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# MENA REGIONAL WATER GOVERNANCE BENCHMARKING PROJECT

## COUNTRY PROFILE – TURKEY

**October 2010**

This report was produced for review by the United States Agency for International Development (USAID). It was prepared by International Resources Group (IRG) in association with International Water Management Institute, Institute of Water and Watersheds at Oregon State University, Computer Assisted Development Incorporated, Nile Consultants, and ECO Consult.

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### **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government

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# ACRONYMS

DSI	General Directorate of State Hydraulic Works
EBA	Expert-Based Assessment
EU	European Union
FAO	Food and Agriculture Organization
GAP	Southeastern Anatolia Project
GDP	Gross Domestic Product
IRG	International Resources Group
IUA	Irrigation Union Association
HPBAI	Hydropower Businessmen's Association of Industry
MARA	Ministry of Agriculture and Rural Affairs
MENA	Middle East North Africa
MENR	Energy Market Regulatory Authority
MoE	Ministry of Environment and Forestry
NATO	North Atlantic Treaty Organization
O&F	Organizations and Functions
NGO	Non Government Organization
P&L	Policy and Legal
ReWaB	MENA Regional Water Governance Benchmarking Project
SPA	Special Provincial Administrations
SPO	State Planning Organization
USD	Unites States Dollar
USAID	United States Agency for International Development
WUA	Water Users Association
WWF	World Wide Fund For Nature

# FOREWORD

The MENA Regional Water Governance Benchmarking Project (ReWaB) aimed to characterize water governance regimes in five Middle Eastern countries to allow comparisons both across countries and over time. In doing this, information on a variety of aspects of water governance was generated, including the country context, policies and laws, organizations, and expert-based ratings of performance. This information has been consolidated into a profile for each country in a common format.

The Turkey profile was drafted by Lucia De Stefano, Mark Svendsen, Jonathan Lautze and Luke Sanford, with contributions from Huseyin Gundogdu, Andrés Vaughan and Brent Steel. It also drew from a great many other inputs – other project team members, national collaborators, and workshop and rating session participants.

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International Resources Group  
Team Leader  
Regional Water Governance Benchmarking Project

# SUMMARY

## COUNTRY PROFILE – TURKEY

### HIGHLIGHTS

#### OVERALL FINDINGS OF INTEREST

##### High Capacity

- Strong central control and coordination
- Organizing the sector and setting goals
- Collection and use of surface water data
- System operations and maintenance
- Rule of law and responsiveness

##### Potential Challenges

- Regulating water quality and environmental protection
- Wide participation in decision making and transparency of decision-making process
- Resolving disputes
- Long and short-term matching of supply and demand

### WATER SECTOR ORGANIZATIONS

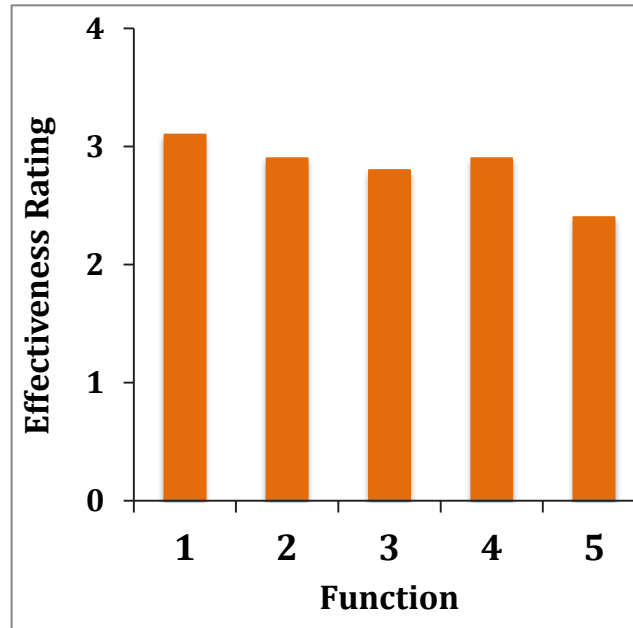
#### RELATIVE INFLUENCE ON WATER GOVERNANCE FUNCTIONS

	Organizing	Planning	Allocating	Developing	Regulating
DSI	●●●	●●●	●●●	●●●	●●●
M. Environment	●●	●●	●	●●	●●●
State Planning Org.	●●	●●●	●	●	●
M. Energy	●	●●	●	●	●
Parliament	●●	●	●	●	●
Irrigation User Assoc.	●	●	●	●●	●●●
Municipalities	●	●●	●●	●●	●●
M. Agriculture	●	●●	●	●●	●●
SPRD	●	●	●●	●●	●●
M. FA, GDEWE	●	●●	●	●●	●
Irrig. Coop. Assoc.	●●	●●	●	●	●●
Energy Reg. Agency	●	●	●	●	●●
Universities	●	●	●	●	●
Iller Bank	●●	●	●	●	●●
Hydro Power IA	●	●	●	●	●
Pressurized IIA	●	●●	●	●	●
Environmental NGOs	●	●	●	●	●
Courts	●	●	●	●	●
M. Health	●	●	●	●	●

## STANDARD WATER GOVERNANCE FUNCTIONS

(1) Organizing & Building Capacity – (2) Planning Strategically – (3) Allocating  
(4) Developing & Managing – (5) Regulating

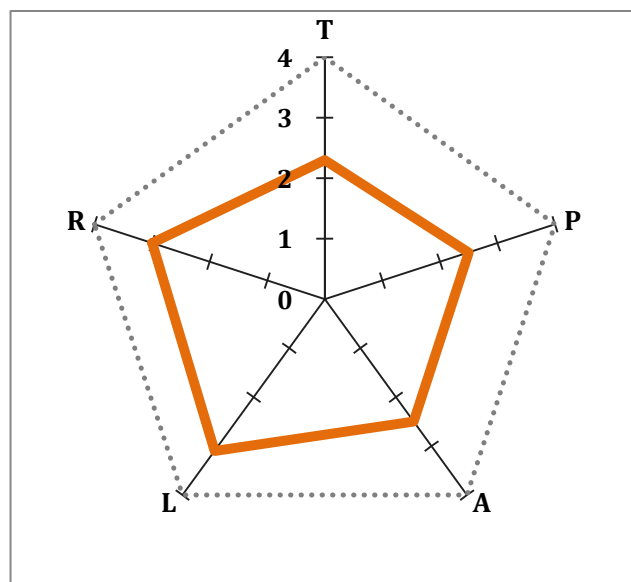
■ Expert Rating



## GOOD GOVERNANCE PROCESS FEATURES

(T) Transparency – (P) Participation – (A) Accountability – (L) Rule of Law – (R) Responsiveness

■ Expert Rating    ■ Highest Possible



# I INTRODUCTION

Most countries of the Middle East are chronically water stressed. Population growth and climate change impacts will exacerbate that stress. Most of the region's countries have already constructed significant water resource infrastructure, but the effectiveness of water governance and management has often lagged behind. Clearly, hardware solutions to these formidable challenges are not, by themselves, sufficient. Water governance shortcomings also hamper the achievement of durable solutions to water stress.

