

ENVIRONMENTAL MANAGEMENT

14.1 INTRODUCTION

Preservation, development and protection of the Environment received considerable attention in successive development plans, with efforts designed to reconcile requirements of sustainable development with upgrading macroeconomic, sectoral and spatial indicators. This approach has been reaffirmed by Article 32 of The Basic System of Government, which stipulates, "The State shall work towards the preservation, protection and improvement of the environment, as well as prevent pollution."

During the Eighth Development Plan, there were numerous developments at various levels related to the environment and its protection. The Presidency of Meteorology and Environment (PME) completed the first phase of establishing a network of radiation monitoring; in addition to environmental protection, management, monitoring, analysis, forecasting and control projects, and the national network for monitoring air quality. Moreover, several environmental national strategies and plans were issued, including: the National Strategy and Work Plan for Forests, the National Biodiversity Strategy, and the National Strategy for Health and Environment. Furthermore, the Saudi Wildlife Commission (SWC) continued its wildlife preservation activities in the protected areas, as well as its efforts to protect endangered species. It also issued wildlife preservation laws and regulations, conducted research and studies, and launched environmental awareness programmes.

The Ninth Development Plan aims to highlight the strategic role of environmental management, through encouraging various developmental sectors to participate effectively in environmental activities, and developing the institutional and technical capacities of the parties concerned. The plan will also focus attention on enforcement of the General Environmental Law and Rules for Implementation, addressing ecological issues and related challenges at both the domestic and international levels, in addition to conserving,

protecting, and developing both terrestrial and marine wildlife, in order to achieve ecological balance.

This chapter addresses the current conditions of the environmental management sector, elaborating on developments under the Eighth Development Plan and reviewing the key issues and challenges that must be addressed under the Ninth Development Plan. It also highlights the future vision, objectives, policies and targets for the sector under the Ninth Plan.

14.2 CURRENT CONDITIONS

14.2.1 Environmental Protection

Enactment of the General Environmental Law by Royal Decree, No. M/34 of 2001 is an important turning point. The decree tasked PME with the responsibility for enforcing and implementing its provisions, in coordination with the relevant agencies. As a result, PME promulgated in 2006 the Rules for Implementation of the Law, and conducted a study to ascertain adequacy of environmental policies for the set requirements and its own ability to undertake the tasks entrusted to it by the General Environmental Law and Rules for Implementation.

PME began implementing a plan in the regions to modernise and develop the environmental standards and guidelines for air and water quality, and implemented a project for environmental inspection of facilities, as well as studying the establishment of an environmental database. In an effort to improve environmental protection capacity and services, PME is conducting a study to identify and adapt international best practices.

To maintain coastal areas and limit their environmental degradation, PME, in collaboration with several government agencies, implemented a set of measures, including working towards issuing the National Coastal Zone Management Plan and its executive orders, enforcement of the National Plan for Combating Pollution by Oil, and development of air and sea monitoring along the shores of the Kingdom.

To tackle the problem of reducing air pollution in industrial zones and urban areas, PME, in collaboration with several scientific research centres, implemented a set of measures, including commencing to identify the types of pollutants and the level of their concentration in the ambient air of polluted and populated areas, conducting studies to establish an inventory of emissions and identify their sources, assessing the health and economic cost of air pollution, and identifying the best policies for pollution reduction.

To improve environmental management in the Arab region, PME launched the Saudi Arabia Award for Environmental Management. This award, which is offered every two years by the Arab Organization for Administrative Development of the League of Arab States, aims to establish broad environmental management in the Arab world, stimulates interest in sustainable development, publicize distinguished Arab environmental management efforts and successful practices, and encourage environmental practices and activities in the Arab countries.

During the Eighth Development Plan, a programme for periodic inspection of gas, washing and lubrication stations was launched by PME, through the use of units equipped with the latest test and inspection equipment. PME encourages the private sector to expand its use of this test programme, while being committed to transferring advanced technologies and training Saudis for this work, with the aim of reducing pollution resulting from the operation of such stations.

To raise environmental awareness, PME, in collaboration with numerous stakeholders, implemented a package of measures, including: establishment of the first environment satellite TV channel (Be'aty), expansion of awareness-raising campaigns on environmental issues, holding workshops on environment and development, and establishing the National Centre for Environmental Awareness.

