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SAUDI ARABIA



COUNTRY PROFILE



UNITED NATIONS

INTRODUCTION - 2002 COUNTRY PROFILES SERIES

Agenda 21, adopted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, underscored the important role that States play in the implementation of the Agenda at the national level. It recommended that States consider preparing national reports and communicating the information therein to the Commission on Sustainable Development (CSD) including, activities they undertake to implement Agenda 21, the obstacles and challenges they confront, and other environment and development issues they find relevant.

As a result, in 1993 governments began preparing national reports for submission to the CSD. After two years of following this practice, the CSD decided that a summarized version of national reports submitted thus far would be useful. Subsequently, the CSD Secretariat published the first Country Profiles series in 1997 on the occasion of the five-year review of the Earth Summit (Rio + 5). The series summarized, on a country-by-country basis, all the national reports submitted between 1994 and 1996. Each Profile covered the status of all Agenda 21 chapters.

The purpose of Country Profiles is to:

- Help countries monitor their own progress;
- Share experiences and information with others; and,
- Serve as institutional memory to track and record national actions undertaken to implement Agenda 21.

A second series of Country Profiles is being published on the occasion of the World Summit on Sustainable Development being held in Johannesburg from August 26 to September 4, 2002. Each profile covers all 40 chapters of Agenda 21, as well as those issues that have been separately addressed by the CSD since 1997, including trade, energy, transport, sustainable tourism and industry.

The 2002 Country Profiles series provides the most comprehensive overview to date of the status of implementation of Agenda 21 at the national level. Each Country Profile is based on information updated from that contained in the national reports submitted annually by governments.

Preparing national reports is often a challenging exercise. It can also be a productive and rewarding one in terms of taking stock of what has been achieved and by increasing communication, coordination and cooperation among a range of national agencies, institutions and groups. Hopefully, the information contained in this series of Country Profiles will serve as a useful tool for learning from the experience and knowledge gained by each country in its pursuit of sustainable development.

NOTE TO READERS

The 2002 Country Profiles Series provides information on the implementation of Agenda 21 on a country-by-country and chapter-by-chapter basis (with the exception of chapters 1 and 23, which are preambles). Since Rio 1992, the Commission on Sustainable Development has specifically addressed other topics not included as separate chapters in Agenda 21. These issues of trade, industry, energy, transport and sustainable tourism are, therefore, treated as distinct sections in the Country Profiles. In instances where several Agenda 21 chapters are closely related, for example, chapters 20 to 22 which cover environmentally sound management of hazardous, solid and radioactive wastes, and chapters 24 to 32 which refer to strengthening of major groups, the information appears under a single heading in the Country Profile Series. Lastly, chapters 16 and 34, which deal with environmentally sound management of biotechnology, and transfer of environmentally sound technology, cooperation, capacity-building respectively, are presented together under one heading in those Country Profiles where information is relatively scarce.

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LIST OF COMMONLY USED ACRONYMS

ACS	Association of Caribbean States
AMCEN	Africa Ministerial Conference on the Environment
AMU	Arab Maghreb Union
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
CARICOM	The Caribbean Community and Common Market
CBD	Convention on Biological Diversity
CIS	Commonwealth of Independent States
CGIAR	Consultative Group on International Agricultural Research
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
CSD	Commission on Sustainable Development of the United Nations
DESA	Department for Economic and Social Affairs
ECA	Economic Commission for Africa
ECCAS	Economic Community for Central African States
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FIDA	Foundation for International Development Assistance
GATT	General Agreement on Tariffs and Trade
GAW	Global Atmosphere Watch (WMO)
GEF	Global Environment Facility
GEMS	Global Environmental Monitoring System (UNEP)
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GLOBE	Global Legislators Organisation for a Balanced Environment
GOS	Global Observing System (WMO/WWW)
GRID	Global Resource Information Database
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IAEA	International Atomic Energy Agency
ICSC	International Civil Service Commission
ICSU	International Council of Scientific Unions
ICT	Information and Communication Technology
ICTSD	International Centre for Trade and Sustainable Development

IEEA	Integrated Environmental and Economic Accounting
IFAD	International Fund for Agricultural Development
IFCS	Intergovernmental Forum on Chemical Safety
IGADD	Intergovernmental Authority on Drought and Development
ILO	International Labour Organisation
IMF	International Monetary Fund
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IPCS	International Programme on Chemical Safety
IPM	Integrated Pest Management
IRPTC	International Register of Potentially Toxic Chemicals
ISDR	International Strategy for Disaster Reduction
ISO	International Organization for Standardization
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature and Natural Resources
LA21	Local Agenda 21
LDCs	Least Developed Countries
MARPOL	International Convention for the Prevention of Pollution from Ships
MEAs	Multilateral Environmental Agreements
NEAP	National Environmental Action Plan
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organizations
NSDS	National Sustainable Development Strategies
OAS	Organization of American States
OAU	Organization for African Unity
ODA	Official Development Assistance/Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Papers
SACEP	South Asian Cooperative Environment Programme
SADC	Southern African Development Community
SARD	Sustainable Agriculture and Rural Development
SIDS	Small Island Developing States
SPREP	South Pacific Regional Environment Programme
UN	United Nations
UNAIDS	United Nations Programme on HIV/AIDS
UNCED	United Nations Conference on Environment and Development
UNCCD	United Nations Convention to Combat Desertification
UNCHS	United Nations Centre for Human Settlements (Habitat)
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDRO	Office of the United Nations Disaster Relief Coordinator
UNEP	United Nations Environment Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNIFEM	United Nations Development Fund for Women
UNU	United Nations University
WFC	World Food Council
WHO	World Health Organization
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wildlife Fund
WWW	World Weather Watch (WMO)

CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES

Decision-Making: Ministerial Committee on Environment chaired by HRH Prince Sultan Bin Abdulaziz, Second Deputy Premier, the Minister of Defense and Aviation and Inspector General and represented by all relevant ministries and agencies. Presidency of Meteorology and Environment (PME) acts as the Secretariat of the MCE.

Programmes and Projects: No information available.

Status: The Kingdom has signed a number of regional and international agreements, protocols and conventions dealing with various aspects of sustainable development. Saudi Arabia is a party to the following international and regional conventions (as on January 2001):

- International Convention for the Prevention of Pollution of the Sea by oil, London, 1954 (as amended in 1962 and 1969);
- 2- Amendment to the International Convention for Prevention of Pollution of the Sea by Oil (1954), Concerning Tank Arrangements and Limitation of Tank Size (1971);
- Amendment to the International Convention for Prevention of Pollution of the Sea by Oil (1954), concerning the protection of the Great Barrier Reef, London, 1971;
- Agreement for Establishment of a Commission for Controlling the Desert Locust in near East (as amended), Rome, 1965;
- Treaty on Principles Governing the Activities of States in the Exploration and use of Outer Space in the Moon and Other celestial Bodies, London, Moscow, Washington, D.C, 1967;
- International Convention on Civil Liability for Oil Pollution Damage, Brussels, 1969 and Rome, 1976 Protocol;
- Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea Bed and the Ocean Floor and in the Subsoil Thereof;
- Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on Their Destruction, London, Moscow, Washington, 1972;
- Convention Concerning the Protection of The World Cultural and Natural Heritage, Paris, 1972;
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London, 1972;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973;
- Kuwait Regional Convention For Cooperation on The Protection of Marine Environment From Pollution, Kuwait, 1978;
- Protocol Concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency, Kuwait, 1978;
- Protocol Concerning Marine Pollution Resulting from Exploration and Exploitation of the Continental Shelf, Kuwait, 1989;
- Protocol For the Protection of the Marine Environment Against Pollution From Land-Based Sources;
- Convention On The Conservation Of Migratory Species Of Wild Animals, Bonn, 1979;
- Regional Convention For The Protection Of the Red Sea and Gulf Of Aden Environment, Jeddah, 1982;
- Protocol Concerning Regional Cooperation In Combating Pollution By Oil and Other Harmful Substances In Cases Of Emergency, Jeddah, 1982;
- United Nations Conventions On The Law Of The Sea, Montego Bay, 1982;
- Agreement Relating To The Implementation Of Part XI Of The United Nations Convention On The Law Of The Sea Of 10 December 1982, New York, 1994;
- Vienna Convention For The Protection Of The Ozone Layer, Vienna, 1985;
- London Amendment To The Montreal Protocol On Substances That Deplete The Ozone Layer, London, 1990;
- Copenhagen Amendment To The Montreal Protocol On Substances That Deplete The Ozone Layer, Copenhagen, 1992;
- Convention On Early Notification of A nuclear Accident, Vienna, 1986;
- Convention On Assistance In The Case Of A Nuclear Accident Or Radiological Emergency, Vienna, 1986;

- Basel Convention On The Control Of Transboundary Movements Of Hazardous Wastes And Their Disposal, Basel, 1989;
- International Convention On Salvage, London, 1989;
- United Nations Framework Convention On Climate Change, New York, 1992;
- Convention On Biological Diversity, Rio de Janeiro, 1992 (Under Consideration);
- Convention On The Prohibition Of The Development, Production, Stockpiling and Use Of Chemical Weapons And On Their Destruction, Paris, 1993;
- United Nations Convention To Combat Desertification In Those Countries Experiencing Serious Drought And Desertification, Particularly in Africa, Paris, 1994;
- Protocol on the Control of Marine Transboundary Movements and Disposal of Hazardous Wastes and Other Wastes, Tehran, 1998.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: See under **Status**.

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**CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE
DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC
POLICIES - TRADE**

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 3: COMBATING POVERTY

Decision-Making: See under **Status**.

Programmes and Projects: *Social insurance programme:* A government social insurance programme for the citizens is in place since 18/3/1382 H through an independent agency established by a Royal Decree and number of the offices. The aim of this agency is to provide help to the needy people in the form of pensions (to the orphans and handicapped, woman having no support) and social helps (disabled, partially disabled, families of the prisoners, disaster affected people).

Productive projects: The social insurance agency undertakes some productive projects for the individuals to enable them to earn their livelihood.

Charities: There are voluntary organizations comprised of citizens interested in the social work. Different activities and programmes these voluntary organizations are involved in are as follows: monthly assistance; assistance in kind; assistance to patients; assistance to help young individual with limited income in marriage; the provision of services to the tenants of the charitable buildings in the holy places; the establishment of the hospitality homes to the families in need of urgent care; help for the orphans and the handicapped and their families; help of the families of the prisoners; programmes for the care of handicapped and senior citizens; establishment of Shelter centers; the establishment of the centers of the physiotherapy; the establishment of medical complexes; the establishment of education centers for handicapped; the establishment of technical education centers; and, the issuance of medical sets to the handicapped.

See also under **Status**.

Status: An approach of the social welfare in the kingdom is aimed at social development and improvement of family and children conditions by overcoming their problems.

Social insurance budget: The social insurance has developed since its establishment receiving heavy support from the government by increasing its budget by four times. Social insurance budget increase ranged between 43% and 38%. The first budget to the social insurance in the financial year 1382/138 (pensions, help and the administrative expenses) amounts to 24,656,000 rial while in the financial year 1421/ 1422 (2000/2) it reached 3.060 billion Saudi riyals. The total charity value in the year 1419 / 1420 H (1999/2000) reached an amount of 119,979,410 Saudi Riyal.

The Ministry of Labor and Social Welfare has announced a relief of Saudi Riyals 50,000 for a technically qualified handicapped to establish his own business in the area of his specialization.

Retirement systems: The government has embarked upon a retirement system for its citizens after attaining a certain age after working for a certain period of time. This system would provide to them a reasonable amount of money so that they can live respectably after retirement.

The government deducts 9% of the salary of the civil service personnel and adds 2% from its budget to it. After 40 years of service, the person gets full salary as pension while no one should get less than 1,500 Saudi Riyals per month. In case of death, the inheritors get the pension according to their share as per Shariyah law.

For military personnel, the period of service is 35 years to get full salary as pension rather than 40 years.

Social insurances: In the private sector, if a person gets disabled during work, he is compensated for this disability according to the assessment by authorities of the social insurance organization. The employee pays 5% of their salary while employer pays 8% of the salary towards the insurance system.

Specialist lending corporations: The government is paying special attention for its citizens by offering housing loans without commission (interest) to construct their houses.

Saudi industrial development fund: The government offers long-term loans for the industrial projects for five to ten years. By the end of the year, the total amount of loan has reached 1420 H (2000) 10 billion Saudi riyals.

Land development fund: The government has established a land development fund for the development of property in the villages and towns to discourage immigration.

Saudi Arabian agricultural bank: To encourage agricultural sector in the kingdom, the government gives easy agricultural loans to the farmers. The government also gives agricultural relief to purchase agricultural equipments. The total value of loans by the end of the year 1420 has reached 26 billion Saudi riyals. The government has also established Saudi credit banks to give marriage loans, refurbishment of homes, and loans

for professionals to start business. The government also donates land to the needy people and to the factories. In addition, needy people are being given house ownerships.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: See under **Status**.

