievance channels managed by the HCWW is the "125" hotline. In practice, most complaints are still being communicated through other informal channels, including verbally to laboratory staff, maintenance service staff, security, commercial personnel, or media. There is no strict documentation and record for the complaints received through these informal channels (World Bank 2015). There are also "Customers Service Centers," which are located on the level of all branches (districts) in all the Governorates. The Centers receive different types of complaints, but their core operation is more oriented to issues related to billing and connecting new customers (subscription) (World Bank 2015). WSCs send reports to the Public Awareness and Customers Services Department at the HCWW, which is responsible for monitoring checks on a daily basis, and documenting the number of grievances received, the actions taken to handle them, and progress in resolving the complaints. They also send samples of the recorded calls to the Public Awareness and Customers Services Department at the HCWW (World Bank 2015). The HCWW produces regular reports on the types of complaints received and this report is used to inform decision makers. Several institutions are responsible for addressing grievances in the WSS sector at the national, governorate, and district levels. Table 3.4 provides a brief description of the main responsibilities of each institution.

TABLE 3.4. Roles and Responsibilities of Grievance Mechanisms in the Water Supply and Sanitation Sector

Institution	Roles and responsibilities
PMU of MHUUC	Overall leadership for overseeing the timely implementation of all activities under Egypt's WSS sector.
EWRA	Responsible for collecting information from WSCs and HCWW on various aspects of the sector, including grievances and certifying the WSCs in the future.
HCWW	Oversees the work of all the WSCs and operates at the national level. Their Awareness Raising and Public Relations Departments track grievances based on reports sent from WSCs to them. The HCWW provides remote IT support to WSCs. Complaints that are not resolved at the WSC level are escalated to the HCWW. It is responsible for quality control and monitoring and evaluation of grievance mechanisms and ensures that good practices developed in one WSC are scaled up to other WSCs.
WSCs	WSS service delivery operating at the governorate level. They also host the Call Centers and report to HCWW. They oversee the Customer Service Centers at the branch level. They are responsible for addressing and resolving customer complaints and grievances.

Source: World Bank compilations (2015b. "Sustainable Rural Sanitation Services Program for Results (SRSSP), Technical Assessment.").
Note: EWRA= Egypt Water and Wastewater Regulatory Agency; HCWW= Holding Company for Water and Wastewater; MHCC= Ministry of Housing, Utilities and Urban Communities; PMU= Program Management Unit; WSC=Water and Sanitation Company; WSS = water supply and sanitation.

Performance Monitoring

One of the first initiatives undertaken by HCWW to monitor and evaluate the performance of the WSCs was the development of the Monitoring, Analysis, and Reporting System (MARS) program, through which it monitors the performance of its WSCs through select Key Performance Indicators (KPIs). The MARS tool allows for the periodical transfer of data from the WSCs to the HCWW, which includes performance indicators, water and wastewater quality sampling, technical monitoring, and financial monitoring data (annex 3.1). MARS enables the HCWW to monitor and benchmark performance of the WSCs, identify areas of improvement, understand progress toward sector objectives including cost recovery, and reward initiative or take remedial action (USAID 2009).

In parallel to the MARS, the Annual Information Return (AIR) system was first introduced in 2009 (USAID 2012). EWRA collects information on WSC performance from the HCWW and develops the Annual Information Return and produces a report for the MHUUC, which includes recommendations for improving sector performance. Table 3.5 lists the performance criteria of the WSCs reported by EWRA, which include financial, commercial, service, quality, and technical indicators (ACWUA 2013, 49-51):

TABLE 3.5. Annual Information Return (AIR) Performance Criteria

Performance criteria	Select indicators
WSS: Access	• Access levels and number of customers subscribed to WSS services
	• Number of water and sanitation networks conforming to Egyptian laws and standards
WSS: Quality	• Quality of treated wastewater and drinking water
Technical	• Operational performance
	• Non-revenue Water
	• Actual capacity compared to the design capacity of water stations by branch
	• Sample pumping stations, networks, and WWTPs in line with Egyptian technical and operational standards at the national and branch levels
Financial	• Costs and expenses of WSS services categorized by activity
	• Costs and expenses of WSS services categorized by operations process
	• Total revenue
	• Total grants
	• Labor costs and total number of workforce
	• Revenue water and number of customers
	• Billing collection rate
	• Electricity consumption and costs
	• Value of fixed assets and their replacement and maintenance costs
Consumer protection	• Total number of complaints received
	• Complaint source, resolution, and effectiveness in response

Source: World Bank compilations and EWRA, 2015.
Note: WSS = water supply and sanitation; WWTPs = Wastewater Treatment Plants.

Next Steps

Although there is much to be done to further develop Egypt's WSS regulatory framework, EWRA has taken a proactive approach, with significant support from the donor community, to develop its technical capacity. One pending issue is the enactment of the Water Law, which would provide additional de jure support to EWRA for carrying out its role. At the time of writing, Parliament is expected to finalize the Water Law imminently. It would establish a firmer legal basis for concession agreements, clarify regulatory responsibilities, and provide sanctions for noncompliance. Some of the responsibilities EWRA might assume include:

- Regulation of all activities related to drinking water and wastewater services
- Licensing of WSCs
- Auditing all sector activities/projects
- Following up on water and wastewater projects in order to achieve the highest level of performance; ensure service sustainability without compromising quality and efficiency; and assure the provision of services to customers in a satisfactory and affordable manner.

ANNEX 3.1. Monitoring, Analysis, and Reporting System (MARS) Performance Indicators and Definitions

Indicator	Definition
Wastewater indicators	
Cost indicators	
Labor cost per cubic meter of wastewater treated (LE/cubic meter)	Labor costs: cost of salaries, including technical and managerial labor (salaries, bonuses, overtime, allowances, and insurance)
Energy cost per cubic meter of wastewater treated (LE/cubic meter)	Energy costs: cost of electricity, oils, coal, and greases
Chemicals cost per cubic meter of wastewater treated (LE/cubic meter)	Chemicals costs: all costs related to material and chemicals used for wastewater treatment
Rest of O&M cost per cubic meter of wastewater treated (LE/cubic meter)	Rest of O&M costs: including costs of maintenance, spare parts, transportation, publications, etc.
Total O&M cost per cubic meter of wastewater treated (LE/cubic meter)	
Financial indicators	
Percentage of activity revenue represented by cost of O&M regained	O&M costs regained/total O&M cost
Percentage of total revenue represented by total cost of O&M and depreciation regained	O&M costs plus depreciation regained/total O&M cost
Percentage of total revenue represented by total expenses	Total revenue/total cost
Labor cost/total O&M cost (%)	Labor cost/total O&M cost
Energy cost/total O&M cost (%)	Energy cost/total O&M cost
Chemicals cost/total O&M cost (%)	Chemicals cost/total O&M cost

table continues next page

ANNEX 3.1. continued

Indicator	Definition
Rest of O&M cost/total O&M cost (%)	Rest of O&M cost/total O&M cost
Wage pound production (value) (total operating revenue/labor cost)	Total operating revenues/total labor cost
Total cost of O&M per cubic meter of collected wastewater (LE/cubic meter)	Total O&M cost/each cubic meter of collected wastewater
Coverage of the O&M cost of septic evacuation from septic evacuation revenues	Septic evacuation revenue/septic evacuation total O&M cost (material, transportation, energy)
Coverage of the O&M cost of domestic connections from connections revenues	Domestic connections operations revenue/total O&M for domestic services
Commercial and administrative indicators	
Productivity per 1LE (amount of treated wastewater/labor cost)	Amount of treated wastewater/labor cost
Number of employees per 1000 wastewater connections	Total number of workers in wastewater/total number of wastewater connections (1000s)
Number of complaints per 1000 wastewater connections	Total number of complaints per year (network blockages, odor, overflow, etc.)/total number of wastewater connections (1000s)
Septic evacuation service revenue/total operations revenue	–
Domestic connections service revenue/total operations revenue	–
Other operation revenues/total operations revenue	Other operations revenues/total operations revenues
Revenue collected from the WSC/total wastewater revenue (Cairo and Alexandria)	–
Technical indicators	
Percentage of wastewater treated	Total quantity of treated wastewater/total quantity of collected wastewater
Percentage of samples meeting specifications	Total samples passed (conforming to the applicable laws and rules of the Ministry of Health, EEAA and WSC labs)/total samples tested
Electricity consumption for 1000 cubic meter (kW/1000 cubic meter)	–
Percentage of coverage from wastewater	Total quantity of collected wastewater/total quantity of water produced
Percentage of outlets to connections	Number of connections established/number of planned connections
Percentage of utilization of treatment plants	Actual volume of wastewater treated/WWTPs design capacity
Percentage of cleared networks	Length of cleared networks in kms/total length in kms
Water indicators	
Cost indicators (same as above)	
Financial indicators (same as above)	
Commercial and administrative indicators	
Percentage of collection from period's bills domestic	Cash collected from current period of revenues/total period revenues or bills issued during the period
Percentage of collection from period's bills governmental	Cash collected from current period of revenues/total period revenues or bills issued during the period
Percentage of collection from period's bills others	Cash collected from current period of revenues/total period revenues or bills issued during the period

table continues next page

ANNEX 3.1. continued

Indicator	Definition
Percentage of collection from arrears domestic	Cash collected from arrears/receivables balance at the beginning of the period
Percentage of collection from arrears governmental	Cash collected from arrears/receivables balance at the beginning of the period
Percentage of collection from arrears others	Cash collected from arrears/receivables balance at the beginning of the period
Percent of issued bills to accounts	Percent of bills issued/total number of accounts
Productivity per 1LE (amount of treated wastewater/labor cost)	Amount of water produced/labor cost
Number of employees per 1000 water connections	Total number of workers in water/total number of water connections (1000s)
Number of complaints per 1000 water connections (in terms of service and bills)	Total number of complaints per year (service stoppage or substandard)/ total number of water connections (1000s)
Other operation revenues/total operation revenue	
Percentage of connection fitted with meters	Total number of metered connections/total number of connections
Percentage of functioning meters	Total number of functioning meters/total number of metered connections
Technical indicators	
Percentage of water measured (according to meters)	Quantity of metered produced water/total quantity of produced water
Percentage of plants fitted with meters	Number of plants fitted with functioning meters/total number of plants
Percentage of water sold versus actual readings	Quantity of sold water by readings/volume of water sold
Amount of alum used per one cubic meter of water produced (gm/cubic meter)	Amount of alum used to purify one cubic meter of water in grams
Amount of chlorine used per one cubic meter of water produced (gm/cubic meter)	Amount of chlorine used to purify one cubic meter of water in grams
Percentage of leakage	Total quantity of sold water/total quantity of water produced
Percentage of samples meeting specifications	Total number of samples passed/total number of samples tested conforming to the laws and rules of the Ministry of Health, EEAA, and WSC labs

Source: USAID, 2009 Egypt Environmental Affairs Agency.
Note: gm = gram; km = kilometers; LE = Egyptian pounds; O&M = operations and maintenance; WSC = Water and Sanitation Company; WWTP = Wastewater Treatment Plant.

Notes

1. World Development Indicators, 2014, World Bank.
2. CAPMAS defines the poor as households that are unable to cover costs of the basket of necessary basic goods and services, comprised of the total costs to cover the basic nutritional needs and nonconsumption goods such as transportation.
3. Calculations from Egypt Poverty Map (CAPMAS 2013).
4. The WHO and UNICEF Joint Monitoring Programme for WSS defines an improved drinking water source "as one that, by nature of its construction or through active intervention, is protected from outside contamination, in particular from contamination with faecal matter. This includes the following: piped water into dwelling, piped water in to plot, public tap, tube well, protected dug wells, protected springs, rainwater collection and bottled water."
5. UNICEF, http://www.unicef.org/egypt/immunisation_7135.html.

6. The WHO and UNICF Joint Monitoring Programme for WSS defines an improved sanitation facility "as one that hygienically separates human excreta from human contact."

7. The Egyptian government defines access to water and sanitation as households with access to piped connections to a water and wastewater treatment plants.

8. The percentage was as of about two weeks before the 2008 Demographic Health Survey (DHS) survey. The DHS categorizes the interruptions of water supply by frequency (daily, a few times per week, and less frequently), but does not mention the duration of interruptions.

9. Donia 2007.

10. The descriptions here are as of September 2016, before the enactment of the new draft Water Law, which may be put in place as early as 2017.

11. This section is based on the existing laws and decrees, and will require updating once the new law is enacted, possibly in 2017.

12. Presidential Decree No. 136 of the year 2004 on Establishment of an Agency for Potable Water and Wastewater and Consumer Protection.

13. Presidential Decree No. 136 of the year 2004 on Establishment of an Agency for Potable Water and Wastewater and Consumer Protection.

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Chapter 4 Status of Water Sector Regulation in Jordan

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Abstract

Jordan is one of the world's most water-scarce countries. Options for increasing water resources are limited and highly political. Further complicating matters, Jordan is host to a very large population of displaced persons. The Jordanian government recognizes the importance of sustainable water use, is taking steps to increase efficiency and awareness of this vital resource, and is working with partners and varied stakeholders, including the private sector, to increase the options available.

Introduction to the Water Supply and Sanitation Sector and the Country Context

Jordan is an upper-middle-income country with a population of 6.6 million,[1] not including an estimated 1.3 million refugees (mainly Syrian) who have entered the country since 2011.[2] One of the world's most water-scarce countries, Jordan has faced a steep increase in water demand in recent years because of rapid population growth. The influx of refugees alone has led to an increase in demand by 21 percent.[3] Groundwater contributes approximately 61 percent to total water supply (World Bank 2016),[4] but the aquifers are being depleted. This depletion has been exacerbated by the lack of enforcement of regulations on private sector drilling of wells, and the near absence of controls on licensed abstraction rates. As water tables drop, pumping costs and salinity levels increase.[5] According to the National Water Strategy 2016–55 document, since the Disi-Amman Conveyor became operational in summer 2013, the continuity of supply in the capital city of Amman has improved. Aqaba has continuous water supply from the Disi aquifer. However, there are still water shortages in the northern Governorates because of the influx of refugees.

