

# JOHANNESBURG SUMMIT 2002

QATAR



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.

*At the release of this Country Profile, Qatar had not updated it and therefore any new changes will appear on our web page: <http://www.un.org/esa/agenda21/natlinfo>*

## TABLE OF CONTENTS

CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES - TRADE.....	1
CHAPTER 3: COMBATING POVERTY.....	2
CHAPTER 4: CHANGING COMSUMPTION PATTERNS.....	3
CHAPTER 4: CHANGING CONSUMPTION PATTERNS - ENERGY.....	4
CHAPTER 5: DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY.....	5
CHAPTER 6: PROTECTING AND PROMOTING HUMAN HEALTH.....	6
CHAPTER 7: PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT.....	8
CHAPTER 8: INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING.....	10
CHAPTER 9: PROTECTION OF THE ATMOSPHERE.....	11
CHAPTER 10: INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES.....	12
CHAPTER 11: COMBATING DEFORESTATION.....	13
CHAPTER 12: MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT.....	14
CHAPTER 13: MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT.....	16
CHAPTER 14: PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT.....	17
CHAPTER 15: CONSERVATION OF BIOLOGICAL DIVERSITY.....	18
CHAPTER 16 AND 34: ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION AND CAPACITY-BUILDING.....	20
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.....	21
CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES.....	23
CHAPTER 19: ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS.....	26
CHAPTER 20 TO 22: ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS, SOLID AND RADIOACTIVE WASTES.....	27
CHAPTER 24 TO 32: STRENGTHENING THE ROLE OF MAJOR GROUPS.....	28
CHAPTER 33: FINANCIAL RESOURCES AND MECHANISMS.....	29

CHAPTER 35: SCIENCE FOR SUSTAINABLE DEVELOPMENT.....30

CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING..... 31

CHAPTER 37: NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR CAPACITY-  
BUILDING IN DEVELOPING COUNTRIES.....34

CHAPTER 38: INTERNATIONAL INSTITUTIONAL ARRANGEMENTS.....35

CHAPTER 39: INTERNATIONAL LEGAL INSTRUMENTS AND MECHANISMS.....36

CHAPTER 40: INFORMATION FOR DECISION-MAKING.....37

CHAPTER: INDUSTRY.....38

CHAPTER: SUSTAINABLE TOURISM .....40

## 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 - 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:** 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 4: CHANGING CONSUMPTION PATTERNS**

**Decision-Making:** No information available.

**Programmes and Projects:** No information available.

**Status:** Industrialization of Qatar has improved the country's standard of living. Import of technology has brought about rapid changes in lifestyles. While this has made consumer goods easily available, it has taken place at a cost to the environment, particularly the attendant wastage, both at the manufacturers and also at the consumers end. These include excessive consumption of plastics, metals, glass, paper and other items which are littered and ultimately find their way to the dumpsites. Awareness of these problems can certainly improve the situation. Special emphasis needs to be given in building awareness in children, the decision- makers of tomorrow.

**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 4: CHANGING CONSUMPTION PATTERNS - ENERGY**

**Decision-Making:** No information available.

**Programmes and Projects:** No information available.

**Status:** The government has actively promoted the development of both heavy and light industry concentrating on in-country resources. Cheap energy has led to the development of a steel and iron industry, and healthy gas reserves have led to the establishment of chemical, fertilizer, and petrochemical industries. Cement is also produced in Qatar. Oil has played a significant role in Qatar's economy, accounting for about 85% of export earnings and 75% of government revenues. Currently, Qatar has oil reserves of about 3.3 billion barrels and also has the third largest reserves of liquefied natural gas (LNG) in the world. According to a report by the international energy consultant firm Gaffney, Cline & Associates, Qatar possesses 30% of the world's proven gas reserves, but accounts for only 5% of the global consumption. Large automobiles of the fifties and sixties have been replaced by highly efficient vehicles with high compression engines. The current trend is the development of automobiles on energy sources which are both renewable and also less polluting.

**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 5: DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY**

**Decision-Making:** No information available.

**Programmes and Projects:** No information available.

**Status:** Qatar is an independent sovereign Arab state with a population of about 650,000. Arabic is the official language, although English is widely spoken by the Arab, European and Asian communities who reside and work in Qatar. Doha, where 80% of the population lives, is the capital and administrative centre of the country. It lies on the eastern coast and houses the ministries, government departments, and financial and commercial institutions. Other major towns in Qatar are Umm Said (the industrial town), Dukhan, Al-Khor and Al-Shamal.

**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 Master Plan Update (update for the health care master plan prepared by the Ministry of Public Health and Hamad Medical Corporation, 1994) noted that the health care system in Qatar was modeled on the Danish system, with strong focus on community-based local health services providing primary health care. The Master Plan noted that the system for primary health care centres was designed with catchment area populations averaging 11,000 persons. In addition, one of the emerging trends and philosophies in hospital planning in Qatar has been, and is expected to be, decentralization of secondary health care services from centralized locations in Doha to suburban and rural health care centres. Currently, the population for health centres outside Doha is in the average of between 5,000- 20,000 and the health care centres in Doha have catchment areas averaging over 35,000.

**Programmes and Projects:** Currently, Qatar is preparing a detailed and comprehensive five-year health programme. It is also in the process of creating a National Council for Health and of restructuring the Ministry of Health in order to maximize effective coordination and reduce bureaucracy.

**Status:** Health care services in Qatar are provided mainly through the Ministry of Public Health and Hamad Medical Corporation in cooperation with other Ministries, health care associations (e.g. Red Crescent, Qatar Diabetic Association, etc.), health clinics operated by some public sector and government agencies (police, army, industries) and privately operated health clinics. Major industries in Qatar which employ a large number of personnel provide health care services for employees. Basic health care in Qatar is provided free of charge to all residents including expatriates. A nominal fee for annual registration and for prescribed medicines has been introduced recently for non-Gulf Co-operation Council persons to decrease misuse and overburden on the health care system. However, essential services such as emergencies, well baby and maternal care, school health care, vaccinations against communicable diseases, etc., have been exempted from these charges. The Preventive Health Department of the Ministry of Public Health provides for the following services for identifying and eradicating communicable diseases: (1) follow-up of vaccinations given at health centres to prevent out-break of communicable diseases; (2) follow-up of contacts with patients suffering from communicable diseases; (3) detecting disease carriers and checking newcomers to the country; (4) study of disease patterns in the country and epidemiological statistics; (5) issue of 'Communicable Disease-Free' License to food handlers and persons in contact with humans or animals; (6) providing vaccination to travellers to endemic countries, and vaccination to all inhabitants during epidemics in near-by countries; and (7) ensuring quality of food and water. The following list summarizes issues and constraints facing identification and eradication of communicable diseases: inadequate communication between departments providing health services; improper system of notification of communicable diseases; responsibility of water and food safety is under care of many departments and in more than one ministry; a variety of disease patterns due to presence of persons from different parts of the world; difficulty in searching for a source of a communicable disease due to traditional customs of the population.

**Capacity-Building, Education, Training and Awareness-Raising:** Health education in schools runs through the school nurse, the school doctor who visits the school two or three times a year providing health services and health education, social workers in the school and from teachers. In addition, health and hygiene lessons are part of the curriculum in primary and preparatory levels of education. The primary health centres have social workers dedicated to providing health education. The constraints in health care education include the following: inadequate training of health providers; shortage of staff, mainly school nurses and doctors; lack of health education in non-governmental schools through health professionals; lack of a training section in the Ministry of Health. Among the actions planned in this area are those to conduct extensive short training programmes for intermediate and junior staff; to exchange experience in health education and training with other Gulf countries; to prepare training for different sectors of health providers; to invite experienced personnel in training and health education; and to run health education programmes about the importance of preventive and epidemiological medicine.