Cooperation: No information available.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS

Decision-Making: The responsibility is with the Ministry of Industry and Electricity (MIE).

Programmes and Projects: The MIE has implemented two major policy decisions: the privatization of power companies and their unification nationwide; and the destruction of the power pricing system to minimize the undue over consumption. See also **Capacity-Building, Education, Training and Awareness-Raising**.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: The MIE has a number of training programmes for capacity building. The ministry has also initiated a number of education and awareness programmes.

Information: No information available.

Research and Technologies: The Kingdom has built power plants through international tenders. Power plants in the Kingdom are modern using state-of-the-art technology.

Financing: The Ministry of Electricity and Industry receives its budget from the Government's annual budget. Saudi Arabian Consolidated Electricity Company (SCECO), a public sector company responsible for the production and distribution of power, which has been recently privatized, draws its finances from the consumers. The company is also embarking upon built, operate and transfer (BOT) procedures for new projects.

Cooperation: No information available.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS - ENERGY

Decision-Making: One of the important approaches in the energy and petroleum sector has been the achievement made by the Ministry of Petroleum and Mineral Resources in successfully adopting a policy accommodating collection and treatment of the natural gas accompanying production of crude oil. This trend, introduced for economic reasons, has a positive impact on the environment since it has been possible to get rid of almost all emissions from combustion of huge quantities of gases saturated by sulfur. The produced sulfur will either be consumed domestically or exported. The Ministry also applies strict environmental standards by which the existing local refineries abided. As a result, the content of lead in gasoline has been reduced as a first step toward a lead-free gasoline for both domestic consumption and export.

Among the main objectives identified in the Fifth Development Plan to be accomplished within its five-year duration include the following: To provide sufficient energy at an appropriate cost and by the means that avoids environmental deterioration; with conservation of non-renewable energy resources and the utilization of the clean and safe renewable energy resources such as solar and wind. Saudi Aramco Company, considered to be one of the world's major oil companies, operates within the framework of sustainable development. The company stresses the application of internal controls aimed at protection and conservation of the environment. Saudi Aramco's plan for the conservation of the environment states that the company guarantees that its operations will not cause unnecessary hazards which damage the environment or the public health, and will be carried out with the utmost care for the protection of the land, the air, and the water from harmful pollution. Each department in Saudi Aramco is responsible for guaranteeing the design and operation of its facilities in compliance with this plan, and ensuring that they will not cause unnecessary hazards to the environment or to public health.

In 1952 the Directorate General for Oil and Minerals was established under the Ministry of Finance to monitor oil and mineral production and to safeguard the government's interest in the sector. In 1960, the Directorate General for Oil and Minerals was transferred to the Ministry of Petroleum and Mineral Resources. An independent directorate, the DGMR (Directorate General of Mineral Resources), under the Ministry of Petroleum and Mineral Resources, was established in 1962 to administer a systematic geologic mapping and mineral exploration programme. This led to the discovery of several commodities, including copper, zinc, gold, silver, iron, bauxite and phosphate deposits, and sources of ornamental stone and industrial minerals. In 1987, a new organizational structure was adopted for the DGMR. This was necessary due to the rapid growth and increasing diversity of the administrative and technical entities of the DGMR, and the need to provide a modern and solid base of government support for the Kingdom's mineral resource sector.

The principal divisions of today's DMMR (the successor of DGMR) are as follows: Office of the Deputy Minister for Mineral Resources: Dr. Zohair A. Nawab; Office of the Assistant Deputy Minister for Finance and Administration: Mr. Gamil M.S. Tayeb; Office of the Assistant Deputy Minister for Mining Investment: Mr. Sultan J. Shawli A prime objective of DMMR since 1987 has been to provide a broad range of Saudi personnel who can manage and integrate its administrative and technical activities and make decisions concerning mineral sector policy. The DGMR became the present day Deputy Ministry for Mineral Resources (DMMR) in 1994. A major objective of the DMMR is to stimulate the development of a sound mineral industry. The intention is to provide, in association with Saudi Geological Survey (SGS), reliable geologic and economic data to prospective investors. Another objective of DMMR is to stimulate and encourage investment in mineral resources by the private and public sectors. More information is available from the Ministry of Petroleum and Mineral Resources site at www.mopm.gov.sa.

The Mining Code in use today is the version introduced in 1972. It is the basic framework for controlling exploration and mining activities in the Kingdom. The present Mining Code and Regulations have been extensively revised and currently are in final form awaiting ratification by the Council of Ministers. The following section relates to the present Mining Code, which will be superceded when the new Code becomes law. DMMR is the sole agency responsible for implementing the provisions of the Mining Code and Regulations. All enquiries and applications should be addressed to DMMR. DMMR will advise on the availability of any lands applied for, and confirm the necessary technical and financial qualifications for the work programme proposed. The specific terms for any concession will be negotiated with the applicant in the spirit of reaching an agreement that is in the interests of both parties. DMMR will execute the documents within its power and be responsible for ensuring that the terms of the agreement are complied with. Applicants should

inform DMMR of the nature of their requirements and objectives. Such enquiries should be addressed to: Dr. Zohair A. Nawab, Deputy Minister for Mineral Resources, Deputy Ministry for Mineral Resources, P.O. Box 345, Jeddah 21191, Kingdom of Saudi Arabia.

Normally the first rights to be granted are in the form of a Reconnaissance Permit. This is a simple document with minimal procedural requirements. The holder may have access to the libraries of reports, maps and data. He may visit locations of interest and take samples. If areas of interest are subsequently delineated, the holder may wish to obtain exclusive rights by applying for an exploration license.

An application for an Exploration License shall include a technical report outlining the objectives, duration and costs of the exploration programme. The license contains the basic provisions for a Mining Lease. The licensee will undertake the agreed programme of work, submit the necessary progress reports, and in the event of a significant discovery, submit a feasibility study. Based on the provisions outlined in the exploration license, the final terms for a mining lease will be agreed between the licensee and DMMR.

Applications for a Mining Lease must be accompanied by a technical and economic assessment outlining the mining possibilities and projecting the proposed development. An Environmental Impact Study is also required for applications for mining leases.

There is no surface rental for exploration, and the rental rate for mining is limited by the Mining Code to a maximum of SR10, 000 (US\$2,666) per square kilometer per year. Profits and capital may be repatriated without any restriction. The Mining Code permits all document holders to use water resources within their concession area, subject to any existing arrangements that may have been made for the supply of towns or villages. All equipment required for the implementation of a concession is exempt from import and export duties.

Programmes and Projects: The Kingdom of Saudi Arabia has restructured the prices of gasoline, diesel and cooking gas to control the over-consumption. The Kingdom has also phased out the leaded gasoline since January 2001. Some projects are advertised for tender by DMMR in order to grant the appropriate rights to the successful applicant for exploration. Site visits can be arranged, and assistance will be provided to make relevant information and data available. Proposals will be evaluated by DMMR based on the applicants' financial and technical qualifications. See also under **Capacity-Building, Education, Training and Awareness-Raising**.

Status: *The mineral resource and mining sector of the kingdom of Saudi Arabia:* In addition to hydrocarbons, Saudi Arabia produces gold, silver, copper, zinc, industrial and construction materials, and ornamental stone. At the end of 2000, current concessions comprised 23 mining leases (5 for metallic, 6 for non-metallic and 12 for cement raw materials), 23 small mine permits (including such commodities as clay, glass sand, barite, limestone, feldspar, diatomite, dolomite and basalt), 13 exploration licenses, 18 reconnaissance permits, and 875 building materials permits for crushers, granite, marble and sand. The Saudi Arabian Mining Company (Ma'aden) operates an underground gold mine at Mahd Ad'Dahab which also produces by-product silver, copper and zinc, and The Saudi Company for Precious Metals operates an open pit gold mine at Sukhaybarat. Total gold production from these two mines in 1999 was 4.57 tons.

The Arabian Shield, which forms a geologic and metallogenic province, has been the site of ancient cultural and mining activities that predate Islam. Evidence of ancient mining traditions includes old inscriptions, and numerous scattered ruins of mining sites and their associated villages along ancient caravan routes. By the time of the early Islamic period (AD 750-1258), mining in Arabia was flourishing, and the archaeological evidence includes gold coins dating from this period.

Modern mineral exploration in the Kingdom began in 1931 when the late King Abdul Aziz commissioned the American geologist K.S. Twitchell to investigate the occurrence of oil and minerals in the Kingdom. Twitchell's work confirmed the existence of oil in the Eastern Province and of gold in the Hijaz Region. In 1933 the Bureau of Mines and Public Works was established under the Ministry of Finance to oversee mining operations in the Kingdom. On February 12, 1935 an agreement was signed between the government and a British-American consortium - the Saudi Arabian Mining Syndicate (SAMS) to operate the ancient gold mine of Mahd ad Dhahab. In an effort to streamline the operations of foreign companies in the Kingdom, late that year the government established the Bureau of Mines as a liaison office between the Ministry of Finance, SAMS and other international companies holding mining concessions in the Kingdom.

There is no surface rental for exploration, and the rental rate for mining is limited by the Mining Code to a maximum of SR10, 000 (US\$2,666) per square kilometer per year. Profits and capital may be repatriated without any restriction. The Mining Code permits all document holders to use water resources within their concession area, subject to any existing arrangements that may have been made for the supply of towns or villages. All equipment required for the implementation of a concession is exempt from import and export duties. There are large tracts of geologically favorable land available. Many prospects are available for further exploration and evaluation, and major projects await development. Comprehensive reviews of both metallic and non-metallic mineral resources have been published.

Capacity-Building, Education, Training and Awareness-Raising: Education and awareness-raising is the main tool to encourage sustainable consumption and production patterns supported by the government policies and strategies. The government, in coordination with the industry and business community, education institutions specially the Presidency of Girl's Education and professional organizations has initiated campaign to change unsustainable consumption and production patterns in various sectors.

The government has evolved a policy to recycle waste wherever it is possible and has awarded waste recycling contracts to private sector. As a major step, the government is studying the possibility of switching over to gas fuel in power production and desalination sector where crude oil or heavy fuel oil (HFO) is currently in use.

Information: DMMR employs 475 staff including those with undergraduate and graduate degrees in geology and mining engineering. The Government has given DMMR the responsibility to: collect; interpret; and disseminate information on all mineral resources other than gas and petroleum. DMMR activities are primarily concerned with the implementation of the Mining Code and include: promotion and licensing of mining development; mining investment; supervision; collection of fees; and safety and protection of the environment specifically in the mining sector.

In 1993 DMMR published the Saudi Arabian Atlas of Industrial Minerals and in 1994, the Mineral Resources of Saudi Arabia reference book. Detailed economic studies of particularly promising prospects were also undertaken. Projects that reached this stage include Az Zabirah bauxite, Al Jalamid phosphate, Khnaiguiyah zinc, Khulays bentonite, and Zarghat magnesite. See also under **Decision-Making**.

Research and Technologies: The government, through educational and research institutions, encourages and conducts research on different aspects of sustainable use of natural resources, and promotes efficient production and recycling of waste. Industries also conduct in-house research to make the industry energy and production efficient. From 1987 until its reorganization in 1999, when the Saudi Geological Survey (SGS) was established, DMMR designed and produced a number of new thematic maps on a geologic base that can be of particular use to other government agencies, to universities, oil companies, development authorities and private companies. Some of these specialized maps include a geotechnical map of Ar Riyadh, Az Zabirah bauxite map, and the industrial mineral resources maps of the major urban centers of the Kingdom. Exploration for mineral commodities was the principal activity of the DMMR until 1999. Many of DMMR's previous exploration programmes were long-term and therefore provide a range and depth of data about prospective areas of great value to potential investors and developers. Gold occurrences and prospects are widely distributed throughout the Saudi Arabian Shield. In 1987, DGMR utilized modern exploration techniques to launch a gold exploration programme that resulted in the discovery of significant gold mineralization at Al Hajar, Hamdah, Ad Duwayah and Zalim. DMMR undertook a systematic inventory of all known or newly discovered base-metal occurrences followed by detailed studies of promising localities. Significant deposits of copper have been discovered at Jabal Sayid, in the west-central Shield; of zinc at Khnaiguiyah, in the eastern Shield; and of copper and zinc at Al Masane, in the southern Shield. These have been the subject of comprehensive economic evaluation studies. DMMR exploration for industrial minerals included the completion of a systematic inventory of all known or newly discovered occurrences.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS – TRANSPORT

Decision-Making: The government ministries/agencies responsible for making decisions in the management and improvement of the transport system include the following Ministries of: Defense (Civil Aviation) and Saudia Airlines, which are responsible for Air Transport; Communications (MOC) — Intercity (between cities) Road and Ring Road Systems, Railway Planning; Interior (General Directorate of Traffic Police) and Traffic Management; Municipality and Rural affairs (MOMRA) — Traffic Safety, Intracity (within city zone) Road System and Urban planning; Saudi Railway Organization (SRO) — Railway Operation and Management and Maritime Planning; and Saudi Seaports Organization — Maritime Operation and Management.

