

# WATER AND SANITATION

## 25.1 INTRODUCTION

The Eighth Development Plan was a turning point for the development of the water sector. During the period, tangible achievements were made, including initial but fundamental steps, to formulate a comprehensive strategy for water resources development and sustainability. Moreover, significant progress was made towards providing integrated management of water resources, in addition to development of renewable water resources by enhancing dam capacity throughout the Kingdom. Furthermore, water and sanitation services improved in terms of both scope and efficiency.

Regulations governing private-sector participation in the management and operation of water and sanitation utilities were approved, the National Water Company (NWC) was licensed, the executive programme for the privatisation of the Saline Water Conversion Corporation (SWCC) was approved, and a number of companies that will be engaged in major water-desalination and power-generation projects were established.

The Ninth Development Plan will build on these achievements through the completion of the National Water Strategy, which will involve comprehensive water database, covering sources, usages, and mechanisms and procedures for its implementation. The Ninth Plan will also enhance implementation efficiency of water policies, focusing on the demand side of water management, along with supporting and developing water-saving technologies. Furthermore, efforts will continue to expand coverage of water and sanitation services, raise rates of reclaiming water and expand its uses, in addition to including non-conventional water resources in the water budgets of the regions. In addition, administrative and managerial capacities will continue to be built and enhanced at all levels, especially at regional levels, in relation to water resources and usage sites. In furtherance of development efforts, restructuring will proceed, in order to ensure efficient, productive operation of water and sanitation facilities on a commercial basis, through active participation of the private sector.

This chapter reviews the current conditions of the water and sanitation sector, including the developments that took place under the Eighth Development Plan. It also reviews key issues and challenges that need to be addressed under the Ninth Development Plan, assesses projected demand for water sector services, presents the future vision for the sector and states the objectives, policies and targets set for it under the Ninth Development Plan.

## 25.2 CURRENT CONDITIONS

### 25.2.1 Conservation and Development of Water Resources and Rationalisation of their Use

Estimates point to a decline in water consumption for all purposes from about 20.3 billion cubic metres in 2004 to about 18.5 billion cubic metres in 2009, indicating a negative average annual growth rate of 1.8 %. This decline is attributable mainly to the decline in consumption of water for agricultural purposes, at an average annual rate of 2.5% over the period (Table 25.1).

Page  
494

**Table 25.1**  
**Water Balance**  
**Eighth Development Plan**  
(Million cubic metres/year)

Description	2004	2009	Average Annual Growth Rate under the Plan (%)
Water demand for municipal purposes	2100	2330	2.1
Water demand for industrial purposes	640	713	2.2
Water demand for agricultural purposes	17530	15464	-2.5
<b>Total demand for water</b>	<b>20270</b>	<b>18507</b>	<b>-1.8</b>
Renewable surface & ground water (Arabian Shield)	5410	5541	0.5
Non-renewable ground water	13490	11551	-3.1
Desalinated sea water	1070	1048	-0.4
Reclaimed agricultural wastewater	40	42	1.0
Reclaimed wastewater	260	325	4.6
<b>Total available water resources</b>	<b>20270</b>	<b>18507</b>	<b>-1.8</b>

*Source: Ministry of Water and Electricity, and Ministry of Economy and Planning.*

Noteworthy is the positive effect of measures and regulations taken by government to rationalise water consumption and regulate its use in agriculture in general, and rationalise cultivation of water-intensive crops. Consumption of water for municipal purposes grew at an average annual rate of 2.1% over the period of the Plan, while water consumption for industrial purposes grew at a rate of 2.2%.

In the development of renewable water resources, the dam building programme, to collect water for direct use or to recharge underground water reservoirs, is important in enhancing sustainable water supplies. The number of dams increased during the Eighth Plan from 210 dams in 2004 to 302 in 2009, and the storage capacity of dams increased from 832 million to 1354 million cubic metres (Table 25.2), which constitutes 117% of the target envisaged by the end of the period of the Plan.