In order to tackle water governance weaknesses it is necessary to assess the present situation and its evolution over time. The Regional Water Governance Benchmarking Project<sup>1</sup> (ReWaB) aims at establishing a system of water governance capacity and performance benchmarking for Middle East and North Africa (MENA) countries. After analyzing the state of the art on the subject, the project team defined concepts of *governance*, *policy*, *management*, and others and designed a strategy for assessing *de facto* water governance based on essential water governance functions and characteristics of good governance decision-making processes. It also suggested a three-tiered framework defining the structural capacity for effective water governance comprising policies, laws, and organizations. Based on these concepts, it defined an approach to measuring and assessing water governance and tested it in six countries in the MENA region (Egypt, Jordan, Morocco, Oman, Turkey, and Yemen).

This report summarizes the results of the ReWaB assessment for Turkey. After this Introduction, Section 2 briefly presents the project's approach to water governance benchmarking. Section 3 provides a brief overview of the political, economic, and social situation in Turkey; looks at water availability; broadly outlines the main users and managers of Turkey's limited water resources; and identifies relevant transboundary issues. Section 4 describes the main actors in Turkey's water governance and their influence on functional performance, as shown by the Organizational and Functions (O&F) Matrix. Section 5 presents and discusses the results obtained in the expert-based assessment (EBA), which gauged the functional effectiveness of the Turkish water sector and the application of good governance processes in water-related decision making. Section 6 concludes the profile, highlighting areas of high capacity and areas where potential for improvement exists.

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<sup>1</sup> [www.rewab.net](http://www.rewab.net)

# 2 THE REWAB APPROACH

## 2.1 CONCEPTS<sup>2</sup>

After critically reviewing the variety of existing definitions of water governance, ReWaB defined water governance as *the manner in which authority is acquired and exercised on behalf of the public in developing, utilizing, and protecting a nation's water resources*.

For analytical purposes, governance structures can be divided into three groups: policies, laws, and organizations (Saleth and Dinar, 2004). In this context, **policies** are purposive courses of action giving overall direction to governance, while **laws** are codified and informal “rules of the game”. Finally, **organizations** are groups of individuals engaged in purposive activity.

The observation that, while there are large differences in organizational structures across different countries there is substantial consistency in the core functions that water sectors perform, led to the identification of a set of core functions, called standard water governance functions (functions), that must be performed by any effective national water sector (Table 1).

**Table 1. Standard water governance functions and sub-functions**

<p><b>1. Organizing and building capacity in the water sector</b></p> <ul style="list-style-type: none"><li>1.1 Creating and modifying an organizational structure</li><li>1.2 Assigning roles and responsibilities</li><li>1.3 Setting national water policy</li><li>1.4 Coordinating and integrating among sub-sectors, levels, and national sub-regions</li><li>1.5 Establishing linkages with neighboring riparian countries</li><li>1.6 Building public and political awareness of water sector issues</li><li>1.7 Securing and allocating funding for the sector</li><li>1.8 Developing and utilizing well-trained water sector professionals</li></ul> <p><b>2. Planning strategically</b></p> <ul style="list-style-type: none"><li>2.1 Collecting, managing, storing and utilizing water-relevant data</li><li>2.2 Projecting future supply and demand for water</li><li>2.3 Designing strategies for matching expected long-term water supply and demand and dealing with shortfalls (including drought mitigation strategies)</li><li>2.4 Developing planning and management tools to support decision-making</li></ul> <p><b>3. Allocating water</b></p> <ul style="list-style-type: none"><li>3.1 Awarding and recording water rights and corollary responsibilities</li><li>3.2 Establishing water and water rights transfer mechanisms</li><li>3.3 Adjudicating disputes</li><li>3.4 Assessing and managing third party impacts of water and water rights transaction</li></ul> <p><b>4. Developing and managing water resources</b></p> <ul style="list-style-type: none"><li>4.1 Constructing public infrastructure and authorizing private infrastructure development</li><li>4.2 Forecasting seasonal supply and demand and matching the two</li><li>4.3 Operating and maintaining public infrastructure according to established plans and strategic priorities</li><li>4.4 Applying incentives and sanctions to achieve long and short term supply/demand matching (including water pricing)</li></ul>
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<sup>2</sup> More details on the project approach and framework can be found in the document “MENA Regional Water Governance Benchmarking Project Concept and Approach Framework” (Part I) (2009), available at [www.rewab.net](http://www.rewab.net).

4.5 Forecasting and managing floods and flood impacts

#### 5. Regulating water resources and services

5.1 Issuing and monitoring operating concessions to water service providers

5.2 Enforcing withdrawal limits associated with water rights

5.3 Regulating water quality in waterways, water bodies, and aquifers (including enforcement)

5.4 Protecting aquatic ecosystems

5.5 Monitoring and enforcing water service standards

Water governance is, in essence, a series of interlinked decisions. The way in which decisions are made can be an important determinant of the quality and content of the decisions actually reached. After reviewing the literature on the subject and critically discussing the decision-making features characteristic of “good governance,” ReWaB posited a set of five decision process dimensions for use in assessing water governance (Table 2).

**Table 2. Decision-making process features characteristic of good water governance**

- 1. Transparency.** Information should flow freely within a society. The various processes and decisions should be open to scrutiny by the public.
- 2. Participation.** All citizens, both men and women, should have a voice, directly or through intermediate organizations representing their interests, throughout water governance policy formulation and decision-making.
- 3. Accountability and Integrity.** Governments, the private sector and civil society organizations should be accountable to the public or the interests they represent.
- 4. Rule of law.** Legal frameworks should be fair and enforced impartially.
- 5. Responsiveness.** Institutions and processes should serve all stakeholders and respond properly to changes in demand and preferences, or other new circumstances.

In the resulting framework, policies, laws, and organizations provide the institutional structure in which water governance takes place. Effectiveness in water governance stems from effective performance of a set of standard functions. Finally, the characteristics of governance decision making provide a way of assessing the degree to which governance reflects the will of the public, its fairness, and its self-awareness and ability to adjust to changing conditions.

## 2.2 ANALYTIC TOOLS

In the ReWaB approach, water governance capacity is evaluated by a combination of policy, legal, and organizational analyses. The way in which capacity is employed to reach decisions, and the processes and values used in making those decisions, are assessed by expert-based in-country assessments.

### 2.2.1 ORGANIZATIONAL ANALYSIS

During preliminary interactions with local informants, significant water governance-related organizations in each country, both public and private, were identified and their roles, based on their official mandates, were outlined. These organizations were then examined, relative to the standard water governance functions, to map the *de facto* organizational coverage of the functions.