A government agency proposes a certain legislation or policy in the transport sector. Coordination with other concerned public and private agencies is achieved through joint committees or by writing. Charged committees review the legislation and include all comments and concerns. Proposed policy is sent to Board of Ministers for approval. Board of Minister may form other committees to review proposed policy. Policy will be modified or approved. Ministries and Central Government agencies undertake decision-making and planning on the National level. Certain decisions are delegated to local authorities according to the task and role of this authority.

Law and regulations addressing the transport and traffic systems include: Road and Seaports laws that are issued by Royal Decrees; various Land and Maritime Transport Licenses laws issued by the Ministry of Communications (MOC); and the Traffic law (1971) issued by a royal decree, and implemented by the Ministry of Interior, which is currently under review.

Saudi Arabia (the Ministry of Planning) has developed two transportation national plans 1981 and 1996. The Ministry of Municipal and Rural Affairs (MOMRA) develop urban Planning strategies.

The Private Sector participates through circulation of proposed laws to key players in the public and the private sectors and through public-private joint committees to discuss issues and study recommendations.

Programmes and Projects: See under **Status** and **Research and Technologies**.

Status: The Ministry of Commutations (MOC) does not regulate emission standards, safety codes, maintenance standards, or incentive mechanisms (such as tax measures, production codes, etc.) aimed at reducing vehicle emissions, except for road maintenance standards.

There is a need for: the expansion of expressway system to connect major population regions; public transport within city zones; school transportation; and the expansion of railway network to mining resources.

With regard to commercial, private, and public demands in rural and urban areas of your country, the adequacy of the provision of transport services is as follows: air transport system is well developed and airports cover all major population centers; maritime system is well developed and seaports cover major coastlines; paved roads system is well developed; agriculture roads system is well developed; expressway system needs expansion to cover the whole country; public transportation needs improvements; and, school transport need to be developed. Transportation systems required to be improved include: public transportation; school transportation; maritime transportation; urban transportation. Major obstacles in adopting more efficient transport and traffic systems are as follows: financial; various governmental agencies and conflict in tasks; lack of major laws and regulations and enforcement; long delays in urban transport in major cities; and, high rate of accidents and injuries.

Capacity-Building, Education, Training and Awareness-Raising: Efforts are undertaken through Conferences and Media coverage to promote public awareness of the impact of transport on the environment. Measures taken to educate the public on traffic safety include: the National Traffic Safety Committee (NTSC); School Educational programmes; the Ministry of Interior educational programmes; Media coverage; etc.

Information: Each governmental agency has its own database. Information is available to the public through studies and reports.

Research and Technologies: King Abdulaziz City for Science and Technology (KACST) is the research institute that undertakes transport and traffic issues. Research centers in Universities undertake transport and traffic topics. The Saudi Government (MOC) is undertaking major studies concerning the expansion of the

Saudi railway network, and developing the national highway system. Some of the ITS technologies are being considered.

Financing: Funding for building infrastructure is provided by the government's sources. Supply of fuel is funded by private sector. Research and development of alternative fuels and transport efficiency is funded by joint sources. Enforcement of regulations and standards is funded by governmental agencies.

Measures that have been introduced to increase the volume of investment in the transport sector include: the Saudi Government's efforts for the accession to the WTO; and studies to privatize major transport systems (Airline, Railway, Road expansion, Seaports services).

Cooperation: The Kingdom's cooperation involves: various bilateral agreements with neighboring and other countries in Air, Land and maritime transport; regional agreements through the Arab League Organization; and many international agreements, to which the Kingdom is party.

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CHAPTER 5: DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 6: PROTECTING AND PROMOTING HUMAN HEALTH

Decision-Making: The Ministry of Health (MOH) of the Kingdom of Saudi Arabia, which takes charge of health care and hospitals, has made progress in most health and environmental areas listed in Agenda 21.

The Council of Ministers Decree number 78 dated 3/7/1415 H, was issued to approve the recommendations of the Ministerial Committee of the Environment (MCE). Recommendation number 2.5 provides for the composition of a nationwide technical task force chaired by the MOH and with membership from the Ministry of Agriculture and Water, the Ministry of Municipality and Rural Affairs, the Ministry of Planning, the Meteorology and Environmental Protection Administration, and certain relevant agencies; it is charged with preparing a draft national strategy for health and the environment in the Kingdom. The Minister of Health issued a decree providing for the formation of a committee charged with preparing a comprehensive public health system for the Kingdom with a view to upgrading the standard of health services.

Programmes and Projects: The Ministry of Health implemented a comprehensive national programme for tuberculosis control, and the ratio of incidence of pulmonary tuberculosis in the total population has dropped from about 17:100,000 in 1991 to 11:52: 100,000 in 1995. In the area of nutritional safety, health monitoring records have been updated; a manual of guidelines for health officers has been prepared; a task force has been formed to visit, in groups, various parts of the Kingdom in order to oversee provision of health conditions in outlets related to public health.

Status: Five specific constraints need to be overcome: an overlap of functions and competencies among agencies concerned with environmental issues and activities; the lack of coordination among agencies concerned and their irregular meetings for consideration of urgent and new environmental issues; the need for material support of health and environmental activities; the lack of databases and an information network which could link agencies concerned with the environment; and the shortage of highly-qualified specialists in health and environmental sciences.

A number of proposals have been made to address these difficulties. These include: enacting legislation and rules which provide a regulatory framework concerned with terms of reference of each agency related to the environment; the invitation of committees concerned with the environment to regularly scheduled meetings in order to consider urgent and new environmental issues; establishing information databases, networks and centers at and among agencies concerned with the environment in order to facilitate exchange of information and expertise in this vital area; the provision of the resources necessary for achievement of the objectives and programmes listed in the recommendations of Agenda 21, and various environmental activities; providing the necessary posts and support in order to attract specialized staff capable of keeping abreast of the numerous new developments in this area, and the progress of development in the Kingdom; and supporting training and scholarship programmes with a view to upgrading national cadres engaged in the area of public health and the environment.

Primary health care centers total 1,725, with a rate of 10,353 persons per center, and the services cover all villages and hamlets in all parts of the Kingdom. These centers provide both curative and preventive primary health care services, particularly immunization, mother and child care, and environmental sanitation services. The ration of physicians to population is 1: 1,154, and of dentist, 1:14,734. In the area of current disease control, incidence per 100,000 populations declined from 1991 to 1995.

In recent years, expansion in the use of non-traditional pesticides such as phenomenal insect control and other biological materials has reduced the usage of chemical pesticides known to have a negative impact on the environment. Within the framework of health regulations applicable in the company, Saudi Aramco adheres to protection against ailment and disease that may arise in areas of its facilities and operations, by means of application of the best available practices in preventive medicine. The company controls diseases arising from food and water pollution through monitoring and control of the operations of the sewage treatment plants.

Capacity-Building, Education, Training and Awareness-Raising: A health education programme has been prepared in the company to increase staff awareness and training in areas of cardio-pulmonary resuscitation (CPR), chemical hazards, safety measures, and (first aid) treatment of patient. Through this programme, (awareness) material is developed as well as the production of films and the dissemination of information. On

the other hand, the programme monitors occupational health hazards existing at the workplace, offers advice on how to minimize them, and monitors the health of staff vulnerable to these hazards. Company activities related to safety are designed to prevent or minimize the occurrence of accidents and therefore aim primarily at the prevention of human, as well as in hydrocarbons, and other materials which may have negative impact on the atmospheric, aquatic, and terrestrial environment.

Training in handling and disposal of hazardous and toxic materials is considered part of the daily activities of the company. Saudi Aramco's plan for the conservation of the environment states that the company guarantees that its operations do not cause unnecessary hazards which damage the environment or the public health, and will be carried out with the utmost care for the protection of the land, the air, and the water from harmful pollution. Each department in Saudi Aramco is responsible for guaranteeing the design and operation of its facilities in compliance with this plan, and ensuring that they will not cause unnecessary hazards to the environment of public health.

The MOH conducted a specialized national training course in the area of chemical safety, disaster preparedness, and management in collaboration with the World Health Organization (WHO). Officials and specialists from relevant ministries and agencies participated with the aim of developing skills in the areas of chemical safety, the role of curative and preventive medicine in preparedness for addressing chemical accidents, exchange of information, finding a coordinated approach among relevant agencies, and raising public awareness of chemical safety issues.

Information: Information on various aspects of this chapter entitled "protecting and promoting human health" has been available in databases in the relevant ministries, agencies and departments such as Ministry of Health, Meteorology and Environmental Protection Administration (MEPA) for air and water pollution levels, hazardous waste, Ministry of Municipal and Rural Affairs (MOMRA) for solid waste and human settlement, Ministry of Agriculture and Water (MAW) for pesticides and Ministry of Industry and Electricity (MIE) for industry and power etc.

Research and Technologies: The current situation in the MOH and private sector hospitals has been studied and coordination with the relevant agencies achieved with a view to finding effective approaches for the disposal of hazardous materials in proper scientific ways. A number of offers have been submitted by certain companies to engage in collection, transport, and processing the disposal of waste by the most modern means and technologies that take into consideration environmental factors with a view to choosing among technologies and formulating the necessary criteria and controls for practicing this activity. A draft has been prepared for the terms and conditions for using certain waste components, in order to facilitate private sector participation in establishing projects for recycling and re-using solid waste. Investment for the treatment of waste in Jeddah, Riyadh, Qassim and Hail has been approved.

Financing: The budget of the Ministry of Health is 4.9% of the total budget of the state.

Cooperation: Coordination with WHO is under way with a view to establishing an information network for the environment, chemical safety, and addressing emergencies.

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CHAPTER 7: PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT

Decision-Making: The Ministry of Municipalities and Rural Affairs (MOMRA) is responsible for the administration of municipalities throughout the Kingdom, including the planning of cities and towns; the development of roads and basic infrastructure; and the management and maintenance of services to keep cities and towns clean and healthy. The Ministry of Municipalities and Rural Affairs has devised strategies aimed at addressing consequences of population growth through comprehensive supervision of urban development, and it has prepared a long-term strategy for guiding urban planning, based on a set of long-term and specific national development objectives.

Programmes and Projects: By the end of the Fifth Five-Year (1990-1995), the Kingdom had provided services, utilities and housing for everybody. MOMRA played an effective role in implementing projects within its jurisdiction. Interim boundaries of urban expansion have been identified to alleviate the pressure of demand on utility networks to supply scattered residential areas lying far away from urban blocks and allowing for use of the surplus capacity of the existing utility networks. Acquisition of land is considered one of the most essential fundamentals for the provision of housing as well as production and services activities for the population. Since the increasing cost of land is considered an impediment to the provision of appropriate housing for everybody, the Government of the Kingdom of Saudi Arabia has adopted a system that ensures citizens' ownership of land for building houses through government grants and the provision of interest-free loans. The current activities of MOMRA in this area are: a comprehensive compilation of land grants as a basic step for establishing an integrated information system related to land use in urban areas; adoption of special controls, regulations and rules for implementing grants and prioritizing sites for land grants in conformity with the national objectives regarding rationalization of expenditure on utility services and the achievement of an inter-related urban matrix; and the use of scientific means and modern technology for management of land resources and organization of its use such as GIS, remote sensing technology and digital map production which are essential for the planning and management of land resources. MOMRA is also making great efforts to improve the quality of the urban environment through planning for the provision of urban infrastructures and the enhancement of public utilities. The most important activities achieved include: urban heritage programmes which aim at protection and repair of historic buildings as well as cultural antiquities; development of city centers with a view to restoring their role as commercial and cultural focal points; and involvement of municipalities in increasing environmental awareness. See also under **Status**.

Status: Water networks have been expanded nationwide, to a total length of 33 million meters, and with a total of 823,000 household connections. By the end of the Sixth Five-Year Plan, 36 projects for drinking water are expected to have been implemented in towns not yet covered by the services of the water and sewerage directorates, at a cost of SR 556 million (US \$180 million). Sewerage networks nationwide total 8,883,000 meters, with 532,000 connections; this is in addition to storm drains in the major cities and numerous towns suffering from rain and flood problems.

Capacity-Building, Education, Training and Awareness-Raising: One of the most important governmental activities is the involvement of municipalities in increasing environmental awareness. Capacity-building, education and training have been the corner stones of various agencies of the government of Saudi Arabia.

Information: No information available.

Research and Technologies: No information available.

Financing: It is expected that 186 sewage projects will be implemented at a cost of SR 30 billion (U.S. \$9 billion) and 30 storm drains at a cost of SR 1.437 billion (US\$ 0.4 billion).

Cooperation: No information available.

