



# State of Environment in the Arab Region A progress Report



United Nations Environment Programme  
Division of Regional Cooperation  
Regional Office for West Asia



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# **State of the Environment in the Arab World**

## **A Progress Report**

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## I. Introduction

The Council of Arab Ministers Responsible for the Environment (CAMRE) presented on behalf of the Arab Countries to the World Summit on Sustainable Development (WSSD) in Johannesburg (September 2002) an Assessment Report on the progress made towards achieving sustainable development. CAMRE also launched the Arab Initiative on Sustainable Development as a Type II Initiative, to be implemented in the region and linked with other regional/global initiatives. The report was prepared by the Joint Secretariat for the Arab Region, comprised of the Technical Secretariat of the Council of Arab Ministers Responsible for the Environment (CAMRE), the United Nations Environment Programme, Regional Office for West Asia (UNEP/ROWA) and the Economic and Social Commission for West Asia (ESCWA), based upon the outcomes of a series of consultative meetings involving a wide number of stakeholders.

The assessment report provided background, baselines, trends and challenges that serve to identify the progress made in achieving sustainable development over a decade of rapid economic and social development in the Arab Region. It identified the driving forces that are impacting the sustainability of our natural and cultural resources, as well as the challenges that must be addressed to strengthen progress towards sustainable development. A platform of priorities for action was also provided to identify the key components of sustainable development that should be addressed in the Region during the upcoming ten to twenty years.

The current report is a follow up of the WSSD Report, outlining the major changes in the state of the environment, trends and challenges that have emerged since the WSSD. The process for preparing a more comprehensive report will commence in 2004, as part of the Global effort to produce the GEO4 report.

The overall assessment of the State of the Environment (SOE) in the region may be summarised as follows:

Data released in 2003 indicate that economic growth in the region was affected by war and instability and is lagging behind the world average. Furthermore, unemployment is rising and reaching double digits in most countries of the region, especially among females, due to population growth, lack of investments, and political instability (World Bank 2003).

Peace and security, especially at the national and regional levels, have a major influence on the form and rate of economic and social development. This is also true on the Arab region, where the situation is even more critical than during last decade. In 2003, the region experienced a major war that had a major impact on socio-political and economic stability of Iraq, with potentially major consequences on the environment and human safety and health that could also have regional impacts to neighbouring countries. Although it may have contributed to the accelerated political transition and reform in some countries of the region, the war and deterioration in security have pushed many countries to accord national security higher priority which often leads to leaving environmental issues lagging behind in priority.

Except for revealing the catastrophic environmental decay in the Iraqi marshes, there were no major development occurred in water status in the region. However, water scarcity is still considered as a major issue of concern leading to policy and institutional reforms in some Arab countries. Expansion in desalination and sea reclamation, (especially in the GCC countries), for commercial and recreational purposes has become a booming business.

Releases of sewage, industrial effluents and over fishing have aggravated ecological strain in the marine and coastal ecosystems.

Incidence of sand and dust storms, heat waves, flash floods, as well as forest fires increased in the whole region. Huge sandstorms were imaged on the skies of the region in several occasions in 2003. This may reflect the state of deterioration of the terrestrial ecosystem and the environmental changes in the region, often associated with war operations, industrial activities (including open pit, mining of sand and gravel) and over grazing of animals.

In spite of the noticeable increase of awareness and interest in changing towards more sustainable forms of industrial production, the rates of release of emissions, liquid effluents and solid (including hazardous) wastes remain a major challenge for the rapidly growing industrial sector in the Arab region.

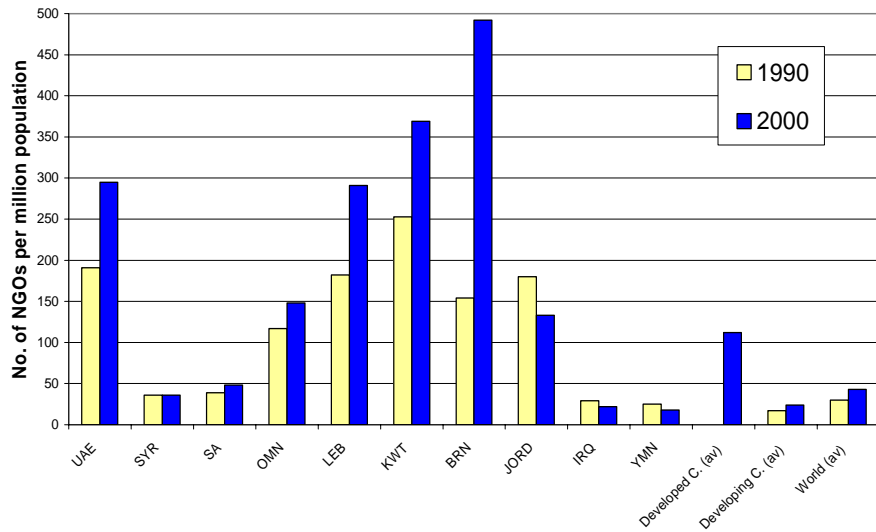
As for public participation the growing number of NGOs and the socio-economic policy reforms as well as new legal and institutional arrangements in some countries is considered a positive development in the region. The WSSD Arab initiative along with other declarations and pan-Arab initiatives reflect the growing concerns about environmental as well as socio-economic sustainable development in the region. However, lack of financial resources and the difficulty of establishing local and external partners to implement Arab action plans may hamper the initiative and slow the trend towards sustainable development.