This analysis employs a matrix-based assessment tool in which panels of water-experts in the country rated the degree of *de facto* involvement of particular organizations in carrying out the water functions in that country<sup>3</sup>. Participants assign scores assessing the degree to which particular organizations influence decisions relating to each of the five standard water governance functions. During the process,

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<sup>3</sup> See *Fieldwork Protocol* at [www.rewab.net](http://www.rewab.net) for detailed description of the methodology employed.

participants discuss in groups, and then evaluate individually, the roles of the various organizations. The resulting O&F Matrix is presented and discussed in Section 4.2 of this document and in the Summary at the beginning of the profile.

### **2.2.2 POLICY AND LEGAL ANALYSIS**

The water governance assessment process normally includes an analysis of policy and legal documents for the country. In the case of Turkey, the policy and legal analysis was not completed due to difficulties with document translation. Policy and legal documents collected for Turkey are available on the project website and are listed in Annex 2.

### **2.2.3 EXPERT-BASED WATER GOVERNANCE RATING**

The expert-based assessment evaluates the overall level of effectiveness in performing the five standard water governance functions (functional effectiveness rating) and the extent of application of five characteristics of good governance decision-making (process features rating)<sup>4</sup>. Both ratings are derived from questionnaires completed by national water experts at a Rating Session in the country. To assess functional effectiveness, participants in the Rating Session are asked to complete the questionnaire using a 4-value rating scale. Respondents discuss the scoring in groups and then complete the questionnaire individually.

A second questionnaire is used to rate the degree of application of the five good governance decision-making features defined in the ReWaB framework. Country performance was assessed against the highest conceivable level of each of the five features while considering a common set of five water-related challenges that are used in all countries in which the assessment is conducted. These challenges are: (1) increasing demand for drinking water; (2) decreasing groundwater levels; (3) strategic planning for a national water policy; (4) regulating water quality in rivers, aquifers and waterways; and (5) matching supply and demand in agriculture. For each challenge, participants are asked to use a 4-value scale to score two to five statements related to the five decision-making features. Participants discuss the scoring in groups and then complete the questionnaire individually.

The resulting scores of both ratings together with their analysis are presented in Section 5 and in the Summary.

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<sup>4</sup> See *Fieldwork Protocol* at [www.rewab.net](http://www.rewab.net) for detailed description of methodology employed.

# 3 WATER RESOURCES CONTEXT

This section gives a brief overview of the political, economic, and social situation in Turkey which provides a context for Turkish water resource governance and management. In addition, it outlines water availability and the main water users in Turkey and relevant transboundary issues.

## 3.1 POLITICAL STRUCTURE

Modern Turkey was founded in 1923 and has been a democracy since then. Turkey is a republican parliamentary democracy with a unicameral legislature and a civil law system. Turkey is a member of the UN and NATO, is an associate member of the European Community, and has been in membership accession talks with the EU since 2005.

## 3.2 ECONOMY

Turkey's economy is a mix of modern industry and traditional agriculture, the latter of which employs almost one third of the country's workforce. The contribution of the different economic sectors to the national GDP shows the importance of services in the Turkish economy: services account for about 65% of the GDP, industry for 26% and the agricultural sector for 9% (CIA, 2010). Turkey has a rapidly growing private sector that is encouraged by the state through market incentives. Although Turkey is undertaking a privatization program, the government remains a major player in basic industry, banking, transport, and communication (CIA, 2010).

## 3.3 GEOGRAPHY AND POPULATION

Turkey is the 17th most populous country in the world, with a population of over 75 million and a 1.3% growth rate. Roughly 69% of the population live in cities, with a projected average increase of the urban population of 1.9% per year (CIA, 2010). The remaining 31% of the population is rural. Turkey is vast, stretching over an area of 783,000 square kilometers and shares borders with eight neighboring countries. The exposure to both maritime and continental weather patterns combines with a highly varied topography to produce several distinct climatic zones. The Mediterranean region is essentially subtropical, characterized by hot dry summers and mild, rainy winters. The Black Sea region receives rain throughout the year and enjoys both mild summers and mild winters. The Aegean Region (Western Anatolia) has mountains which run roughly east to west (i.e. perpendicular to the coast) and which are interspersed with grassy flood-plains. Central Anatolia is a vast high plateau with an average altitude of 1,000 meters above sea level and a semi-arid continental climate. Average annual precipitation is highest in the Black Sea Region (1,120 mm), and it exceeds 800 mm/year in some of the coastal areas. However in the remaining 70 percent of the country, which includes some coastal areas, Thrace and eastern Anatolia, precipitation averages less than 500 mm/year. In the highland plains of central Anatolia it averages less than 400 mm.

## 3.4 WATER AVAILABILITY

Renewable freshwater per capita in Turkey in 2005 is 2,950 cubic meters per year (FAO, 2010). Relative to other countries in the region, Turkey is water abundant (Baris and Karadag, 2007). According to the

Turkish government, Turkey has 112 cubic kilometers of exploitable renewable water resources, and currently uses about 46 cubic kilometers of that amount (Turkey Water Report, 2009). Domestic use accounts for about 15% of the total, industry 11%, and agriculture the remaining 74% (CIA, 2010). As more people move to cities and Turkey's economy continues to industrialize, both municipal and industrial water use will increase, creating pressure on agricultural water use. However, these figures vary geographically, as the climate varies substantially from one part of the country to another. Turkey has 25 distinct hydrological basins and extremely variable precipitation patterns across basins, resulting in varied hydrological conditions across the country (Turkey Water Report, 2009). Global climate models predict a decrease in annual precipitation and an increase in temperature across most of Turkey as an effect of global climate change (Turkey Water Report 2009). As a result, "Turkey is expected to be a water-stressed country by 2030" (Burak, 2008: 152). While there is no fixed water tariff (Sozen et al, 2008), prices and scales vary according to the intended use of water and the available water resources.

Turkey is the largest producer of agricultural products in the Near-East and North Africa regions (Turkey Water Report, 2009). Turkish agricultural policy is set out in successive five-year development plans, which are focused on "stabilizing agricultural prices, providing adequate and stable income for those working in agriculture, meeting the nutritional needs of a fast-growing population, increasing yield, minimizing vulnerability of production due to weather conditions, promoting development in rural areas, promoting the application of modern agricultural techniques and developing an export potential for agriculture" (Turkey Water Report, 2009: 24). Most irrigation in Turkey is through surface application systems, while about 8% makes use of more efficient pressurized technologies such as sprinklers or drip. In the early 1990s, the Turkish government initiated a program of transferring responsibility for irrigation service delivery and operation and maintenance of secondary and tertiary canals to Water Users Organizations (WUOs). As a result of this internationally-regarded program, currently 96% of all irrigation systems are run and maintained by locally-based Water Users Organizations (Turkey Water Report, 2009).

Turkey currently has 172 hydroelectric power plants in operation, which corresponds to about 35% of the country's economically exploitable hydropower potential. Currently there are 148 hydropower plants under construction, and another 1,700 in the planning stage.