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CHAPTER 8: INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING

Decision-Making : The key coordinating mechanism for sustainable development is the Ministerial Committee on Environment (MCE). The relevant sectoral ministries included in the MCE are Agriculture and Water, Municipal and Rural Affairs, Industry and Electricity, Health, Petroleum and Mineral Resources, Foreign Affairs, Interior, Finance and National Economy. Other than these ministries, King Abdul Aziz City for Science and Technology (KACST), Meteorology and Environmental Protection Administration (MEPA), National Commission for Wildlife Conservation and Development (NCWCD) are also members of MCE. The MEPA President acts as Secretary-General of the MCE. Immediately upon conclusion of the United Nations Conference on Environment and Development (UNCED), Saudi Arabia's Ministerial Committee on Environment (MCE), the apex policy-making body in the country on environmental issues, started an elaborated study on Agenda 21. The objective was to formulate a national implementation plan that conforms and accommodates the Kingdom's capabilities, policies and strategies. The central environmental agency, namely, Meteorology and Environmental Protection Administration (MEPA), was established in 1980. Such concern for the environment culminated in the issuance of the Basic Rule of Governance of the Kingdom of Saudi Arabia, wherein Article 32 specifically addresses the environment.

The Kingdom of Saudi Arabia adopted its policies on the environment and development based on principles of Islam that have ordained people to thrive and inhabit the earth as the primary function of humankind. Accordingly, utilization of the natural and environmental resources of the Kingdom has been ascertained with the purpose of satisfying requirements without tampering with the capabilities and rights of future generations. Within this framework, Saudi Arabia adopted the principle of preventive measures; hence, the principle of environmental impact assessment within feasibility studies of proposed projects was adopted. In this context, the government restructured MEPA to be the central environmental agency, responsible for preparing environmental standards, undertaking monitoring and control of the environmental indicators as well as deterioration of the condition of natural resources and carrying out environmental impact assessment in cooperation with the relevant agencies.

This is in addition to MEPA's duty to coordinate with agencies responsible for implementation of environmental work. Establishment of MEPA has been in response to the urgent need for supporting the concerned agencies in taking utmost care for uses of the natural resources and their development from the perspective of productivity and to provide services. A number of ministries work in partnership with MEPA. The most salient among these are the Ministry of Agriculture and Water, particularly with respect to uses of rangelands, agricultural lands, water resources, wildlife and national parks; the Ministry of Petroleum and Mineral Resources with respect to minerals, petroleum and its industries. In addition to these there is the Ministry of Municipality and Rural Affairs which carries out many activities pertaining to urban services, especially sewerage, water networks, management and disposal of wastes, cleaning of the cities and towns and development of public parks, playground and other relevant utilities. Additionally, the Ministry of Industry and Electricity is primarily concerned with the comprehensive industrial development of Saudi Arabia and the proper geographical location of industries in all provinces in a way that give due consideration to environmental aspects.

Based on the general policies of the Kingdom and within the framework of its strategies and objectives pertaining to development, the Fifth Development Plan (1410-1415H) incorporates the following long-term objectives: i) promote a standard of living and the welfare of citizens; endeavor to provide an environment which is free from pollution and particularly of clean air, pure water and healthy food; and ii) Achieve a balanced development on the basis of improved management of the available natural resources and sustain the current capacity of the environment; in addition to this, an attempt should be exercised to maintain existing environmental damages that are due to insufficient care.

An environment unit has been established within the studies and research department of the Ministry of Planning, and its terms of reference have been specified. Among the general objectives and strategic principles for the Sixth Five-Year Development Plan (1995-1999), the tenth strategic principle provides for environmental conservation, protection and enhancement as well as prevention of pollution. In addition, in preparing the Sixth Five-Year Development Plan (1995-1999), the framework for analysis has been broadened to include the term

“environmental” with “economic and social”, including for the purposes of collecting data from all government agencies and for the design of operational plans.

Programmes and Projects: The Ministerial Committee on the Environment has prepared, approved and adopted a general environmental system for the Kingdom. In order to implement Agenda 21, a number of different Government agencies, such as the Ministries of: Planning; Industry; and Agriculture and Water, have established units to oversee environmental assessment of projects, and develop the principles and criteria necessary for environmental protection and pollution control. Among the tasks of these units is acting as liaison with MEPA, which is the central environmental body.

In addition, the Meteorology and Environmental Protection Administration (MEPA) has carried out the following activities: prepared a plan for the management of coastal areas in the Kingdom with the aim of conservation of the marine environment and natural habitats, and the prevention of their degradation as a result of land-based activities with a view to sustainable utilization of marine and coastal resources; conducted a field of study of toxic chemicals and hazardous waste in the Kingdom. The purpose of the study was to draw up policies and future executive plans for management of hazardous toxic materials in the Kingdom; formulated standards, in collaboration with the relevant agencies, for environmental protection (and management of) hazardous and toxic materials in the Kingdom, including criteria and standards for storage, transportation, and treatment as well as final disposal of such waste; prepared “The Environment File” for the city of Jeddah, covering a study of water and air quality which includes measuring the quality of ambient air using a mobile air quality laboratory and listing the sources of water pollution such as sewage and industrial effluent, and taking samples of ground and sea water from various locations; prepared a final draft for updating the standards of water and air quality in order to avert the shortcomings of current standards; made a list of pollution control equipment in collaboration with other agencies in order to strengthen the application of the national plan for control of oil pollution and other harmful materials; and prepared guidelines for the Kingdom’s pollution and control operations in collaboration with the Ministry of Petroleum and Mineral Resources (Saudi Aramco Company).

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: See under **Programmes and Projects** .

Financing: No information available.

Cooperation: With respect to degradation of the marine environment as a result of land-based activities, the agencies concerned in the Kingdom are implementing a protocol for protection of the marine environment against pollutants from sea-based sources. In this respect, the Kingdom cooperates with the Regional Organization for Protection of Marine Environment (ROPME) and the Red Sea and Gulf of Aden Environment Programme (PERSGA). The agencies concerned in the Kingdom also support regional and international conventions for the protection of the environment, and participate with the international community in this respect including application of such conventions and financial contributions.

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CHAPTER 9: PROTECTION OF THE ATMOSPHERE

Decision-Making: Article 32 of the Basic System of Governance calls for the government to “ensure the Protection and Conservation of Environment and its development and control of all kinds of Pollution.” To fulfill the requirements of the Article, MEPA has promulgated “National Environmental Standards” covering air and water quality standards and hazardous waste management standards. EIA has been made mandatory for any major developmental projects.

The Kingdom has signed Montreal Protocol for phasing-out Ozone Depleting Substances (ODS) and United Nations Framework Convention on Climate Change (UNFCCC). Within the framework of a national strategy, industrial facilities/plants are gradually stopping the use of certain ozone depleting chemicals such as the chlorofluorocarbons (CFCs), and are shifting to the use of substitute materials in application of the frame of action of the Montreal Protocol and the requirements of Agenda 21.

Programmes and Projects: Among the environmental activities and programmes currently being undertaken is the Programme for Monitoring Air Quality and the meteorological system. Air quality specifications in Saudi Aramco have been designed according to applicable standards in the Kingdom, which include upper limits for sulfur dioxide and particulates that may be inhaled, photochemical oxidants, nitrogen oxides, carbon monoxide, and hydrogen sulfide; and specifications for emission sources from seven industrial categories including (gas) flaring, petroleum and petrochemical facilities. The company continues to conduct follow-up studies to monitor ancillary facilities, modifications and operation changes that should be carried out in order to enhance the performance of existing facilities. Construction of the main gas network for collection, refining and utilization of associated gas has led to the establishment of a facility capable of extracting more than 3,500 tons of elemental sulfur per day, or more than 90 percent of the sulfur associated with crude oil. Naturally, this has contributed to improving the quality of air, particularly in the Eastern Province of the Kingdom. A second activity is the Programme for the study of emissions and their impact on ambient air. This programme has been prepared according to engineering specifications applied in the company with the aim of assessing adherence of new projects and enhanced facilities to standards applied in the Kingdom with respect to the quality of ambient air. Projections of the potential impact on the quality of ambient air in a particular area of Saudi Aramco projects are made within the framework of this programme, and the results are used as needed in taking measures that ensure reduction of such impact.

Status: In addition to the National Ambient Air Quality Monitoring Network (NAAQMN) operated by MEPA, local ambient air quality networks run by Saudi Aramco, Royal Commission For Jubail and Yanbu (RCJY) and King Abdulaziz City For Science and Technology (KACST) and universities also exist. These networks submit the air quality data to MEPA on periodical basis. Integration of these networks with MEPA network is under study so that MEPA may get direct real-time monitoring data from all the ambient air quality monitoring networks.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: There are now nine stations operating at full capacity in various parts of the Kingdom for the monitoring of air quality and for meteorological purposes. Data produced by these stations are analyzed, compiled into an annual report, and sent to the competent government agency (MEPA) in order to state the level of adherence to applicable specifications and regulations.

Research and Technologies: The Kingdom has been able, through the MEPA, to undertake appropriate studies on hazards of pollution, inventory of pollutants, development of necessary environmental standards and measures to protect air and water quality and to deal with hazardous wastes as well as to introduce the principle of Environmental Impact Assessment. The National Meteorology and Environment Center (NMEC) is one of the largest centers of its kind as far as capabilities, qualified cadres and systems employed are concerned. The World Meteorological Organization as a regional and authoritative center in its surrounding area recently named NMEC. The Committee for Coordination on Chlorofluorocarbons (CFCs) monitors activities of companies related to the consumption, handling, and keeping of such materials, and formulates strategies in

accordance with the provision of the Montreal Protocol. Implementation was recently initiated for a technical programme and another for monitoring consumption of chillers in Aramco. The committee has completed consumption projections, and plans to limit, or ban, the use of solvents containing CFCs, and to find alternatives to such ozone-depleting materials. There are similar efforts to use Halon gases.

Financing: The programmes and projects are supported either directly or indirectly from the National Budget.

Cooperation: Saudi Arabia acceded to the Montreal Protocol (1987) and its Amendments, including the London Amendment (1990) and the Copenhagen Amendment (1992), on 01 March 1993. Saudi Arabia acceded to the United Nations Framework Convention on Climate Change on 28 December 1994.

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CHAPTER 10: INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES

Decision-Making: The Ministry of Agriculture and Water (MAW) is responsible for the planning and management of agriculture land in the Kingdom while the planning and management of urban areas is the responsibility of the Ministry of Municipal and Rural Affairs. Responsibility for the management of land resources for mining and oil and gas resources has been given to the Ministry of Petroleum and Mineral Resources. The Ministry of Municipal and Rural Affairs in coordination with the local municipalities always keep updating the long-term housing plans and other urban land uses.

Programmes and Projects: MAW completed a study of the land resources of the Kingdom which included the following: definition and identification of agricultural climatic regions and land resources units, and assessment of vulnerability of these units to the risks of degradation, erosion, salinization, and inundation, which range from light to high risk. Under this study, the Kingdom is divided into 3,176 terrestrial units shown on maps of a scale of 1:500,000 and contained in an atlas of land resources that were recently published. Data on the characteristics, specific negative factors, risks, and areas of each terrestrial unit are collected in a computer database. The maps are being entered into the computer in order to prepare a comprehensive geographical information system (GIS). MAW plans to conduct detailed studies of cultivated areas with the aim of establishing the negative factors which determine the production of crops, identifying the environmental hazards, and monitoring land degradation with a view to making recommendations which include appropriate farming methods and standards that serve optimal and sustainable utilization of soil and water resources. This programme includes identification of areas affected by degradation on maps of a scale of 1:50,000. The detailed study of cultivated land aims at establishing suitability of various locations for different types of utilization, and will in turn assist in making recommendations on appropriate farming methods with a view to sustainability and increase of production from available utilization options taking into account economic and social variable factors. A number of national parks have been established such as Asir National Park, an area of 450,000 hectares, in the Asir Highlands; the AlHasa National Park, an area of 4,500 hectares; and the Taif National Park, an area of 50,840 hectares. There are new projects for converting suitable areas into national parks such as Al-Baha, Thumama, Huraymilla, Haysiyya, and Najran.

Status: The Precambrian Arabian Shield is the basement of the Arabian Peninsula. It is composed of a variety of Precambrian rocks in contrasting belts of variously metamorphosed and deformed rocks occupying an area of about 575,000 km², and represents more than 1,200 million years of geological time. The Red Sea rift from its counterpart, the Nubian Shield of Egypt and Sudan, separates it.

The vast area of sedimentary rocks in the east and north of Arabia constitutes the Arabian platform. These rocks are less than 540 million years old and belong to the Phanerozoic Era. They overlie the older rocks of the Arabian Shield and hence are often termed the Cover Rocks. In mid-Tertiary times, crustal failure led to the development of the Red Sea rift system during which the western margin of the Arabian plate was elevated by as much as 3 km to form the Red Sea escarpment. Associated with the doming were the vast outpourings of basalt (volcanic lava) that forms the harrats of western Arabia. See Chapter 4 Energy of this Profile for more information.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: See under **Programmes and Projects** .