**Table 25.2**  
**Number of Dams and Storage Capacity**  
**Eighth Development Plan**

Description	2004	2009	Average Annual Growth Rate (%)
Total number of dams	210	302	7.5
Storage capacity (million cubic metres)	832	1354	10.2

*Source: Ministry of Water and Electricity.*

In 2009, the capacity of water desalination and electricity generation reached 2,878 thousand cubic metres per day, and 3,426 megawatts, respectively, indicating insignificant change under the Eighth Development Plan (Table 25.3).

Progress made under the Eighth Development Plan in the use of treated wastewater for agricultural and industrial purposes is important from the viewpoint of development of non-conventional water resources. The amount of reclaimed wastewater used increased from 260 million cubic metres in 2004 to 325 million cubic meters in 2009, an average

annual growth rate of 4.6%, while the amount of reclaimed agricultural wastewater used was 42 million cubic metres in 2009, up from 40 million cubic meters in 2004, an average annual growth rate of 1%.

**Table 25.3**  
**Water Desalination**  
**Eighth Development Plan**

Description	2004	2009	Average Annual Growth Rate (%)
Number of desalination plants	30	30	0.0
Water production capacity (thousand cubic metres/day)	2878	2878	0.0
Amount of water produced (million cubic metres)	1070	1048	-0.4
Actual power generating capacity MW)	3426	3426	0.0
Power produced (million MW/hour)	21.8	21.0	-0.8

*Source: SWCC.*

## **25.2.2 Water and Sanitation Services**

Potable water services grew steadily over the first four years of the Eighth Development Plan, bolstered by additional funds provided by the state for public services and infrastructure from the budget surplus revenues. The number of household connections of potable water and the lengths of the new water networks increased at an average annual rate of 12.3% and 14.5%, respectively; and the number of new connections was 596 thousand.

In 2008, the number of potable water purification plants was 68, with a total design capacity of 1.7 million cubic metres per day, and the daily average of purified water was 1.4 million cubic metres (Table 25.4).

In 2008, the number of sanitation network connections was about 720 thousand, compared with about 572 thousand in 2004, an increase at an average annual rate of 6.1%. The capacity of wastewater treatment facilities for reuse in agriculture and industry rose at an average annual rate of 1.5%, from about 4.1 million cubic metres per day in 2004 to

about 4.3 million cubic meters per day in 2008, while the amount of reclaimed wastewater increased from 1.4 to 2 million cubic metres per day (Table 25.5).

**Table 25.4**  
**Potable Water Services**  
**Eighth Development Plan\***

Description		2004	2005	2006	2007	2008	Average Annual Growth Rate (%)
Potable Water Networks	Household connections (thousand )	1006	1027	1312	1556	1602	12.3
	Length of networks (thousand km)	36.0	37.2	51.9	60.5	61.8	14.5
Purification Plants	Capacity (thousand Cubic meters/day)	1499	1964	1964	1273	1713	3.4
	Amount of Purified water (cubic meters/day)	1276	1664	1275	984	1428	2.9

\* Up to the end of the fourth year of the Eighth Development Plan.

Source: Ministry of Water and Electricity.

**Table 25.5**  
**Sanitation Services**  
**Eighth Development Plan\***

Description		2004	2005	2006	2007	2008	Average Annual Growth Rate (%)
Sanitation Networks	Household connections (thousand)	572	572	622	688	720	6.1
	Length of networks (thousand km)	11.0	11.3	13.4	15.1	15.4	8.8
Wastewater Treatment Plants	Capacity (thousand cubic meters/day)	4097	4097	4121	4346	4346	1.5
	Quantity of reclaimed water (cubic meters/day)	1400	1814	1861	2009	2000	9.3

\* Up to the end of the fourth year of the Eighth Development Plan.

Source: Ministry of Water and Electricity.