In addition to securing adequate raw water, other main challenges the government and service providers face (ACWUA 2013, 73–82) are to:

- Improve the financial viability of services by fostering efficiency and increasing cost recovery, while taking into account the political sensitivity of water
- Encourage more efficient use of water through public education and awareness campaigns, as well as appropriate pricing.

More than half of water resources in Jordan is used for irrigation. The high cost of finding and providing new nontraditional water sources and the long distances between water sources and consumption centers contribute to high capital and operational costs.[6] Water has traditionally been perceived as a public good and water services (including irrigation) are highly subsidized.

Capital expenditures are funded primarily by build-operate-transfer (BOT) projects (government concessions); the government and donors (as capital contributions and grants);

and, to a lesser extent, by national and foreign loans (as debt). Capital costs are not recovered through end user tariffs. In 2014, revenues for WSS services covered only 70 percent of operations and maintenance (O&M) costs. Inadequate revenues from services have contributed to the country's fiscal deficit (World Bank 2016, 8). Revenues for irrigation services also do not recover all O&M costs and require significant annual subsidies (van den Berg and others 2016, Executive Summary, ix-xii). Recognition that these deficits could not be maintained contributed to the decisions to increase WSS volumetric tariffs in 2014 and fixed charges in 2016. Further tariff increases and current and future efforts to improve efficiency are expected to contribute to gradual improvements in cost recovery (World Bank 2016, 25, 42). Efforts to reduce the financial burden of irrigation services are expected to focus on improving energy efficiency and wastewater reuse (World Bank 2016, 28-29).

Table 4.1 provides basic data on population, water resources, water use by sector, and access of the population to WSS services.

TABLE 4.1. Basic Data on the Water Sector in Jordan

Population: Total	6.6 million,[a] not including recent refugees
Urban[b]	83.3% (5.5 million)
Rural[b]	16.7% (1.1 million)
Total annual water endowment of the country[c]	106 m^3 per capita (699.6 million m^3 total)
Percentage of water used by sector:[d]	
Domestic	44
Agricultural	52
Industrial	4
Percentage of population with improved water service: Total[e]	97
Urban[f]	98
Rural[g]	92
Percentage of population with improved sanitation[h]	99
Urban[i]	99
Rural[j]	99

Source: World Bank, World Development Indicators; World Bank 2016.
a. World Bank, http://wdi.worldbank.org/table/2.1.
b. World Bank, http://data.worldbank.org/indicator/SP.RUR.TOTL. The rural population in 2014 was 1,093,657. Therefore 5.5 million people live in urban settings and 1.1 million in rural settings. The percentage was calculated with those figures.
c. World Bank, http://data.worldbank.org/indicator/ER.H2O.INTR.PC.
d. World Bank 2016, 25.
e. This percentage does not include the recent influx of Syrian refugees. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.ZS.
f. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.UR.ZS.
g. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.RU.ZS.
h. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.
i. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.UR.
j. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.RU.

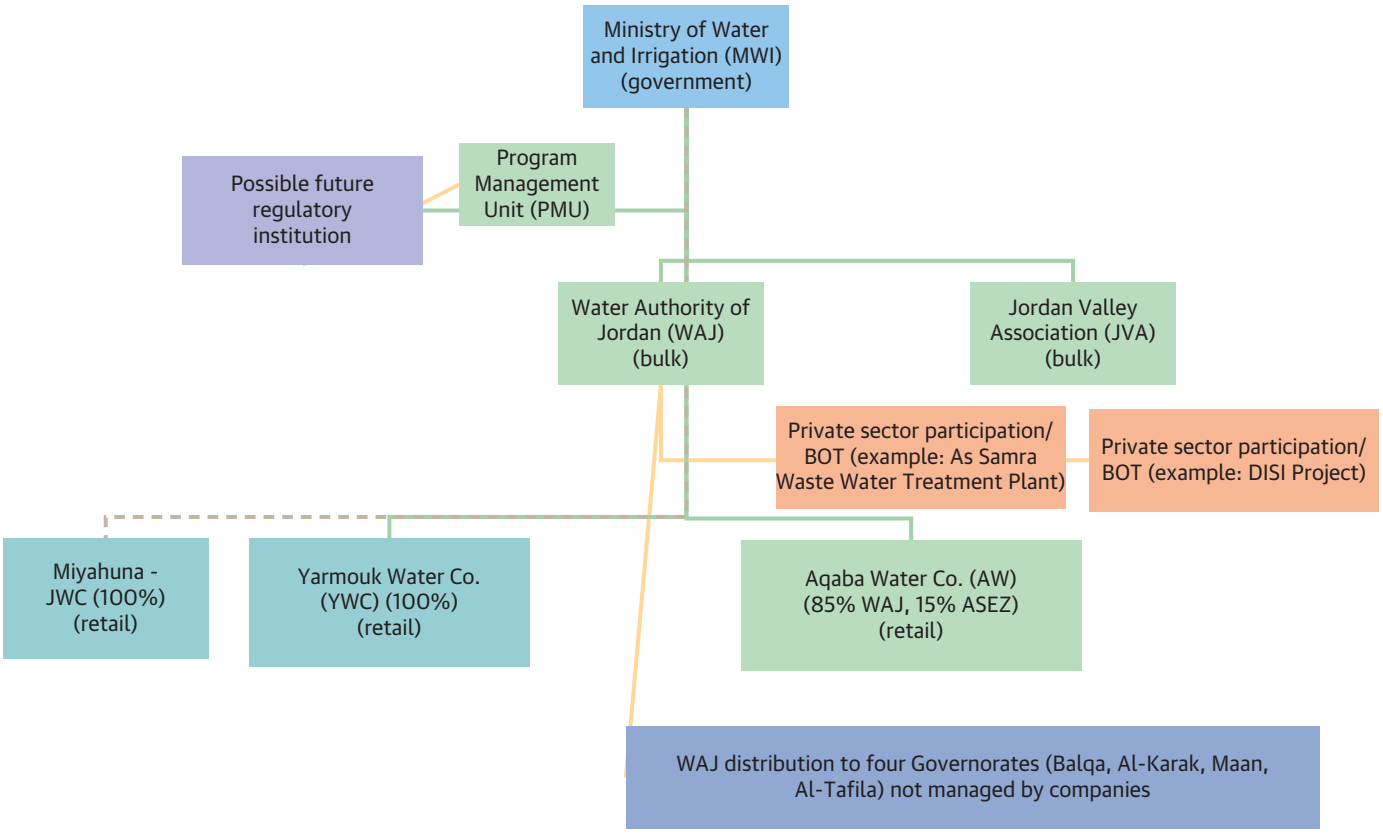
Structure and Organization of the Water Supply and Sanitation Sector

The institutional framework of Jordan's WSS sector is shown in figure 4.1.

The Ministry of Water and Irrigation (MWI) is responsible for overall leadership on water matters, including formulation of strategy, policy, planning and decision making, resource development, provision of services, pricing, and monitoring.

The Water Authority of Jordan (WAJ) (created by Law No. 18 in 1988, which predates the establishment of MWI) is responsible for ensuring bulk water supply (except in areas served by the Jordan Valley Authority, JVA) and for developing and operating WSS services throughout Jordan. Bulk water is supplied in part through WAJ's own abstraction operations, in part through BOT contracts and, in the Jordan Valley, by an arrangement with JVA. WAJ owns and provides bulk water to three limited liability WSS utilities that operate the treatment and distribution of drinking water and the collection and treatment of wastewater in several governorates. WAJ remains responsible for funding capital investments for these three utilities.

FIGURE 4.1. Institutional Framework of Jordan's Water Supply and Sanitation Sector



Source: World Bank.
Note: ASEZ = Aqaba Special Economic Zone; BOT=build-operate-transfer; JWC = Jordan Water Company.

- *The Jordan Water Company-Miyahuna* is a government (WAJ)-owned utility that serves Amman, and certain parts of Balqa, Zarqa and Madaba governorates. It has an estimated 550,000 customers.
- *Aqaba Water Company (AWC)* serves Aqaba governorate. Unlike the other water companies, AWC is not a fully owned subsidiary of WAJ. WAJ has a substantial ownership stake (85 percent), but the remaining minority share (15 percent) is owned by the Aqaba Special Economic Zone (ASEZA).
- *Yarmouk Water Company (YWC)* is fully owned by the WAJ and serves four northern governorates (Irbid, Mafraq, Ajloun, and Jerash). YWC was created in January 2011. A management team from the French transnational company, Veolia, was embedded from September 2011 to December 2012 to carry out change management, develop solid corporate practices, and achieve the ring-fencing of YWC from WAJ.[7]

WAJ's governorate-level administrations operate WSS services in areas not served by the three utilities (in Al-Karak, Maan, and Al-Tafila governorates, and parts of Balqa governorate).

The Jordan Valley Authority (JVA) (created by Law No. 30 of 2001) is responsible for the development and protection of water resources, the management of dams, and the provision of irrigation services in the Jordan Rift Valley.

The Program Management Unit (PMU) of MWI is charged with auditing and monitoring the performance of the corporatized utilities and developing and promoting private sector partnerships. Its mission is "to obtain efficiencies in investment in infrastructure and to improve the management of water and sanitation services." It is intended to resemble a regulator, but currently lacks the capacity and de facto authority to carry out regulatory functions.

The *Water Sector Audit Unit (WSAU)* within PMU was created in 2008 to audit and monitor private sector activities, report to MWI, and recommend remedial action when necessary. At inception, it was believed WSAU might evolve into a full-fledged regulatory body,[8] but this has not occurred, and it seems to have limited authority.

Joint Technical Affairs Committees, comprised of representatives of MWI and other concerned ministries and institutions, advise the Minister of MWI on a variety of issues, including investment projects, land use, and water resources development. There are more than 15 permanent committees. In addition, temporary committees are formed as needed.[9]

JVA has organized *Water Users Associations (WUAs)* in the Jordan Valley to encourage community and private sector participation in managing public resources and to provide services for customers. As of 2015, 19 WUAs had been established and 16 had signed agreements with JVA under which the WUAs assume specific tasks and receive fees paid by JVA. JVA and MWI are monitoring the performance and sustainability of the initiative.[10]

Important infrastructure projects that require significant funding have been financed by *build-operate-transfer projects (BOTs)*, as well as other forms of private sector participation.

Several private investments in water production and transmission and wastewater treatment have contributed to improving water security. These include the the Disi Water Conveyance Project (box 4.1), the As Samara Wastewater Treatment Plant (box 4.2), and the Red Sea to Dead Sea Conveyor, all of which are supervised by MWI (with support from JVA and WAJ).

BOX 4.1. DISI-Amman Conveyor

The Disi-Amman Conveyor is a multinational build-operate-transfer (BOT) project to build and operate a 325 km-long pipeline to bring water from a nonrenewable aquifer located under the Disi region, near the Saudi border (Wadi Rum) to Amman, Aqaba and recently from Amman onward to Zarqa. It will carry 100 million m^3 per year for a total of 25 years. Construction was mainly carried out by the Disi Water Company (DIWACO), which is owned by GAMA Energy Water International B.V. (50 percent by GAMA Holding, a Turkish Company; and 50 percent by a subsidiary of General Electric). Disi-Amman Conveyor is operated by Disi Amman Operation & Maintenance (DAOM), a subsidiary of Suez Environnement (a French company). The project became operational in 2013 and commercial as of 2014.

BOX 4.2. As Samra Wastewater Treatment Plant Expansion

In 2012, the Jordanian government, led by the Ministry of Water and Irrigation (MWI), initiated an expansion (Phase II) of the As Samra wastewater treatment plant. The project is funded by international donors such as The Millennium Challenge Corporation; the MWI; and private lenders, including a local syndicate led by The Arab Bank. Equity is provided by international corporations acting as sponsors. The two project companies are Samra Wastewater Treatment Plant Company Ltd. (SPC) and Samra Plant Operation and Maintenance Co. Ltd. (O&M), which are partnerships of Morganti, Suez Environnement, and its subsidiary, Degrémont. The innovative financing package, which was designed to mitigate risks, has received international prizes. It is the first in the Middle East to incorporate private, host government, and donor financing.

Phase I was completed in 2008 under a 25-year build-operate-transfer (BOT) contract signed in 2003 It has a capacity of a 267,000 m^3/day. Phase II, also to be built and operated under a 25-year BOT contract, has a total project cost of US$267.7 million. The expansion works are expected to last for three years, followed by 22 years of operations (until 2037).

box continues next page

BOX 4.2. continued

The As Samra expansion project (Phase II) will increase the plant's water line capacity by 40 percent to 367,000 m^3/day, and increase sludge line capacity by 80 percent. Once Phase II is complete, it is estimated that 75 percent of wastewater treated in Jordan will be treated in the As Samra plant. The reusable treated water produced in the plant will be used for irrigation and will represent about 10 percent of the water supply available in the country. Considering that about 65 percent of water resources in Jordan is used for irrigation, the re-use of treated water frees up fresh water for more valuable uses and is critical for balancing water supply and demand.

Sources: Samra Wastewater Treatment Plant, A Major Asset for Jordan (power point presentation), SPC, Samra Wastewater Treatment Plant Company, October 17, 2014; "Suez Environnement Signs a 25-year Contract to Expand the As Samra (Jordan) Wastewater Treatment Plant," June 12, 2002 press release, accessed May 16, 2016, http://www.club.suez-environnement.com/wp-content/uploads/2012/11/cp-assamra-extension-vdef-va.pdf.

Legal, Policy, and Regulatory Framework

The Jordanian water sector has historically been highly centralized and nationally integrated. The government is now moving toward disaggregation and devolution of responsibilities through the creation of ring-fenced service providers and the engagement of the private sector in key projects.