Research and Technologies: Geological Survey of Saudi Arabia, in coordination with the Ministry of Petroleum and Mineral Resources has completed studies on the geology and mineral resources of the Kingdom of Saudi Arabia.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 11: COMBATING DEFORESTATION

Decision-Making: The Ministry of Agriculture and Water (MAW) is responsible for the implementation of economic plans and programmes for agriculture, water development, desalination, irrigation, and conservation of scarce water, fisheries, animal resources and locust control. The legislation, regulations and policy instruments are as follows: the Forest and Rangeland Regulations, issued by Royal Decree Number M/22 dated 3/5/1398 H.; the Executive Regulations for the Forest and Rangeland Regulations Number 34931 dated 27/10/1399H, issued by the Ministry of Agriculture and Water (MAW), and concerned with “protecting the vegetation and the land of forests and rangelands, and regulating their use and utilization.”; regulations on 2/7/1399 H, to control violations and institute penalties on violators of the Forest and Rangeland Regulations, issued by MAW and the Ministry of the Interior; Royal Order Number 1182/8 dated 5/7/1405 H, issued to provide for the conservation of forest land and the prevention of any person laying claim to such land; and Royal Order Number 4/3620/M dated 5/7/1407 H, issued to regulate exploitation of sand and pebbles.

Programmes and Projects: MAW established 24 enclosures, each with an area ranging between 250 donums and 87,000 donums. Some of these enclosures are designed for rangeland and environmental studies and others as reserves for natural fodder to be opened up for grazing in years of drought. Conservation of such rangelands led to noticeable improvement in vegetation cover and pasture productivity.

MAW constructed 14 silos (warehouses) each with a capacity of about 12,000 tons, distributed over various regions of the Kingdom, in order to store animal feed for distribution whenever needed as part of a plan to create the necessary feed reserve to address years of drought. The total storage capacity of these silos is 168,000 tons of feed. This quantity is adequate to preserve the life of about 3.7 million head of sheep for three months during years of drought (assuming that a head of sheep needs daily one half of a kilogram of enriched feed and some coarse fodder to preserve its life). By establishing such silos and rangeland enclosures, MAW will have insured part of its fodder requirements and protected its living stock wealth against the risks of drought. MAW is engaged in constructing earth embankments and dams in order to spread and distribute surface runoff water over rangelands with the aim of developing vegetation cover and improving the quantity and quality of their pasture production. It has constructed 32 storage and diversion dams on the major wadi (valley) courses. The height of such dams ranges between 2.5 and 4.0 meters, serving an area of about 18,000 donums. MAW also constructed a network of small earth embankments with a height ranging between 75 cms. and 150 cm (0.75 to 1.5 meters) along the contour lines perpendicular to the general slope of the area in question (sic). More than 600 contour earth embankments have been c-constructed with a total length of about 200 kilometers, serving an area of 200,000 donums. The construction of such embankments has noticeably improved the vegetation cover of the areas concerned.

MAW imported about 18,000 kilograms of seeds of 52 different species of trees, shrubs, and perennial grass from Australia, USA, Chile, Pakistan, Syria, Egypt and Tunisia. Seeds of trees and shrubs were planted while grass seed were sown in two ways: seed broadcasting and covering after soil preparation and seed drilling (row sowing) along contours. The total cultivated acreage is about 100,000 donums in 16 areas. Degraded rangelands have improved noticeably. MAW established stations for propagation of species of local range seeds in order to produce adequate sees for various programmes. A seed production station has been established at Buseita in the northern part of the Kingdom, where 22 species of perennial range seeds have been planted, produces about 4 tons of range seeds annually. Certain meadows, which are characterized by particular plant cover, have been enclosed and protected against the entry of vehicles. Their plant cover is being developed with a view to preservation of biological diversity and creation of recreational areas for the citizens. More than 150 forest wardens have been appointed to control forest areas and report any violations in order that the competent authorities can carry out the procedures provided for in the Forest and Rangeland Regulations. Trees have been planted in 53 locations of degraded forest land in various areas of the Kingdom in addition to particular afforestation locations for fixing sand dunes. Treated sewage water (wastewater) has been used for irrigation of certain afforested locations in Taif and is being utilized in Riyadh and other areas. Water from dams is currently being used for irrigating certain afforested areas. MAW has established 30 forestry nurseries in various areas of the Kingdom, with an annual production capacity of about 1,000,000 saplings. The capacity of these nurseries

can be increased as needed to produce saplings, which are suitable for the various environments of the Kingdom.

Status: Forests in Saudi Arabia are considered one of the renewable natural resources that play an important role in the ecosystem of the Kingdom in view of its extensive area and diverse environment. This renewable natural resource provides protection to such areas by preserving the soil from water and wind erosion. It also helps in the distribution of water and control of its flow, and consequently the increased moisture in the soil. In addition, forests have economic, recreational, scenic, tourist and climatic moderating values. The most important problems facing the development and protection of this resource are the following:

- *Harsh environmental conditions:* Among the constraints and determining factors which restrict expansion in the forestry development programme, particularly in increasing the afforested areas, are the location of the Kingdom in the dry desert belt whose climate is characterized by scarcity of rain, dominance of drought throughout the year, high temperatures especially in summer, and lack of adequate quantities of water or rivers;
- *Felling of trees and shrubs:* People in the Kingdom traditionally use wood and charcoal for heating in winter and cooking on (special) occasions. This is still the custom in spite of the availability of electricity, (butane) gas and other petroleum derivatives at token prices. Felling living trees for the above purposes has caused shrinkage of acreage covered by natural trees and shrubs. To regulate or restrict this process, MAW introduced a licensing system for utilization of dry (dead) plants (for obtaining firewood, for producing charcoal, or for transporting either of these). The impact of these new regulations is evident, as a result of public awareness campaigns on the importance of maintaining trees and shrubs, as well as applying penalties for violators. There are still unlicensed operations of felling and transporting trees and shrubs. Efforts of the agencies concerned should be stepped-up and coordinated to apply this regulation in order to adhere to the rules which aim at protecting natural vegetation resources from extinction;
- *Urban expansion in forest areas:* Expansion of residential master plans due to the development boom in the Kingdom, particularly in the southwestern region, caused an overlap of forest areas and urban planning of towns, villages and residential centers, and removal of extensive areas of forest for such purposes;
- *High cost of re-forestation of areas which had lost their natural vegetation cover:* Scarcity of water, low soil fertility, high temperature, and low rainfall have all contributed to shrinkage of afforested areas and suitable imported species or similar local species are needed to compensate for lost trees. Provision of all or part of these conditions requires allocation of adequate amounts of money; and
- *Shortage of forestry specialists:* The number of forestry specialists is considered very low relative to the programmes to be implemented in this area, such as the inventory of forest areas, or the evaluation, development or monitoring of such activities.

Capacity-Building, Education, Training and Awareness-Raising: MAW has been training specialized technical staff in forestry and afforestation by availing opportunities to numerous employees to attend specialized courses. The MAW also approached the Ministry of Higher Education to open a Department of Forestry and Rangelands at King Saud University for granting a bachelor's degree in order to meet the increasing need for such specialization. This programme was launched in the academic year, 1997-98.

Information: MAW initiated a survey and inventory of forests by recruiting a specialized company to carry out aerial photography of 70,000 square kilometers of the southwestern part of the Kingdom. Aerial photography and interpretation will shortly be completed for the rest of the natural forest areas.

Research and Technologies: The National Center for Agriculture and Water Research in collaboration with departments and research centers of the Ministry and other scientific institutions in the Kingdom are establishing a bank for collecting and keeping seeds and genetic plant strains in the Kingdom with a view to utilizing them in the development of species and varieties to be grown as well as for the development of both rangeland and forest natural plant cover.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 12: MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT

Decision-Making: The Ministry of Agriculture and Water (MAW) is responsible for implementation of plans and programmes for the control and combating of desertification. MAW is currently preparing a national strategy and action programme for desertification control. The Ministry has also published a booklet on the Kingdom's efforts in the area of desertification control, conservation of rangelands and forest.

Programmes and Projects: Some of the programs of the Ministry of Agriculture and Water are as follows.

MAW is making all efforts to balance the relationship between the development and conservation of environment to improve the level of living for the citizens of Saudi Arabia.

Natural resources are considered to be assets, which should be protected in order to ensure sustainable development.

Various steps taken by MAW in this regard are as follows.

1. MAW has developed a database on the rangelands and forests, which includes survey, classification, conditions and updating this data through research and studies.
2. Issuing the laws for rangelands and forests.
3. Issuance of implementation procedures.
4. Issuance of various Royal Decrees for the protection of rangelands and forests.
5. Establishment of the department of rangelands and forest in the ministry to prepare strategies and plans.
6. Protection of endangered rangelands and rehabilitate the affected rangelands by (i) fenced areas to undertake research and to protect the species having special characteristics (b) Construct dams to collect rain water and flood water to irrigate rangelands (c) importing seeds for grass and trees and distribute them among affected rangelands (d) constructing animal feed storage to supplement the feed during drought conditions (e) separate rangeland from normal land not to be distributed to the farmers (f) scientific program for the development of local seeds and plant nurseries and for the development and planning of vegetation cover for the rangelands (g) scientific research for controlling desertification and movement of sand dunes.
7. MAW has undertaken a lot of projects and activities to protect existing forests and to replant the affected forests because of climatological conditions and human activities.
8. Protecting the areas of forests by forest rangers and guards.
9. Increasing awareness.
10. Replant some valleys.
11. Developing seed banks to protect genetic species.

Status: As above.

Capacity-Building, Education, Training and Awareness-Raising:

MAW has intensified educational activities among rangers against unsustainable use of rangelands and against cutting trees.

The Ministry is also engaged in capacity building activities through on-job training and higher education programs.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: Saudi Arabia acceded to the International Convention to Combat Desertification in Countries Experiencing Drought and/or Desertification Particularly in Africa on 25 June 1997. An international workshop was held on sustainable use of rangelands and desertification control in 1996, in collaboration with the International Fund for Agricultural Development (IFAD).

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CHAPTER 13: MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 14: PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

Decision-Making: The Ministry of Agriculture and Water is responsible for implementation of economic plans and programmes for agriculture, water development, desalination, irrigation, and conservation of scarce water, fisheries, animal resources and locust control.

Programmes and Projects: Degraded agricultural land is being rehabilitated by supporting diversified food crops, adoption of agricultural crop rotation, construction of draining systems, improvement of crop characteristics by controlled use of fertilizers, containment of soil erosion, monitoring of the problems of salinity and water logging, construction of dams, and control of desertification, as well as the use of modern means of irrigation.

National companies have been established for development of domestic markets, support for agriculture exports, monitoring the supply and demand sides of agricultural products and surplus, as well as support for establishment of various agricultural industries. Use is being made of integrated agricultural pest control by introducing pesticide substitutes such as biological, mechanical, legislative and pest-resistant varieties of control techniques, in order to maintain environmental equilibrium. An example is a current successful programme for control of red insects on date palms in certain parts of the Kingdom whereby the integrated control approach has produced good results, with emphasis placed on application of preventive safety measures with respect to pesticides through proper optimal storage, use and disposal of waste as well as paying attention to the health of agricultural workers, public and environmental health. Under higher leadership directives, there is noticeable joint activity among a number of government agencies for the investigation and study of limiting the use of pesticides and disposal of hazardous waste, and national networks, a database and autonomous and specialized agencies will be established for monitoring environmental pollution by pesticides and their hazards to public health. New agricultural land is being reclaimed after assessment and establishing suitability for agricultural utilization. Such land will be allotted free of charge to persons capable of investing in it.

Status: Saudi Arabia faces a number of constraints and difficulties in this area for example, coordination among various government agencies for the creation of an advanced common database has been slow, particularly in the area of chemical materials. There are insufficient service facilities (structures and equipment) in executive branches and shortage of specialized staff, especially among the executive branches. Research studies are not keeping pace with existing and planned activities, and there is a shortage of available domestic labor in the area of agricultural production and difficulty of dealing with and relaying information to transitory expatriate labor. More attention needs to be paid to the support of executive branches, supplying them with trained human resources and ensuring that they have the equipment necessary to improve their services. Traditional systems of irrigation need to be replaced with modern technology systems of irrigation and more research is needed on safe alternatives to agricultural pesticides and encouragement of environmental less harmful pesticides and fertilizers.

National safety programmes to develop appropriate rules for use, storage, transport and disposal of toxic and hazardous chemical materials need to be accelerated, and encouragement given to exchange of visits and experiences with technically advanced countries in the areas of non-chemical control and use of training possibilities provided by regional and international cooperation programmes.

The Government has also participated in activities of committees, conferences and symposia organized by local agencies and international organizations related to enhancement of agricultural production, protection of the environment, national safety and control of illegal trade in pesticides.

Capacity-Building, Education, Training and Awareness-Raising: A number of practical and tangible measures have been taken in realizing the recommendations of Agenda 21. Infrastructure for agricultural services has been developed as have human resources working in the agricultural sector through intensification of training, public awareness campaigns, extension services and organization of agricultural exhibitions.