### **25.2.3 Utilisation of Water for Industrial and Agricultural Purposes**

In 2008, a number of rules and measures aimed at rationalising the consumption of water and regulating its use in agriculture was taken, including: continuing to ban export of locally produced wheat; banning export of vegetables cultivated on open farms; banning export of animal fodder, facilitating their import, and offering credit facilities to stimulate investment in their cultivation abroad; exempting agricultural imports from customs duties; and banning drilling for water in areas that suffer from decline of water levels or low water quality. These measures are expected to bear fruit in the coming years.

The Eighth Development Plan carefully considered water tariffs and called for reviewing them, especially for municipal, industrial, and agricultural uses, in order to regulate consumption, while taking into account the purchasing power of consumers. In 2008, a project to develop a comprehensive water system and its executive regulations was initiated, with the aim of establishing a framework for an advanced system that would meet current and future water demand for all purposes.

**Page**  
**498**

### **25.2.4 Integrated Management of Water Resources**

In an endeavour to achieve integrated management of water resources, the Eighth Development Plan called for finalising the National Water Plan, which includes identification of water resources and reserves, particularly non-renewable groundwater; development of comprehensive databases for the water sector; and finalising the regulatory frameworks for water uses. The first phase of the proposed National Strategy and Action Plan for Water, which constitutes the overall long-term framework for the National Water Plan, with the aim of improving the management and demand of water supply, taking into account the economic and legislative aspects, was completed. Moreover, detailed studies of aquifers and water reserves in various parts of the Kingdom continued. Two studies on the formation of Umm

er-Radhuma and the Saq aquifers were completed; others are underway.

### **25.2.5 Institutional and Organisational Development**

Under the Eighth development Plan, the water sector underwent major institutional and organisational developments, the most prominent of which was decentralisation through expanding the powers of regional water and sanitation administrations in the thirteen administrative regions. In addition, a set of policies and measures aimed at raising the performance of the water and sanitation sector was adopted, the most important of which was approval of the Executive Regulations for treatment and reuse of wastewater and standardisation of the specifications of wastewater treatment plants.

Privatisation of water and sanitation activities achieved remarkable progress, through:

- Formulation of the methodology for privatisation for water and sanitation facilities, and continued efforts to develop the administrative, regulatory and legal frameworks required for implementation of such a methodology.
- Issuance of the Supreme Economic Council Resolution 2/27 of 2006 concerning the rules governing private-sector participation in development of the water and sanitation sector.
- Issuance of the Council of Ministers Resolution No. 5 of 2008 approving the establishment of the National Water Company (NWC), which will be responsible, among other things, for providing all groundwater and potable water distribution services, as well as collecting and treating wastewater on a sound commercial basis. The resolution also stipulated that NWC gets all its entitlements for all services provided to all subscribers.

As for privatisation of the projects and facilities of the Saline Water Conversion Corporation (SWCC), the following measures were taken:

- Issuance of Supreme Economic Council Resolution 2/29 of 2008 approving the executive programme for the privatisation of the SWCC , through converting it into a holding company wholly owned by the state. The executive programme of action to privatise and restructure the Corporation was launched at the beginning of 2009.
- Issuance of Council of Ministers Resolution No. 180 of 2005 licensing establishment of the Shuaiba Water and Electricity Company.
- Issuance of the Council of Ministers Resolution No. 44 of 2007 approving establishment of the Shuqaiq Water and Electricity Company.
- Issuance of the Council of Ministers Resolution No.298 of 2007 licensing establishment of the Ras Al Zour Water and Electricity Company as a joint-stock company.

## **25.3 ISSUES AND CHALLENGES**

### **25.3.1 Water Resources Sustainability**

The issue of sustainability of water resources goes back to 1980, when agricultural development began to be concentrated in the semi-arid regions characterised by scarcity of rain, with non-renewable groundwater being the main source of irrigation. The immense support and numerous subsidies provided by the state to the agricultural sector led to the expansion of cultivated areas, and subsequently to rising depletion rates of ground water. Such support also contributed to widening the gap between the social cost of groundwater and the cost borne by farmers, which encouraged expansion in the cultivation of water-intensive crops.