Cost recovery is currently inadequate and tariffs for residential customers are extremely low. Subsidies are not highly targeted. However, the National Water Strategy endorses the objective of financial viability through full cost recovery of O&M as well as capital costs in the long term. Among the Strategy's stated objectives are to reduce and target public subsidies and "to protect the interests of consumers while providing a good quality service and paying attention to the poor."[11]

The National Water Strategy emphasizes increased use of nonconventional water sources such as treated wastewater and desalinated seawater to bridge the shortfall in supply. Projects such as the As Samara Wastewater Treatment Expansion and the proposed Red Sea to Dead Sea Conveyor are important components of this strategy.[12]

A new Water Law is being drafted to reflect the objectives set out in the strategy documents. The new water law will define the structure and functions of the institutions governing and managing the water sector and clarify the responsibilities of the different ministries involved in the water sector. It will also clarify legal issues related to water.[13]

Key water sector laws and policy documents are summarized in table 4.2, and in some cases elaborated in more detail in the next section on regulation.

TABLE 4.2. Main Laws and Strategy Documents Governing the Water Supply and Sanitation Sector

Title of strategy/policy	Summary
Water sector	
Law No. 54 of 1992 (executive order)	Creates the Ministry of Water and Irrigation (MWI) and makes it responsible for all water issues, including formulating strategy, policy and decision making, pricing, planning, and resources monitoring.
Bylaw No. 14 of 2014	Gives MWI full responsibility for water and public sewerage and all related projects in Jordan.
Law No. 18 of 1988	Created the Water Authority of Jordan (WAJ), which predates the MWI, and makes it responsible for bulk water supply to municipal and industrial users (except in areas served by the Jordan Valley Authority), and the development and operation of water supply and wastewater systems.
Law No. 30 of 2001	Created the Jordan Valley Authority (JVA) and made it responsible for the development and conservation of water resources in the Jordan Rift Valley, including functions such as the provision of irrigation services, the management of dams, the development of wastewater reuse, soil conservation, protecting and saving the Dead Sea, and the management and protection of land in the Araba valley for agricultural, tourist, and industrial purposes.[a]
Related laws	
Standards and Metrology Law No. 22 of 2000	Governs quality of service. Assigns legal responsibility for setting standards for drinking water[b] and effluent quality, sampling methods, and engineering standards to the Jordan Institution for Standards and Metrology (JISM).[c]
Other selected related laws	
Public Health Law No. 47 of 2008	Gives the Minsitry of Health the responsibility for ensuring that water supply and wastewater services comply with public health standards for drinking water quality and sanitation. Empowers the Ministry of Environment to control and monitor the quality of water pumped for domestic use.[d]
Environmental Protection Law No. 85 of 2006	Provides for the protection of water resources against ground water contamination, among other environmental matters.
Groundwater Bylaw No. 85 of 2002	Addresses pollution prevention and the protection of water resources used for domestic purposes through appropriate land use restrictions and zoning. Also deals with the development, protection, management of groundwater resources, and reduction of abstraction from each renewable aquifer to the sustainable rate.[e]
Strategy documents	
National Water Strategy 2016–55 (2015)[f] (sometimes referred to as "Vision 2025")	A new strategy was required because the population projection for 2022 had already been reached due to the influx of refugees. The strategy calls for institutional reform and endorses independent regulation of the sector; a focus on new water source options (including harvesting rainwater and brackish and seawater desalination) while sustaining existing levels of supply; reducing the drain on public funds through tariffs that should eventually recover all costs; further corporatization of operators; improvements in governance and management; and clear boundaries between bulk and retail water services.[g] It includes key performance indicators for water security.
Jordan's Water Strategy 2008–22–Water for Life (2009)	Though superseded by the 2015 Strategy, it was an important document that called for institutional reform and endorsed independent regulation of the sector (which are reiterated in the 2015 strategy).

Source: World Bank compilations.

a. Jordan Valley Authority, http://www.jva.gov.jo/sites/en-us/SitePages/About%20JVA/Institutional%20goals.aspx.

b. Jordanian Institute of Standards and Metrology, Technical Regulation on Drinking Water, http://www.gama.com.tr/doc/3-5.pdf.

c. Gerlach 2010.

d. Hübschen 2011, 134.

e. El-Naqa and Al-Shayeb 2009.

f. http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20%20The%20Water%20Sector/National%20Water%20Strategy%28%202016-2025%29-25.2.2016.pdf.

g. National Water Strategy Document 2016–55, pg. 31, http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20%20The%20Water%20Sector/National%20Water%20Strategy%28%202016-2025%29-25.2.2016.pdf.

Regulation of Water Supply and Sanitation Services

Drinking water quality and effluent quality. Regulation of drinking water quality and wastewater effluents is and will remain the remit of the Ministry of Health (MoH) and Ministry of Environment (MoE), respectively. The Ministry of Health monitors the quality of water provided by all types of service providers, including private water tankers. It also issues (and can revoke) the licenses of private water tankers.[14] The consultants were unable to determine how frequently the two ministries sample or require operators to sample the water or effluents.

Licensing of WSS service providers. Currently WAJ issues permits/mandates for utilities (subject to MWI approval). These are not necessarily time bound, and for this reason they are not licenses per se. It is not known whether the proposed new Water Law, which is being drafted, would delegate authority to issue licenses to a regulatory body.

Groundwater abstraction. Permits for groundwater abstraction are issued by the MWI, which is developing a more comprehensive regime to improve control and mitigate the depletion of aquifers.

Tariff Setting and Reviews

WAJ and JVA recommend water tariff changes as well as capital investment projects to the Council of Ministers (Cabinet) for approval. In the case of tariffs, changes are subject to the approval of the Parliament.[15] In addition, the King (Royal Court) may veto tariff changes and, as recounted later in this chapter, has done so. The National Strategy (Vision 2025) confirms current tariff-setting practices: "WAJ and JVA recommend water service cost changes and capital projects, but the Cabinet has ultimate regulatory authority, especially for tariffs."[16] The National Water Strategy endorsed the objective of financial viability through full cost recovery of O&M as well as capital costs in the long term.

In 2014, volumetric tariffs for all categories of customers and usage were increased. In late 2015, the fixed rates across most customer categories were increased. However, a recent attempt of the Miyahuna Company to bring tariffs in line with rising costs of production was unexpectedly vetoed. While verbal approval for the revised tariff structure had been secured from the Cabinet, it was vetoed by the Royal Court.[17]

Cost recovery is currently inadequate and tariffs for residential customers are extremely low. Subsidies are not targeted to the truly needy low-income households. Rather, all residential customers are highly subsidized. Among stated objectives of the Strategy are to reduce and target public subsidies and "to protect the interests of consumers while providing a good quality service and paying attention to the poor."[18]

Currently, the low volumetric tariff for the first block is applied to all residential consumption, regardless of income: all residential customers pay JD 0.12 per m^3 (US$0.17/$m^3$) for the first 18 m^3 per quarter. This rate is highly subsidized. In contrast, nonresidential (commercial and industrial) customers of the three water utilities pay a water tariff of JD 1.3 per m^3 (US$1.83 per m^3), which is 11 times the residential water tariff. However, it is worth noting

that when the fixed charge is included, the cost of 18 m^3 rises to JD 0.36/m^3 (US$0.51) for residential customers. The cost of 18 m^3 rises to JD 1.73/m^3 (US$2.44 m^3) for no-residential customers when the fixed charge is included-a figure that is nearly five times the cost for residential customers.

The nonresidential sewerage tariff is more than 20 times higher than the first block of sewerage tariffs paid by residential customers. Only when residential consumption exceeds 90 m^3 per quarter does the residential tariff exceed the nonresidential tariff.

Tables 4.3 and 4.4 show the tariff schedules for residential and nonresidential customers.[19] As shown in the tables, the water bill consists of three parts: a fixed charge to cover the administrative costs; volumetric water consumption tariffs; and volumetric wastewater tariffs (for those who have a sewerage connection).

Connection fees for residential customers are also lower than those for nonresidential customers. The minimum residential connection fee is JD 245 (US$345.56) and the minimum for nonresidential connections is JD 325 (US$458.39). The incurred amount depends

TABLE 4.3. Tariffs for Residential Customers Served by WSS Companies

Jordanian Dinars

Consumption (m^3/quarter)	Fixed charge per quarter[a]	Water tariff/m^3[b]	Wastewater tariff/m^3[b]
0–18 (min. 18m^3)[c]	4.40	0.1183 (2.13)	0.0383 (0.69)
19–36	3.85	0.145	0.045
37–54	1.65	0.500	0.290
55–72	—	0.935	0.570
73–90	2.00	1.160	0.785
91–126	—	1.610	0.925
≥ 127	—	1.920	1.105

Source: http://www.waj.gov.jo/sites/en-us/Documents/Water%20and%20Wastewater%20Tariff%20for%20Quarterly%20Bills%20for%20Governorates%20which%20are%20Managed%20by%20Companies%202016.pdf

Note: The tariff for each block applies to all customers regardless of total consumption. Thus, a customer of one of the companies who consumes 20 m^3 would pay JD 0.118/m^3 for the first eighteen m^3 and JD 0.145/m^3 for the nineteenth and twentieth m^3. m^3 = cubic meters.

a. Fixed charges are cumulative. A customer who consumes 20 m^3 would pay JD 4.4 + JD 3.85 = JD 8.25.

b. Minimum charges are in parentheses.

c. The minimum consumption is 18 m^3/quarter. Thus the minimum quarterly charge for water consumption is JD 2.13 and the minimum quarterly charge for wastewater is JD 0.69. The fixed charge of JD 4.4 is added.

TABLE 4.4. Tariffs for Non-Residential Customers Served by WSS Companies

Jordanian Dinars

Consumption (m^3/quarter)	Fixed charge per quarter[a]	Water tariff/m^3	Wastewater tariff/m^3
0–6[b]	6.0	1.3	0.805
≥ 7	7.8	1.3	0.865

Source: http://www.waj.gov.jo/sites/en-us/Documents/Water%20and%20Wastewater%20Tariff%20for%20Quarterly%20Bills%20for%20Governorates%20which%20are%20Managed%20by%20Companies%202016.pdf

a. It appears that fixed charges are cumulative. If so, a customer who consumes more than 6 m^3 would pay JD 6.0 + JD 7.8 = JD 13.8.

b. Apparently, there is no minimum consumption.

on the area of the property, the type of use, and the length of the wastewater network. No analysis of the affordability of the connection charge was found.

The prices, for residential users in Jordan—especially for the first block—are somewhat lower than other countries in the Middle East and North Africa region. When the fixed charges are taken into account, rates are more comparable. A recent study found that the combined average water and sewerage bills of a household in Jordan are less than 0.5 percent of household monthly expenditures.[20] However, this does not reflect expenditures due to intermittent supply and other factors, such as for bottled water from vendors, as well as emptying septic tanks.[21]

Consumer Protection

A customer's first point of contact is with the utilities. If the problem is not resolved, the customer may contact WAJ and finally MWI. Consultants were unable to obtain more information on how well the process works.

Performance Monitoring and Promotion of PPP/PSP

The Performance Management Unit (PMU) within MWI is charged with developing public-private partnerships (PPPs) and promoting private sector participation (PSP) in water services and management. It also monitors the implementation of donor-funded projects and ensures compliance with covenants.[22] The WSAU within the PMU monitors and audits the performance of only the three corporatized utilities. Its duties include data collection, performance evaluation, periodic inspections, and investment project feasibility reviews.

Next Steps

The National Water Strategy states a number of objectives aimed at rationalizing the sector, improving performance, and promoting water security. Steps envisioned include the following.

- A new Water Law and regulatory framework. The V*ision 2025* strategy document mentions the need for the development of the legislation/regulatory framework governing the water sector. The National Water Strategy states that "there is a growing need for a more consolidated, harmonized and coordinated water management organization, backed by a strong legal/regulatory framework."[23]
- The National Water Strategy states that "MWI will work to complete the separation and corporatization of all water and wastewater utilities and build their capacities to manage the change to continuous supply."[24]
- The Strategy (Vision 2025) endorses improved efficiency in both technical and commercial operations as an essential component of a plan to achieve financial viability over time. Technical improvements in energy efficiency, reduction of physical water losses, and system optimization are proposed. Commercial improvements through the elimination of

unauthorized connections, more effective billing and revenue collection, and the outsourcing of billing to third parties are mentioned. The Strategy states that the government plans to adopt, a Structural Benchmark-Action Plan to Reduce Water Sector [fiscal] Losses, which states its intention to achieve recovery of O&M costs by 2021 through improvements in efficiency and tariff increases.[25]

- The National Water Strategy emphasizes the potential role of the private sector and a greater role for water users associations (WUAs).
- Also mentioned, the National Water Strategy states that subsidies should be appropriately targeted. MWI is currently investigating the issue of whether and how to target subsidies to low-income households.