Information: Mass media is being used as a means of disseminating and updating agricultural information methods with a view to gaining the confidence of recipients, and encouragement has been given to various research projects in areas of agriculture, maintaining continued and close cooperation with research agencies in

the Kingdom. The establishment of an advanced data base should be accelerated in order to facilitate not only research and the implementation and monitoring of activities related to agricultural production and marketing as well as various environmental affairs, but also production of information regarding toxic chemical materials.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 15: CONSERVATION OF BIOLOGICAL DIVERSITY

Decision-Making: National Commission for Wildlife Conservation and Development (NCWCD) is the focal point for Biological Diversity in the Kingdom and as such is also the Chair of the National Biological Diversity Committee. The primary objective of NCWCD is *in situ* conservation of ecological areas, both terrestrial and marine; therefore the Commission is directly, actively and effectively meeting the requirements of Agenda 21. NCWCD has been identified by IUCN as a centre of excellence as far as the development of protected areas is concerned. This is based on the system of protected areas in the Kingdom that at present numbers 16 including two marine protected areas and all of which conserve *in situ* a variety of ecosystems. The Commission also has a nursery where it produces seedling mangroves which is used to strengthen and reinforce the mangroves stands along the Red Sea and Gulf coasts of Saudi Arabia.

NCWCD is in the process of developing, with the cooperation of the National Committee, a National Biodiversity Strategy and Action Plan, which calls for integrated strategies for the conservation of biological diversity and sustainable use of biological resources into national development strategies, and or plans. Other Ministries that serve on the National Committee are, Ministry of Defence and Aviation, Ministry of the Interior, Ministry of Petroleum and Mineral Resources, Ministry of Agriculture and Water, Ministry of Planning, Ministry of Municipalities and Rural Affairs, Ministry of Education, Ministry of Information, King Abdulaziz City for Science and Technology, Meteorological and Environment Protection Agency. Combined they have the responsibility to see the recommendations of the National Biodiversity Strategy and Action Plan be implemented.

NCWCD has developed a System Plan for Protected Areas for Wildlife Conservation and Sustainable Rural Development in Saudi Arabia in 1990, now being revised and updated. This calls for the establishment of a series of protected areas in each of the biotopes in the Kingdom. It also started the Regional Training Centre for the Conservation of Natural Resources.

Programmes and Projects: NCWCD has been identified by IUCN as a centre of excellence as far as the development of protected areas is concerned. This is based on the system of protected areas in the Kingdom that at present numbers 16 including two marine protected areas and all of which conserve *in situ* a variety of ecosystems.

The participation of and support of local communities are sought in a variety of ways, the most successful have been the establishment of Liaison Committees at protected areas on which serves both local sheiks and NCWCD staff. Through zonation of the protected areas local communities are allowed to utilize the natural resources in the protected areas in a sustainable way.

In order to promote the rehabilitation and restoration of damaged ecosystems NCWCD has adopted a two-pronged approach. First is the proclamation of protected areas to restore damaged ecosystems. Second, it carries out captive breeding programmes of endangered native species for reintroduction into these protected areas if it falls within the historic range of the specific species.

Five species, Arabian oryx, reem, idmi, houbara and ostrich, have been successfully introduced into four protected areas; reem has also been reintroduced into several military areas that have suitable habitat.

See also under **Status** and **Research and Technologies**.

Status: The Kingdom's objectives in the area of conservation of biological diversity are as follows: press for the early entry into force of the Convention on Biological Diversity; develop national strategies for the conservation of biological diversity and the sustainable use of biological resources; integrate strategies for the conservation of biological diversity and sustainable use of biological resources into national development strategies and or plans; take appropriate measures for the fair and equitable sharing of benefits derived from research and development and use of biological and genetic resources, which is being achieved through the National Committee and by the implementations of the recommendations of the National Biodiversity Strategy and Action Plan; carry out country studies, as appropriate, on the conservation of biological diversity and the sustainable use of biological resources, including analyses of relevant costs and benefits, with particular reference to socio-economic aspects; promote broader international and regional cooperation in furthering scientific and economic understanding of the importance of biodiversity and its functions in ecosystems; develop new or strengthen existing strategies, plans or programmes of action for the conservation of biological

diversity and the sustainable use of biological resources, taking account of education and training needs; take action where necessary for the conservation of biological diversity through the *in situ* conservation of ecosystems and natural habitats, *in situ* measures should include the reinforcement of terrestrial, marine and aquatic protected area systems and embrace, *inter alia*, vulnerable freshwater and other wetlands and coastal ecosystems, such as estuaries, coral reefs and mangroves; and, promote the rehabilitation and restoration of damaged ecosystems and the recovery of threatened and endangered species.

Capacities for the assessment, study and systematic observation and evaluation of biodiversity need to be reinforced at the national and international levels. Effective national action and international cooperation is required for the *in situ* protection of ecosystems, for the *ex situ* conservation of biological and genetic resources and for the enhancement of ecosystem functions. The participation of and support of local communities are elements essential to the success of such an approach.

Capacity-Building, Education, Training and Awareness-Raising: Continue to build capacity for the conservation of biological diversity and the sustainable use of biological resources in all relevant sectors.

NCWCD is engaged in increasing its capacities for the assessment, study and systematic observation and evaluation of biodiversity at the national and international levels. Apart from the Department for Research and Field Surveys it has established two other research centres, at all three scientists are engaged in the study and systematic observation and evaluation of biodiversity. It also has a number of staff members enrolled at universities for postgraduate studies and two students are registered at universities in England for PhD degrees. Conservationist and protected area rangers and middle management staff, from as far a field as Morocco in the west to Iran in the east. Teachers from primary and secondary schools in the region have been attending courses in environmental awareness.

Information: Regularly collate, evaluate and exchange information on the conservation of biological diversity and sustainable use of biological resources; NCWCD is a national organization that is involved in collecting and analyzing environmental data. NCWCD organizes on the average two to three regional or international meetings and/or symposia where there is an exchange of scientific knowledge. Apart from the publication as Proceedings the results from these symposia and workshops, the research staff and visiting scientists regularly publish scientific papers in international scientific journals.

Research and Technologies: NCWCD staff and the NCWCD Research Centres are involved in a variety of research activities related to the conservation of biological diversity and the sustainable use of biological resources; these projects cover both the terrestrial and marine ecosystems. A newly instated Section on Socio Economics has started with surveys in communities living around protected areas focusing on the hidden costs of having a protected area on your doorstep, as well as possible financial benefits to the communities.

All the research programmes of the Commission are integrated, since the research carried out by NCWCD is all directed at managing ecosystems in its protected areas so as to ensure the maintenance of biodiversity and the continued functioning of healthy ecosystems.

Two research and captive breeding centres have been established: the National Wildlife Research Centre (NWRC) and the King Khalid Wildlife Research Centre. Species being bred are the Arabian oryx *Oryx leucoryx*, houbara bustard *Chlamydotis undulata macqueenii*, red-necked ostrich *Struthio camelus camelus* at NWRC and three species of native gazelle species, idmi *Gazella dorcas saudiya*, the Afri *Gazella gazella erlangeri* and the reem, *Gazella subgutturosa marica*. Trail work is also being done on onager, the Syrian wild ass and the Nubian ibex and it is hoped to expand this into a restoration project for these two species as well.

Financing: See under **Cooperation**.

Cooperation: In 1998 NCWCD with financial support from UNDP established a regional Training Centre for the Conservation of Natural Resources. The Kingdom has signed the Convention on Biological Convention.

Promote cooperation between the parties to relevant international conventions and action plans with the aim of strengthening and coordinating efforts to conserve biological diversity and the sustainable use of biological resources; including appropriate levels of support for the establishment and management of protected areas in transboundary locations; promote national efforts with respect to surveys, data collection, sampling and evaluation, and the maintenance of gene banks.

The Secretary General and staff members are directly involved in the various Commissions of IUCN promoting broader regional and international cooperation in furthering scientific and economic understanding of the importance of biodiversity and its functions in ecosystems. NCWCD is therefore directly and actively involved in communication, cooperation and collaboration with international and regional bodies for the improvement of the conservation of biological diversity.

NCWCD organizes on the average two to three regional or international meetings and/or symposia where there is an exchange of scientific knowledge and a promotion of regional cooperation, i.e., the various species action plans to conserve species with ranges that span several countries. Examples are the Conservation Action Plans for Houbara, Arabian oryx, Arabian leopard and through its commitment to the Convention on Migratory Species also to migratory species. Through participation of NCWCD staff in international scientific meetings and meetings of parties to the various conventions, and activities of staff in committees to the conventions, NCWCD actively promotes not only the exchange of information, but cooperation among parties to the conventions and coordination of efforts to conserve biological diversity. NCWCD maintains a gene bank that was started through cooperation with Kew Gardens.

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**CHAPTERS 16 AND 34: ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY
AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY,
COOPERATION AND CAPACITY-BUILDING**

Decision-Making:

Technologies: No information available.

Biotechnologies: No information available.

Programmes and Projects: No information available.

Technologies: No information available.

Biotechnologies: No information available.

Status:

Technologies: No information available.

Biotechnologies: No information available.

Capacity-Building, Education, Training and Awareness-Raising:

Technologies: No information available.

Biotechnologies: No information available.

Information:

Technologies: No information available.

Biotechnologies: No information available.

Research and Technologies:

Technologies: No information available.

Biotechnologies: No information available.

Financing:

Technologies: No information available.

Biotechnologies: No information available.

Cooperation:

Technologies: No information available.

Biotechnologies: No information available.

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CHAPTER 17: PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES

Decision-Making: The Ministry of Agriculture and Water (MAW) is responsible for the implementation of economic plans and programmes for agriculture, water development, desalination, irrigation, conservation of scarce water, fisheries, animal resources and locust control. The Saline Water Conversion Corporation (SWCC) functions as the principal desalination complex. The MAW, in cooperation with the Saline Water Conversion Corporation, through the Jubail Station, monitors the marine environment regularly, follows any changes as a result of pollution, and gives early warning.

Programmes and Projects: For sustainable conservation and utilization of living marine resources under national jurisdiction, the MAW established the Saudi Fisheries Company. This is a joint stock company 40 percent of whose shares are owned by the State and the major part of its interest is in marketing. In record time, Saudi Fisheries had set up 52 outlets for the sale of fish and other marine products. These outlets are designed to the highest standards, where seafood is handled under appropriate environmental conditions that ensure the quality of the product. The establishment and development of fish farms has been completed in marine coastal areas and inland water bodies in order to alleviate pressure on certain economic species of the fish stocks which are amenable to farming, with 98 projects currently licensed for fish farming; prohibition of disposal of solid waste and effluents in sea water, except in coordination with the relevant competent authorities. See also under **Capacity-Building, Education, Training and Awareness-Raising and Research and Technologies**.

Status: The most important achievements of the fisheries sector with respect to Agenda 21 include:

- the identification of fishing means and equipment in a manner that would not negatively impact the fish stock, the most important being determination of appropriate mesh size of all nets used in the waters of the Kingdom in order to allow small fish and other marine creatures to escape;
- the development of the traditional fishing sector and modernization of fishing means by use of engines for propelling boats as well as improvement of material for boat making, provision of soft loans and increase in the awareness of fishermen;
- the identification of periods for banning the catch of certain types of fish and shrimps in order to protect them from depletion as has been the case during the period of banning for the catch of shrimps and both *najil* and *taradi* fish; and
- temporary suspension of the issue of new fishing licenses or registration of new means of fishing to prevent increased fishing from causing deterioration of fish stocks as has happened in certain countries; etc.

The identification of certain environmentally sensitive marine zones has been completed and these have been made into protected areas in order to conserve places of propagation, growth and nursing of fry and other marine life.

A specialized expert has been recruited to oversee the replanting of the mangroves. Surveys have been conducted to identify suitable coastal land for fish farming with a view to sustainable development, including about 10,000 hectares in the area between Jeddah and the southern borders of the Kingdom. Some plots are to be distributed to investors and two large projects are being implemented for this purpose at certain locations. During the survey, ecologically sensitive as well as nursing and feeding grounds were identified.

Strains of certain freshwater fish have been enhanced and acclimatized to living in sea water, and subjected to propagation and breeding, and licenses have been issued to projects for commercial fish farming. Artificial propagation of certain species of shrimp has been successful for improvement of genetic characteristics. Certain species such as *nimr* and *abyyadh* shrimps have been released into the sea in order to revive stocks of them. A study has been prepared for re-stocking the Arabian Gulf with shrimp through the establishment of incubators. In order to conserve important coastlines and restore to their natural state those affected, the MAW protected shrimp hatching and feeding areas in the Arabian Gulf and in the area of Gizan and the Red Sea. Fishing is banned in the Arabian Gulf from January to the beginning of August, and on the Red Sea from March to August. Both *najil* and *taradi* fishing was banned for two consecutive years during the time of propagation, and only this year has this ban been lifted in order to determine the impact of such protection. The MAW has set up

environmental protection measures designed to restrict the handling of living fish with a view to protecting fish stocks and the marine environment, and to ensure the safety and quality of the Kingdom's fish products.