14.2.2 Wildlife Protection

Within the framework of interest in biodiversity, the SWC developed a national system of measures and policies for protecting flora, fauna

wildlife, as well as marine wildlife in the Red Sea and the Arabian Gulf. This aims at achieving ecological balance through the diversification of genetic resources, taking into account rational exploitation of available natural resources to ensure their sustainability. SWC also reintroduced endangered species into their natural habitats, developed environmental human resources capacity, and adopted the principle of community participation to strengthen the role of the private sector in the development of wildlife habitat.

In a clear sign of the concern for terrestrial and marine wildlife protection, SWC administers 16 protected areas, covering approximately 82.7 thousand square kilometres, i.e., 4.26% of the entire territory of the country (Table 14.1). SWC also developed some regulations, primarily the Protected Areas and Rangers Regulations. In addition, it commenced preparing draft zoo regulations, developed a plan to identify priorities for protection, and worked towards raising awareness of environmental issues related to wildlife.

Table 14.1
Existing Protected Areas until 2008

No.	Name of Protected Area	Administrative Region	Area (km ²)	Year Established
1.	Harat AL HURRA	Jawf	13775	1987
2.	Al-Khanfa	Tabuk	20450	1987
3.	Al-Woaul	Riyadh	2369	1987
4.	Mahazat Al-Said	Makkah	2100	1987
5.	Um Al Gamari Islands	Makkah	1	1987
6.	Tubaig	Tabuk	12200	1988
7.	Farasan	Jazan	697.4	1988
8.	Raida	Asir	9	1988
9.	Magamea Al-Hadab	Riyadh	2200	1991
10.	Erouq Bani ma-arid	Riyadh	11980	1992
11.	Nufud Al-Ariq	Madinah	1960	1994
12.	Taisiya	Hail	4262	1994
13.	Al-Gandaliya	Northern Borders	1160	1994
14.	Saja – Umm Al-Ramth	Makkah	7190	1994
15.	Jubail	Eastern Region	2300	1992
16.	Shada Al'ala mountain	Baha	67	2000

Source: Saudi Wildlife Commission.

SWC, through its affiliated research centres, undertook work on propagating some endangered wild fauna species and reintroducing them to some protected areas (Table 14.2). In addition, SWC continued its environmental monitoring work, in an effort to identify changes in the ecosystems of the protected areas, such as changes in vegetation cover. It conducted periodic studies to assess biodiversity and map out important biological areas, in addition to demarcating the proposed protected areas by using a geographic information system (GIS).

As part of its efforts to encourage participation of the private sector in the development of wildlife, SWC identified 38 sites as proposed protected areas, and is working on identifying parties that could be involved. In addition, in cooperation with the Saudi Commission for Tourism and Antiquities, SWC organizes eco-tourism (on an experimental basis) in some protected areas (Mahazat Al-Said, Bani Ma-arid, Al-Woaul, Farasan and Raida).

Table 14.2
Number of Reintroduced Animals and Birds
Eighth Development Plan

Animal/Bird	Name Of Protected Area	Number
Arabian Oryx	Mahazat Al-Said	350–400
	Erouq Bani Ma-Arid	200
Reem Gazelle	Mahazat Al-Said	700–1000
	Erouq Bani Ma-Arid	380
Idmi Gazelle	Al-Woaul	40
	Erouq Bani Ma-Arid	121
Ostrich	Mahazat Al-Said	150–160
Houbara Bustard	Mahazat Al-Said	500–600

Source: Saudi Wildlife Commission.

14.2.3 Combating Desertification

Increased population activity, overgrazing, logging, expansion of agriculture, and urban expansion, coupled with lack of rain and vulnerability to recurrent droughts, have increased pressure on renewable natural resources and have led to desertification in various

regions. The Ministry of Agriculture is exerting intensive efforts to combat desertification and sand creeping, while preserving the desert environment and the biodiversity therein. It is also working towards raising public awareness of the importance of community work in implementing national action programmes to combat desertification.