As a result, ground water depletion has been unabated over the past three decades. The extent of this depletion will be determined by studies being conducted by the Ministry of Water and Electricity. Lately, measures were taken to rationalise cultivation of low water efficiency crops, such as wheat, barley and fodder, leading to a relative

reduction in the volume of crops and cultivated areas. Yet, this did not lead to a significant reduction in water consumption, since farmers moved to cultivation of alternative low water efficiency crops.

To resolve the issue of water scarcity, it is necessary to bridge the gap between the rates of groundwater extraction and their natural replenishment rates, i.e., finding a balance between available resources and demand, through the application of strict, effective demand management, as well as through making maximum use of non-conventional water resources (treated water). In addition, there is a need to continue efforts to restructure agricultural production, by transferring water-intensive agriculture to areas where renewable water sources are available, and to continue providing support and incentives to farmers to encourage them to use modern irrigation techniques. Moreover, in order to rationalise use of water, its pricing for all purposes should be reconsidered, with the aim of setting appropriate tariffs that take into account the ability of consumers to pay and the sustainability of water resources.

### **25.3.2 Quality of Water and Sanitation Services**

Except in some cities, the quality of water and sanitation and the efficiency of services need to be upgraded to international standards, especially with regard to coverage and network losses. In addition, wastewater collection and reclamation require further improvement and development. Despite the improvements in water services that have been achieved, a proportion of the population still relies on tankers to meet their needs at a higher cost than that of water drawn from the network.

The issue can be dealt with through continuing efforts to intensify rationalisation of water demand for all purposes, treat and reuse wastewater, upgrade existing water purification plants, reduce water distribution network losses, and protect networked water from pollution.

Greater private-sector involvement can contribute to expansion and finance of water and sanitation services, thereby increasing the coverage and improving quality, in addition to reviewing water tariffs to rationalise use and enhance conservation.

## **25.4 DEMAND FORECAST**

### **25.4.1 Water**

As a result of the efforts and measures adopted under the Eighth Development Plan to rationalise water consumption and those that will be applied in the coming years, total water demand is expected to decline under the Ninth Development Plan at an average annual rate of 2.5%, from 18.5 billion cubic metres in 2009 to 16.3 in 2014, due to declining demand for water for agricultural purposes, at an average annual rate of 3.7%, leading to a decline in consumption for these purposes from 15.5 billion cubic metres to 12.8 billion. In contrast, water demand for industrial purposes is expected to go up at an average annual rate of 5.5%, from 713 million cubic metres to 930 million, due to an increase in the number of factories, and operations of the new industrial cities, in addition to economic cities. Demand for municipal purposes is also expected to rise under the Ninth Plan at an average annual rate of 2.1%, from 2.3 billion cubic metres to 2.6 billion cubic meters; a consumption rate that closely matches expected population growth (Table 25.6).

In consequence, demand for non-renewable groundwater is expected to decline at an average annual rate of 4.9%, for its share of total water consumption to be 55% by the end of the Plan, while the quantity of desalinated water is expected to almost double, from 1,048 million cubic metres to 2,070 million, to constitute 12.7% of the total water used by the end of the Ninth Plan. Demand for reclaimed wastewater is expected to grow at an average annual rate of 11.9%, up from about 325 million cubic metres in 2009 to 570 million cubic meters in 2014, for its share of total water consumption to be 3.5%.

**Table 25.6**  
**Forecast of Water Supply and Demand**  
**Ninth Development Plan**

Description	2009		2014		Average Annual Growth Rate (%)
	Million Cubic Metres	Share (%)	Million Cubic Metres	Share (%)	
Water demand for municipal purposes	2330	12.6	2583	15.8	2.1
Water demand for industrial purposes	713	3.9	930	5.7	5.5
Water demand for agricultural purposes	15464	83.5	12794	78.5	-3.7
<b>Total water demand</b>	<b>18507</b>	<b>100.0</b>	<b>16307</b>	<b>100.0</b>	<b>-2.5</b>
Non-renewable groundwater	11551	62.4	8976	55.0	-4.9
Renewable groundwater & surface water	5541	29.9	4644	28.5	-3.5
Desalinated water	1048	5.7	2070	12.7	14.6
Reclaimed wastewater	325	1.8	570	3.5	11.9
Reclaimed agricultural wastewater	42	0.2	47	0.3	2.3
<b>Total available water resources</b>	<b>18507</b>	<b>100.0</b>	<b>16307</b>	<b>100.0</b>	<b>-2.5</b>