**Information:** Monitoring of health programmes is done through statistical analysis of data collected by different departments of the Ministry of Health, reports of short term WHO consultants, analysis of patients complaints and

numbers of patient visits to health facilities in comparison to the population. Available data show that some aspects of health services in Qatar are good and with good facilities. However, the current system for monitoring the progress and effectiveness of health services is inadequate. The methods used for collecting and analyzing information are not up-to-date, and communication between sectors providing health services is inadequate. Efforts are being made to establish a modern database of health indicators and to set up a specialised unit for monitoring and follow-up.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** No information available.

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## CHAPTER 7: PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT

**Decision-Making:** Qatar is currently preparing a National Human Settlements Plan. A Physical Development Plan (PDP) has been prepared based on an estimated population of 620,000 in 1995, and going up to 1,000,000 in 2020. The capital, Doha and its surrounding suburbs account for about 90% of the population of Qatar. The PDP policies cover the following critical areas: water resources, sanitation facilities, coastal and marine environment, conservation of natural resources, impacts of development projects, and coastal zone management. The PDP has put forward a general physical planning framework for Qatar. There is, however, an urgent need for formulating plans dealing with specialized areas such as a national plan for protection of environment, a comprehensive housing programme, a national strategy for industrial development, a national plan for waste management, water resources conservation and the protection of rural habitat. Procedures and policies need to be established to ensure that the potable underground water supply is replenished and held as a strategic resource. In order to integrate environmental dimensions into human settlements, legislation has been enacted to cover environmental issues and to require environmental impact assessment for new development projects including those of power plants, high voltage substations and overhead lines. New constructions are required to take a building permit which has to be approved by the concerned Municipality, Planning Department and other service authorities including Electricity, Water and Civil Defence. A completion certificate is also required to ensure compliance with all regulations. Legislation on a number of issues has already been passed. The main ones are as follows: Law No.4 -1985 and its amendments, related to controlling buildings; Ministerial Order No.2 - 1989, related to precautions to be taken for public safety to avoid hazards from building construction; Ministerial Order No.7 - 1989, related to technical and architectural specifications for buildings; Law No.3 - 1975 and its amendments, related to commercial, industrial and public buildings; Law No.8 - 1974 and its amendments, related to general cleanliness; Ministerial Order No.2 - 1989, related to the transport of debris, solid and liquid waste. In addition to the above legislation, the Planning Department of the Ministry of Municipal Affairs and Agriculture has published several planning and building regulations under the existing law giving specifications for the main development types in urban areas. These include: (1) Regulations for Flats and Flat Complexes (Draft); (2) Regulations for Villa and Villa Complexes (Draft); (3) Qatar Commercial Development Manual (Draft); (4) Planning Regulations for Residential Developments in Al Rayyan Municipality; (5) Planning Regulations for Commercial Developments in Al Rayyan Municipality; (6) Subdivision Regulations; and (7) Interim Zoning Regulation. The main constraints facing implementation of legislation and criteria regulating constructions in urban areas can be summarized as follows: the existing legislation is not comprehensive and there are still several areas for which legislation needs to be enacted; lack of proper mechanisms for enforcement of existing legislation which includes lack of experienced personnel and funding; many of the regulatory documents do not have legal status.

**Programmes and Projects:** No information available.

**Status:** The main issues and constraints facing the implementation of plans and policies related to human settlements, distribution of population and the sustainable management of land resources are as follows: lack of a comprehensive and coordinated physical development strategy that will identify the character and direction of urban growth at national, regional, and settlement levels, as well as land use compatibility and impact of urban growth on physical environment; absence of a well-defined legislative framework that provides the planning agencies in Qatar with tools to effectively control and direct physical development; lack of proper utilization of existing planning and building regulations due to absence of legal backing and technical expertise; absence of well-defined regulations for protecting physical environment as well as procedures for assessing environmental impact; inadequate coordination and interaction between agencies involved in physical, economic and utilities planning and infrastructure departments resulting in irrational utilization of economic and physical resources which is reflected in improper phasing of implementation of projects for infrastructure and public facilities which in turn affects the quality of human settlements. There are also issues and constraints facing integration of environmental dimensions in human settlement. The rapid pace of physical development during the past few decades has created extensive demand on infrastructure and public facilities. There is a lack of adequate coordination and interaction between concerned agencies and departments, such as the Planning, Environment and Public Health and a lack of effective

environmental standards and associated legislation for their implementation. Older districts have residential areas in poor condition inhabited by less affluent expatriate workers from less developed countries and these areas require redevelopment and rehabilitation. And there is an inadequate number of trained personnel for implementation and monitoring.

**Capacity-Building, Education, Training and Awareness-Raising:** The Physical Development Plan for the State of Qatar (PDP) has put forward several recommendations for overcoming the negative impact caused by the rapid pace of development and for providing infrastructure and facilities that match with the rate of growth to ensure high quality of the living environment. Some of the recommendations to ensure a satisfactory environmental quality of the human settlements are as follows: ensure coordination and information exchange between the concerned agencies; enact effective environmental standards and associated legislation for their implementation, prepare action plans for restoration of deteriorated areas with appropriate allocation of funds; set up of a specialized unit for monitoring and recommending remedial action. There is a need to revise existing regulations to make them more effective in controlling the current rapid pace of physical development. There is an urgent need to enact comprehensive building codes and planning laws that guide and control building and planning activities in urban areas. These legislation should be detailed enough to become effective tools for concerned government agencies.

**Information:** No information available.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** No information available.

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## **CHAPTER 8: INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING**

**Decision-Making:** Qatar joined the consensus adoption of the United Nations Conference on Environment and Development (UNCED) along with the principles of Agenda 21. One of the principles calls for the commitment of the State to institutionalize environmental impact assessment for its new development projects. With the objective of importing appropriate technology, a policy has been laid down for environmental impact assessment of new industries and major infrastructure projects. A procedure for evaluation of projects has also been brought out. This seeks to incorporate environmental considerations at the early stage even when a project report is commissioned. The approved procedure for examination of the environmental impacts of development project requires a committee of experts in different aspects of environment, many of them drawn from Departments of the University and Government. Examination of projects should not only improve institutional linkages but also expose and train persons in environmental aspects of projects and the precautions that need to be taken during construction and operation.

**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 9: PROTECTION OF THE ATMOSPHERE

**Decision-Making:** The Environment Department was created in 1994 within the Ministry of Municipal Affairs and Agriculture. Among the main functions of the Department as stipulated in Law 20 of 1993, are those to monitor and document pollution episodes, implement measures to mitigate pollution impacts, conduct studies on the effects of pollutants and ways of minimizing these impacts, and evaluate and approve (or withhold approval) of environmental impact assessment studies conducted in support of government or private projects. An Environmental Technical Committee comprising all the major industrial companies and the Environment Department has also been formed. The main objective of the Committee is to provide a discussion forum for the evaluation of the environmental protection legislation and attendant regulations. Most companies are keen to participate and collaborate with the regulatory authorities.