Notes

1. World Development Indicators, World Bank, http://wdi.worldbank.org/table/2.1.
2. Jordan, especially in 2015, has faced overwhelming pressure on water and sanitation as a result of hosting over 650,000 Syrian refugees and another over 750,000 Syrian residents. (A distinction is made between "refugees" and "residents.") See http://www.mwi.gov.jo/sites/en-us/Hot%20Issues/Strategic%20Documents%20of%20%20The%20Water%20Sector/National%20Water%20Strategy%28%202016-2025%29-25.2.2016.pdf and http://www.theguardian.com/world/2016/feb/03/syrian-refugees-jordan-london-conference. The percentages used in this report are based on total population, without including the refugee figures.
3. World Bank 2016, pg. 3, paragraph 3.
4. Calculated using data from table 4 in World Bank 2016.
5. Jordan's Water Strategy-Water for Life, p. 3-1, http://www.mwi.gov.jo/sites/en-us/Documents/Jordan_Water_Strategy_English.pdf.
6. Jordan 2025, A National Vision and Strategy, announced in May 2015, Part 1, p. 42.
7. "Veolia Managed since 2011 Yarmouk_water_company_value_add_report.pdf," accessed May 16, 2016, http://www.veolia.com/sites/g/files/dvc171/f/assets/documents/2014/05/yarmouk_water_company_value_add_report.pdf.
8. "Water Sector Audit Unit," accessed August 16, 2016, http://www.pmu.gov.jo/Home/AlMeyyahProgram/RegulatoryFramework/WaterSectorAuditUnit/tabid/86/Default.aspx.
9. Water Authority of Jordan Annual Report 2012, pg. 18, http://www.waj.gov.jo/sites/en-us/Documents/Annual%20Report%202012.pdf.
10. Jordan National Water Strategy Document, pg. 19.
11. National Water Strategy, pp. 34 and 49.
12. National Water Strategy, p. 9.
13. From Jordan's Water Strategy-Water for Life p. 3-1 (Goal #1), http://www.mwi.gov.jo/sites/en-us/Documents/Jordan_Water_Strategy_English.pdf.
14. Gerlach 2010, 7-8, item 2.2.5, Jordan.
15. National Water Strategy, p. 20.
16. National Water Strategy, p. 20.
17. http://www.acwua.org/sites/default/files/regulatory_design_and_practice_in_the_mena_region_beyond.pdf Gerlach 2011, pg. 25.
18. National Water Strategy, pp. 34 and 49.

19. Water Authority of Jordan, Water and Wastewater Tariffs for Quarterly Bills for Governorates Which are Managed by Companies, 2016.

20. PWC, "Water Sector Tariff Study v9 (2).pdf," pg. 61.

21. PWC, "Water Sector Tariff Study v9 (2).pdf," pg. 61.

22. ACWUA 2013, 73-82, on Jordan; PMU website, http://pmu.gov.jo/Home/AboutUs/RolesofPMU.aspx.

23. National Water Strategy, p. 17.

24. National Water Strategy, p. 33.

25. World Bank 2016, 18. At the time of writing, the authors understood that there was a Structural Benchmark in place agreed with IMF in 2013, but this is likely to be updated by the end of 2016 as part of the new IMF program.

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Chapter 5 Status of Water Sector Regulation in Morocco

Ali Dirioz

Abstract

Morocco is experiencing high population growth and urbanization, like many other countries in the Middle East and North Africa. Water resources are becoming increasingly scarce. In addition, most of the country's water resources are utilized by the agriculture sector (over 80 percent). As a result, the provision of water supply services is becoming a significant challenge. To meet this challenge, Morocco has utilized a variety of institutional and contractual arrangements to deliver water and sanitation services to its people, involving national, regional, municipal, and private sector entities. The regulatory approach adopted to date is largely the French model of regulation by contract. Further studies of the Moroccan water sector might analyze how the different institutional and service delivery models compare, and the most appropriate regulatory arrangements to support improved access and service delivery in each respective case.

Introduction to the Water Supply and Sanitation Sector and the Country Context

Morocco is an upper-middle-income country with a population of 33.9 million.[1] It is located in northwest Africa, between the Sahara desert and the Atlas mountains, with coastlines on both the Atlantic and the Mediterranean. Given the topography, there are significantly more water resources available in the northern parts of the country than the southern. Morocco's annual population growth rate of 3 percent[2] is much higher than the global average annual growth rate of 1.2 percent.[3] Over time, the urban population has increased and surpassed the rural population, and, at 20.25 million, currently accounts for 59.7 percent of the population (see table 5.1).[4]

In recent years, Morocco has been faced with a set of challenges in the management of its water resources. In particular, a 2013 study by the Arab Countries Water Utilities Association (ACWUA) states that the per capita endowment of water resources is expected to fall from the current 730 m^3 per capita per year to 520 m^3 per capita per year by 2020.[5] Water demand is expected to increase from 13.7 Billion cubic meters (BCM) currently to 16.2 BCM by 2030 (ACWUA 2013). Therefore, the government is focusing on responding to the growing demand for drinking water, while providing agriculture with enough water to meet the population's nutritional needs and encourage export agriculture (ACWUA 2013, 3-21).

TABLE 5.1. Basic Data on the Water Sector in Morocco

Total population[a]	33.90 million
Urban[b]	20.25 million (59.7%)
Rural[c]	13.65 million (40. 3%)
Annual water endowment of the country	29,391.3 million m^3 (total)[d] (867 m^3 per capita)[e]
Percentage of population with improved water supply: Total[g]	85%[g]
Urban[h]	99%[h]
Rural[i]	65%[i]
Percentage of population with improved sanitation: Total[j]	77%[j]
Urban[k]	84%[k]
Rural[l]	66%[l]

a. World Development Indicators (WDI), World Bank, http://wdi.worldbank.org/table/2.1.
b. World Bank indicator, WDI urban population, http://data.worldbank.org/indicator/SP.URB.TOTL (percentage was calculated).
c. World Bank indicator, WDI rural population, http://data.worldbank.org/indicator/SP.RUR.TOTL (percentage was calculated).
d. Calculated as follows: 867 m^3 per capita x 33.9 million total population = 29,391.3 million m^3.
e. World Bank, http://data.worldbank.org/indicator/ER.H2O.INTR.PC.
f. FAO AQUASTAT, http://www.fao.org/nr/water/aquastat/countries_regions/Profile_segments/MAR-WU_eng.stm) Table 4, 9156/10580. Around 86.5 percent.
g. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.ZS.
h. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.UR.ZS.
I. World Bank, http://data.worldbank.org/indicator/SH.H2O.SAFE.RU.ZS.
j. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.
k. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.UR.
l. World Bank, http://data.worldbank.org/indicator/SH.STA.ACSN.RU.

Structure and Organization of the Water Supply and Sanitation Sector

The institutional framework of Morocco's WSS sector is shown in figure 5.1.

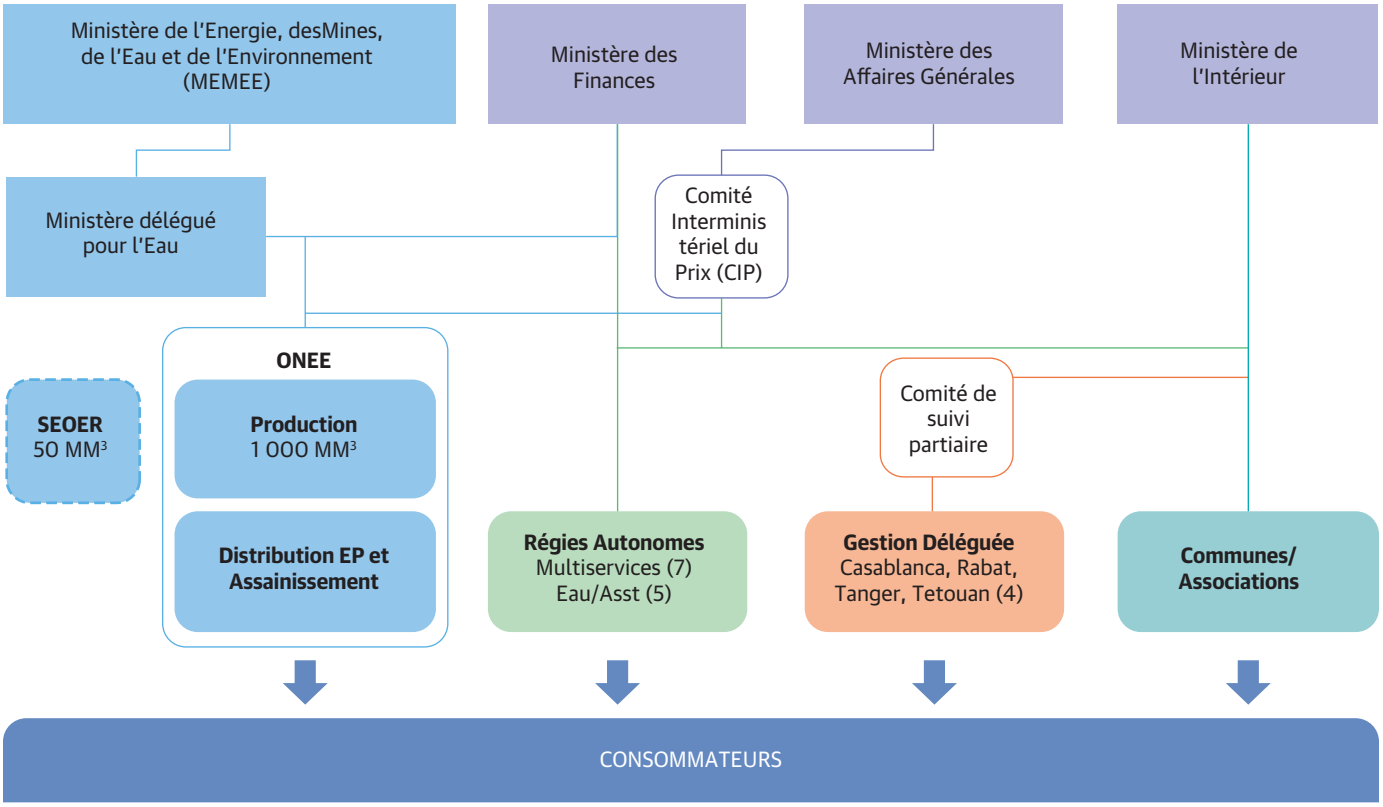
As is often the case in the water sector, several ministries are involved in the management of the sector. The principle line ministry is the *Ministry of Energy, Mines, Water, and Environment (MEMEE)*. Within this very large ministry, most of the responsibilities related to the water sector have been delegated to the *Ministry of Water*.

The *Interministerial Price Committee (CIP)* housed under the *Ministry of General Affairs and Governance* plays an important role in tariff setting. Four ministries are represented in CIP: the Ministry of General Affairs and Governance (MAGG); the Ministry of Energy, Mines, Water, and Environment (MEMEE); the Ministry of the Interior (MoI); *and the Ministry of Finance* (MoF).

CIP plays an overall quasi-regulatory role. Service delivery is organized largely along the lines of the French contractual model. Contracts are the basis of the relationship between the government and service providers, whether private or public. (The regulatory arrangements within this model are explained further in the fourth section.)

The *Ministry of the Interior* plays a role in monitoring and supervision of the sector. One of the MoI's departments (Direction des Regies et Services Concedes –DRSC) handles the day-to-day monitoring and supervision of the *Autonomous Agencies (Régies Autonomes)*,

FIGURE 5.1. Institutional Framework of Morocco's Water Supply and Sanitation Sector



Source: World Bank compilations.

as well as the renegotiation of the private concessions. To date, this monitoring and supervision has been fairly light, perhaps in part because of relatively limited capacity. The DEA, also within MoI, is intended to monitor service provision in small local collectives that have been delegated to the *National Office of Electricity and Drinking Water Supply/L'Office National de l'Electricité et de l'Eau Potable (ONEE)*. But again, the supervision/monitoring function to date has been fairly light.

Other ministries that are not part of CIP but nonetheless are stakeholders in the water sector include the *Ministry of Agriculture* and the *Ministry of Health*. It is important to note that the Ministry of Agriculture, through its *Irrigation Directorate*, oversees about 86 percent of the water in Morocco.

For production and distribution (including bulk-water wholesaler) of water, the principal state institution is ONEE. The main strategic goals of ONEE are to:[6]

- Assure, implement, and plan the provision of potable water in urban areas
- Increase the general availability of water in rural areas[7]
- Improve sanitation access and service delivery.[8]

ONEE also plays a major function in planning of developing the projections for the sector, and working with the Ministry of Water Resources, which actually mobilizes the resource.

Institutional Service Provision Models

The current institutional arrangements for services include four service delivery models:

1. Delegation to ONEE (services in about 600 small and medium-sized cities) (30 percent of the population)
2. Autonomous Agencies (Régies Autonomes) in 12 large cities, whereby the government has a contractual agreement with ONEE and 12 Regional Collectives (33 percent of the population)
3. Delegation to private sector operators in four large cities through concession-like arrangements (37 percent of the population)
4. Direct management by a municipality of its own services (less than 1 percent).[9]

More than 80 percent of bulk water is provided by ONEE as owner and operator. The remainder is supplied by municipal distributors.

In the Middle East and North Africa, Morocco is considered relatively experienced with public-private partnerships (PPPs). In the water sector, this is most visible through the delegated management (gestion déleguée) of services. The delegation of service to a private company was first introduced through a contract for multiple public services (electricity, water, and wastewater) in the Casablanca region in 1997.[10,11] There are currently delegated management contracts with international companies for water services in four major cities: Lydec (owned by Suez) in Casablanca; Redal (owned by Veolia) in Rabat; Amendis Tanger (owned by Veolia); and Amendis Tetouan (owned by Veolia). The bids for delegated management are negotiated and operators are assigned exclusive right to provide service in specified region. Thus, once they have secured the rights to manage the distribution services in a certain market, there is no effective competition *in the market*. Morocco is exploring further advances in this domain, through both changes in the legal and institutional framework and with regard to increased financial sustainability (including the recovery of capital costs).

Legal, Policy, and Regulatory Framework

Organization of the water sector in Morocco to date is based on Law 10-95 of 20 September 1995.[9] However, a new water sector law has just been approved by Parliament and is awaiting final ratification and publication. The proposed law aims to address some of the most current and critical environmental and water challenges of Morocco. This law is likely to set the basis for many of the activities, investments, and regulations in the sector going forward (see table 5.2).

Currently, the prevalent arrangement is the contractual model. This model is used for the four private management companies (Casablanca, Rabat, Tangier, and Tetouan). The contractual model is also used between government entities, and specifically between CIP and ONEE.