*Source: Ministry of Water and Electricity, and Ministry of Economy and Planning.*

Table 25.7 shows the distribution of expected water demand for municipal, industrial and agricultural purposes by administrative region, illustrating the expected effects of the measures aimed at rationalising consumption of renewable water in agriculture.

Quantities of desalinated water will increase due to total production capacity of desalination plants rising at an average annual rate of 14.5%, from about 2.9 million cubic metres per day in 2009 to about 5.7 million cubic meters per day in 2014; with private and joint stations producing about 1.4 million cubic metres per day by the end of the Plan. In addition, the actual electricity-generation capacity of dual-purpose desalination plants is expected to rise during the period from 3,426 MW to 7,476 MW (Table 25.8).

**Table 25.7**  
**Forecast of Water Demand By Region**  
**Ninth Development Plan**

(Million cubic metres)

Region	2009				2014				Average Annual Growth Rate (%)			
	Municipal	Agricultural	Industrial	Total	Municipal	Agricultural	Industrial	Total	Municipal	Agricultural	Industrial	Total
Riyadh	673	4089	236	4998	752	3467	280	4499	2.2	-3.2	3.5	-2.1
Makkah	608	861	144	1613	667	737	193	1597	1.9	-3.1	6.0	-0.2
Madinah	158	968	52	1178	178	775	69	1022	2.4	-4.3	5.8	-2.8
Qassim	86	2274	21	2381	96	1866	24	1986	2.2	-3.9	2.7	-3.6
Eastern Region	353	911	198	1462	387	734	249	1370	1.9	-4.2	4.7	-1.3
Asir	124	350	16	490	137	330	24	491	2.0	-1.2	8.4	0.0
Tabuk	67	733	8	808	75	565	15	655	2.3	-5.1	13.4	-4.1
Hail	45	1352	7	1404	50	1099	18	1167	2.1	-4.1	20.8	-3.6
Northern Borders	24	4	3	31	27	6	3	36	2.4	8.4	0.0	3.0
Jazan	86	2040	8	2134	97	1712	20	1829	2.4	-3.4	20.1	-3.0
Najran	37	252	5	294	42	207	12	261	2.6	-3.9	19.1	-2.4
Baha	30	120	5	155	32	100	11	143	1.3	-3.6	17.1	-1.6
Jawf	39	1510	10	1559	43	1196	12	1251	2.0	-4.6	3.7	-4.3
<b>Kingdom Total</b>	<b>2330</b>	<b>15464</b>	<b>713</b>	<b>18507</b>	<b>2583</b>	<b>12794</b>	<b>930</b>	<b>16307</b>	<b>2.1</b>	<b>-3.7</b>	<b>5.5</b>	<b>-2.5</b>

*Source: Ministry of Economy and Planning.*

Page  
504

**Table 25.8**  
**Water Desalination**  
**Ninth Development Plan**

Description	2009			2014			Average Annual Growth Rate under the Plan (%)	
	SWCC	Private Companies	Total	SWCC	Private Companies	Total	SWCC	Total
Number of desalination plants	30	0	30	41	3	44	6,2	8,0
Water production capacity (thousand cubic metres/day)	2878	0	2878	4260	1411	5671	8,2	14,5
Quantity of water produced (million cubic metres)	1048	0	1048	1555	515	2070	8,2	14,6
Actual power generation capacity (MW)	3426	0	3426	4526	2950	7476	5,7	16,9
Power produced (million megawatt /hour)	21	0	21	24	9	33	2,7	9,5