**Programmes and Projects:** No information available.

**Status:** Specifications for air quality monitoring stations have been prepared and are awaiting approval. These stations will be fixed at strategic sites to represent the impacts of traffic movement and industrial installations. This will help assess the quality of air in the country. A national report on Ozone Depleting Substances has been prepared. The national consumption of these substances is determined to be below 0.3 kg/ca/year and, thus Qatar is assessed to be an "Article Five country".

**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:** Qatar ratified the Montreal Protocol and its Amendments and the United Nations Framework Convention on Climate Change in 1996.

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

**Decision-Making:** The Government has developed a Strategy to Combat Desertification which, inter alia, calls for taking precautionary measures for those lands which have not yet deteriorated or those that have only slightly deteriorated. Future and long-term plans include legislation to restrict overgrazing and prevent desertification of natural pastures.

**Programmes and Projects:** No information available.

**Status:** Among land management issues are those concerned particularly with water and desertification. New agricultural land use is prohibited unless the water to be used comes from other resources. Agricultural production and the total area cultivated have grown steadily during the past few years, and put very serious stress on the available groundwater base. There is thus clearly a need to diversify the resources of income, taking into account its water resources and the projected water demand. The self-sufficiency concept should be revised on the basis of practical self-sufficiency to ensure sustainability.

**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 11: COMBATING DEFORESTATION**

**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 12: MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT

**Decision-Making:** A programme to combat desertification has been initiated. This has the interplay of Government bodies, local communities and land users. Already a large number of steps have been taken. First is laying down legal procedures for agricultural development. The next steps consist of establishing experimental farms, made up of indigenous and imported species, and finally, fixing sand dunes through cultivation using irrigation methods that require much smaller quantities of water. The present Strategy to Combat Desertification is based on sustainable development and by building the nation's capacities. These include the following: taking precautionary measures for those lands which have not yet deteriorated or those that have only slightly deteriorated; promoting policies and strengthening the institutional framework to encourage cooperation and facilitate access to information and appropriate technology; strengthening climate forecasting facilities; forging plans for drought emergency at the local, national, regional and subregional levels which include sustainable income generation in drought-stricken areas; developing sustainable irrigation programmes for crops and cattle using non-conventional waters (potable, semi-potable and saline); setting up warehousing and marketing facilities for food in rural areas; and providing appropriate technology and training in agriculture and pastoral activities in a way which is compatible with modern social and economic circumstances. Future and long-term plans include legislation to restrict overgrazing and prevent desertification of natural pastures.

**Programmes and Projects:** No information available.

**Status:** Qatar has an area of 11,437 square kilometres and lies in the middle of the Arabian Gulf in the dry desert zone. The average annual rainfall is 75.2 mm and the humidity varies between 45 and 95 percent. The main structural elements consist of sand dunes, Sabkhas, beach deposits and collovium depression ("rawda"). The surface is mostly dolomitic (limestone and marls) with some gypsum and anhydride beds in the lower parts. The landscape appears as a flat eroded land of low to moderate relief mainly ranging from 50 to 100 metres above sea level. All land in Qatar is desert or semi-desert. All agriculture in Qatar requires perennial or complementary irrigation due to scanty rainfall. A land use scale for cultivation has been prepared. Grade 1 is cultivable land, Grade 2 is fairly cultivable, Grade 3 is marginally cultivable land, and so forth, up to Grade 6, which is absolutely unsuitable. The land is characterized by desert plant cover which can survive for long periods of up to tens of years. The total pastoral area is about 50,000 ha with a production of nearly 5,650 tons of dry material. These areas are largely rainfed. The plant groupings can be distinguished as: (1) Coastal subkha; (2) Coastal area plants that grow in saline land; (3) Roda: Samr (acacia tortilis), sidr (ziziphus mummularia) and awsaj (lycium showii); and (4) Sand dunes group. The causes of desertification in Qatar are basically three: a drop in ground water levels, an increase in salinity of the ground water, and encroachment of sand on agricultural land. The ground water reservoir has declined by twenty-five percent in the twelve years of a study period. In 1995, the total amount of water extracted for irrigation purposes amounted to 221 MCM. Most of the abstracted ground water is used on farms. A decrease in the available water for irrigation leads to deterioration and desertification of these farms. Potable water is found at a depth ranging from five to fifty metres. The source of ground water is the Dammam Formation. The rate of abstraction is more than ten times the recharge. The quality of water has declined by five percent annually. An increase in the salinity is a result of sea water ingress and the flow of added salts (fertilizer) from the irrigation water to the ground water. The salinity of the water in the southern parts of the country is higher than in the northern part. This has been successfully used in the irrigation of light textured soil. Sand dunes in Qatar cover about 1,500 square kilometres or about thirteen percent of the area. Other sand formations cover five percent. The rate of movement of sand dunes in Qatar is about 8 km per year. Higher rates have been encountered in drier areas depending on the direction of the wind and the slope of the surface of the sand dunes. It has been estimated that 21,000 ha of agricultural and pastoral land has been lost due to wind desertification. Exploitation of oil and gas reserves have brought about significant changes in demography. From 40,000 in 1960, the population went up to 280,000 in 1983 and to 504,000 in 1991. Also the increase was concentrated in the urban areas. The capital, Doha has encroached upon three principal agricultural areas, Rayyan, Sharaffa and Markabia.

**Capacity-Building, Education, Training and Awareness-Raising:** Among the activities that need to be undertaken is enhancing the development of water resources, and especially recharging ground water.

**Information:** There are several areas which need to be investigated. Primarily these pertain to accurately mapping the present situation. This can be summarized as follows: compiling a desertification map of Qatar showing the degraded areas and also "rawdas" and other agriculturally promising lands; monitoring desertification through land degradation due to desert creep or salinity from decline of water quantity and quality; and surveillance of human behavior in the vulnerable environment.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** Qatar has not ratified the International Convention to Combat Desertification in Countries Experiencing Drought and/or Desertification Particularly in Africa.

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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:** No information available.

**Programmes and Projects:** No information available.

**Status:** In the agriculture sector, the country is self-sufficient for 70% of its summer vegetables and 40% of winter vegetables. There is some production of grains, eggs and poultry. However, the country is still dependent on food imports. The government has made an effort to strengthen the agricultural sector offering several incentives to investors. Qatar has 28,000 hectares of arable land. The government has also placed increased emphasis on the fishing industry.

**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 15: CONSERVATION OF BIOLOGICAL DIVERSITY

**Decision-Making:** A national committee consisting of representatives from concerned agencies was set up in the Environment Department. Its mandate was to establish an action plan for implementation. The work pertaining to different aspects of conservation is being carried out through different agencies. A number of regulations and decrees have been passed. Notable among these are the following: Law No. 12 of 1981 for regulating agriculture; Law No. 4 of 1983 for the use and conservation of marine resources, amended by decree No. 17 of 1993; and Law No. 1 of 1983 for protection of animal health. Emiri decrees have been issued calling for the protection of the marine environment from pollution. This includes pollution from ships and also from land-based sources. Decree No.55 of 16 November 1996 approved the Convention on Biodiversity such that it has the power of law. Ministerial decisions have been taken to prevent the import of diseased plants and the conservation of marine resources. This includes the ban on shrimp harvesting. Circulars and notices are also issued by the concerned Ministries from time to time. These cover trawling practices and the types of nets to be used so that non-commercial marine life is not affected. Development of natural life and its conservation is a priority for the State. However, illegal fishing and hunting coupled with modern sporting weapons has a direct effect on the survival of the country's biodiversity. It therefore becomes necessary to create awareness amongst the citizens. This needs to be backed up with enforceable legislation.