In 2004, 96% of the country's population had access to clean water (The Pacific Institute 2010), and the average per capita water consumption was 250 l/day. Overall, 88% of the population (urban 96%, rural 72%) of the country has access to improved sanitation (The Pacific Institute 2010), and the domestic wastewater of 40% of the Turkish population is treated before discharge (Turkey Water Report, 2009).

The Southeastern Turkey region is the least developed and poorest of the country's regions. Located in this region is the biggest water resources project in Turkey, the *Guneydogu Anadolu Projesi* (GAP) or Southeastern Anatolia Project. GAP is a regional development project aimed at socio-economic development of the region. The scheme involves the construction of 22 dams and the irrigation of 1.8 million hectares of land, as well as the construction of 19 hydropower plants with a projected annual energy production of 27 billion kWh (source <http://www.gap.gov.tr/>).

### **3.5 TRANSBOUNDARY ISSUES**

Turkey is an upstream country on the Coruh, the Tigris, The Euphrates, the Kura-Aras rivers and a downstream country on the Meriç and Asi (Orontes). Approximately 40 percent of Turkey's water resources are transboundary, with the native outflow of the Euphrates and Tigris rivers alone accounting for 28.5% of the country's available resources (Turkey Water Report, 2009; Kibaroglu et al, 2005) Turkey's transboundary water policy aims at the efficient utilization of transboundary water resources and sharing the benefits through cooperation among riparian states.

At present there is some form of cooperation and agreements for all rivers shared between Turkey and its neighboring countries. A study commissioned by German Federal Ministry for Environment, Nature Conservation and Nuclear Safety (Kibaroglu et al, 2005: 87) concluded that “all these agreements are bilateral and predominantly concern water quantity or border issues. Turkey and its neighbors have not yet agreed on more comprehensive forms of cooperation that would tackle the different aspects of water use and needs (quality, quantity, flood protection, preservation of ecosystems, and prevention of accidents) in an integrated manner and could potentially facilitate negotiations by linking different water management issues.”

# 4 ORGANIZATIONAL ANALYSIS

This section describes the prominent organizations involved in water management in Turkey and their roles in the water sector. Then, it assesses the level of de facto influence of these organizations in decision-making related to the five standard water governance functions using an Organizations and Functions (O&F) Matrix.

## 4.1 MAIN ORGANIZATIONS IN THE WATER SECTOR

Article No.168 of the Turkish Constitution on the “Exploration and Management of Natural Wealth and Resources” states that natural assets and resources are at the disposal of the government and that the authority to explore and manage such wealth and resources is vested in the government. Water resources fall under two distinct categories: public water resources, and water resources in the domain of private law and private ownership. According to the Turkey Water Report (2009:13) “Public water resources are water resources out of the domain of private proprietorship and under the rule and disposal of the state. Their management and utilization are to be provided by means of public law.” These include groundwater, water supplies for cities with populations over one hundred thousand, and water that is related to environmental issues. “Water resources in the domain of private law and private ownership are water sources of springs that are considered inseparable from their location, and as a result are under the ownership of private persons” (Turkey Water Report, 2009:14).

*The General Directorate of State Hydraulic Works (DSI in the Turkish acronym)* is the main executive state agency for Turkey’s overall water resources planning, management, execution and operation. The primary objective of DSI is to develop all water and land resources in Turkey, as well as the management of surface and groundwater and the prevention of flood damages. To fulfill this mandate, DSI is empowered to plan, design, construct and operate dams, hydroelectric power plants, domestic water supplies systems for large cities and irrigation schemes. DSI is in charge of the elaboration of projects, master plans and feasibility reports needed for the development of the country’s water resources. Toward this end, the DSI collects data related to river and groundwater hydrological parameters, meteorological conditions, soil classification, agricultural economy, soil erosion and geological conditions.

*The Ministry of Agriculture and Rural Affairs (MARA)* is responsible for planning and designing projects to protect and improve soil, water, plant, animal and fishery resources and products, to control wastewater discharge into fish production areas, and to monitor nitrates in freshwater and groundwater. The Agricultural Research Institutes under the auspices of MARA conduct research related to soil-water interactions and plants. The main duties of the research institutes of MARA include: the establishment of agricultural research priorities and the consequent allocation of the available resources to research programs and projects; the follow-up of the projects development, and the dissemination of their results; the improvement of agricultural productivity and of quality of agricultural products with the final goal of increasing farmers’ incomes; the protection of natural resources and the environment; the transfer and adaptation of international technological and scientific advances to Turkish society; and building the capacity of the country’s researchers and research organizations.

**Ministry of Energy and Natural Resources** (MENR) is involved in the development of energy resources. The General Directorate of Energy describes its role as being "to ensure efficient, effective safe and environment-sensitive use of energy and natural resources in a way that reduces external dependency of our country, and makes the greatest contribution to our country's welfare" (<http://www.enerji.gov.tr>).

**The Energy Market Regulatory Authority** is also involved in developing energy resources. It was established in 2001 "with a view to creating a financially sound, stable and transparent energy market and ensuring an independent regulation and control of that market with the ultimate objective of offering adequate electricity and natural gas to consumers of high quality continuously with a low cost and in an environment-friendly manner, which will be able to function in accordance with provisions of private law in a competitive environment" (<http://www.epdk.gov.tr>).

**The Ministry of Environment and Forestry** (MoE) was established to take the necessary measures to protect the environment and prevent pollution. The duties of MoE include protecting the environment and promoting environmental conservation, ensuring the most appropriate and effective use and protection of the land and natural resources in rural and urban areas. The MoE has the responsibility of coordinating implementation of international conventions, including designation of Ramsar sites. It is empowered to co-ordinate the nature protection activities of the other ministries.

**The Ministry of Health** is responsible for determining quality standards for drinking water and water for consumption, monitoring these standards and preparing legislation in these areas

**Iller Bank** is a state-owned, non-depository bank that provides loans for infrastructure building projects, including water distribution networks, water treatment plants, sewerage systems and wastewater treatment plants.

**The State Planning Organization** (SPO) was established to carry out the economic, social and cultural planning activities of the country in order to use resources efficiently to accelerate development. The duties of SPO include advising the government about economic, social, cultural, and environmental policies; preparing long-term development plans; coordinating the actions of ministries and other organizations; working closely with international institutions and the private sector; and a host of other minor advisory tasks. Generally, the SPO is responsible for advising the government about development projects and coordinating across ministries when it comes to implementing those projects.

**The Ministry of Foreign Affairs** is responsible for all trans-boundary water issues. In this aspect, it coordinates with the DSI through the SPO.

**The Irrigation Union Association** (IUA). The IUA is a federation of Irrigation Unions that represents irrigated farmers and advocates for their interests. Its members manage and maintain over 95% of all irrigation systems in the country. The IUA also mediates disputes between farmers.

**Municipalities** are responsible for managing some water infrastructure, and are in charge of implementing small-scale projects according to recommendations and instructions provided by DSI.