The MAW has encouraged Saudi businessmen to invest in industrial fishing projects, and support services on the eastern and western coast of the Kingdom. Future plans in the area of sustainable conservation and utilization of living marine resources include: completion of updating the regulations for fishing, investment and protection of living aquatic resources; completion of updating the strategies designed for the development of fish resources and farms, and the sustainable protection of their natural environment; completion of coastal surveys and study of pollutants in the coastal environment with the aim of optimal management of such zones; research and studies on the Marine Environment, including collection of basic data on habitats studies including complimentary data on physical, chemical and hydrographical criteria; studies monitoring pre- and post-construction/operation of facilities; and Studies related to oil spills.

Capacity-Building, Education, Training and Awareness-Raising: Within the general plan for increasing efficiency, the Ministry trained and sent on scholarships, a number of its staff; three of them have obtained doctorate degrees, and five masters' degrees, in addition to the many who attended specialized training courses. Future plans in this area include the following activities: the completion of updating the regulations for fishing, investment and protection of living aquatic resources; the completion of updating the strategies designed for the development of fish resources and farms, and the sustainable protection of their natural environment; the completion of coastal surveys and study of pollutants in the coastal environment with the aim of optimal management of such zones; Research and studies on the Marine Environment, including collection of basic data on habitats studies including complementary data on physical, chemical and hydrographical criteria; and studies monitoring pre- and post-construction/operation of facilities; and studies related to oil spills.

Information: The studies have been completed to aid replanting various coastal areas of the Red Sea and the Arabian Gulf with mangrove plants due to their effective environmental importance, mangroves being considered the most suitable environment for the propagation, growth and nursing of fry and other marine creatures, in coordination with the National Parks Directorate and SWCC. See also under **Status**.

Research and Technologies: To encourage environmentally-sound technology, the MAW has prohibited and banned all indiscriminate activities of catching fish and other aquatic creatures, such as the use of toxic chemicals and electric shock; designated appropriate mesh sizes for nets, in order to protect small fish; and promoted the use of modern fishing techniques which ensure protection and effective catches designed to reduce secondary fishing and wastage of fish, in addition to the use of modern marine farming systems which take the environment into consideration. The Saudi Fisheries Company has started the preparation of a number of environmental research/studies in collaboration with local universities and private institutions. Most of these studies are related to the marine environment and are being prepared within the framework of a continuing research project in Saudi Aramco in collaboration with King Fahd University of Petroleum and Minerals (KFUPM). The research project had three phases: the Marine Environmental Studies (1984-1989), (1990-1994) and, (1994-2000). Additional research projects include, among others, the following: i) Studies on the marine environment; ii) Research on the impact of dredging; iii) Studies on transplanting mangrove trees; iv) Coral reef studies; v) Minerals traces in Arabian Gulf deposits; and vi) Study of fungal life.

Financing: No information available.

Cooperation: The UN Convention on the Law of the Sea (1982) was signed by Saudi Arabia on 07 December 1984, and ratified on 24 April 1996.

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CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

Decision-Making: The Ministry of Agriculture and Water (MAW) is responsible for the implementation of economic plans and programmes for agriculture, water development, desalination, irrigation, conservation of scarce water, fisheries, animal resources and locust control. The Saline Water Conversion Corporation (SWCC) functions as the principal desalination complex.

With respect to measures for protecting water resources from environmental pollution and the regulations for the conservation of water issued by Royal Order Number M/34 dated 24/8/1400 H, for the effective management and protection of water from pollution, the regulations are enforced by executive regulations allowing MAW to apply measures for the protection and conservation of freshwater to be closely monitored. The Saline Water Conversion Corporation (SWCC) established a special division concerned with the environment and its affairs within the competence of its General Directorate for Research and Development, entrusted with the study of the impact of the environment on desalination plants, and their impact on the environment, with a view to maintaining the environmental criteria and standards required, in a manner compatible with the developmental responsibilities of the Corporation and enhancement of water resources in the Kingdom.

Programmes and Projects: MAW took a number of steps aimed at conservation of water and rationalization of its consumption through limiting the cultivation of certain crops with high water requirements such as grains and fodder, in such a way that production should not exceed self-sufficiency in basic crops.

Adopting the concept that calls for usage of economic mechanisms and treatment of water as an economic commodity, water pricing for household purposes has been updated and restructured into brackets whereby the unit price of a cubic meter increases with the increase of consumption.

Emergency programmes and plans have been prepared and supplied with structural facilities, for example the construction of (reservoirs) dams for emergencies for most major towns in the Kingdom. In certain locations, their capacity is 1.5 million cubic liters. Emergency programmes and plans have been prepared and supplied with structural facilities, for example the construction of (reservoirs) dams for emergencies for most major towns in the Kingdom. In certain locations, their capacity is 1.5 million cubic liters.

When disposing of sewage water, Saudi Aramco generally adhered to specifications applicable in the Kingdom, including: Physiochemical pollutants; Organic pollutants; Inorganic pollutants; and Biological pollutants.

The information collected regarding sewage water is analyzed and compiled into an annual report, a copy of which is sent to MEPA to indicate adherence to the applicable specifications and regulations. This programme is designed to uncover potential groundwater pollution at facilities for storage and disposal of waste, at industrial plants, and at surface facilities for the disposal of drainage water from sewage (sprinkler fields), with a view to protection of precious water resources. Groundwater is also monitored in the vicinity of extraction sites with the purpose of management of the quality and quantity of resources in areas of high water tables, and in aquifers in oil fields, in order to discover possibilities for seepage/infiltration.

Status: Since water is a vital resource that concerns all agricultural, industrial and construction sectors, there is always a pressing need for continued advancement and development through endorsement of projects and studies proposed in the Sixth Five-Year Plan of the Ministry. If there are constraints, they are embodied in the difficulty of approval of the necessary funds for implementation of the Ministry's plans and projects in the area of water.

Capacity-Building, Education, Training and Awareness-Raising: In application of Royal Order Number 3/B/6096 dated 21/4/1401 H, concerning the necessity for rationalization of water consumption, MAW undertook the following: publishing and distributing booklets, bulletins, and posters addressing all classes of society; prepared and distributed various sizes of annual calendars carrying statements on the rationalization of water consumption; educating and instructing farmers on optimal modern agricultural methods through encouraging the use of drip irrigation, lined canals, high-efficiency irrigation equipment, and exclusion of all equipment and machinery which are proven to be less useful in saving water; accelerating the rationalization of

water consumption through television and radio programmes; drawing up contracts with a number of specialized advertising companies for launching awareness campaigns on the rationalization of water usage by displaying large-size billboards (15 x 4 meters) mounted on 9-meter high posts and located along major roads in most towns of the Kingdom as well as displaying posters at intersections of major roads and using electronic screens, with public transportation buses being used in more than 25 towns as a means for displaying posters carrying messages urging optimal usage of water, and continued and intensive work in implementation of water consumption programme to go on throughout the Sixth Five-Year Plan.

Annual expenditure on public awareness is estimated at about SR 3.5 million. During the past year, 1416 H, the Saline Water Conservation Corporation (SWCC) held a symposium attended by more than 150 specialists from the Kingdom and abroad, on the experience of Japan in re-use of water. The Corporation actively participates in GCC committees, in particular the committee on rationalization of water and electricity consumption, as do representatives from the Ministry of Industry and Electricity, and from the Ministry of Municipal and Rural Affairs (MOMRA); this year (1417 H) there will be a symposium in the Sultanate of Oman on water loss from networks as one way of conserving water.

With respect to specialized labor force and intensification of training in the area of freshwater, a large number of specialists from the MAW participated over the past years in scientific conferences, symposia, and training sessions inside the Kingdom and abroad. The Saline Water Conservation Corporation (SWCC) also trained a large number of its employees and new recruits both inside the Kingdom and abroad. The total number of trainees in the Kingdom was 1,722 and those abroad numbered 652 during the period 1410 to 1417 H.

Information: With respect to water information and its dissemination, MAW has a large database containing information on ground, surface, and rainwater, in addition to climatic data. Recently a computer programme has been designed for the organization, classification, and processing of information and preparation for dissemination, in addition to available information in the form of detailed water resources studies which are continually updated. MAW has booklets, bulletins, and atlases that are published and disseminated, such as Water Atlas, Soil Atlas, Climate Atlas, and Land Resources Atlas.

Research and Technologies: The Research and Development Center of the Corporation conducts the necessary analysis to ensure that the plants adhere to environmental criteria and standards, and monitors continually the operation of the plants with respect to smoke emitted and the exhausted water that is returned to the sea as well as the process of handling, keeping and destroying various chemical materials. With respect to transfer of technology related to freshwater resources, the Kingdom is in continual contact with advanced countries in connection with modern technologies related to water resources such as re-cycling sewage water, treatment of salt water, construction of dams, reservoirs and networks, and the use of mathematical models for ground and surface water through active participation in relevant conferences and symposia as well as through joint programmes with certain advanced countries where the transfer of technology and training are the most important objectives.

Financing: See under **Status**.

Cooperation: No information available.

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CHAPTER 19: ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS

Decision-Making: The Ministry of Health (MOH) takes charge of health care and hospitals.

Programmes and Projects: Saudi Aramco has initiated a programme for the gradual limiting and phasing-out of the use of polychlorinated biohenyls (PCBs) from all electric transformers and capacitor oils in vies of the high toxicity of these compounds. In addition to the removal of these chemicals, there plans to replace old equipment containing more than 50 parts per million of PCBs. Company regulations prohibit procurement and installation of equipment containing these compounds. See also under **Capacity-Building, Education, Training and Awareness-Raising**.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: The MOH conducted a specialized national training course in the area of chemical safety, disaster preparedness, and management in collaboration with the World Health Organization (WHO). Officials and specialists from relevant ministries and agencies participated with the aim of developing skills in the areas of chemical safety, the role of curative and preventive medicine in preparedness for addressing chemical accidents, exchange of information, finding a coordinated approach among relevant agencies, and raising public awareness of chemical safety issues.

The Chemical Emergency Response Team is a task force formed to respond to emergencies such as chemical spills or leakage. Among the activities of this team is frequent training on emergency situations as well as regular training of company staff.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: Coordination with WHO is under way with a view to establishing an information network for the environment, chemical safety, and addressing emergencies.

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CHAPTERS 20 TO 22: ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS, SOLID AND RADIOACTIVE WASTES

Decision-Making:

Hazardous Wastes: A number of committees and task forces that have been formed to study various matters related to the environment and safety with respect to handling and controlling hazardous materials include: the Committee for Protection Against Radiation, charged with the safe handling, storing and disposing of radioactive materials; the Chemical Emergency Response Team, a task force formed to respond to emergencies such as chemical spills or leakage, among the activities of this team is frequent training on emergency situations as well as regular training of company staff; the Committee for Coordination on Chlorofluorocarbons (CFCs), which monitors the company's activities related to the consumption, handling, and keeping of such materials, and formulates strategies in accordance with the provision of the Montreal Protocol; and the Committee for Hazardous Materials, which gives opinions on plans for the appropriate use and disposal of all hazardous materials and participates in preparing and executing such plans. Among the terms of reference of the Committee for Hazardous Materials are oversight and coordination of the relevant committees and task forces formed for this purpose, such as the above-mentioned committees charged with the control and management of hazardous materials. The committee also acts as an umbrella to ensure effective coverage of all stages and matters related to hazardous materials.

Solid Wastes: The Meteorology and Environmental Protection Agency takes charge of meteorology and environment. New plants with potential impact on the environment have been obliged to conduct studies on environmental impact assessment in adherence to Agenda 21 requirements. Certain plants have adopted the principle of clean production, for example the companies of SABIC (Saudi Arabian Basic Industries Corporation) and those of other basic industries. Plans are in place to achieve this objective.

Radioactive Wastes: The Committee for Protection Against Radiation has been charged with the safe handling, storing and disposing of radioactive materials.

Programmes and Projects:

Hazardous Wastes: An example of the activities of the Committee for Coordination on Chlorofluorocarbons is Saudi Aramco's programme for the handling and re-processing of CFCs. Its implementation was recently initiated for a technical programme and another for monitoring consumption of chillers in Aramco. The Committee works on alternatives to such ozone-depleting materials. There are similar efforts to use halon gases. Company operations produce both human and industrial waste. Solid waste resulting from human use is disposed of in approved hygienic waste-disposal facilities, whereas industrial waste is normally screened and handled according to acceptable practice in the industry. Saudi Aramco has always stressed the development of safe procedures for handling hazardous materials, and reduction in the waste produced. The company has implemented the following projects: Installation of mixers in crude oil tanks in order to reduce the amount of deposited oil sludge that needs to be removed; Installation of cells for oxidation of highly toxic tetra-ethyl lead, and converting it into inorganic lead with low toxicity that can be buried safely in special disposal sites; Construction of a special storage facility for handling expired hazardous materials. The Programme for minimization of waste aims at minimizing the waste produced by plant operations through reduction of waste at source, modification of the manufacturing process, replacement of the materials used, separation of waste, and better management as well as reuse and re-processing of waste. At present, depending on its nature, Saudi Aramco handles waste in a number of ways, such as impoundment, treatment of waste, aeration, and storage. Small quantities of oil sludge produced in company facilities are treated in waste treatment units constructed for this purpose in numerous locations. Tetra-ethyl lead sludge produced in benzene tanks is a particularly hazardous toxic and water-soluble material. This sludge is treated in a special facility where tetra-ethyl lead is oxidized, converted into inorganic lead with low toxicity that is insoluble in water, and impounded by the category 1 method. When the above-mentioned methods are inadequate for safe disposal of hazardous materials, certain materials may be stored in surplus chemical warehousing and handling facilities until a suitable way is found to dispose of them. Detailed procedures and guidelines formulated by the company provide for waste handling, monitoring and control.