**Programmes and Projects:** Natural Reserves: The State encourages private farms. There are one thousand, one hundred twenty-three farms of which forty belong to the Government. There are four natural reserves and thirty farms for breeding gazelles and ostriches. The main ones are in Al Shahhaniya, Ras Ashairij, Haloul Island, Khor Al-Adaid, Al Aaliya Island, Al Thakhira and Tribuk. A project is under way for setting up three reserves aimed at breeding plants facing depletion. A reserve for gazelles is being planned in Maszhabiya.

**Status:** Marine Environment: Surveys of aquatic ecosystems have been carried out, as follows: biodiversity in the areas of natural and planted mangroves (*avicennia morina*) and sabkhas, 1996; locations and range of pearl oysters in Qatari waters; a preliminary study of the Arabian Gulf fish in the aftermath of oil spillage during the Gulf War, 1990; and the state of fisheries in Qatar, 1980 to 1992. In addition, books have been published by concerned agencies on "Common species of fish in Qatari waters," (1982, Qatar University), on "Qatar's Fish," (1983, Department of Fisheries), and on "Qatar and the Sea," (1987, Qatar National Museum).

**Capacity-Building, Education, Training and Awareness-Raising:** The Environment Department is new. There is a need to increase the staff and also have a network of experts in Qatar or the GCC who could help in the field. It is very important for Qatar to conserve its plant, animal and marine population through education and awareness and by enforceable laws. Among the activities that should be undertaken are the following: (1) Supporting scientific research for the improvement of genetic features; (2) Setting the work priorities of the uses of bio-technology in Qatar, and specifying the possible joint projects in this field; (3) Establishing a "gene bank" for the conservation of local species and types; (4) Preparing the outlines for using genetic engineering, its products, and investigating its effects on health and environment; and (5) Preparing additional legislation, where required, for conservation of biodiversity.

**Information:** Monitoring capabilities and scientific back-up are very necessary. The priority items are as follows: (1). Surveying all local plants and animals and establishing a data bank; (2). Following-up and caring for the species endangered with extinction; (3) Helping in preparing workshops and meetings on biodiversity and publishing the economic data and information as an added value to biodiversity; and (4) Surveying the areas targeted for conservation and specifying the programmes for their development and administration in the appropriate manner.

**Research and Technologies:** Research is being carried out on the diversity of marine organisms in the environment of coral reefs in Qatari waters and the effect of organic compounds on these; on the effect of ban on

catching shrimps on the restoration of their stocks; and on a biological study of king fish. Plant Environment: A laboratory has been set up in the Department of Agricultural and Water Resources for the culture of plant tissues. To date, the laboratory has overseen the reproduction of very high quality palm trees, the conservation of natural and indigenous trees; and the introduction of species from places having a similar environment. Published research work has focussed on the plant environment in Qatar, medicinal and toxic plants in Qatar, agricultural development in Qatar, and Sabkha plants. Three hundred fifty-five plant varieties and one hundred six types of fungi have been identified. Research has been taken up on grazing plants in Qatar and the Green cover in Haloul Island. Animals and reptiles: A survey is being carried out of all types of reptiles, on land and water in Qatar. This includes turtles, lizards and snakes.

**Financing:** There is a need for greater funds for taking up studies and also hiring competent specialized staff.

**Cooperation:** Qatar ratified the Convention on Biological Diversity in 1996. The Convention on International Trade in Endangered Species of Wild Fauna and Flora has not been ratified. Conservation of biodiversity is a multidisciplinary task. Cooperation at the international and regional levels is called for. There is a need to have regional cooperation on many aspects regarding marine biota, the effects of marine pollution and illegal fishing. A greater degree of cooperation needs to be fostered amongst GCC countries.

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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:* With the objective of importing the appropriate technology, a policy has been laid down for environmental impact assessment of new industries and major infrastructure projects.

*Biotechnologies:* No information available.

### **Programmes and Projects:**

*Technologies:* No information available.

*Biotechnologies:* No information available.

### **Status:**

*Technologies:* Qatar is at the cross-roads of economic development. Rational development and use of natural resources is the basis for any sustainable development programme. This is applicable for industrial processes and as well as in the daily consumption patterns and habits of citizens. Developed countries have already gone through the learning curve and their focus is on conservation. The technology which would be used should primarily be state of the art, low or no waste technology (LNWT). The current trend is the development of automobiles on energy sources which are both renewable and also less polluting. The requirements of Qatar in the future, therefore, are evident: selection of appropriate technology and conservation of natural resources. The implementation of environmental policies has to be done one step at a time in an economy in transition. The objective would be to have a good environment using the latest trends in science and technology. Just as the economic benefits are distributed among the State, local bodies, industry and individuals, so must the objective of sustainable development be met through the joint effort of all the entities. The formulation of policies is a function of the State and these have to be such as to promote economic and social development in order to hand down a clean environment to future generations. Qatar plans to promote clean technologies in the future by establishing a link to international databases, and encouraging local colleges and universities to conduct research and development projects, in relation to environmental issues specific to the nation's industries and ecosystems.

*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.

## **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 Environment Department is presently under the Ministry of Municipal Affairs and Agriculture. It is a fledging department established by law in 1994. A number of State laws have been issued to protect the marine environment. In addition the State is required to comply with regional conventions which it has ratified. Legislation includes the following: Decree No. 55 of 1978 for approving Kuwait Regional Agreement of Cooperation for Protecting the Marine Environment from pollution, and the Protocol of regional cooperation for combating pollution which results from the discharge of oil and other damaging substances; the resolution of the Council of Ministers, No. 4 of 1986 providing that the plans and projects of development shall be shown to the permanent committee for environment for approval, etc.

**Programmes and Projects:** No information available.

**Status:** The State of Qatar is made up of the main peninsula. It also has a number of small islands. The coasts of the state, including the islands, extend for more than 700 km (approximately 23 percent of the coasts of the Gulf). The coasts have acute curves forming bays and capes such as Ras Laffan, Ras Rekn and Ras Ashirij. The State's coasts includes a number of environmentally sensitive areas, such as mangrove forests and coastal coral reefs. These form a natural environment for a number of living organisms which are a national natural wealth. Marine environment in the Arabian Gulf is considered to be of special importance. The coastal waters of Qatar are polluted from a number of sources. These include untreated industrial effluent, garbage from indiscriminate disposal by visitors to the benches and human activities in port areas. Oil spills due to accidents in exploration and transport still constitutes the biggest source of pollution of the coastal waters. The State has taken a multi-pronged action in this regard.

**Capacity-Building, Education, Training and Awareness-Raising:** Infrastructural gaps exist in the Environment Department. A study has been undertaken by a private consultant to identify the appropriate structure of the Environment Department. In order to function effectively in controlling marine pollution it is necessary to have the appropriate human resources, a sea-going vessel and a properly manned laboratory. A system of enforcement needs to be established. Deterrent fines and punishment would have to be enforced on willful polluters of the marine environment. Emergency preparedness to fight accidents needs to be established. Laws concerning ships with segregated ballast and facilities at ports for accepting and treating wastes need to be established and enforced. A continuous education and awareness programme needs to be carried out. While a lot is currently being done by the Environment Department, it is necessary to network with other departments and agencies which have the expertise in the field. For instance, the Qatar National Museum can do significant support work through its section on marine environment. A long-term coordinated programme with identified responsibilities is required.