An example of a contractual model between government agencies is the Contract-Program (Contrat-Programme) between ONEE and the government (represented by CIP), which is overseen by the MAGG. The Contract-Program indicates policy objectives. The Preamble[9] of the Contract-Program 2014-77 states that one of the 2020 targets of the National Sanitation Program (PNA) is to decrease wastewater pollution by 60 percent. Another target is to increase urban sanitation connection levels to 80 percent.

The main laws that set the institutional framework of the sector are summarized in table 5.2.

TABLE 5.2. Main Laws and Strategy Documents Governing the Water Supply and Sanitation Sector

Title of law, strategy, or policy	Summary
Water resources	
New water sector law (as the law is still to be ratified and published, details are still to be confirmed)	The proposed law covers such areas as water resources management and environmental protection, including management of water-related risks like flooding, and industrial pollution, and more explicitly addresses water property rights. A "user pays and polluter pays" principle is adopted in several instances. The law includes a section on water governance and administration, and affirms the Superior Council on Water and Climate as a key consultative institution in charge of oversight of the water sector. The Council is presided over by the head of the government. Half its members are government representatives while the other half are from regional councils, hydraulic basin councils, academia, nongovernmental organizations, and the like. Some "formalization/ reorganization" for the council in the 12 Regies and in the rural settings (outside the four delegated management contracts) is outlined.
Law 10-95 The Water Code	Overall governance of the water sector.[a]
Law 78-00 The Municipal Charter	Defines the functions and duties of the municipalities in Morocco. Article 39 assigns the right and duty to manage public utility services such as water and sanitation to the municipal council.
WSS service delivery	
Public-private partnerships and delegated management	
Law 54-05 promulgated by the Dahir No. 1-06-15 of 14 February 2006	Governs the delegated management of public services/utilities.
Decree No. 2-06-362 dated 9 August 2006	Endorses competitive tendering of delegated management contracts.
Law No. 39-89, Article 8	Deals with the transfer of public enterprises to the private sector.[b]
Selected laws governing regional collectives	
Law 45-08	Describes the organization of the finances of the local collectivities and their regrouping.
Law No. 69/1200	Establishes a Board of Directors to act as the decision-making body for each Régie, with authority over budgets and accounts, and including a steering committee in which representatives from the Ministry of Interior (MoI) and Ministry of Finance (MoF) are members. MoI members maintain technical and administrative control, while MoF members maintain financial control. Establishes a separate Audit Committee with representatives of both ministries as well as elected members.[c]
Law No. 2-64-394 of September 1964	Establishes the authority for the Ministry of the Interior to audit and supervise the regional and municipal collectives.[d]

table continues next page

TABLE 5.2. continued

Title of law, strategy, or policy	Summary
Wastewater management	
National Sanitation Plan (Plan National de L'Assainissement, PNA)	Includes, for example pollution abatement targets.[e]
ONEE[f]	
Law 40-09	Creates the National Office of Electricity and Water/L'Office National de l'Electricité et de l'Eau Potable (ONEE). (Previously ONE provided electricity and ONEP provided water.[g])
The Contract-Program between ONEE and the government	Overseen by the Ministère des Affaires Générales/Ministry of General Affairs and Governance (MAGG).[h]
Law 69-00	Deals with the financial controls of the state over all public enterprises, including ONEE.[i]

Source: Court of Accounts 2014pg. 17, Article 4-2, paragraph No. 61.
a. http://siteresources.worldbank.org/EXTMETAP/Resources/WQM-MoroccoP.pdf.
b. ACWUA 2014, 20–21; Court of Accounts 2014, p. 45, Article 6, paragraph No. 171.
c. Interview/meeting at the Ministry of Interior in Rabat.
d. Court of Accounts 2014, p. 50, paragraph No. 189.
e. Court of Accounts 2014.
f. Court of Accounts 2014, p. 49, Part II, Chapter I, Article 1, paragraph No. 182.
g. ACWUA (Mohammed Al Haj) 2013, 3–21, on Morocco.
h. Revision des Tariffs, Contrat-Programme Entre le Gouvernement et L'ONEE, p. 5.
i. Court of Accounts 2014, p. 49, Part II, Chapter I, Article 1, paragraph No. 182.

Regulation of Water Supply and Sanitation Services

At present, there is no independent regulator. The French contractual model (with its built-in regulatory system) prevails (see Chapter 1 for more explanation of the different regulatory models). However, the need for a regulatory agency for the electricity sector is mentioned in the Contract-Program. The need for a regulatory agency is also described in detail in the report of the Court of Accounts, which calls for an "independent body" for regulatory purposes.

The recent merger of ONE and ONEP may imply an inclination to adopt a multisector model. Delegated management contracts sometimes include multiple distribution services (water and electricity, as in the example of Lydec in Casablanca).[12] Of the twelve Régies Autonomes, seven provide multiple services (water, electricity, and sanitation). It remains to be seen, however whether a regulatory agency or agencies would be created by the new laws, and if so whether the multisector or single sector model will be chosen.

Currently, due to the decentralized structure of the water sector, some regulatory functions rest with two bodies. The Ministry of General Affairs and Governance (MAGG), which hosts the Interministerial Committee on Prices (CIP), plays a leading role in governance and inspections. CIP is the closest formal body to a price regulator. It approves tariff revisions and negotiates programs and contracts.

Tariff Setting and Reviews

The four institutional service models have slightly different tariff-setting arrangements.

Delegation to ONEE (around 600 small and medium cities). In the rural and smaller urban areas, municipalities often delegate water distribution services to ONEE. Like the Régies,

ONEE is also subject to CIP for price review and to the Ministry of Interior for technical matters. It may petition for a change of tariff to CIP. ONEE has a formal 2014-2017 Contract-Program with the government (through CIP).

Autonomous Agencies (Régies Autonomes) in 12 large cities/regions. As with municipalities, the Régies are also subject to tariff review by CIP and technical oversight by the Ministry of Interior. The tariffs of the Régies are negotiated and then fixed by the government, based on CIP's advice. The Régies may petition for a change of tariff to CIP. The cost of investments and efficiency levels are key to CIP's consideration.

Delegation to the private sector (four concessions in big cities). The tariffs of the private companies (delegated management) are negotiated with the delegating authority (first with municipalities, and then with the government). While the prices of services provided under delegated management tend to be higher than the average, they are not always higher than those charged by ONEE or the Régies. The private operators have been deemed successful in increasing managerial capabilities and spearheading progress in the water sector, as well as increasing service quality, water security, and attention to environmental considerations.

Direct management. If a municipality chooses to manage tariffs directly, CIP oversees prices and the Ministry of the Interior oversees technical matters. CIP advises with regards to differential tariffs in different regions. In water-scarce regions, water can be twice as expensive. The current practice is to regulate the price according to the contract.

For all four models, the government (CIP) applies the concept of economic and financial equilibrium by calculating an average tariff as the revenue requirement divided by the total volume sold. Actual tariffs are set for each tranche of consumption and type of user (based on economic and social considerations). The relative flexibility of tariffs, which was introduced by the initiation of the delegated management contracts, has enabled the delegated management companies to fund maintenance and replacement of existing infrastructure.

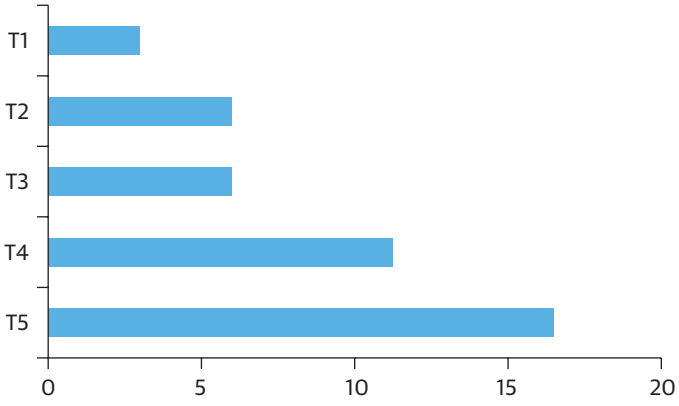
However, the current tariff system does not generate sufficient revenues to cover the investment needed to improve distribution services. In addition, the revenues for sanitation services are low and scheduled reviews have not been made to date. Another important problem is that tariff increases requested by Boards of Directors of Régies have not been applied, while investments have nonetheless continued.

Examples of Tariffs in Major Cities. Cross-subsidization from the electricity sector to the water and sanitation services is an ongoing feature of tariffs in Morocco.[13] In most major cities, there are five tariff blocks for domestic consumers, based on monthly m^3 consumption[14] T1=0-6 m^3; T2=6-12 m^3; T3=12-20 m^3; T4=20-35 m^3; T5=more than 35 m^3. Figure 5.2 depicts the tariff structure for Casablanca, a system that is currently being managed by a private company, Lydec,[15] while figure 5.3 presents the tariff structure for Rabat, whose system is currently delegated to another private company, Redal.[16]

Licensing

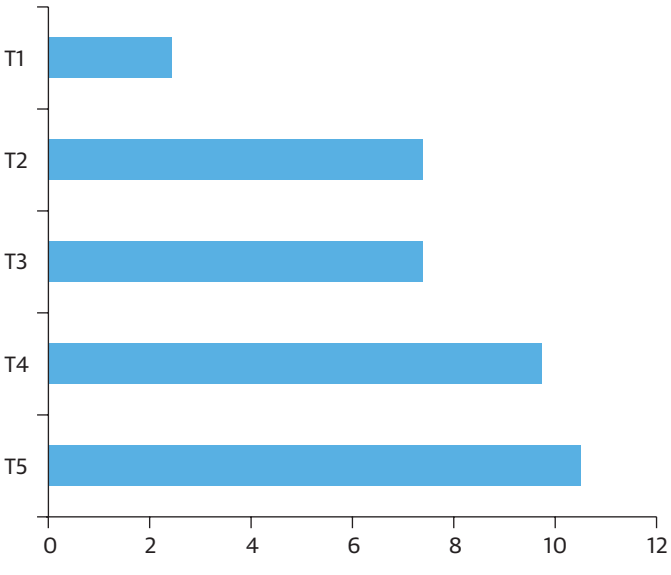
Article 39 of Law 78-00 gives municipal councils the responsibility to manage water and sanitation. Municipalities may provide services themselves, may delegate, or form Régies.

FIGURE 5.2. Tariffs in Casablanca (Lydec)



Source: "Tranches de Facturation et Tarifs - Accueil," accessed May 5, 2016, https://client.lydec.ma/site/fr/web/guest/tranches-de-facturation-et-tarifs.
Note: The y-axis shows tariff blocks for domestic consumers, based on monthly m^3 consumption: T1 = 0–6 m^3; T2 = 6–12 m^3; T3 = 12–20 m^3; T4 = 20–35 m^3; T5 = more than 35 m^3.

FIGURE 5.3. Tariffs in Rabat (Redal)



Source: "Lire Votre Facture," accessed May 5, 2016, http://www.client.veoliaenvironnement.ma/Redal/Votrefacture/Pages/Lirevotrefacture.aspx.
Note: The y-axis shows tariff blocks for domestic consumers, based on monthly m^3 consumption: T1 = 0–6 m^3; T2 = 6–12 m^3; T3 = 12–20 m^3; T4 = 20–35 m^3; T5 = more than 35 m^3.

Delegation is per contract (and subject to the review of the CIP). The Ministry of Interior's Directorate on Water and Sanitation has an oversight role on rural water and sanitation.

According to the new draft law not yet published, the Agency for the Hydraulic Basin (Agency HB) will have the power to license (grant concessions) based on the advice of a "special commission." Regulation is again by the contract (Article 36). Agency HB can revoke concession contracts in urban areas upon the advice of the municipal council (Article 30).

Technical Regulation

The Ministry of Interior enforces both technical and quality standards for services provided by the Régies. The 2014-77 Contrat-Programme between the government and ONEE provides guidance on conforming to specific norms and standards,[17] such as ISO 10005 for project management; ISO 9001 Standards for the process of Water Quality Control; ISO 17025 Standards for regional laboratories; ISO 22000 Standards for water treatment plants; and ISO 9001 for sanitation and environmental standards before 2015 for studies, and before 2016 for sanitation works.

Service Quality Standards

Universal service, quality of service, and private investments (build-operate-transfer, BOT/public-private partnerships, PPP) to realize the objective of efficient management and service provision[18] are mentioned as general objectives, although no targets and dates have been specified in broad terms by government.[19] Each contract has its own targets. As stated, the MOI has the power of oversight and enforcement of technical standards.

Financial Audits and Enforcement

CIP and other government agencies such as the Court of Accounts are responsible for regulation of financial standards and audits.

Rural Water Supply

Increasing rural water availability is an important objective for the Moroccan government. This is especially significant considering that 40.3 percent or the population (around 13.65 million people)[20] live in rural areas. In 2015, only 65 percent[21] of rural population had

access to improved water supply, and only 66 percent[22] of the rural population had improved sanitation in 2011.

ONEE manages water supply and waste water in rural areas, and has the strategic objective of increasing general access to water in rural areas from the levels of 94 percent in 2013 to 96.5 percent in 2017.[23] CIP and the Ministry of Interior each play a role with regard to water supply in rural areas: CIP by virtue of its role setting tariffs, and the MOI in terms of the oversight and the power to enforce technical standards for Regies and rural areas. The Ministry of Agriculture also has a large stake in the availability of water in rural areas.

Consumer Protection and Citizen Engagement

ONEE plans to improve customer service by extending the mandate of its electricity Customer Relation Center to also accommodate water services customers.[24] One of the motiviating factors for unifying ONE and ONEP was the introduction of synergies through consolidation of call-centers, telecommunication services, and information technology (IT) systems, which are expected to provide customers with improved services.[25]

Next Steps

Morocco is at an important juncture, attempting to reconcile the dilemma of increasingly scarce water resources in several parts of the country with increasing demands. The government is exploring many options for how to best meet these challenges, such as desalination schemes. Integrated urban water management (IUWM) is being considered to help bring the many disparate stakeholders together to explore options that are most efficient, holistic, and sustainable. Since the passage of the new constitution in 2011, the government has been devolving more autonomy to the regions. There has been some discussion of regional multisector utilities.