The Ministry of Agriculture has identified 40 sites in the various regions for protecting pastoral plants from overgrazing. It has also set up 3 stations for the propagation of pastoral-plant seeds, 27 pastoral- and forestry-plant nurseries, and a plant gene bank. In addition, several national parks that are important for tourism and entertainment have been offered for investment, in an effort to enhance private-sector participation in their development and highlight the role of national parks in preserving the environment. Moreover, a centre has been established to receive satellite images of movement of sand dunes, to monitor and study such movements that threaten areas that are suitable for human settlement and agricultural production. Furthermore, efforts have been made to rehabilitate the vegetation cover in rangeland and forests, and a special centre for studying deserts and combat of desertification was established.

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14.2.4 Pollution and Environmental Health

Within the framework of the endeavour to maintain the safety of the environment and protect it from pollution and degradation, provide a healthy and clean environment, improve environmental health, reduce pollutants of various types, and develop national environmental capacities, a National Strategy for Health and Environment was adopted by the Council of Ministers Resolution No. 292 of 2008, covering a number of basic issues including, among other things: air quality, potable water, coastal areas, solid waste, hazardous waste, safe use of chemicals, and radioactive contamination, as follows:

□ *Air quality*

Implementation of some projects under the successive development plans, and the high level of consumption of energy and other products,

resulted in a number of air-quality challenges that are being addressed under the General Environmental Law and Rules for Implementation.

❑ *Quality of potable water*

Development efforts under the successive development plans have succeeded in providing access to safe and clean potable water to 1,660 cities, villages and hamlets. About 4,060 other villages and hamlets are supplied by tankers. Expanded of the consumption of potable water, resulting from population growth and urban expansion in various regions, represents a challenge to water management systems.

❑ *Wastewater and its reuse*

The lengths of sanitation networks extend to more than 17,6 thousand kilometres, and the number of household connections is more than 831 thousand. The sanitation networks cover about 42% of the areas of major cities, while sewage treatment stations receive wastewater at rates that exceed their maximum designed capacity. The treated wastewater is a renewable resource that can contribute to alleviating the load on other sources.

❑ *Coastal areas*

The length of the coastal areas of the Kingdom is 2,320 km; about 76% on the Red Sea coast and about 24% on the Arabian Gulf. Pollution has increased as a result of the growing number of development projects along the two coasts; for example, oil refineries, petrochemical plants, power stations, desalination plants, recreational and commercial projects, wastewater purification plants, and industrial cities. Moreover, traffic of ships and oil tankers increased, and population density in coastal cities grew. In 2008, the population of coastal cities accounted for some 23% of the Kingdom's total population.

❑ *Solid Waste*

As a result of expansion of commercial and industrial activities, the

volume of solid waste has grown in absolute terms, as well as per capita, while recycled waste is still below 35%. Landfills are also under pressures, the most important of which are the decrease in assumed lifespan due to the increasing quantities of waste and encirclement by residential land subdivisions. Intensive efforts are needed under the Ninth Development Plan to address such environmental pressures and challenges.

❑ *Safe use of chemicals*

The expansion in the use and circulation of chemicals , both in warehouses and factories, led PME to develop and implement the National Programme on Chemical Safety, which aims to develop an integrated national plan for ensuring safety and reducing pollution when handling chemical substances, and for managing hazardous waste in accordance with local regulations and international conventions. Work is under way to develop regulations that govern entry of chemicals into the country and their circulation within it.

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❑ *Monitoring and forecasting*

Natural disasters affect the economy of many countries significantly, wasting 10%–15% of GDP. Hence, protecting society requires studying and understanding the potential dangers and providing adequate early warnings to support fully the efforts of civil defence in mitigating effects of natural disasters.

14.2.5 Institutional and Organizational Development

The Presidency of Meteorology and Environmental Protection (PME) was established by Royal Decree No. M/34 of 2001, with responsibility for environmental protection and conservation of natural resources; in addition to monitoring, coordination and analysis. However, there are other government agencies concerned with environmental issues, underscoring the importance of coordination to enhance effectiveness.

14.2.6 National Strategies and Plans for Environmental Protection

During the Eighth Development Plan, several strategies and plans for the protection of the environment were issued, including:

❑ *The National Strategy and Action Plan for Forests*

This was endorsed according to the Council of Ministers Resolution No.306 of 2006, with the aim of preserving and enhancing the vegetation cover and ensuring that the accruing environmental, economic and social benefits are enjoyed sustainably for the present and the future.