**Information:** There is a need to build a proper structure for monitoring the status of the marine environment with an appropriate laboratory. It is necessary to integrate the existing GIS in monitoring and modeling studies. Marine reserves need to be mapped and areas which are ecologically sensitive need to be preserved. This would require monitoring and support of properly equipped and trained technical personnel.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** Qatar participates in a number of regional and international agreements, including the UN Convention on the Law of the Sea signed by Qatar in 1984, the Kuwait Regional Agreement of Cooperation for Protecting the Marine Environment from Pollution, the Protocol of Regional Cooperation for Combating Pollution which results from discharge of oil and other damaging substances, the international agreement concerned with the

establishment of an international fund for compensations for damages resulting from oil pollution, the international agreement concerned with the right to intervene in cases of accidents which cause pollution or may cause oil pollution in the upper seas (Brussels, 1969), the International Charter of Civil Liability on Damages from Oil Pollution, the Protocol for Marine Environment Protection from Pollution which Results from the Continental Shelf, and the Protocol for Marine Environment from Pollution which Results from Land Sources, among others.

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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 present strategy in Qatar is to use groundwater resources primarily for agriculture and develop alternative resources, through construction of desalination plants for potable water supply. The groundwater will be reserved for agricultural production, and for domestic water supply in rural areas. For communities north of the country, short-term reliance is being placed on groundwater resources. Alternative options which are being considered for this area include the use of aquifer recharge, construction of desalination facilities, and construction of transmission lines from existing desalination facilities. The existing pricing policy is to supply potable water free of cost to the prime residence of all Qatari nationals. In general terms Qatar's strategy is to encourage the diversification of its economy, focusing on agricultural development in order to achieve self-sufficiency in foodstuffs. Rationalization of existing water resources is a prerequisite to ensure sustainable socio-economic development, self-sufficiency in vegetables, development of orchards, development of fodder crops, promotion of water conservation and metering, with progressive introduction of tariffs in the agricultural sector (demand management) and a legal provision to control drilling. This strategy implies utilization of desalinated sea water for domestic and industrial use, whereas ground water resources would be utilized in irrigation purposes. In order for the government to maintain the level of commitment to irrigated agriculture, and in the absence of any other source of water supply, they are looking for imported water from Iran to augment the remaining groundwater reserves through artificial recharge to combat and minimize the environmental impact on the deteriorating water quality caused by salt water intrusion and soil degradation. It is believed that artificial recharge/aquifer storage recovery schemes are an effective tool in groundwater management.

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

**Status:** Qatar lies within a torrid sub-region of the northern desert belt. It is characterized by scanty rainfall of 50 to 80 mm per annum. High temperature and high relative humidity are common in summer. The rainfall is confined to the winter months, November to March. Although scanty, it is the only source of natural water replenishment, while groundwater is the only natural source of water supply. There is a severe water resources deficit. Steps taken for water conservation and use: All fresh groundwater in Qatar originates from local rainfall, except for the confined, slightly brackish water near Abu Samra which is believed to have its source to the west, in Saudi Arabia. The country's reserves of fresh groundwater are concentrated in the northern part, where the fresh water body has the form of a lens that floats on saline groundwater, that is saturating a lower part of the Umm er-Radhuma formation. Laterally, it is controlled by sea water intrusion in coastal areas. Most of the water occurs in the Rus formation and in the upper part of the Umm er-Radhuma formation. Fractures, vugs and solution channels provide the principal means for storage and groundwater movement in carbonate aquifer. The lens in the central part of Northern Qatar is about 80 m thick and diminishes towards seashore. The fresh salt water interface was detected at 120 m depth. The lens has been heavily overexploited. Sources and reserves of potable water: Since 1954 the use of desalination has increased so that all demands for domestic and industrial water supply for Doha and its surroundings are met by desalinated water. Annual production capacity for desalinated water is presently 126 MCM/yr. Desalination plants account for approximately 96% of the total municipal (excluding irrigation) potable water production. Water to the rural areas in the Northern Qatar, as well as to communities, is supplied by six well fields of 9,000 m<sup>3</sup>/d (2.5 MCM) of water annually. The total available potable water storage in the country, in buffer reservoirs, ground tanks, elevated tanks, and water towers, totals approximately 1.1 MCM. This represents approximately three days' supply based on an average national consumption rate. The total gross extraction of groundwater for irrigation purposes increased from about 44 MCM in 1972 to about 220 MCM in 1995. The abstraction for public supply increased from 4 MCM to 6 MCM in 1977 and then fell to 2.5 MCM in 1994, met entirely from groundwater. Agricultural water supply and possible impact: The agricultural sector relies basically on irrigation, and its development will require vast amounts of water and put further demands on an already highly depleted unrenewable natural water resources. In Qatar the renewable water resources are now totally depleted. Such mining

will continue to cause lowering of the water table, deterioration in water quality, upcoming of highly saline water from deeper aquifer and resulting in a greater water cost. Therefore owing to the limited available groundwater supplies in the country, the main emphasis has been on construction of desalination units. Considering the current trends for an ever increasing amount of groundwater exploitation, it is estimated that the remaining groundwater reserve will be deteriorated within 10 years. Consequently agriculture will be at a critical situation, facing a stringent shortage of adequate water for irrigation purposes. Previous works in early 1980 had suggested that artificial recharge of freshwater into the aquifer systems may be a possible solution to the prevailing water supply problems, in order to augment the diminishing groundwater reserves and control environmental deterioration caused by saltwater intrusion and soil degradation. Rapid deterioration of water quality has resulted in the abandonment of several farms located adjacent to the coastal strip due to the over-exploitation practices prevailing in the region, which has resulted in a severe environmental impact observed by a rapid soil degradation. New agricultural land use is prohibited, including licensing of existing unlicensed farms, unless the water to be used comes from other resources. Agricultural production and the total area cultivated have grown steadily during the past few years, and put very serious stress on the available groundwater base. The government is aiming at lessening dependence upon oil and gas and focusing on the development of the agricultural sector in order to achieve a large measure of self-sufficiency in basic foodstuffs. There is thus clearly a need to diversify the resources of income, taking into account its water resources and the projected water demand. The self-sufficiency concept should be revised on the basis of practical self-sufficiency to ensure sustainability. In agriculture production Qatar is fairly self-sufficient, in dairy products (62.5%), eggs (61.2%) and vegetable production (42.0%). Other plants and animal products include: field crops, fruits and dates (19.9%), barley and bran fodder (18.5%), livestock and poultry (21.4%), and red meat (12.4 %). The total cultivated area is approximately 7,585 hectares which constitute three percent of Qatar's surface land. Qatar's desire for self-sufficiency in food production should be balanced against the loss of strategic groundwater resources and other environmental impacts. There is now a realization, particularly after the Gulf War, for the need to maintain strategic groundwater reserves and also to restore the configuration of the lens to mitigate the effects of saline water intrusion and salination from irrigation recycling. The accumulated groundwater deficit calculated during the period 1972-1995 reached 994 MCM, more than one third of the 1977 estimate of total groundwater reserves in the country (2,500 MCM). Consequently groundwater levels have dropped up to 0.5-1.10 m per year and the quality of water deteriorates due to sea water ingress and to the intrusion of saline water from deeper aquifers. The estimated safe yield of the aquifer, based on the calculated average natural recharge over the last 20 years, is of the order of 35 MCM/ yr. Given the limited supply of potable water in underground storage, there is insufficient capacity to supply national needs if desalination plants are not operative. Therefore underground potable water needs to be preserved and available as a national strategic resource. To fulfill ad hoc strategic tasks a complex of studies and investigations should be carried out within the present context of seeking ways and means to manage the scarce groundwater resources of Qatar and to enhance the environmental considerations in all possible development alternatives. The application of aquifer storage and recovery techniques is a useful tool for almost all possible groundwater development alternatives in addition to possible storage recovery of surplus water of various sources. Imported water from Iran is being negotiated and the Government has commissioned a study to test the feasibility of using this water for direct irrigation purposes. It is expected that 5m<sup>3</sup>/sec water would be delivered from Karun river.