In terms of other sector priorities, the government is focused on the need to significantly improve access to sanitation services and wastewater management, especially in rural areas.[26]

Contract-Program 2014-77 and the Court of Accounts report discuss the possibility of a regulatory body or bodies, but it is unclear whether such a regulator or regulators will be created, how its or their role would be defined, and if created whether a multiservice model or single sector model would be chosen. The decision to create some sort of regulatory agency would be a political one that would be taken by the government and approved by the high councils. A new law for the water sector has recently passed in Parliament, and a public-private participation law passed in 2014. The next steps involve the publication and application of the new water sector law.

Notes

1. World Development Indicators, World Bank, http://wdi.worldbank.org/table/2.1.
2. World Bank indicator, WDI http://data.worldbank.org/indicator/SP.POP.GROW/countries/PS?display=graph.
3. World Bank for 2005 to 2015, http://data.worldbank.org/indicator/SP.POP.GROW.

4. World Bank indicator, WDI, urban population, http://data.worldbank.org/indicator/SP.URB.TOTL, (percentage was calculated).
5. The ACWUA's estimate of current per capita endowment differs from the figure provided by the World Bank in table 5.1.
6. ONE Branche Eau (Nos Axes Stratégiques) website, http://www.onep.ma/.
7. Court of Accounts 2014, pg. 84, paragraph No. 271.
8. Court of Accounts 2014, pg. 53, paragraph No. 197.
9. Revision des Tariffs, Contrat-Programme Entre le Gouvernement et L'ONEE, p. 5.
10. Court of Accounts 2014, pg. 8, paragraph No. 27.
11. Communal Charter from Interior Ministry, http://gis.nacse.org/rewab/docs/Communal_Charter_No_78_Fr.pdf Also mentioned in the 2014 Court of Accounts report, pg. 18, paragraph 63.
12. Lydec website, mission statement, https://client.lydec.ma/site/notre-mission.
13. As discussed during the Center for Mediterranean Integration workshop "Regulating Water Services Provision in MENA: Center for Mediterranean Integration," World Bank, Marseille, July 28-30.
14. Unless reference is made to the websites of Suez (Lydec) or Veolia (Redal, Amendis), the information the follows is from the Contract-Program between the state and the National Office of Water and Electricity (l'ONEE) 2014-2017, French version dated May 2014. Official Bulletin No. 6288 has a very detailed structure of tariffs by different tranches and by regions (pages 4032-45).
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23. Court of Accounts 2014, pg. 84, paragraph No. 271.
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Chapter 6 Status of Water Sector Regulation in Iraq

Nafie Mohammed Mofid, Abdul-Ilah Younis, and Norhan Sadik

Abstract

Iraq faces significant challenges in water and sanitation services delivery, and gains have not necessarily been commensurate with the substantial spending in the sector. This may be understandable given the violent conflict and regime-change experienced over the past decades. More recently, various institutional reforms have been attempted: for example, with regard to decentralizing service delivery. However, reforms have been slow to take hold. Economic regulation per se is scarce and institutions are fledgling. The preparation of this report revealed the dearth of data, information, and analysis. The World Bank's recent Public Expenditure Review has contributed to the knowledge base, as has a recent study by the Japan International Cooperation Agency (JICA 2015), but more needs to be done to gain a better understanding of how the sector functions institutionally and what can be improved.

Introduction to the Water Supply and Sanitation Sector and the Country Context

Despite rapid increases in spending in the sector between 2007 and 2012 (an increase of 356 percent) (World Bank 2015), Iraq's water supply and sanitation (WSS) sector suffers from a number of challenges that have hampered sector performance. Managerial challenges relate to the lack of performance standards and management autonomy, civil service laws that protect poor staff performance, low administrative skills, and weak accountability mechanisms. Technical and financial challenges include a low-skilled labor force and weak enforcement of tariff and connection policies. Institutional and policy challenges include inconsistencies in institutional roles and responsibilities, lack of strategic direction, and lack of formal coordination mechanisms, which may in part be attributable to the absence of a comprehensive Water Law.

It is important to analyze these realities within the current context. Iraq's WSS sector has suffered serious setbacks due to a series of political events that have taken place since the 1991 Gulf War, which have inevitably had a widespread impact on the country. Despite the political challenges the Iraqi government faces, progress has been made during the past 10 years, leading to improvements in access to WSS services. Table 6.1 provides some data on the general country/sector context.

Yet the sector continues to face second-generation challenges in terms of quality of service delivery, including intermittent water supply services, low water pressure, and significant network losses due to aged infrastructure. The public water network provides less than two hours a day of access to about 25 percent of the customers connected. The Knowledge Network Survey of 2011 has demonstrated the general dissatisfaction of Iraqi citizens, with 59 percent of households describing the sanitation services on offer as bad or very bad. This percentage increases in rural areas and reaches 85 percent dissatisfaction, particularly in central and

TABLE 6.1. Basic Data on the Water Sector in Iraq

Population: Total (2012)	32,168,519
Urban (2012)	22,850,075
Rural (2012)	9,318,444
Total annual water endowment	55 BCM
Percentage of water usage by sector	
Domestic	10.0%
Agricultural	80.0%
Industrial	10.0%
Percentage of population with improved water supply service: Total (2015)[a]	78.7%
Improved water supply Urban (2015)	86.1%
Rural (2015)	62.1%
Improved sanitation (2015): Total[b]	64.0%
Urban (2015)	83.3%
Rural (2015)	20.0% (estimate)
Household water connection Urban	78.7%
Household sewerage connection	
Urban aggregate	23.8%
Baghdad	82.0%
Other	10.28%
Kurdistan Regional Governorate	8.0%

Source: UNICEF and UN-HABITAT 2013; Ministry of Water Resources 2014; data provided by the Ministry of Construction Housing, Municipalities and Public Works (MCHMPW), 2016.
Note: BCM = Billion cubic meters.
a. Some disparities in available data sets may exist. Although the percentage of population with access to improved water supply is 78.7 percent, the Iraq Public Expenditure Review of the Water Supply and Sanitation Sector cites access to piped water services at 87 percent of the total Iraqi population in 2012.
b. Although the percentage of total population with access to *improved* services is 64 percent, according to the Iraq Public Expenditure Review of the Water Supply and Sanitation Sector, only 28 percent of the total Iraqi population had access to sewerage networks in 2012.

southern regions of Iraq. In addition, 83 percent of wastewater is not subject to sufficient treatment (JICA 2015). WSS operations are constrained by energy shortages, including intermittent power and fuel supplies, as well as shortages of chemical supplies. The sector is marked by weak bill collection rates, low tariffs, and a significant number of illegal connections, which jeopardize financial sustainability. For example, water sales in the Mayoralty of Baghdad (MOB) in 2010 stood at around 195.7 million cubic meters, at a value of ID47.9 billion (US$0.04 billion). Only 13 percent of that total value was actually collected; the remaining 87 percent was left in arrears. These challenges are common across all WSS service providers in the sector.

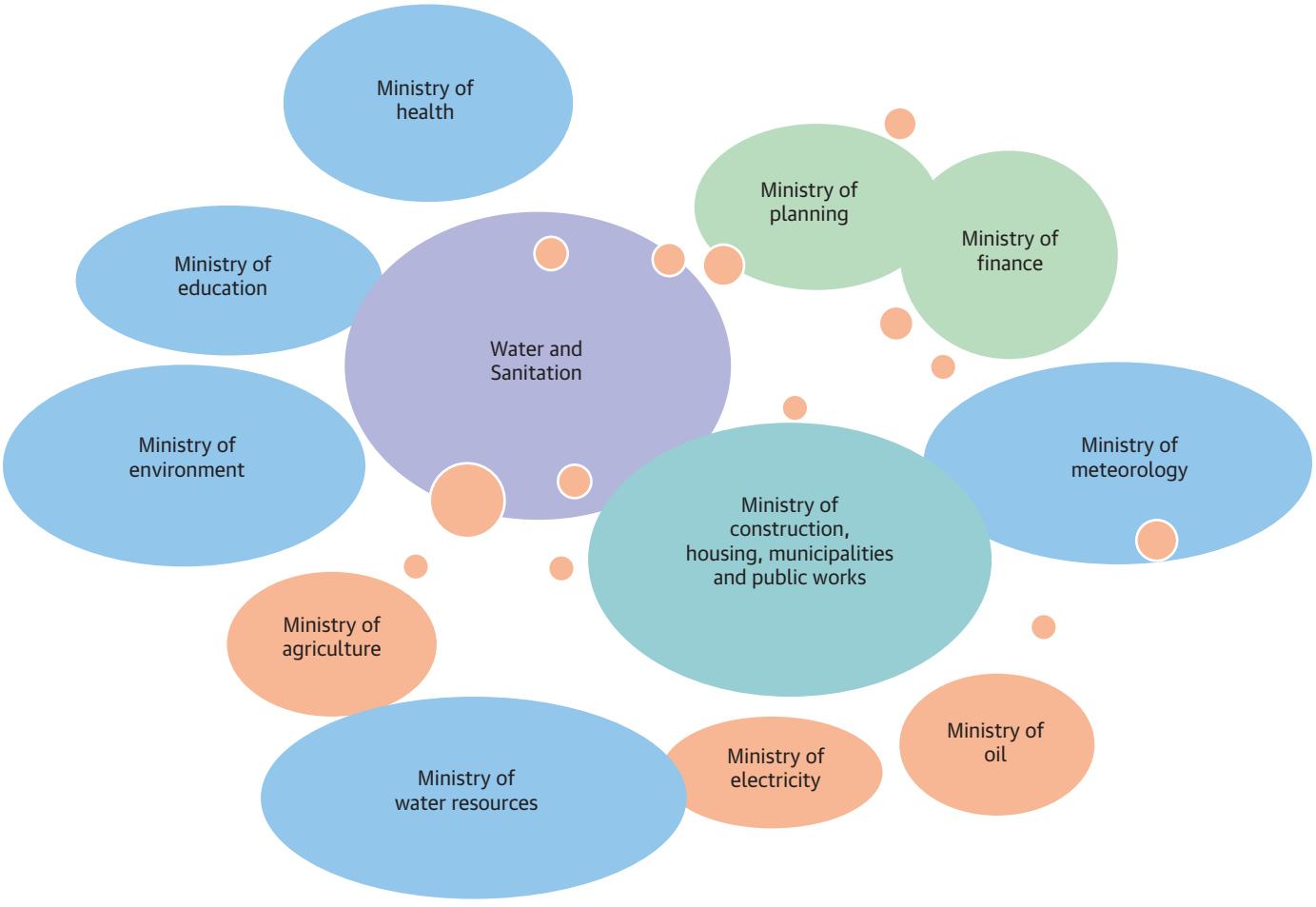
In addition to the managerial, technical, financial, and institutional challenges, the sector suffers from other external factors as a consequence of the political turmoil in the region. This includes

extensive damage to infrastructure, as well as population displacement at a large scale. Furthermore, violations of housing planning zoning laws, such as the illegal splitting of houses and illegal construction, place additional pressures on services and increase challenges to achieving financial sustainability. A review of the sector's legal and policy frameworks highlighted that overall sector performance has been suboptimal because of inconsistencies in the institutional and policy framework, including the lack of clear mandates and strategic direction. The absence of a comprehensive water law further inhibits implementation of formal coordination mechanisms among relevant stakeholders in a manner that can ensure delivery of sustainable WSS services.

Structure and Organization of the Water Supply and Sanitation Sector

WSS service delivery is heavily centralized across 11 ministries and governmental organizations. However, coordination mechanisms are not well developed within this centralized system. Figure 6.1 depicts the different ministries involved in the sector (UNICEF and UN-HABITAT 2013).

FIGURE 6.1. Institutional Framework of Iraq's Water Supply and Sanitation Sector



Source: UNICEF and UN HABITAT 2013.

The ministries responsible for WSS service delivery operate and interact in an adhoc and informal manner in the absence of an official water law that allows for the establishment for formal coordination mechanisms. The roles and responsibilities of select key institutions that play a significant role in WSS service delivery are outlined next.

Council of Ministers. The Iraqi Constitution empowers the Council of Ministers to propose and oversee implementation of plans and policies within the public sector. However, these authorities are also mandated to the municipality councils and the governorate councils, which have the right to establish, manage, and develop water projects (World Bank 2015).

The Ministry of Construction, Housing, Municipalities and Public Works (MMPW prior to merger, MCHMPW post merger). The MCHMPW is the lead ministry responsible for overall monitoring and oversight of the sector. Law No. 27 of 1999 established the General Commission of Water and Sewerage, which consists of two authorities for water and sewerage within the Ministry of Municipalities and Public Works. This Commission is responsible for supporting the MCHMPW in planning investments, conducting the relevant studies including feasibility studies, preparing annual long-term and short-term plans, and overseeing their implementation. The Ministry was also mandated to carry out monitoring of water quality and treated wastewater, set and enforce technical standards, and set tariffs. The MCHMPW is responsible for ensuring that WSS services are provided across 15 provinces throughout Iraq, in addition to other municipal services, including solid waste management, urban development, municipal road works, and public land management services.

It is important to note, however, that the service area of the current MCHMPW excludes the Mayoralty of Baghdad and the Kurdistan Regional Governorate. Further, with the passing of Governorate Law 21 in 2008, which essentially decentralizes responsibilities for WSS service delivery to the local authorities, it is not entirely clear how much supervision of local governorates the Ministry will undertake.