❑ *The National Biodiversity Strategy*

This was adopted by Council of Ministers Resolution No. 197 of 2008, and aims to preserve biodiversity and make its preservation central to national planning. In addition, Royal Decree No. M/5 of 2007 approved accession to the Cartagena Protocol on Biosafety, specifically the Convention on Biological Diversity, which came into force in the Kingdom in 2007.

❑ *The National Strategy for Health and Environment*

This was approved by Council of Ministers Resolution No. 292 of 2008. PME was entrusted with overseeing its implementation, directing all competent agencies to develop detailed measurable implementation plans, and produce annual performance reports. The Strategy covers issues related to health and environment, including: air quality, food safety, potable water quality, wastewater and its reuse, housing and urbanization, coastal areas, solid waste, hazardous waste, safe use of chemicals, radioactive contamination, noise pollution, and development and conservation of renewable natural resources.

□ *The National Plan for Combating Pollution of Marine Environment*

The National Plan for Combating Pollution of Marine Environment by oil and other harmful substances was approved by Council of Ministers Resolution No.157 of 1991. Article 5 stipulates that PME will monitor the application of procedures for combating and reducing pollution in the marine environment. Furthermore, PME was given the task of coordinating activities of other agencies associated with responding to incidents of marine pollution in cases of emergency.

14.3 ISSUES AND CHALLENGES

14.3.1 Coordination of Environmental Action

To enhance the efficiency of addressing environmental challenges, government and private agencies concerned with environmental issues need to coordinate with each other and with PME in implementation of environmental activities. This must be carried out according to the General Environmental Law, with all agencies complying with the environmental benchmarks and guidelines issued by the PME. Moreover, there is a need to unite environmental work under the umbrella of the General Environmental Law, through a unified national strategy for protecting the environment, as well as to adopt international environmental standards as a methodological reference for environmental management in enterprises.

14.3.2 Natural Resources

Given the steady increase of demand for natural resources, their limitedness is a major issue. Use of non-renewable groundwater resources to meet growing demand was one of the most prominent issues under the Eighth Development Plan, for it has the following serious implications: increase of water salinity; decline of proven water reserves; and increase of soil degradation and soil salinity due to constant planting of crops, particularly those that are stressful to the soil. Moreover, unregulated overgrazing and logging resulted in

increased pressure on rangelands; dilapidation of natural vegetation cover; and increased rates of desertification, which constitutes one of the major challenges to natural resources and vegetation cover in the Kingdom.

14.3.3 Environmental Pressures

Population growth over the past four decades has resulted in escalation of pressures on the environment and natural resources. Environmental pollutants generated by various human activities, notably solid and liquid waste (domestic, industrial and medical) increased, and the growing quantities of wastewater put pressure on purification and treatment facilities.

Likewise, demand for water in cities for municipal and industrial usage has increased. Incessant expansion of desalination plants put pressure on the marine environment. The steady rise in the number of cars in cities increased pressure on the atmospheric environment. Moreover, as already mentioned, overgrazing and logging caused environmental damage, with soil erosion and transformation of the rangelands to desert. Furthermore, urban growth imposed challenges and put pressure on agricultural areas, which were increasingly exploited for residential and commercial purposes.

14.3.4 Marine Environment

Under the Eighth Development Plan, increase in trade and maritime transport led to environmental problems, the most prominent of which are pollution resulting from disposal of waste from ships and super tankers in the Arabian Gulf, and the continued environmental damage caused to the Red Sea and Gulf shores by urban development and over-exploitation of shores. These problems have affected fishing and coastal tourism, in addition to their impact on coral reefs that provide the necessary environment for maintenance of marine life (invertebrates, phytoplankton and zooplankton and crustaceans), in addition to their importance to fish and migratory birds.

14.3.5 Exhaustion of Wildlife Resources and their Natural Habitats

Despite the Wild Animals and Birds Hunting Act issued in 1999, harmful hunting practices continue to pose a threat to wildlife and its natural habitats, especially with availability of advanced technologies that have facilitated chasing and hunting of wild animals. As a result, the rate of loss of large mammals is relatively high compared with world standards, as evidenced by the extinction of the Arabian lion, Arabian ostriches and the leopard, as well as the decline in the number of wild animal species. Hence, there is a need for enforcing hunting regulations.