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

**Information:** No information available.

**Research and Technologies:** It is now realized that developments in science and technology can cause a large number of environmental problems if they are applied to Qatar without taking appropriate precautionary measures. For instance earlier technology imported into the country paid little heed to water conservation through recycling. The water needs for agriculture and industry were made up by supplementing desalinated water with ground water. As a consequence ground water reserves have fallen to precarious levels. In order to overcome the aggravating water resources deterioration, the Government of Qatar launched several studies such as Hydro-agricultural Surveys (1971), Integrated Water and Land Use (1974), Water Resources and Agricultural Development (1981). Recommendations were focused on the remedial measures concerning the reduction of water abstraction for agricultural use. In view of the prevailing self-sufficiency in foodstuff's supply, the ad hoc recommendations failed

to achieve their targets. The Department of Agricultural and Water Resources carried out two studies in the field of water resources management and development during the 1992-1994 period. These are "Agricultural Project Utilizing Water from Iran" and "Study of Artificial Recharge of Groundwater in Northern Qatar". Both studies were completed in 1994.

**Financing:** No information available.

**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:** An inter-departmental Committee has been set up by the Environment Department for controlling imports and proper management of hazardous chemicals, including radioactive materials. The Committee would look into five specific areas, including: Registration of imported chemicals, Transportation, Storage Handling, and Disposal. The Department was set up by Emiri decree in 1994. The first technical section to be set up was for management of hazardous chemicals, particularly related to their importation. Another part of the work relates to the transport of hazardous chemicals within the State. Finally, there is the issue of disposal of expired or spoiled hazardous chemicals, including waste. A policy on pesticides calls for avoiding highly toxic pesticides which may affect animals and humans and persistent pesticides. Pesticides are applied under close supervision and at the right time to counter the disease. Application during flowering and ripening is avoided. In addition, under this policy, workers are given periodical medical examination which cover liver function and cholesterol enzyme levels. The State was conscious of the large number of chemicals required for its development linked to oil and petrochemicals. Consequently the State passed Law No.4 in 1981 covering safeguards and requirements for the protection of the environment. The requirements to be fulfilled by the importer of chemicals have been derived from the UN and the International Maritime Organization. Detailed rules pertaining to transport of hazardous chemicals have been framed. Special regulations have been prepared for import and transport of radioactive materials. They are more stringent than those for hazardous chemicals. The rules cover transportation and monitoring of radiation levels.

**Programmes and Projects:** No information available.

**Status:** Industries desirous of importing chemicals are required to fill out an application form. Toxicity data, country of import and storage facilities are some of the relevant information sought. The form has been standardized and the information is fed into the computer both industry-wise and also according to the chemical name. Consumption patterns by the industry and its safety record are checked before issuing a new import permit to the industry.

**Capacity-Building, Education, Training and Awareness-Raising:** The Department lacks institutional capabilities. The number of industries and the chemicals which they import need to be more closely monitored with respect to storage and disposal. The present infrastructure does not permit this. The present system of examination of import licenses needs to be further streamlined, particularly with respect to repeated applications. A system of industrial inspection of storage systems for hazardous chemicals needs to be instituted. This would help in cutting down the possibility of accidents. Certain chemicals are highly toxic or confirmed carcinogens. These need to be banned where safer substitutes are available. There remains an insufficient awareness regarding the use of pesticides. Generation of toxic wastes from industry should be minimized by engineering improvements and other techniques. Infrastructure for disposal of expired chemicals and pesticides needs to be built.

**Information:** The consumption rates for chemicals, particularly pesticides, need to be monitored closely so that excessive use is avoided. Quantities of expired pesticides need to be cut down both from the wastage and disposal viewpoints. Close links need to be forged with other GCC countries and UN-agencies, such as IRPTC, for exchange of information on use of toxic chemicals, precautions and their disposal methods.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** No information available.

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

### **Decision-Making:**

*Hazardous wastes:* Waste management legislation for the transboundary movement of hazardous wastes has been prepared, as required by the Basel Convention.

*Solid wastes:* No information available.

*Radioactive wastes:* No information available.

### **Programmes and Projects:**

*Hazardous wastes:* No information available.

*Solid wastes:* No information available.

*Radioactive wastes:* No information available.

### **Status:**

*Hazardous wastes:* No information available.

*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:* No information available.

*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:* Qatar ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in 1995.

*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 ratified.

**Children and youth:** Status: There are two organizations promoted by the Youth and Sports Authority (YASA). One is the Center of the Friends of Environment, an NGO which promotes voluntary community work thereby acquainting the people with the features of the Qatari environment and also helps in improving community relations. The other is the Department of Youth, which contributes to environmental awareness through organizing camps for cleaning beaches and tree plantation.

**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:** Status: The majority of the local industries are becoming aware of the need to protect the environment. The efforts exerted in this regard vary in degree and intensity from one company to another. The industrial sector activities can be summarized as follows: Some of the companies are adopting management systems and environmental policies of continual improvement. Some of these management systems are based on the International Environmental Rating System. The ultimate aim of these efforts is to obtain ISO certification. An Environmental Technical Committee comprising all the major industrial companies and the Environment Department has been formed. The main objective of the Committee is to provide a discussion forum for the evaluation of the environmental protection legislation and attendant regulations. Most companies are keen to participate and collaborate with the regulatory authorities. Environmental impact assessment studies are being conducted for all new major industrial installations since 1992. Most companies are taking the responsibility for providing employee-training programmes on environmental issues. (e.g., The Qatar General Petroleum Corporation (QGPC) organizes training sessions to build environmental awareness for its employees.) Some have already implemented in-house training sessions for their line management and are planning to take it down to the lower levels of their operational hierarchy. All major companies have formed environmental protection sections or departments to look after and assess the environmental impacts of their operations.

**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:** The Scientific and Applied Research Center (SARC) was set up within the University by Emiri Decree in 1980.

**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:** The main purpose of SARC is for the support of scientific research and application of modern technology in the different sectors of development and economics, to keep abreast of international scientific advances. The objectives of the Center are basic research and the development of applied experiences in scientific, industrial and agricultural fields. In particular, it is to concentrate on industries already in operation in the State of Qatar and/or new industries needed for development, as well as the State's natural, agricultural and animal resources. SARC is to share in the transfer of technology and its applications to Qatar and to cooperate, in particular with organizations with a mutual interest in the following fields: 1. Industry: provide advisory services to industrial organizations and offer expertise for feasibility studies on industrial projects; 2. Agricultural and Animal Resources Research into: the best irrigation methods, the best fertilization methods, production of high-yield crops, the constituents of desert and marine plants animal, animal husbandry and its economics, provide agricultural services, and carry out other agricultural projects; 3. Natural Resources and Ecology: carry out appropriate research, draw up policy to enable the best use to be made of the resources, and preserve the ecology from pollution; 4. Water: research into Qatar's water table and into new methods of desalination, and research into the most economical ways of using water; 5. Energy Resources: research into the most economic ways of using water; 6. Remote Sensing: cooperate with other scientific centers working in the field, carry out all possible research which is of interest to the different organizations of the State of Qatar, and take all necessary measures to yield results in possible applications; 7. Databank: set up a data bank for the collection and storage of knowledge, and make statistics available to authorities.