The Ministry of Finance and the Ministry of Planning. Responsibilities for policymaking and investment planning lie with the central government through the Ministry of Finance and the Ministry of Planning. Local authorities submit requests for new investments to the MCHMPW based on feasibility studies that have been conducted. The MCHMPW is then responsible for prioritizing the need for investments, which is based on deprivation levels. These levels are determined based on a ratio of actual supply to an assumed 380 lpc/d demand. The proposal for investments is then submitted to the Ministries of Finance and Planning for review and approval. The final investment plan is determined by the Ministries of Finance and Planning based on their own set of selection criteria. Decisions on spending and investments in the sector are undertaken jointly between the Ministries of Finance and Planning.

Following the passing of Governorate Law 21, both ministries now undertake and manage fiscal transfers from the central government to the local authorities. Article 102 of the Iraqi Constitution calls for the establishment of an independent authority mandated to monitor the distribution of federal and foreign aid funds between the different governorates, in order to ensure that funds are distributed in a transparent, efficient, and equitable manner.

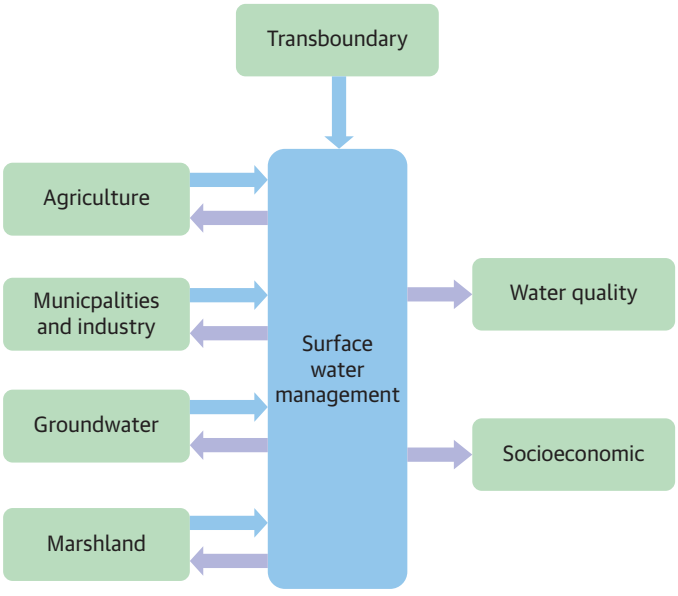
However, at the time of writing this report, the Ministry of Planning has indicated that this authority is yet to be established.

The Ministry of Planning (MoP). In addition to the roles and responsibilities described, the MoP is also responsible for developing research, studies, and plans that achieve the goals of the WSS sector. In addition, the MoP contributes statistical data and information necessary to establish a national sector database. These responsibilities are undertaken by the Ministry's statistical body, the Central Organization for Statistics and Information Technology (COSIT), which in turn supports the MCHMPW in making its decisions regarding investment planning.

The Ministry of Water Resources. The Ministry of Water Resources is the sole entity responsible for water resource management in Iraq, as mandated by the Ministry of Water Resources Law of 2008. Its responsibilities include the efficient allocation management, and development of additional water resources as well as safeguarding water quality. The Ministry is also responsible for protection of Iraq's best interests in shared water resources with neighboring countries. The Ministry carries out many of its functions through the National Center for Water Resources Management, which exercises control through the operation of a complicated system of dams, reservoirs, and hydraulic structures. Figure 6.2 illustrates the various water resource management activities undertaken by the Ministry.

The Ministry of Environment and Health. The Ministry of Environment and Health (MoEH) is responsible for the oversight of policy, planning, regulation, and enforcement of everything related to Iraq's environment, public health, biodiversity, and cultural and natural heritage. The MoEH formulates national strategies for environmental protection, as well as drafting and reviewing legislation related to environmental matters (JICA 2015). The MoEH is mandated to monitor the quality of surface, groundwater, and water supply in Iraq, and is equipped with a number of labs in order to do so. The frequency of sampling undertaken by the MoEH is often done at random, but usually analysis is undertaken on a monthly basis. The Ministry also undertakes responsibilities to monitor the quality of drinking tap water delivered to households. However this sampling is generally carried out in exceptional events such as a breakout of an epidemic. The municipalities also carry out water quality monitoring responsibilities and test their samples on a daily basis. Results of the tests are reported to the MCHMPW, which is responsible for oversight and supervision of water quality across the sector. Guidance is issued by the MoEH to the service providers in case it is necessary. In Baghdad, the MOB maintains departments that also carry out water quality monitoring activities for the city of Baghdad.

FIGURE 6.2. Functions of the Ministry of Water Resources of Iraq



Source: Iraq, Ministry of Water Resources 2014.

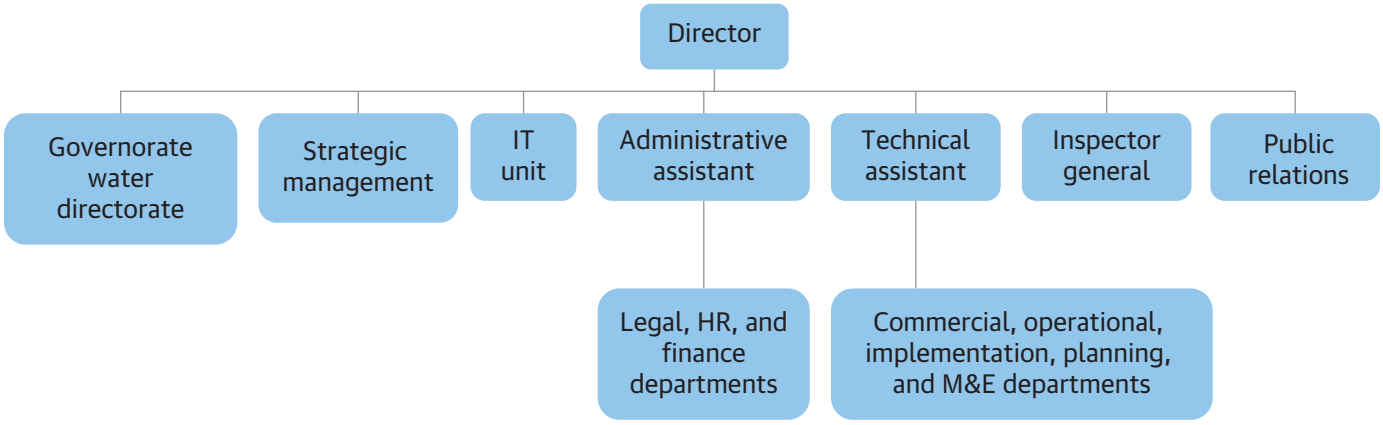
The National and Provincial Environment Councils (NPEC). Law No. 3 of 1997 establishes NPEC, which is responsible for protection and improvement of the environment. The NPEC is administratively linked with the Council of Ministers and is headed by the Minister of Health. The law also established a special department within the Ministry of Health to be in charge of the protection of the environment. Of special concern to WSS is that the law also prohibits the discharge of any industrial, agricultural, domestic, or any polluting materials, such as oil, animal waste, or pollutants into rivers, ground, and underground water resources.

The General Directorates of Water and Sewerage. The Governorate Law 21 of 2008 essentially decentralizes responsibility for service delivery and day-to-day operations across the 15 governorates in Iraq through the General Directorates. The General Directorates are public entities owned by the central government. The Governorates' law allows the local authorities to collects revenues. The General Directorates of Water and Sewerage combined are comprised of 152 departments. Each department reports directly to a General Director who reports directly to the MCHMPW, demonstrating the centralized nature of the system. Managers run day-to-day operations at the local level with directions from the Director General at the Governorate level. Figure 6.3 illustrates the typical organizational structure of the general directorates.

Mayoralty of Baghdad. Municipalities are the only entity authorized to sell water within their geographic areas. However, actual control of service delivery is limited (World Bank 2015). The Mayoralty of Baghdad is established by Law 16 of 1995 and is mandated to carry out the investment planning responsibilities for water and wastewater projects in Baghdad. The law calls for a new organizational municipality, which includes dedicated departments for water, wastewater, quality monitoring, and capacity building.

Governorate-level institutions. The Governor's office is responsible for the strategic planning of the WSS sector, and assumes decision-making authority regarding the procurement procedures related to WSS sector investments. Provincial councils within the governorates

FIGURE 6.3. Organizational Structure of the Director Generals of Water and Sewerage



Source: (UNICEF and UN-HABITAT 2013).
Note: IT = information technology; HR = human resources; M&E = monitoring and evaluation.

TABLE 6.2. Main Institutions in the Water Supply and Sanitation Sector and Their Roles and Responsibilities

Ministry	Main role
Ministry of Construction, Housing, Municipalities and Public Works (MMPW, or more recently, MCHMPW)	Overall monitoring and oversight of the water supply and sanitation sector
Ministry of Water Resources	Water resources management: Transboundary water issues, water resources sharing and quality
Ministry of Environment	Wastewater discharge standards and monitoring
Ministry of Health	Potable water monitoring and enforcement
Ministry of Finance	Investment planning, review, and approval Budget approval, monitoring, and financial auditing
Ministry of Planning and Development	Investment project review and approvals
Central Organization for Metrology and Quality Control	Water quality standards

Source: World Bank compilations.

are the highest legislative and supervisory authority and are entitled to draft and issue local legislations as authorized by the decentralization law. The Provincial Council provides support to the governor on awarding tenders and also plays an oversight and supervisory role in ensuring that projects are completed on time and in line with the budget. The provincial government controls a budgetary stream separate from that of the MCHMPW (JICA 2015).

Table 6.2 provides a summary of the roles and responsibilities of the different ministries that play a role in the WSS sector.

Legal, Policy, and Regulatory Framework

Iraq's legal and policy framework is comprised of many different laws and decrees that are not always consistent with one another. Although the Iraqi Constitution includes laws that govern the establishment of water sector institutions, it does not include a more comprehensive Water Law that clearly indicates the objectives and responsibilities of the water sector (World Bank 2015). Despite the absence of a water law, other legal instruments are established to govern the sector.

Increased access to WSS service delivery is endorsed by the Strategy for Water and Land Resources in Iraq (SWLRI) and the National Development Plan of 2010-44. Prepared by the Ministry of Water Resources, the SWLRI outlines the objectives of the WSS sector and covers the period up until 2035. Main objectives include improving the access and quality of water supply services. In terms of allocation of water resources, municipal water supply is given highest priority. Previous and current government plans aim to achieve 100 percent access to improved water supply in urban areas by the end of 2018, but progress toward this target has been hindered by significant budget constraints, with many projects either on hold or suffering delays. The strategy (SWLRI) also establishes Strategic Evaluation Criteria to screen and prioritize investment projects. Projects that address the challenges of water security and improvement of land productivity receive priority for investment, thus demonstrating the adoption of an integrated approach to water resources management. The National Development Plan

includes a recommendation to establish a National Water Council that would assume responsibilities for management of water resources at national and transboundary levels, thus formalizing coordination mechanisms between relevant stakeholders in the WSS sector.

In addition to placing a priority on improved access and quality of WSS services, the Iraqi government endorses pro-poor pricing policies by subsidizing costs in order to ensure that WSS services are available and affordable to all. The National Development Plan emphasizes that the state policy in providing potable water service is concerned not only with quality and quantity, but also with affordability for all—even if requiring subsidies and low tariffs.

The government is moving toward decentralizing WSS service delivery through the enactment of Governorate Law No. 21 of 2008, which establishes the legal framework to promote the transfer of WSS service delivery from the central government to local authorities. Despite establishment of a legal framework that promotes decentralization of public service delivery, the central government continues to undertake much of the management responsibilities of the sector because of the lack of clarity of the relationship between the national and subnational levels of government.

Some of the key laws that govern the sector are described in table 6.3.

TABLE 6.3. Legal Framework of the Water Supply and Sanitation Sector

Title of strategy/policy	Summary
General	
Iraqi Constitution	Iraq's Constitution contains several articles relevant to the WSS sector: • Article 30 states that "the state guarantees social and health security." • Article 33 guarantees citizens the right to live in a safe and protected environment. • Article 110 empowers the federal and regional governments to draw laws to protect the environment and to formulate strategies and regulations for the equitable distribution of internal water resources.
National Development Plan of 2013–77[a]	The main mission of the National Development Plan of 2013–77 is to guarantee access to potable water for all. The Plan sets five goals for nationwide development of Iraq's water sector: 1. Goal 1: Increase Water Coverage and Reduction of Waste. Increase access to piped water supply from 82 percent in 2011 to 98 percent in 2017. 2. Goal 2: Reduce Disparities between Urban and Rural Areas. Reduce the number of residents without access to safe drinking water to 2 percent in urban areas and 15 percent in rural areas. 3. Goal 3: Provide High-Quality Water at a rate of 350 liters per capita per day. 4. Goal 4: Promote PSP [private sector participation] in the Water Sector through BOTs [build-operate-transfer projects], Technical Assistance and Operations 5. Goal 5: Rationalization of Water Use. The goals for the sanitation sector are to improve access to sewerage networks to 95 percent for Baghdad and 53percent for other governorates for 2017; and to improve the waste disposal situation of rivers.
Environmental protection	
Water Protection Bylaw of 2001	The bylaw defines water as a public resource, which includes all rivers, springs, lakes, and surface and ground water. The law prohibits the discharge of any industrial, agricultural, or domestic waste into any water resources. In addition, the law obligates all public or private entities to treat their wastewater, conforming to the set standards in line with World Health Organization (WHO) guidelines. Permission should be obtained from the Environment Department for discharging into a water resource. Regarding enforcement, the law does not clarify if the Environment Department itself will carry out enforcement powers.

table continues next page

TABLE 6.3. continued

Title of strategy/policy	Summary
Law No. 27 of 2009	This law prescribes the following provisions: • Establishment of an environmental protection council/office to enforce environmental conservation at the national level; • The law regulates the Environmental Impact Assessment (EIA) system for projects. The EIA report should include the following: ◦ Predictions of negative/positive environmental and social impacts ◦ Mitigation methods to reduce negative impacts in order to meet the laws and regulations of the national and local government ◦ Possibility of adopting alternative technologies to reduce negative environmental impacts and improve energy efficiency ◦ Consideration of adopting a circular economy approach to water use adopting the 3R's: reduce, re-use, and recycle. • Preparation of environmental conservation management plan for air quality, soil biodiversity, and hazardous waste reatment.
Water quality	
Water Quality Conservation Law of Rivers and Public Waters Law No. 25/1967[a]	This law prescribes regulations regarding water discharge to public waters. Article 7 prohibits the discharge of untreated wastewater to public water sources. Articles 8 and 9 prescribe the conservation mechanisms of pollution of public waters by discharge of wastewater. Article 10 prohibits the illegal dumping of solid and liquid waste in public waters. The law also prescribes the national water quality standards, as well as effluent quality standards.
Law of Water Conservation Practices No. 2 of 2001[a]	This federal law prescribes the regulations for general water utilization, including environmental water resource conservation. The law also provides regulations for water resource development. The central government recognizes water as a fundamental resource for social and economic development. The law prohibits the discharge of wastewater in to public waters and also encourages the recycling of wastewater for reuse. Article 5 prescribes that *(NPEC)* has authority to regulate effluent water quality of public waters, sewerage systems, and rainfall.
Drinking Water Quality Standards Law No. 417 of 1974[a]	This law proscribes drinking water quality standards.
Decentralization of service delivery	
Law No. 165 for Administration of Municipalities	Article 50 of this law authorizes the Municipality Council to establish, develop, and manage water projects, whether on its own or jointly with other municipalities. Furthermore, the law gives municipalities the exclusive right to sell fresh and raw water within their geographic areas. No other entity is authorized to implement projects with the objective of selling water, unless by virtue of a special law.
Governorate Law 21 of 2008	This law essentially places responsibilities for WSS service delivery at the governorate level and holds the general directorates responsible for the day to day operations of WSS services. The law also recognizes the Governorate Council as the highest legislative body within the governorate and empowers the council to issue local laws in line with the constitution and federal laws.