*Source: SWCC.*

## 25.4.2 Potable Water and Sanitation Services

Total coverage of demand for water services requires providing 1.1 million connections and 28 thousand kilometres of main and subsidiary networks. The Ninth Development Plan aims at raising the performance of water services by adding 600 thousand connections, and 15 thousand kilometres of networks, thus increasing total connections from 1,691 thousand connections in 2009 to 2,291 thousand connections in 2014. Length of water networks will increase from 65.8 thousand kilometres in 2009 to 80.8 thousand kilometres in 2014, thereby increasing water-services coverage to 88% by the end of the Plan.

Total coverage of demand for sanitation services requires providing about 1.6 million connections and 22.3 thousand kilometres of networks. The Ninth Development Plan aims at adding 700 thousand connections and 12 thousand kilometres, bringing total connections from 831 thousand in 2009 to 1,531 thousand in 2014; with length of sanitation networks increasing from 17.6 thousand kilometres to 29.6 thousand kilometres over the same period, which will increase coverage from 42% to 60% (Table 25.9).

**Table 25.9**  
**Forecast of Potable Water and Sanitation Services**  
**Ninth Development Plan**

Description	2009	2014	Additions under the Plan	Full-Coverage Total Demand
<b>a. Potable water</b>				
Total household connections (thousand connections)	1691	2291	600	1100
Total length of networks (thousand kilometres)	65.8	80.8	15	28
Service coverage (%)	78	88	10	100
<b>b. Sanitation</b>				
Total household connections(thousand connections)	831	1531	700	1566
Total length of networks (thousand kilometres)	17.6	29.6	12	22.3
Service coverage (%)	42	60	18	100

Source: Ministry of Water and Electricity.

Tables 25.10 and 25.11 show total demand and expected development of potable water and sanitation services during the Ninth Plan for the different administrative regions. The data indicate the possibility of achieving significant progress towards balanced development.

**Table 25.10**  
**Forecast of Potable Water Services by Region**  
**Ninth Development Plan**

Region	2009		2014		Additions under the Plan		Full-Coverage Total Demand	
	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)
	Riyadh	440	19.1	630	21.4	190	2.3	260
Makkah	380	15.7	545	19.2	165	3.5	308	7.3
Madinah	97	3.9	137	5.4	40	1.5	96	2.3
Qassim	94	5.7	119	6.7	25	1.0	32	1.4
Eastern Region	387	9.3	422	11.3	35	2.0	42	3.9
Asir	20	1.7	58	3.2	38	1.5	150	3.6
Tabuk	34	2.0	54	2.6	20	0.6	56	1.0
Hail	53	1.6	63	1.9	10	0.3	12	0.5
Northern Borders	16	0.8	26	1.0	10	0.2	17	0.3
Jazan	82	2.7	112	3.8	30	1.1	62	2.1
Najran	41	1.6	51	1.8	10	0.2	15	0.3
Baha	6	0.6	23	1.1	17	0.5	38	0.8
Jawf	41	1.1	51	1.4	10	0.3	12	0.4
<b>Kingdom Total</b>	<b>1691</b>	<b>65.8</b>	<b>2291</b>	<b>80.8</b>	<b>600</b>	<b>15</b>	<b>1100</b>	<b>28</b>

Source: Ministry of Water and Electricity, and Ministry of Economy and Planning.