**Financing:** No information available.

**Cooperation:** No information available.

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## CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

**Decision-Making:** The Education Ministry is responsible for all educational activities in Qatar at the primary, preparatory, secondary and tertiary levels including general, technical and religious and institutional needs. The Ministry provide facilities for literacy, adult education, cultural relations, skills training, career development, in-service teacher training. It is also responsible for public libraries, school health and school accommodation. There has been a substantial growth in the affairs of the Ministry. In 1982 there were only 141 schools. A 10-year plan was introduced in 1982 for the construction of 156 schools, of which 99 were to be built in the suburbs and desert villages. The objective is to develop the State uniformly by spreading its resources. This would ultimately help in providing educational and other facilities throughout the State, thereby preventing urban growth. This is important for sustainable development in the context of environmental management and social upliftment. An important part of the Education Ministry is the Department of Training and Career Development. Its function is to provide training to ministerial officials, clerical and technical staff in Government and Industry. It is also responsible for providing in-service training and vocational guidance. The Environment Department is in the process of setting performance standards for existing and new industries. Pollution control has already become a major focus area on the industries. Allied areas such as water conservation and environmental audit would require trained personnel to be available in the industries. The Centre for the Affairs of Man and the Environment, located in Riyadh, coordinates the meetings of the respective ministerial committees to bring into focus the situation in each member state in the GCC countries with respect to regional and international issues.

**Programmes and Projects:** No information available.

**Status:** University System: The centre for higher education is Qatar University. This was established in 1973 and has regular courses for the Bachelors programme in Humanities, Engineering and Science. Presently there are three environment-related basic courses, namely, Environmental Chemistry, Pollution and General Ecology. There is a requirement for a project in the curricula for Marine Sciences. Students are encouraged to work on one oriented to environmental management. HH the Emir Sheikh Hamad bin Khalifa Al-Thani is the Supreme President of the University. In the convocation address in November, 1996 he emphasized "the necessity of concentrating on scientific and applied specialization" and on "the need for continuous education which has come to take its place in the programmes and concerns of contemporary universities. There is a need to establish a structure in the State for institutionalizing human resources development. Given human resource and financial constraints, the best way to do this would be to strengthen, support and integrate the existing facilities rather than build another institution. The field of human resource development in the context of sustainable development in Qatar needs to be examined at different levels of age, education and specialization. School Curriculum and Awareness: Initial environment education has undoubtedly to begin with children in school. It is important for the children to imbibe correct perspectives on the need to protect flora and fauna, love for the environment and principles of sustainable development. This would also help in the all-round development of their personalities. In addition, lessons which they learn in environmental education are carried home to their parents. Simple messages such as planting trees to prevent deforestation and improving the microclimate are carried back to their homes with great advantage. Technical Training: The Training and Career Development Department of the Education Ministry looks into the needs both of the Government and of Industry with regard to supply and training of personnel. Technical training is particularly necessary for adopting the management techniques in industry called for by new performance standards being established by the Environment Department. Special Programmes for industry: These courses would essentially provide inputs for making policy decisions in the work place. These programmes would update the management on the needs for orientation of industry to the rules and regulations which would be enforced or at least encouraged for countries to adopt. Awareness programmes related to environmental audit and the need to adopt ISO 14000 are some of the issues which industry needs to be aware of. In many cases, experts would need to be called from specialized organizations in the UN system or from consultants who are specialists in the field in which training is being imparted. In certain cases, the training could be held abroad, particularly in a GCC country to solve a common problem. Training Centre in the Environment Department: There is a pressing need for formalized training at different levels to be imparted in the State. Currently there appears to be a fragmented

approach. Most of the training at the secondary and tertiary (or specialized) level is lacking and "technical training" is currently provided on the job or through contact with people or under a onetime overseas training programme. The training needs in environment must come through a cooperative manner from Government and Industry. Industrialization of Qatar has improved the country's standard of living. Import of technology has brought about rapid changes in lifestyles. While this has made consumer goods easily available, it has taken place at a cost to the environment, particularly the attendant wastage, both at the manufacturers and also at the consumers end. These include excessive consumption of plastics, metals, glass, paper and other items which are littered and ultimately find their way to the dumpsites. Awareness of these problems can certainly improve the situation. Special emphasis needs to be given in building awareness in children: the decision-makers of tomorrow. Increasing public awareness: There are three routes in this mission for reaching out to the people: (1) Using the resources of the Environment Department; (2) Cross-linking with other organizations concerned with Environment, particularly Non-Governmental Organizations (NGOs); and (3) Networking with countries in common projects at the regional or international level. There are a number of awareness-raising programmes conducted annually. Each of these targets a particular segment of society. The main focus, however are the school-going children. For example, each year a number of competitions, on environmental topics, are organized. They include painting, photography, and essays. A number of exhibitions on environmental topics are held each year which include paintings, photographs and posters prepared by children. During these exhibitions, brochures and bulletins are distributed to the visitors. In addition, a number of campaigns for Public Awareness Programmes are held regularly. These include, for example, cleaning important streets of empty cans and bottles; protecting marine birds and turtles; and cleaning beaches of litter using help of NGOs, such as the Qatari Boys Scouts. Wide publicity is given to these campaigns in order to encourage participation. Films have also been prepared for showing to schools or on the local TV channel. The topics covered are either cartoons on civic responsibilities like keeping parks and beaches clean or on subjects of environmental relevance to Qatar, such as marine life, coral reefs, pollution and ozone depletion. The Ministry of Education and Culture is a focal point which cooperates with the Environment Department for spreading environmental awareness amongst school children. The programmes consist of the following: conducting lectures for students; forming groups for the protection of the school environment; arranging competitions, such as plays, posters and bulletins; running campaigns to clean beaches; and inclusion of environmental courses in the school curricula. The local press helps in covering programmes related to the environment. Each month the local paper, "Al Sharq" carries a page dedicated to topical environmental issues with readers' contributions. Radio Qatar transmits a 30-minute weekly programme giving environmental messages and news. It also conducts quizzes on important occasions, such as World Environment Day. Qatar Television coordinates with the Environment Department for broadcasting important functions, including environmental events, such as exhibitions; beach cleaning campaigns; afforestation and tree plantations; and inviting distinguished persons for live discussions on environmental issues. Qatar TV had run 72 episodes of a programme on environmental issues from 1982 to 1989. It regularly broadcasts skits, cartoons and messages to increase awareness, in both young and old.

**Capacity-building, education, training and awareness-raising:** There is a need to strengthen national capabilities specialized in environmental education and information: to organize seminars and training sessions for the nationals in the field of environmental information; to make available scientific material that addresses itself to children, using the media as an educational tool; to provide access to modern communication technology to make it accessible in remote areas; and to train and educate female specialists in the field of environmental education to present lectures and organize training sessions for women, to clarify the role of the family in various environmental activities. Future and long term plans include the following: continue to celebrate 26 February which has been identified as the Qatari Environment Day; establish a permanent environmental museum to house the various aspects of environment; organize children's conferences on environment from 1997 onwards; prepare a weekly programme on environment to be aired on TV; form a network on environmental information specialists in the State of Qatar; translate and publish information and printed material on environmental issues such as natural reserves, coral reefs, etc; produce educational games and computer programmes related to the environment.