**Parliament** is in charge of discussing and passing water-related legislation. While it rarely takes a specific interest in water policies, it does sometimes facilitate discussions about water policy.

**Special Provincial Administrations** (SPA) work under the auspices of provincial governors. The responsibilities of SPA related to water issues include supplying potable water to rural communities and sewage solid waste disposal within the provincial boundaries.

**Non-governmental Organizations** (NGOs). There are many locally, national and international NGOs active in Turkey including the World-wide Fund for Nature (WWF). The WWF plays a wide variety of

roles, from providing information about the environment to funding some projects and advocating for nature protection.

*Courts* use a civil law system like much of the rest of Europe, and have areas of jurisdiction from the Constitutional Court to the Military High Administrative Court. Courts review several water cases each year and follow legislative precedent in those cases.

*Universities* do research related to water, but are generally not directly related to the water sector. They have no formal ties to government water institutions.

The *Association of Pressurized Irrigation Industrialists* (*BASUSAD* in the Turkish acronym) promotes information sharing within the industry and the introduction of pressured irrigation systems across the country.

*Hydropower Plants Businessmen's Association of Industry* (HPBAI), is a trade association which represents the interest of hydropower generators.

## **4.2 ORGANIZATION AND FUNCTION MATRIX**

This section presents the results of a Workshop held in Turkey in July 2009 attended by 33 water experts active in the Turkish water sector and representing a range of backgrounds and institutional affiliations (Annex 1). Participants in the workshop evaluated the roles of different organizations by assigning scores assessing the degree to which an organization influences decision-making in each of the five standard functional areas. Five groups of 3 to 6 participants each completed this exercise. Individual scores were then averaged to yield the value shown in Table 3. Listed vertically are the assessed organizations. Listed horizontally are the five standard water governance functions. The scale ranges from 1 to 5, where 5 indicates the highest level of influence. To give a quick visual picture of the relative magnitudes of the scores, individual cells have been shaded such that darker cells indicate stronger influence and lighter cells indicate less influence.

**Table 3: Organizations influencing decision-making in the Turkish water sector; grey tones correspond to the following scoring intervals, from lighter to darker levels of shading: 1.0-1.9, 2.0-2.9, 3.0-3.9, 4.0-5.0.**

	Organizing	Planning	Allocating	Developing	Regulating	Average
General Directorate of State Hydraulic Works -DSI	4.8	5.0	5.0	5.0	4.8	4.9
Ministry of Energy and Natural Resources	2.8	2.8	1.8	2.6	2.4	2.5
Ministry of Agriculture and Rural Affairs	2.0	2.2	1.0	2.2	2.2	1.9
The Energy Market and Regulatory Authority	2.0	1.4	1.8	1.4	2.0	1.7
Ministry of Environment and Forestry	3.8	3.2	2.2	3.0	4.6	3.4
Ministry of Health	1.6	1.0	1.0	1.0	1.8	1.3
Iller Bank	2.0	1.6	1.0	1.6	2.2	1.7
State Planning Organization	3	4	1.2	2.6	2.2	2.6
Ministry of Foreign Affairs	2.2	2	1.4	2.0	1.6	1.8
Irrigation Union Association	2.2	1.6	1.8	2.0	3.2	2.2
Municipalities	1.6	2	2.0	2.2	2.6	2.1
Parliament	3.8	2.6	1.4	2.2	1.6	2.3
Special Provincial Administration	1.4	1.2	2.4	2.4	2.2	1.9
Environmental NGOs	1.6	1.6	1.0	1.2	1.4	1.4
Courts	1.0	1.0	1.8	1.2	1.8	1.4
Universities	2.4	1.6	1.2	1.4	1.8	1.7
The Center for Irrigation Cooperative Association	2.2	2.0	1.0	1.2	2.4	1.8
Pressured Irrigation Industrialists Association	1.8	2.0	1.0	1.2	1.2	1.4
HPBAI	1.8	1.8	1.0	1.4	1.6	1.5
<b>Average</b>	2.3	2.1	1.6	2.0	2.3	2.1

**Organizing and Regulating have the greatest collective organizational involvement.** *Organizing* is dominated by three main organizations, all of which scored 3.8 and above. The most involved of these is DSI, with a score of 4.8. The Ministry of Environment and Forestry scored a 3.8 indicating a high level of involvement. Parliament also scored a 3.8 in the area of *Organizing*, reflecting the importance of that institution in a parliamentary democracy. In the *Regulating* function, the first two organizations stand out again. DSI received a 4.8 rating while the Ministry of the Environment and Forestry scored a 4.6 in this function, the highest score for any organization outside of the DSI. In addition, the Irrigation Union Association stands out as an important player in making decisions about regulation. This Association represents the Irrigation Unions which manage the bulk of Turkey's surface irrigation water.

**Allocating has the least collective involvement of any function.** In the *Allocating* function, the only organization to score above a 2.5 was DSI, which received a 5 out of 5. This shows that decisions

related to this function are concentrated in the hands of one organization, and other actors are largely un-involved.

**Planning and Developing have medial involvement from organizations.** Both of these functions are dominated by the DSI, but each has several other organizations that have substantial influence. In the *Planning* function, the State Planning Organization scored a 4.0, demonstrating a high level of involvement. The Ministry of the Environment and Forestry also has medium-high involvement. *Developing* had the most parity of any of the functions. After DSI, eight organizations scored between 2.0 and 3.0 in this function.

**DSI is the most important water organization in Turkey.** DSI is by far the most influential organization related to water governance in Turkey. It received a 4.8 or above in each of the functional categories. Only one other organization, the Ministry of Environment and Forestry, received an average score that was greater than 3.0, and most scored below 2.0, demonstrating again the primacy of DSI in Turkey's water sector. This is consistent with the mandate of DSI, which was created to manage all of Turkey's water resources and coordinate with other organizations.

**Two other organizations have influence.** The State Planning Organization and the Ministry of Environment and Forestry are the only two organizations outside of DSI that had more than a moderate level of influence in the water sector. This is interesting and slightly unexpected because of the nature of the Turkish water sector and government. Turkey has a democratic government that is generally representative, and a large number of actors that work in the water sector. Furthermore, Turkey has a diverse climate and a large number of distinct watersheds. One would expect that both of these factors would spread overall influence in the sector more widely.

**The Ministry of Environment and Forestry has several specialized areas of influence.** The MoE appears heavily involved in *Regulating* and is nearly as influential as the DSI in making decisions relating to this function. This is in agreement with the MoE's mandate, which calls for it to regulate pollution (of water resources, among other things). The MoE also appears to have substantial involvement in the *Organizing* function, which is slightly unexpected given that its core areas of focus are much broader than water. Conversely, the MoE was not rated highly in the *Allocating* function, indicating that it has only slight influence in that area, especially compared to its influence in other functional areas. Finally, it is interesting to note that the MoE had the most influence in the areas that the DSI had the least: *Organizing*, *Planning*, and *Regulating*.