Source: World Bank compilations.
Note: WSS = water supply and sanitation.
a. JICA 2015.

Regulation of Water Supply and Sanitation Services

The Iraqi WSS sector is self-regulated; the ministries responsible for service delivery regulate themselves. Regulatory responsibilities lie with civil servants within the respective ministries and are not undertaken independently from their executive and operational responsibilities - therefore there is no form of independent, or arm's-length, regulation.

Key regulatory responsibilities, including performance monitoring, enhancement of competition among service providers, and demand management, are hindered by the absence of authorization for implementation of these responsibilities.

Tariff Setting

Tariff-setting responsibilities are mandated to the MCHMPW. In practice, tariffs are set in cooperation with the directors of the water and sewerage departments in each governorate, which are submitted for approval by the Minister. In the absence of willingness and ability-to-pay surveys, the ability to pay is generally gauged indirectly from the employment conditions (or unemployment) and other indicators of the living standards, which vary considerably between the different governorates.

Currently, the MCHMPW does not have a cost-recovery policy in place for tariff setting, and consumption per capita is extremely high—well beyond levels seen elsewhere in the region. Thus water tariffs are very low and a major part of total water revenues remains uncollected. The Leadership for Results pilot undertaken by the World Bank reports that the cost of water production in Baghdad is estimated at 155 Iraqi Dinars (ID) (US$ 0.13) per cubic meter however, water users pay merely a fraction of these costs. More than half of households do not pay for their water and wastewater services (56 percent in 2012, according to the IHSES). As a consequence, water sector institutions depend heavily on government funding through subsidies, although fees charged by the water and sewerage directorates are low. This level of subsidization has significantly hindered sector performance; utilities are characterized by infrequent or limited billing and collection efficiencies (World Bank 2015).

The water tariffs are adopted nationwide, including in the Mayorality of Baghdad. The rates are set by the minister upon a recommendation of a joint committee representing the governorates and the ministry. For industrial use, the charge is 90 Iraqi dinars per cubic meter, in addition to a flat rate charge and the nominal consumption volume, depending on the area of the building and category of business. Governments and institutional users are charged 60 Iraqi dinars per cubic meter. The wastewater tariff is double the water tariff. Both tariff charges are combined, although most consumers do not pay because they complain about poor service delivery. Although this situation significantly impairs the financial sustainability of the sector, the Water Directorate does not enforce strict penalties on consumers.

Tariff revenues are collected and calculated by the Water and Sewerage Directorates. The calculated billing information is sent to the branch office of the Ministry of Finance. Table 6.4 provides an overview of the water tariff implemented in Iraq (JICA 2015).

Consumer Protection

There is a lack of official grievance redress mechanisms. Conflicts between ministries are generally resolved in an amicable manner between the ministries concerned. The ability of the relevant ministries to cooperate in a concerted manner to resolve grievances has been demonstrated in a number of cases, including when river salinity levels were elevated due to

TABLE 6.4. Water Tariffs

Household size and consumption/Iraqi dinars/U.S. dollars		ID	US$
Domestic Customer	House up to 100 square meters		
	First 30 cubic meters	6.0	0.0050
	30–60 cubic meters	15.0	0.0125
	60–90 cubic meters	22.5	0.0187
	Flat rate	1,305.0	1.0875
	House more than 100 square meters		
	First 30 cubic meters	6.0	0.0050
	30–60 cubic meters	15.0	0.0125
	60–90 cubic meters	22.5	0.0187
	More than 90 cubic meters	60.0	0.0500
	Flat rate	3,105.0	2.6000

Source: JICA Study Team.
Note: 1 U.S. dollar = 1,200 Iraqi dinars.

the discharge of drainage water into watercourses. It is not clear that grievance mechanisms for addressing customer complaints are in place or effective, however.

Next Steps

As outlined in the National Development Plan of 2013-77, the Government of Iraq will endeavor to achieve improved access and sustainability of WSS services by encouraging private sector participation, promoting wastewater reuse, and implementing strategies to address water security challenges. To boost the chances of success of these planned interventions, it is imperative to address key elements of WSS regulation, including mechanisms to foster competition and monitor sector performance. The Iraqi government will also need to address the issue of financial sustainability by improving tariff-setting and revenue collection mechanisms. Otherwise, the government's strategies and investment plans run the risk of remaining unimplemented because of the lack of financing. Due to the overlapping nature of institutions, policies, and regulation, all would have to be addressed in an integrated manner to achieve sustainable outcomes.

In addition—the Iraqi government will also need to develop and implement plans to modernize governance of the sector in order to improve efficiencies. This need was identified in the Public Expenditure Review (PER) of the Water Sector of the Republic of Iraq conducted by the World Bank in consultation with the government in 2015. The recommended modernization process focuses on decentralization, autonomy, and accountability of service providers. In addition, the PER states that institutional changes are necessary in order to ensure the roles and responsibilities of sector institutions are well defined. Institutionalizing official sector coordination mechanisms between different agencies at different levels of government is recommended (World Bank 2015).

The Public Expenditure Review proposes several interventions to improve overall sector efficiency:

- Improve government capacity by enhancing sector planning and streamlining procurement and disbursement procedures
- Establish reporting mechanisms to facilitate improvements in performance monitoring in order to achieve sector outcomes, including access, quality, and sustainability of service delivery
- Gradually move toward decentralizing service delivery in order to give service providers more autonomy in their operations, ensure that service providers are fully involved in investment and O&M decisions, and provide incentives to service providers to generate more of their basic O&M budget independent of the central government
- Clarify institutional roles and responsibilities—particularly more effective and transparent regulation of tariffs, including empowerment to collect tariff revenues, while ensuring that services remain affordable (World Bank 2015).

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Chapter 7 Topics for Further Study

Yogita U. Mumssen and Thelma Triche

Abstract

This chapter outlines some potential topics for further study that have been identified in the course of preparing this report. These range from sector-specific issues such as tariff modelling to issues more specific to particular country contexts, including policy-making processes and data validity. In light of the diverse contexts within which water supply and sanitation (WSS) services are regulated across the Middle East and North Africa, the topics outlined in this chapter may be relevant to some of the countries, but not necessarily to all of them.

Availability and Accuracy of Data and Information

This study was based primarily on desk research of publicly available information. Sources included government websites, service provider websites, reports from international organizations, project documents, and other secondary sources. Challenges related to the availability, reliability, and consistency of information and definitional issues were common across all the countries studied, although to varying extents. For some countries, little if any primary data were available. For example, water and wastewater tariff schedules were available on service provider websites for two countries, but had to be sought in secondary sources for others. Sector and utility performance indicators were difficult to obtain. Although, in some cases the national government appears to have a relatively robust monitoring and evaluation (M&E) mechanism in place to monitor WSS sector performance and progress, it is not common for this information to be publicly available. Moreover, for understandable reasons, the lack or unreliability of data is related to the difficult circumstances and refugee crisis affecting some of the cases analyzed: they may report very high rates of access to improved water supply and sanitation, but these data may not include informal settlements or refugees, and circumstances are constantly evolving.

Summary performance indicators may be meaningless without more in-depth study of conditions on the ground through field surveys of, for example, the number of hours/days water is available, household storage facilities, the environmental impact of on-site and informal sanitation systems, the condition of assets, and the volume of water being extracted by private boreholes.

One of the most immediate needs is thus to identify specific gaps and verify existing information on access and other performance indicators, tariffs, sources of revenue, subsidies (whether hidden or explicit), and the condition of assets. In addition, the mechanisms for collecting, reporting, verifying, and processing information may need to be evaluated and refined and consistent definitions may need to be applied.

Evaluation of Process of Reform and the Applicability of Regulatory Approaches

Several countries have developed strategies for improving sector performance with regard to water availability, access to service, the quality and financial viability of services, water resources management, and environmental protection. It would be useful to assess progress toward the achievement of sector objectives and to analyze how well these plans are being implemented, as well as the challenges encountered and how they have been, or might be, overcome.

It is worth exploring the constraints governments in the region have encountered in trying to introduce effective regulatory frameworks. In some cases, this study found ambiguity or vagueness in regulatory rules and processes and/or significant gaps between de jure regulatory frameworks and de facto implementation. An analysis of the constraints or weaknesses in the enabling environment that impede clarity and successful implementation could be useful. It may be necessary to address constraints in the enabling environment before designing regulatory frameworks. However, given the difficult conditions that exist in several countries in the region, it may not be feasible to eliminate some constraints. Rather, strategies for accommodating them in a transparent manner may be the most practical solution.

Finally, the regulatory fit or appropriateness of alternative regulatory approaches (for example, regulation by contract versus regulation by regulatory agency) to the context needs to be examined, so that frameworks can be designed or refined to provide optimal results within the legal, physical, and cultural environment and the reality on the ground.

Tariff and Efficiency Studies and Financial Projections

More detailed information on how water supply and sanitation (WSS) services are funded—whether through tariffs, taxes, fiscal transfers, or hidden subsidies—is needed before strategies for improving financial sustainability of the services can be formulated. More specifically, tariff levels and tariff structures contribute to poor cost recovery in several (if not all) the cases studied. Tariff studies and studies to identify opportunities for reducing costs through efficiency improvements should be undertaken. Such studies could:

- Develop realistic expectations for cost savings from operational and commercial improvements
- Determine the revenue required to cover operations and maintenance (O&M) costs as well as capital expenditures, taking into account gradual introduction of efficiency improvements
- Determine the need for budgetary transfers (the difference between the revenue requirement and expected tariff revenues), taking into account projected improvements in commercial performance
- Propose options for gradually revising tariffs and tariff structure to reduce budgetary transfers and eliminate subsidies for those who do not need them.

If carried out in a collaborative manner, these studies will enable service providers and governments alike to gain a deeper understanding of the beneficial role of regulation in promoting sector financial sustainability and service improvements.

Surveys of Willingness to Pay, Service Needs, and Customer Satisfaction

On the demand side, there does not seem to be much information on customer satisfaction, percent of income spent on WSS, and willingness to pay, especially by income quintiles and geographic location. Such information would serve as a basis for planning service improvements, improving cost recovery, and designing more targeted subsidies.

Stakeholder Consultation

The authors found little information on stakeholder consultation, particularly at the decentralized level, during the preparation of sector strategies and investment plans. It is not known whether local authorities and existing and potential customers have been brought into the process. In this regard, it is worth further investigating whether all stakeholders have taken ownership of sector strategies and reforms—and, if not, explore how the process could be more inclusive.

Private Sector Participation

Several of the cases analyzed have engaged the formal private sector (national, international, or both) to invest in and operate large-scale projects. Some of these arrangements are quite innovative. Independent evaluations could be undertaken of progress and results, how well contracts are monitored, and whether they are cost-effective, sustainable, and replicable. Strategies may be needed for considering such contracts in designing broader regulatory frameworks for all service providers to ensure complementarity and consistency.

Very little information was reported on informal private sector or community-based service provision and the extent to which these providers are making, or could make, a positive contribution to services. It would be useful to investigate their contributions and the challenges they face, as well as any problems their activities create, and identify ways to strengthen, formalize, and regulate them—or integrate them into formal service providers (for example, through buy-outs or contracts).

The Role and Effectiveness of Integrated Water Resources Management Approaches

It would be interesting to carry out a comparative study of integrated water resources management (IWRM) within the Middle East and North Africa region to identify the common features and differences. This would entail further exploration of issues such as multipurpose hydropower in water-stressed areas, the water, energy-food nexus, and the adoption

of cross-sectoral approaches to achieve sector policies and strategies. Moreover, the complementarity between IWRM and economic regulation of WSS services needs to be distinguished and clarified.

Inadequate emphasis is often placed on the role of IWRM in the management of disasters such as extreme weather, floods, earthquakes, and droughts. This issue is particularly pertinent to the Middle East and North Africa region, where the risk of extreme weather events is relatively high. Further investigations of the existence of national plans (or lack thereof) to mitigate the risks of natural disasters, such as extreme water scarcity, and the development or refining of such plans would be useful.


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