**Information:** See under "Status".

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** The Council of Arab Ministries responsible for Environment (CAMRE) has established a Steering Committee for raising environmental awareness of the people in the Arab countries. The mandate covers the following: (1) Studying attitudes of primary and secondary school pupils towards environment; (2) Organizing meetings on environmental education, awareness and information in Arab countries; (3) Furnishing all member countries of the Arab League with publications and studies issued by the different countries; (4) Conducting training sessions and media gathering and organizing work groups for raising awareness; (5) Holding annual meetings to follow up on the year's achievements; and (6) Celebrating the Arab Environment Day on 14th October of every year. The Regional Organization for the Protection of the Marine Environment (Kuwait), which is located in Kuwait, performs a number of awareness raising activities in the field of the environment. It supervises the execution of decisions and recommendations issued by the Council of Ministry (CAMRE); holds regional meetings with the aim of developing environmental awareness; presents technical advice and financial assistance to the member states to enable them to implement environmental awareness programmes; prepares and distributes the organization's bulletin, brochures, publications, audio-visual aids, reports and documents related to environmental awareness; conducts specialized seminars and practical training courses in the field of pollution control; plans contests on children's paintings on the theme of environment protection for the member states; and prepares and organizes celebrations of the Gulf Environment Day which falls on the 24th of April.

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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.

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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:** There have been several international conventions within the past ten years. The signing of these conventions helps in promoting awareness of the people and shows the commitment of the Government towards managing the environment at national, regional and global levels. Qatar has signed a number of such conventions and is implementing these through national and regional programmes. The Arab Declaration on Environment and Development, signed in September, 1991 in Cairo under the auspices of the Council of Arab Ministers Responsible for Environment (CAMRE) was a major step in implementing these conventions at regional levels. It also called for providing adequate finances in the budget for national issues through human resources development and related programmes.

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

**Information:** No information available.

**Research and Technologies:** No information available.

**Financing:** No information available.

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## **CHAPTER 40: INFORMATION FOR DECISION-MAKING**

**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.

**Research and Technologies:** No information available.

**Financing:** No information available.

**Cooperation:** No information available.

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## CHAPTER: INDUSTRY

**Decision-Making:** It has been recognized that combating industrial pollution requires the establishment of a government institution to spearhead, coordinate and implement the government policies as regards to environmental protection from the ills of industrial pollution. To discharge that responsibility, 1994 saw the creation of the Environment Department within the Ministry of Municipal Affairs and Agriculture. The main functions of the Department have been stipulated in Law 20 of 1993. Among the duties and the mandated functions of the Department are the following: develop and implement plans to protect the environment; establish principles for determining impacts on the environment; monitor and document pollution episodes; develop and set up emergency response plans; implement measures to mitigate pollution impacts; conduct studies on the effects of pollutants and ways of minimizing these impacts; evaluate and approve (or withhold approval) of environmental impact assessment studies conducted in support of government or private projects; submit quarterly reports to the Environment Protection Committee; provide technical staff trained in the fields of environmental monitoring and pollution prevention; enforce environmental laws, standards and criteria; collect data on the state of the environment; supervise and control the import, transport, disposal and storage of dangerous chemicals; implement environmental public awareness programs. An Environmental Technical Committee comprising all the major industrial companies and the Environment Department has been formed. The main objective of the Committee is to provide a discussion forum for the evaluation of the environmental protection legislation and attendant regulations. Most companies are keen to participate and collaborate with the regulatory authorities. Environmental impact assessment studies have been conducted for all new major industrial installations since 1992. Further plans include, among other things, the preparation of industrial zoning guidelines to make use of the diluting capacity of the atmosphere and the preparation of plans for water management policy, e.g. sharing of a common industrial waste treatment plant when clusters of industrial facilities are located and the promotion of the creation of green belts in and around industrial facilities; and preparation of guidelines and codes of practice for light industries. Environmental protection legislation is in circulation and may be promulgated in the near future. Environmental impact assessment procedures are being set, and this will be succeeded by a ministerial decree to be effective and applicable to all concerned projects. Waste management legislation for the transboundary movement of hazardous wastes has also been prepared. This is required by the Basel Convention which Qatar has ratified.

**Programmes and Projects:** No information available.

**Status:** The availability of raw materials, a cheap labor force, and an increased demand for oil/gas derived products led to the diversification of the industrial sector in the 1970s. These years saw the establishment of petrochemical, fertilizer, iron and steel, cement and gas liquefaction plants. Although it was obvious at that time that these industries may result in the generation of water and air pollutants, solid and hazardous wastes, their environmental impacts were not fully considered. The philosophy was one of producing more products with lesser concern to pollution. Following the Earth Summit in 1992, the majority of the local industries are becoming aware of the need to protect the environment. The efforts exerted in this regard vary in degree and intensity from one company to another. Some of the companies are adopting management systems and environmental policies of continual improvement. Some of these management systems are based on the International Environmental Rating System. The ultimate aim of these efforts is to obtain ISO certification. Among the future plans in Qatar is one to divide industries into prescribed and non-prescribed processes depending on their size and the quantity of emissions and discharges that they can produce, if operated uncontrolled. The operators of prescribed process would then be required to eliminate or render harmless the substances that may cause pollution to the environment whether that is to air, water or land. To discharge this requirement, these installations would be required to have a "permit" to operate. This will serve as a compliance enforcing mechanism. Non-prescribed processes which are mainly of light industry type will be given guidance to reduce the environmental impacts by following strict codes of practices and

guidelines. The Environment Department also plans to prepare lists of potentially polluting industries that should operate with a permit.

**Capacity-Building, Education, Training and Awareness-Raising:** Most companies are taking the responsibility of providing employee training programs on environmental issues. Some have already implemented in-house training sessions for their line management and are planning to take it down to the lower levels of their operational hierarchy. All major companies have formed environmental protection sections or departments to look after and assess the environmental impacts of their operations. There is still a lack of strong institutional capability of the environment department, due to its recent formation and resources. The Environment Department is in its infancy and is building up its institutional capabilities. Other constraints include a lack of national infrastructure for the treatment and disposal of industrial wastes and insufficient awareness of the environmental effects of the production processes. Among Qatar's future plans are the following: mandate waste minimization audits to be conducted by the existing prescribed industries to help identify the best possible ways and methods to maximize resource usage and reduce discharge of pollutants to the environmental media; institutionalize the requirement of operating permits; and collaborate and induce other government institutions to build the required infrastructure such as engineered landfills, wastewater treatment works, and so forth.

**Information:** The Environment Department has created a Geographic Information System database of the local industries. The database features the pollution point sources and associated pollution loads. Specifications for air quality monitoring stations have been prepared and are awaiting approval. These stations will be fixed at strategic sites to represent the impacts of the traffic movement and industrial installations. This will help assess the quality of air in the country. A survey of the marine environment for heavy metals and hydrocarbons at selected sites in the coastal areas is being carried out by the Department in collaboration with the Marine Science Department of the University of Qatar, and a national report on Ozone Depleting Substances has been prepared. The national consumption of these substances is determined to be below 0.3 kg/ca/year and, thus Qatar is assessed to be an "Article Five country". Qatar's future plans include the installation of air quality monitoring stations in urban and industrial areas; mandated environmental status reports as a part of the annual report of all companies; and a requirement that industry periodically report its self-monitoring activities to the environment department.

**Research and Technologies:** Qatar plans to promote clean technologies by establishing a link to international databases, and encouraging local colleges and universities to conduct research and development projects, in relation to environmental issues specific to the nation's industries and ecosystems.

**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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