**The State Planning Organization has predictably high levels of influence in Organizing and Planning.** The SPO was highly influential in the *Planning* function. Its mandate involves planning for resource use and development, which undoubtedly involves planning for water development. This also explains its medium-high level of influence in the *Organizing* function. Its high level of influence overall might be explained by its mandate to coordinate policy decisions.

**The Energy Ministry exerts a moderate level of influence in most functional areas.** The Energy Ministry scored around the middle in each area except for *Allocating*, where it scored a 1.8. This result suggests both that the Energy Ministry has some influence in the water sector as a result of its control over hydroelectricity, and also that hydroelectric power is important enough to exert significant influence in the water sector.

**Other institutions are peripheral in their level of involvement in the five water resources functions.** No other organization had an average across functions greater than 2.5, and only two of these organizations received a single functional score above 2.5. These were the Irrigation Union Association in the *Regulating* function, and the Parliament in the *Organizing* function. Both of these scores

are expected—the Irrigation Union Association represents associations responsible for tertiary water distribution in surface irrigation systems. The Parliament passes legislation that helps structure the water sector, which falls in the area of *Organizing*. All of the other actors had overall scores above 1, but less than 2, meaning that they all wield a low level of influence on the water sector in Turkey. This shows that they are involved in the water sector, and do have some influence, but that ultimately decisions are made and implemented under the guidance of the DSI and one or two other organizations.

***Summing Up.*** Turkey’s water sector appears to have a highly centralized organizational structure. Contrasting somewhat with the country’s wide variation in climate and water resources conditions, as well as water resources uses and users, Turkey’s organizational structure is dominated by one organization, with many others wielding only peripheral influence. There were no gaps in functional coverage, at least partially because the DSI is influential in all functions, and relatively few overlaps in different functions (because so few organizations had a high level of involvement overall). Most organizations fulfill their intended role in the water sector and work through the DSI to cover all water resources functions.

# 5 EXPERT-BASED WATER GOVERNANCE RATING

This section presents the results of an Expert Based Assessment of water governance, undertaken in a Rating Session held in Turkey in October 2009. The Rating Session was attended by 27 Turkish experts affiliated with different sub-sectors and different water-related organizations (Annex 1). The analysis considers the experts' perceptions of effectiveness of the Turkish water sector in current (2009) and past (2000) performance of the five standard water governance functions. Also assessed is the extent to which five good governance decision-making features are present in actual decision-making related to key water challenges.

## 5.1 FUNCTIONAL EFFECTIVENESS RATING

Table 4 presents averaged participant responses aggregated by function for the functional effectiveness exercise. Table 5 contains average scores drawn from the 20 questions in the functional effectiveness exercise. Standard deviations are shown in Annex 3.

**Table 4. Aggregated responses to the functional effectiveness exercise; grey tones correspond to the following scoring intervals, from lighter to darker levels of shading: 1.0-1.9, 2.0-2.9, 3.0-4.0.**

	2000	2009
F1: Organizing and building capacity in the water sector	3.1	3.1
F2: Planning strategically	2.8	2.9
F3: Allocating water rights	2.8	2.8
F4: Developing and managing water resources	2.8	2.9
F5: Regulating water resources and services	2.5	2.4

*Turkey's strongest function is Organizing and Building Capacity in the Water Sector.* With an average score of 3.1, *Organizing* appears currently as the strongest function in the Turkish water sector. *Planning*, *Allocating*, and *Developing* all received nearly equal scores, averaging 2.8 out of 4. Together, these scores suggest the country possesses better than average functional effectiveness, and a balanced water sector, placing equal emphasis on planning, water rights, and water management.

*Lack of progress in Turkey's water sector effectiveness.* The aggregate scores for the perceived functional effectiveness in year 2000 and year 2009 showed a minimal increase in overall functional effectiveness over time. This seems to indicate that governance performance has reached a plateau under the current framework, and that more fundamental changes, possibly involving governance decision making practices, may be required to resume an upward improvement trajectory.

**Table 5. Averaged ratings of functional effectiveness; grey tones correspond to the following scoring intervals, from lighter to darker levels of shading: 1.0-1.9, 2.0-2.9, 3.0-4.0.**

Question		2000	2009
F 1	1. Roles and responsibilities of each department or agency are clearly defined	3.6	3.5
	2. Policy goals for the water sector are clearly defined	3.1	3.2
	3. The water sector is provided with sufficient funds to function properly	2.7	2.8
	4. National governmental agencies consult each other when taking decisions that impact multiple sectors	2.9	2.9
	5. National governmental agencies cooperate in the implementation of their policies where appropriate	2.8	3.0
	6. Regional governmental agencies are consulted when decisions that affect their region are taken	3.0	3.0
	7. Governmental agencies are staffed with sufficient and trained personnel to perform the assigned tasks	3.4	3.2
F 2	8. Future water supply and demand forecasts are based on good quality data	2.8	3.0
	9. Water resources data are collected regularly, continuously throughout the country	2.9	3.0
	10. Current strategies for long-term matching of supply and demand have been effective at matching supply and demand	2.7	2.6
F 3	11. Rules and procedures for assigning and recording water rights are clearly defined and functioning	3.1	3.0
	12. Rules and procedures for transferring water rights are clearly defined and functioning	2.7	2.8
	13. Disputes among water users are resolved effectively	2.6	2.6
F 4	14. Government agencies are effective at forecasting seasonal supply and demand and matching the two	2.9	3.0
	15. Government agencies effectively operate and maintain public water infrastructure	3.0	3.1
	16. Current incentives and sanctions (including water pricing) are effective at achieving long and short term supply/demand matching	2.6	2.6
F 5	17. Government agencies are effective at enforcing withdrawal limits that are established	2.8	2.8
	18. Official water quality standards in waterways are met	2.4	2.1
	19. Aquatic ecosystems are protected to the level specified by the government	2.3	2.4
<b>AVERAGE</b>		2.9	2.9

**Organizing and Building Capacity.** *Organizing* is the function performed most effectively in Turkey, with most of the scores by sub-functions above 3.0 (Table 5). When looking at the perceived evolution over the past 9 years, the assessment points to minimal improvement relative to year 2000. The definition of roles and responsibilities of agencies in fact decreased slightly, yet still had the highest effectiveness of any question area at 3.5 (Table 5). Similarly, the perception of the adequacy of the available human resources in the water the water sector declined slightly, but still remained one of the stronger sub-functions. Other sub-functions experienced improvements over time. For example, cooperation of national governmental agencies is perceived to have increased, suggesting that the many organizations involved in Turkey's diverse water sector are working in a more coordinated way than before.

**Planning Strategically.** This function and *Developing* are the second strongest functions at present. Relative to 2000, while forecasts are now based on slightly better data, and the scope of data collection and quality of data have both improved, the effectiveness of matching supply and demand in the long-term has decreased slightly (Table 5).