The Environmental assessment programme is concerned with implementation of Saudi Aramco's plan for the protection of the environment. It is designed to provide company departmental managers with assessment of the adequacy of the environmental performance of their facilities, and of their adherence to applicable environment regulations; and to submit solutions and proposals for implementing essential environmental improvements economically. The scope of action of the programme covers primarily areas of air quality, solid waste, and hazardous chemical materials, as well as the prevention and control of oil spills. The programme includes assessment of environmental hazards in each facility. It conducts surveys of these facilities to determine adherence to regulations applied, carries out joint monitoring in order to solve environmental problems, and follows up implementation of recommendations prepared by the survey team. At present, more than 40 environmental assessments have been successfully completed on exploration, production, refining and distribution facilities.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

Status:

Hazardous Wastes: Existing environment activities are basically related to monitoring of the quality of air and wastewater, management of hazardous materials, and response to accidents of oil spills. They also include assessment of Saudi Aramco operations, study of the marine environment, protection of groundwater sources, and determination of adherence to the regulations of the company and of the Kingdom.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

Capacity-Building, Education, Training and Awareness-Raising:

Hazardous Wastes: No information available.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

Information:

Hazardous Wastes: See under Status.

Solid wastes: No information available.

Radioactive Wastes: No information available.

Research and Technologies:

Hazardous Wastes: No information available.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

Financing:

Hazardous Wastes: No information available.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

Cooperation:

Hazardous Wastes: Saudi Arabia signed the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal on 22 March 1989 and confirmed and ratified it on 07 March 1990. Saudi Aramco is a founding member of a number of regional and international organizations concerned with oil spill control activities. Among these organizations are the Organization for Joint Cooperation of Oil Companies Operating in the (Arabian) Gulf, which is concerned with the protection of Gulf resources in face of oil pollution, and the Oil Spill Services Center in the United Kingdom, an organization which renders response services to oil spills worldwide.

Solid Wastes: No information available.

Radioactive Wastes: No information available.

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CHAPTERS 24 TO 32: STRENGTHENING THE ROLE OF MAJOR GROUPS

Women: Cooperation: The Convention on the Elimination of All Forms of Discrimination Against Women has not been signed.

Children and youth: No information available.

Indigenous people: No information available.

Non-governmental organizations: No information available.

Local authorities: No information available.

Workers and trade unions: No information available.

Business and industry: No information available.

Scientific and technological community: No information available.

Farmers: No information available.

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CHAPTER 33: FINANCIAL RESOURCES AND MECHANISMS

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Cooperation: No information available.

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CHAPTER 35: SCIENCE FOR SUSTAINABLE DEVELOPMENT

Decision-Making: Scientific research in the field of sustainable development is undertaken by universities as well as by King Abdulaziz City for Science and Technology (KACST).

Programmes and Projects: There are a number of programmes and projects going on in various universities and KACST on various aspects of applied scientific research with the aim of strengthening sustainable development. Relevant ministries and government agencies also undertake or sponsor scientific research programmes for achieving sustainable development in the areas of their jurisdiction.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: Capacity building is one the major aspects of these scientific programmes. Saudi nationals have been sent to study outside the country to strengthen the scientific base of the Kingdom.

Information: Information regarding the scientific projects and programmes undertaken by various universities, research institutes, KACST and different government ministries and agencies are available in the databases in these organizations.

Research and Technologies: The Kingdom has been using the state-of-the-art instruments, equipment and facilities available internationally for the scientific advancement of the country. .

Financing: The projects and programmes for scientific development are mainly financed from the National Budget through the relevant ministries and agencies.

Cooperation: The Kingdom of Saudi Arabia put a lot of emphasis on the regional and international cooperation in this field. Saudi Arabia has signed a number of bilateral agreements for scientific and technical cooperation with US, European and Asian countries.

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CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

Decision-Making: In collaboration with the Ministry of Education and the General Presidency for Girls' Education, the Meteorology and Environmental Protection Administration (MEPA) has incorporated into school curricula a number of environmental concepts. It has also published and disseminated in the Kingdom and abroad the second edition of "Protection of the Environment in Islam" in Arabic, English and French, in collaboration with the International Union of Conservation of Nature (IUCN).

Programmes and Projects: MEPA supported the Saudi Environmental Awareness Programme by conducting a number of training sessions for teachers of various educational levels in order to explain posters published on the environment by UNESCO. See also under **Status**.

Status: The Kingdom strives to achieve the accessibility of environmental and development education, linked to social education, from primary school age through adulthood to all groups of people. NCWCD has made great effort to achieve this objective through its Training Centre for Conservation of Natural Resources, established in early 1998. A number of training courses in environmental education for teachers and educators of each of the three phases of public schooling, i.e., elementary, intermediate and high, were developed. Teachers and educators, of both genders, are trained to incorporate environmental and conservation knowledge in their curricular and extra curricular activities for male and female students. These programmes proved to be highly successful and attracted increasing number of male and female teachers and educators who showed high enthusiastic positive response. Trainees from almost all governorates of the Kingdom were enrolled in these programmes. An interactive relationship is maintained between the Centre and the trained educators and teachers after their go back to their schools to sustain the highest possible outcome for their training and to help them manage their way in developing environmentally responsible attitude in their students as well as fellow teachers.

Increasing Public Awareness: NCWCD encourage mobilization of both men and women in awareness campaigns, stressing the role of the family in environmental activities. Another important facet of training activities has been directed towards setting up environmental awareness programmes for housewives and the general women sector in the Kingdom. The theme for these programmes is Environmental protection begins by you in your house, and the woman is a wife, a mother, and a sister i.e., the principal element in bringing up the people of the whole country, and if you environmentally educate the women you educate the whole country and protect the environment.

Another training programme was set up for journalists and media people to update their knowledge of the environment and the current environmental problems and to build their capacities in soliciting public cooperation in dealing with environmental and conservation issues and to help develop personal responsibility sensitization towards the environment. Provisions are made for promoting, as appropriate environmentally sound leisure and tourism activities making suitable use of heritage sites, nature hot spots and protected areas.

Promoting training: The regional Training Centre for the Conservation of Natural Resources has identified the training needs: training programmes have been developed in all facets of wildlife and natural environment conservation to develop skills of workers in these fields. These include the following areas: wildlife survey and monitoring; planning for establishment of protected areas; management of protected areas; rangers of protected areas; conservation of genetic resources and captive breeding of game mammals and birds; reintroduction of captive-bred animals; in situ and ex-situ plant propagation; collection, preservation, identification of plant samples and herbarium techniques; bird watching, identification and ringing techniques; scuba diving and study of marine ecosystems; and, health and everyday care and management of captive-bred wild animals.

Capacity-Building, Education, Training and Awareness-Raising: *Reorienting education towards sustainable development:* NCWCD has worked towards achieving environmental and development awareness in all sectors of society through two lines: i) environmental awareness programmes using all available public communication and ii) media to develop high environmental awareness in all sectors of society. This take the form of televising direct environmental and conservation information to develop knowledge background and to emphasize the relatedness of man to his environment, and to all other forms of life and his complete dependence on the ecosystem life supporting services and natural resources. Nature video films are produced as

well as documentaries on protected areas in the Kingdom, their role in stabilizing biodiversity and supporting a high standard of living to local communities, and the Nation as a whole, is emphasized. More successful efforts are being made through: arranging youth camps in protected areas over the weekends and school - mid year vacation to get them involved in protected area daily activities and management objectives, and to appreciate biodiversity conservation on site; arranging national and regional wildlife biodiversity and conservation exhibits, which are self explanatory for conservation goals and objectives; publishing information pamphlets on protected areas and flag wildlife species of the Kingdom; publishing a quarterly wildlife and environment magazine by the name Al-Wudaihi with an enclosed magazine for kids and youths, which were very successful in developing an interactive response within the whole family; publishing regular articles in leading newspapers about the current environmental problems and conflicts between man and nature to develop awareness and induce personal responsibility feeling responses in individuals as well as in officials and decision makers; highlighting the national and international environment days such as the Arab environment Day, the World Environment Day, the Earth Day, the Tree-Planting Week etc.; and, involving the public, particularly the boy-scouts and high school and university students in projects of rehabilitating degraded habitats and afforestation of dwindled ecosystems such as mangrove forests and juniper mountain forests. See also under **Status**.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 37: NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR CAPACITY-BUILDING IN DEVELOPING COUNTRIES

This issue has been covered under the heading **Capacity-Building, Education, Training and Awareness-Raising** in the various chapters of this Profile particularly in Chapter 36.

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CHAPTER 38: INTERNATIONAL INSTITUTIONAL ARRANGEMENTS

This issue deals mainly with activities undertaken by the UN System.

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CHAPTER 39: INTERNATIONAL LEGAL INSTRUMENTS AND MECHANISMS

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: The Kingdom has signed and/or ratified many international and regional conventions and protocols that are relevant to protection of environment, among which are the following: Basel Convention on Transboundary Movement of Hazardous Waste; Kuwait Regional Agreement for Cooperation on Protection of Marine Environment from Pollution and the regional cooperation protocols for combating marine pollution by oil and other harmful substances in emergencies; The Regional Agreement for Protection of the Red Sea and Gulf of Aden and its complimentary Protocol on Regional Cooperation for Combating Pollution by Oil and other Harmful Substances in Emergency Situation; The Protocol on Marine Pollution due to Exploration and Exploitation of the Continental Shelf in the Arabian Gulf sea area; Protocol on Protection of Marine Environment from Land-based Sources (Arabian Gulf); Agreement on Conservation of Immigratory Wildlife; Vienna Convention (and its protocol) on Protection of Ozone Layer.

In addition to these, Saudi Arabia contributes to many regional and international organizations that are concerned with the protection of environment and conservation of natural resources, such as the United Nations Environment Programme, World Health organization, United Nations Food and Agriculture Organization, World Meteorological Organization, UNESCO, the Regional Organization for Protection of Marine Environment, Programme of the Environment of the Red Sea and Gulf of Aden (PERSGA), the relevant organizations working under the Arab League and the Gulf Cooperation Council as well as the Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO).

See also Chapter 2 of this Profile.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: See under **Programmes and Projects** and the heading **Cooperation** in the various chapters of this Profile, especially Chapter 2.

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CHAPTER 40: INFORMATION FOR DECISION-MAKING

This information has been covered either under Chapter 8 or under the heading **Decision-Making** in the various chapters of this Profile.

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CHAPTER: INDUSTRY

Decision-Making: The Ministry of Industry and Electricity is primarily concerned with the comprehensive industrial development of Saudi Arabia and the proper geographical location of industries in all provinces in a way that give due consideration to environmental aspects. New plants with potential impact on the environment are obligated to conduct studies on environmental impact assessment in adherence with Agenda 21. Certain plants have adopted the principle of clean production, for example, the companies of SABIC (Saudi Arabian Basic Industries Corporation) and those of other basic industries. Plans are in place to achieve this objective. Plants dispose of hazardous waste through environmentally qualified companies, into specialized waste disposal dumps. Within the framework of a national strategy, plants are gradually stopping the use of certain ozone-depleting chemicals such as the chlorofluorocarbons (CFCs) and are shifting to the use of substitute materials in application of the frame of action of the Montreal Protocol and the requirements of Agenda 21.

Programmes and Projects: No information available.

Status: The sustainable approach to development taken in Jubail and Yanbu was done under the responsibility of the Royal Commission for Jubail and Yanbu and under the direct supervision of the Custodian of the Two Holy Mosques. Jubail and Yanbu, which accommodate the basic Saudi industries, were successfully nominated and won the Sasakawa Environmental Prize, which is annually granted by the United Nations Environment Programme (UNEP), the most prestigious international prize honouring environmental achievement. The most outstanding industrial cities are Riyadh, Jeddah, Dammam, Makkah, Qassim and Hassa in addition to Jubail and Yanbu. These cities have been established to the highest standards worldwide. Instances of sophistication achieved could be seen in the construction of industrial wastewater treatment plants, tree-planting and landscaping. The establishment of the industrial cities is geared to the objective of integrating local industries and the benefit of recycling certain wastes, and, thus, reducing environmental impacts of the industrial processes together with utilizing treated wastewater for cooling, industrial uses and for irrigation of green areas.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER: SUSTAINABLE TOURISM

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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