Various factors have contributed to loss of wildlife habitats, the most important of which are harmful grazing and logging, expansion of agriculture, urbanization, intensive use of fertilizers and pesticides, and pollution of fresh water or exhaustion of its resources. Hence, there is a need for applying rangeland cycles in cooperation with the administrative authorities in governorates and centres, enforcing the ban on logging, and taking environmental considerations into account in urbanization and road building. Moreover, environmental assessment of water treatment projects; factories; refineries; and disposal of agricultural, industrial, and medical waste should be enforced.

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14.4 DEVELOPMENT STRATEGY

14.4.1 Future Vision

Improving environmental indicators over the next two decades, with clean manufacturing and environment-friendly means of transportation, while balancing natural resources with the objectives of development, through the conservation of natural resources and the rationalization of their utilization to achieve long-term economic and social objectives.

14.4.2 Objectives

- Protecting and safeguarding the environment from pollution and degradation, and reducing all pollutants and their impact.
- Conserving, protecting, and developing terrestrial, and marine wildlife, to ensure environmental balance and diversification of genetic resources.
- Achieving an optimal balance between development and environment, to ensure sustainable development through making environmental planning an integral part of comprehensive planning for development in all areas.
- Reintroducing rare, endangered wildlife species into their natural habitats.
- Developing national capacities for maintenance and protection of the environment and dealing with environmental disasters.
- Raising awareness of environmental issues, instilling a sense of individual and collective responsibility for their preservation and improvement, in addition to encouraging national voluntary efforts in this area, and raising awareness of climate change and of methods to cope with and adapt to its impact.
- Mitigating consequences of natural disasters, maintaining safety of lives, protecting property, and developing safety indicators for maritime, land and air transport.
- Upgrading meteorological services and supporting climate studies.

14.4.3 Policies

- Improving environmental performance indicators for the sectors concerned with the protection of the environment, through promotion of preventive mechanisms for protection of the environment, natural resources and maintenance of the health of the population.
- Developing specialized environmental management human resources, through education and training programmes within and outside the Kingdom.

- Strengthening environmental management, through enhancing coordination mechanisms and channels and cooperation between PME and all stakeholders.
- Strengthening databases and studies dealing with various issues of environmental protection.
- Preparing to address the environmental issues and challenges that may arise from escalation of climate change and global warming.
- Promoting private-sector participation in implementation of environmental development programmes.
- Addressing pressures resulting from escalating urbanization and development in various sectors, in an effort to maintain sustainability of development.
- Ensuring accuracy in monitoring and projection, and contributing to mitigation of natural disasters.
- Adding new protected areas, in view of priorities and requirements of maintenance of wildlife.
- Employing modern technologies and establishing genetic banks to preserve rare endangered species.

14.4.4 Targets

- Installing 4 radars to monitor the weather.
- Installing 10 fixed marine monitoring stations.
- Supplying and installing 100 agro-climatic monitoring stations.
- Supplying and installing 21 automatic monitoring stations.
- Installing 40 air-quality monitoring stations.
- Supplying 3 mobile stations for measurement of noise levels.
- Installing 8 weather monitoring equipment in protected areas.
- Developing a national plan for dealing with environmental disasters.
- Declaring and operating five protected areas in each of: Jabal Aga, Ras Suaihel, Kasaba, Jabal Qragher, Difatt Al wajh, and Ras Braid
- Establishing the National Centre for Meteorological, Environment and Sustainable Development Information.

- Establishing centres for combating pollution by oil in the Eastern, Western, Tabuk, and Jazan regions.
- Creating an early-warning network in valleys at risk of flooding.
- Establishing a centre for preservation of the genetic stock of wildlife.
- Measuring levels of noise in industrial areas and comparing them with global standards.
- Updating regulations for chemical safety and dealing with hazardous materials.
- Conducting land, sea and air environmental studies to identify their impacts on the population.

14.5 FINANCIAL REQUIREMENTS

The financial requirements for development programmes in the environment sector (PME and SWC) are estimated under the Ninth Development Plan at SR3.75 billion.

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