**Developing and Managing Water Resources.** As mentioned above, *Developing* is one of the strongest function at present. The last 9 years saw miniscule improvement in forecasting supply and demand, as well as a small increase in operation and maintenance of public infrastructure. Yet both sub-functions scored relatively high in 2009 (3.0 and 3.1 respectively, Table 5).

**Allocating Water Rights.** *Allocating* improved only slightly (0.1) between 2000 and 2009. While initial assignment and recording of water rights is relatively strong, re-allocation and dispute resolution are less so. This probably reflects the absence of a formal system for assigning, holding, and trading water rights, a gap that will become increasingly problematic as pressure on available resources increases.

**Regulating Water Resources and Services.** *Regulating* is the least effectively performed function, even experiencing a slight decrease from 2.5 to 2.4 out of 4 over the 10 year period. In particular, the regulation of water quality and the protection of aquatic ecosystems seem to require special attention. These two sub-functions obtained the lowest ratings overall both in 2000 and in 2009 and, in the case of water quality, experienced the highest decrease in effectiveness overall (from 2.4 to 2.1).

## 5.2 RATING OF PROCESS FEATURES

At the Rating Session, participants were asked to consider the extent to which five features were present in decision-making in response to five key water sector challenges (see Section 2).

The aggregated values of the averaged answers by challenge and process feature are shown in Table 6. The scale ranged from 1 to 4. A score of 1 indicates that the strength of a particular governance feature is low, and 4 indicates that the strength of a particular governance feature is high.

**Table 6. Averaged ratings of decision process features; grey tones correspond to the following scoring intervals, from lighter to darker levels of shading: 1.0-1.9, 2.0-2.9, 3.0-4.0.**

Challenge	Decision Process Feature					
	Participation	Transparency	Integrity and Accountability	Rule of Law	Responsiveness	Average
1. Drinking Water	2.4	2.3	2.7	2.9	3.0	2.7
2. Groundwater	2.5	2.4	2.5	3.2	2.7	2.7
3. National Water Policy	2.3	2.2	2.4	3.2	3.2	2.7
4. Water Quality	2.6	2.3	2.4	3.1	3.3	2.7
5. Matching supply-demand	2.8	2.3	2.4	3.3	2.9	2.8
Average	2.5	2.3	2.5	3.1	3.0	

*Rule of Law* and *Responsiveness* appear to be the strongest governance features – the strength of decision-making related to these two features averaged at least 3 out of 4. *Rule of Law* was weakest in the *Drinking*

*Water* challenge, but strong in other areas. *Responsiveness* was weak in the context of *Groundwater* and *Matching Supply and Demand*, but strong in other contexts.

The assessment showed that *Participation* and *Integrity* are less present in decision-making processes. These two features were weaker overall, but particularly in the challenge area of *National Water Policy*.

The weakest decision-making process feature on average and in every challenge area is *Transparency*. It was weakest in *National Water Policy* and strongest in *Ground Water*, though the variation between these two challenges was only 0.2. Thus while expanding participation in water governance decision-making is needed, it is perhaps even more important to make relevant information more accessible to interested parties.

The aggregated strength of governance processes is fairly constant across challenge areas (Table 6), with the challenge *Matching Supply and Demand* scoring slightly higher than the others.

### **5.3 SUMMARY**

From the results of the expert-based assessment, Turkey's functional effectiveness overall is high, with particular strength in *Organizing* and the greatest weakness in *Regulating*. Turkey's functional effectiveness experienced minimal improvement overall over the past 9 years, and decreases in effectiveness in some sub-functional areas. Nonetheless, certain sub-functions performed very well: e.g., definition of responsibility in the water sector, definition of goals, and cooperation between governmental agencies. Among governance features, *Rule of Law* and *Responsiveness* were by far the strongest, while *Transparency* is an area that seems to require particular attention.

# 6 DISCUSSION AND CONCLUSIONS

The analysis presented in this report strives to give an overview of water governance in Turkey using a rigorously-developed conceptual framework. When combining the results of the different analytic tools within the framework, interesting trends emerge. These observations do not purport to provide detailed diagnoses of the causes of problems identified, or “recipes” for change. Instead, they aim at (a) spurring discussion of problem drivers based on a standardized assessment of current water governance practices, and (b) identification of ways to improve water governance in Turkey.

## 6.1 AREAS WITH HIGH CAPACITY

According to the results of the expert-based assessment, Turkey’s functional effectiveness overall is relatively high, with particular strength in organizing and building the capacity of the water sector (score of 3.1 in the EBA). Within this function, the definition of responsibilities in the water sector, definition of goals, and cooperation between governmental agencies stand out as tasks that are performed effectively (all with an EBA score of 3.0 or higher). Other areas that stand out for their high performance are distributed among several functions and are related to the gathering of water data and their use to plan the distribution of water resources among uses (Function 2, score of 3.0), the operation and maintenance of public water infrastructure (Function 4, score of 3.1), and the procedures for allocating water rights (Function 3, score of 3.0).

The O&F matrix shows that Turkey has a centralized organizational structure in water sector, with one dominant organization, DSI. The Ministry of Environment and Forestry and the State Planning Organization both have some weight in most of the functions, while the Irrigation Union Association and Parliament have significant influence in a single function area each. Many other organizations are relevant to decisions related to water but wield only peripheral influence. No gaps in functional coverage were identified, at least partially because the DSI is influential in all functions. At the same time, there seem to be few overlaps in different functions. Most organizations fulfill their intended roles in the water sector.

In terms of quality of the decision-making processes, *Rule of Law* and *Responsiveness* were by far the strongest process features, with a score of 3.2 and 3.0 respectively.

## 6.2 POTENTIAL CHALLENGES

Multiple perspectives may not be brought into decision making processes because of the dominant role of DSI and the limited involvement of other organizations, including civil society organizations.

Turkey’s functional effectiveness experienced minimal improvement overall over the past 9 years, several sub-functional areas showed slight decreases in effectiveness. For example, the score related to the level of trained staff available in governmental agencies to perform the assigned tasks decreased from 3.4 to 3.2. Similarly, the sub-functions “Awarding and recording water rights and corollary responsibilities” and

“Designing strategies for matching expected long-term water supply and demand” saw slight decreases of effectiveness.

*Regulating* appears to be the least well performed function, and it also experienced a slight decrease in the average effectiveness, from 2.5 in 2000 to 2.4 in 2009. In particular, the regulation of water quality and the protection of aquatic ecosystems seem to require special attention. These two sub-functions held the lowest ratings overall both for 2000 and for 2009 and, in the case of water quality, experienced the highest decrease in effectiveness overall (from 2.4 to 2.1). DSI and the Ministry of Environment and Forestry are the organizations with the strongest influence on decisions taken in this field (4.8 and 4.6 respectively), followed by the Irrigation Union Association (3.2).