**Table 25.11**  
**Forecast of Sanitation Services by Region**  
**Ninth Development Plan**

Region	2009		2014		Additions under the Plan		Full-Coverage Total Demand	
	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)	Connections (000 connections)	Networks (000 Km)
Riyadh	268	4.1	473	7.6	205	3.5	327	5.8
Makkah	197	3.2	397	6.7	200	3.5	388	6.5
Madinah	40	1.7	80	2.2	40	0.5	124	1.0
Qassim	63	1.6	83	1.8	20	0.2	44	0.2
Eastern Region	180	4.5	280	5.3	100	0.8	185	1.6
Asir	43	1.2	73	2.0	30	0.8	127	1.6
Tabuk	9	0.3	27	0.7	18	0.4	66	1.0
Hail	5	0.2	20	0.5	15	0.3	49	0.7
Northern Borders	7	0.1	17	0.3	10	0.2	22	0.4
Jazan	2	0.1	32	1.1	30	1.0	128	2.1
Najran	8	0.4	20	0.7	12	0.3	39	0.4
Baha	0	0.0	10	0.3	10	0.3	37	0.6
Jawf	9	0.2	19	0.4	10	0.2	30	0.4
<b>Kingdom Total</b>	<b>831</b>	<b>17.6</b>	<b>1531</b>	<b>29.6</b>	<b>700</b>	<b>12</b>	<b>1566</b>	<b>22.3</b>

*Source: Ministry of Water and Electricity, and Ministry of Economy and Planning.*

## 25.5 DEVELOPMENT STRATEGY

### 25.5.1 Future Vision

Conserving water, ensuring its sustainability, and protecting its sources, through: conservation of non-renewable water resources, comprehensive coverage of water and sanitation services, rationalisation of water consumption in all uses, development of renewable water resources, importation of low-water-efficiency crops, and raising treatment capacity and utilisation of treated water appropriately.

### **25.5.2 Objectives**

- Conservation and development of water resources and maximising effective utilisation rates.
- Good governance and rational and integrated management of the water and sanitation sector.
- Providing water and sanitation services efficiently, through effective partnership between the public and the private sectors.

### **25.5.3 Policies**

- Developing conventional and non-conventional water resources.
- Intensifying methods of rationalisation of water uses for all purposes.
- Achieving a balance between water development and water consumption.
- Expanding the application of advanced methods and technologies to both production and consumption.
- Expediting issuance of the National Water Plan.
- Developing appropriate mechanisms for determining the shares of various uses of water.
- Promoting integrated management of water resources and water demand.
- Upgrading the scientific, technical and development capacities of the human resources operating in the sector.
- Intensifying efforts to provide water and sanitation services reliably at high levels of efficiency.
- Working towards issuing new water tariffs to incentivise rational use of water for all purposes and its conservation.
- Encouraging the private sector to invest in this sector by providing incentives and simplifying procedures.
- Encouraging the trend towards reliance on renewable energy sources by the sector, particularly solar energy.

## 25.5.4 Targets

- Increasing the storage capacity of dams by 85%, from about 1.35 billion cubic metres in 2009 to about 2.5 billion cubic metres by the end of the Ninth Development Plan.
- Doubling the capacity of desalination plants from 1,048 to 2,070 million cubic metres over the period of the Plan.
- Increasing the proportion of treated wastewater to about 50% of consumption for municipal purposes.
- Increasing the rate of reuse of treated wastewater to about 50%.
- Providing a 20% strategic emergency stockpile of water annually in major cities.
- Reducing demand for water for agricultural purposes at an annual rate of about 3.7%.
- Increasing consumption of water for municipal and industrial uses by 2.1% and 5.5%, respectively.
- Adding 600 thousand new household water connections and 15 thousand kilometres of networks, bringing service coverage to 88% by the end of the Ninth Development Plan.
- Adding 700 thousand new wastewater connections and 12 thousand kilometres of wastewater networks, bringing service coverage to 60% by the end of the Ninth Development Plan.
- Expanding cooperation and coordination in application of methods and techniques used in water and sanitation and water desalination nationally and internationally.
- Issuing the National Water Plan during the period of the Ninth Plan.
- Developing a comprehensive national water-management system.
- Enhancing training and scholarships programmes and qualification of human resources for dealing with post-privatisation developments.

## **25.6 FINANCIAL REQUIREMENTS**

The financial allocations for government bodies in the water sector (Ministry of Water and Electricity (Water Affairs), Saline Water Conversion Corporation, and Irrigation and Drainage Authority at Al-Hassa) under the Ninth Development Plan amount to SR162.92 billion.

**Page**

**510**