As for the quality of decision-making processes, the process features related to public knowledge of and participation in water governance decision-making received rather low ratings. *Participation* scored a 2.5 and *Transparency* a 2.3, the latter being the lowest rating among the assessed process features. The EBA results suggest that *Integrity and Accountability* is also an area where there is a good potential for improvement (score of 2.5).

# REFERENCES

- Bagis, A.I. 1997. Turkey's Hydropolitics of the Euphrates-Tigris Basin. *International Journal of Water Resources Development*, 13 (4) 567-582
- Baris M.E, and A.A. Karadag. 2007. Water Resources Management Issues in Turkey and Recommendations. *Journal of Applied Sciences* 7 (24) 3900-3908
- Burak, Selmin. 2008. Overview of Water Management in Turkey: Issues, Constraints, Achievements, Prospect in *Sustainable Use and Development of Watersheds*, I.E. Gonenc, Ed. Springer Science and Business Media.
- CIA. 2009. The World Factbook - Turkey. Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/tu.html> [Accessed February 19, 2010].
- FAO. 2010. Aquastat. <http://www.greenfacts.org/en/water-resources/figtableboxes/aquastat179.htm>. Accessed, 18 January 2011.
- Kibaroglu, A., A. Klaphake, A. Kramer, W. Scheumann and A. Carius. 2005. Cooperation on Turkey's transboundary waters. F+E Project No. 903 19 226. Published by The German Federal Ministry for Environment, Nature Conservation and Nuclear Safety.
- Pacific Institute. 2010. The World's Water. <http://www.worldwater.org/data.html>. Accessed, 18 January 2011.
- Saleth, M. and A. Dinar. 2004. The institutional economics of water: a cross-country analysis of institutions and performance. Cheltenham, UK: Edward Elgar.
- Sozen, S., Teksoy S., and M. Papapetrou. (2008). Assessment of institutional and policy conditions in Turkey: implications for the implementation of autonomous desalination systems. *Desalination* 220 (1) 441-454
- Turkey Water Report. 2009. General Directorate of State Hydraulic Works.

# ANNEX I. WORKSHOP AND RATING SESSION: LIST OF PARTICIPANTS

## WORKSHOP

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Akif	Özkaldı	General Directorate of State Hydraulic Works (DSİ)
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Halime	Bedirhanoğlu	Ministry of Environment and Forestry
Ahmet	Aladağ	Ministry of Environment and Forestry
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Altay	Altınörs	Ministry of Foreign Affairs
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## RATING SESSION

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Mustafa	Diren	General Directorate of Electrical Power Resources Survey and Development Administration
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# ANNEX 2. POLICY AND LEGAL DOCUMENTS

Document Type and Title
<p><b><u>Policy</u></b></p> <p>none identified</p>
<p><b><u>Legal</u></b></p> <p>Water Pollution Control Directive Declaration on Administrative Procedures (Ministry of Environment and Forestry) , 1989</p> <p>Declaration on the Conservation of Wetlands (Ministry of Environment and Forestry), 2005</p> <p>Water Pollution Control Directive Declaration on Hazardous and Toxic Substances in Water (Ministry of Environment and Forestry), 1989</p> <p>Water Pollution Control Directive Declaration on Technical Procedures (Ministry of Environment and Forestry), 1991</p> <p>Declaration on Wetlands, 1995</p> <p>Decree on Procedures Regarding Drought Management and Agricultural Drought Prevention (Ministry of Agriculture and Rural Affairs), 2007</p> <p>Law No. 167 on Groundwaters, 1960</p> <p>Law No. 3039 on Rice Sowing, 1936</p> <p>Law No. 5516 on Swamp Drying and Land Acquisition, 1950</p> <p>Law No. 5686 on Geothermal Resources and Mineral Waters, 2007</p> <p>Law No. 4626 Amending Land Reforms Regarding Irrigation Lands, 2001</p> <p>Regulation on Amendment of the Aquaculture Regulation (Ministry of Agriculture and Rural Affairs), 2004</p> <p>Regulation on Implementing the Law on Geothermal Resources and Mineral Waters (Ministry of Energy and Natural Resources), 2007</p> <p>By-law on Environmental Impact Assessment, 2002</p> <p>Regulation on Aquaculture (Ministry of Agriculture and Rural Affairs), 2004</p> <p>Regulation on Groundwaters, 1967</p> <p>Regulation on Natural Mineral Waters, 2004</p> <p>Regulation on Procedures Governing Drought Management’s Duties, Working Terms, and Conditions (Ministry of Agriculture and Rural Affairs), 2008</p> <p>Regulation on Protection and Utilization of Agricultural Lands, 2003</p>

Regulation on Water Pollution Control (Ministry of Environment and Forestry), 2004  
Regulation on Protecting Waters Against Agricultural Nitrate Pollution (Ministries of  
Agricultural/Rural Affairs and Environment/Forestry), 2004)

# ANNEX 3. STANDARD DEVIATIONS OF THE EXPERT-BASED ASSESSMENT SCORES

Question		2000	SD	2009	SD
F 1	1. Roles and responsibilities of each department or agency are clearly defined	3.6	0.50	3.5	0.76
	2. Policy goals for the water sector are clearly defined	3.1	0.64	3.2	0.69
	3. The water sector is provided with sufficient funds to function properly	2.7	0.74	2.8	0.80
	4. National governmental agencies consult each other when taking decisions that impact multiple sectors	2.9	0.64	2.8	0.67
	5. National governmental agencies cooperate in the implementation of their policies where appropriate	2.8	0.62	3.0	0.92
	6. Regional governmental agencies are consulted when decisions that affect their region are taken	3.0	0.81	3.0	0.78
	7. Governmental agencies are staffed with sufficient and trained personnel to perform the assigned tasks	3.4	0.57	3.2	0.75
F 2	8. Future water supply and demand forecasts are based on good quality data	2.8	0.78	3.0	0.77
	9. Water resources data are collected regularly, continuously throughout the country	2.9	0.78	3.0	0.92
	10. Current strategies for long-term matching of supply and demand have been effective at matching supply and demand	2.7	0.46	2.6	0.64
F 3	11. Rules and procedures for assigning and recording water rights are clearly defined and functioning	3.1	0.60	3.0	0.62
	12. Rules and procedures for transferring water rights are clearly defined and functioning	2.7	0.57	2.8	0.83
	13. Disputes among water users are resolved effectively	2.6	0.77	2.6	0.85
F 4	14. Government agencies are effective at forecasting seasonal supply and demand and matching the two	2.9	0.73	3.0	0.84
	15. Government agencies effectively operate and maintain public water infrastructure	3.0	0.84	3.1	0.87
	16. Current incentives and sanctions (including water pricing) are effective at achieving long and short term supply/demand matching	2.6	0.77	2.6	0.92
F 5	17. Government agencies are effective at enforcing withdrawal limits that are established	2.8	1.01	2.8	1.13
	18. Official water quality standards in waterways are met	2.4	0.88	2.1	0.91
	19. Aquatic ecosystems are protected to the level specified by the government	2.3	0.76	2.4	0.82