The above issues and other subject areas related to the state of environment in the Arab region are addressed in more detail in the following sections.

## **II. Environment and Development in the Arab Region**

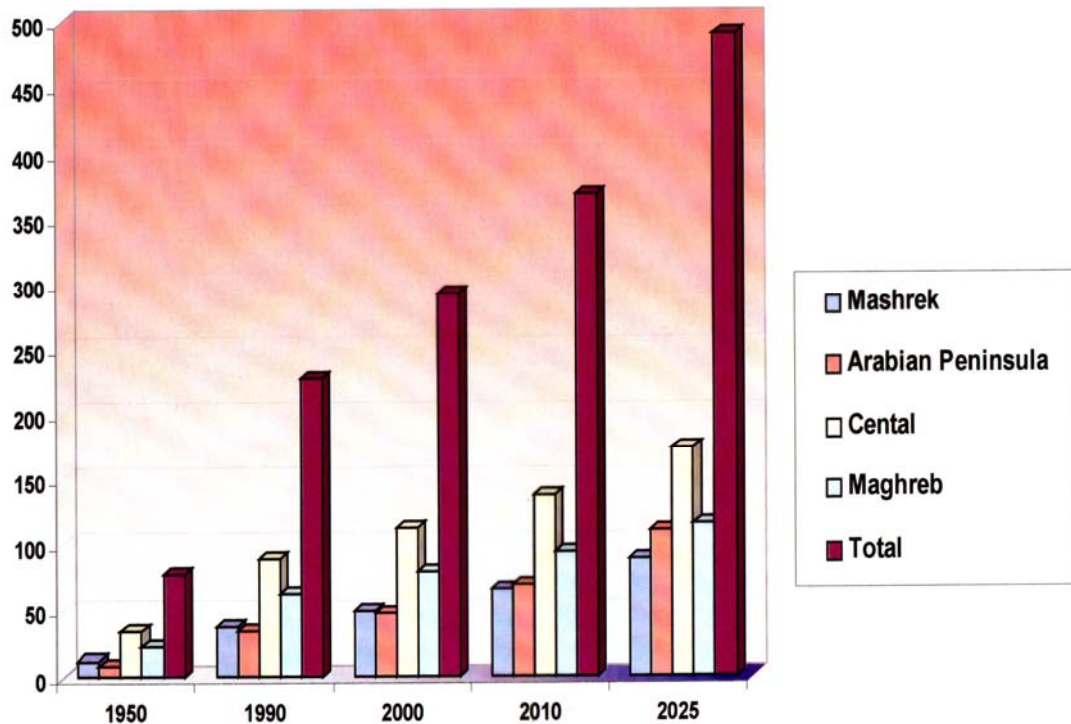
### **A. The Political and Socio-Economic Dynamics of the Arab Region**

The Arab Region is currently in a political transition phase. Constitutional democratisation, public representation (men and women) and voting, auditing and transparency, etc., have been introduced recently in many countries of the region. Civil society empowerment is advancing, which is expected to have a positive impact on the decision-making process, public participation, and effective engagement in environmental protection and sustainable use of natural resources as well as political stability. The process will also have a positive impact on government institutions accountability.



**Figure 1** Source: Centre for the Study of Global Governance, 2001, *Global Civil Society*. <http://www.lse.ac.uk/Depts/global/Yearbook/>, also reported in *World Resources, 2002-2004: Decisions for the Earth, Balance, Voice, and Power*, UNDP/UNEP/WB/WRI, 2003.

The population of the Arab region is estimated at 312 million (2003). The region is highly urbanized with 69 per cent of the population living in urban areas. The agricultural sector in rural areas is insufficient to support the development and employment needs of rural populations. Accordingly, the rate of urbanization in the region has increased, although this does not reflect major improvements in socio-economic conditions at the regional level.



**Figure 2.** Population Growth in the Arab Region (Source: ACSAD)

In 2002, the GDP in West Asia (excluding Iraq, the West Bank and Gaza Strip) grew by 1.9%, less than the low 2001 growth rate of 2.5%. The GDP for the African Arab Countries also falls within this range. The region's weak economic performance in 2002 reflects a slowdown in the performance of the oil sector, low rates of economic activities and the negative impact on the private sector of heightened political instability in the region. To promote economic development, countries of the region are taking drastic measures and policies to promote domestic private investments, and to attract foreign direct investments. This trend is emerging even in the most conservative countries. Unemployment is a main challenge for the countries of the region, especially in the Mashriq countries (World Bank 2003). The spread of unemployment and inequality could have a negative impact on social rest and stability. The continued instability in Iraq, and the fear of spill-over that carries the potential for destabilization of the entire region, as well as the on-going strife in the Occupied Palestinian Territories represent major sources of concern that have direct impact on the economic and social development in the region.

Income equality is still an issue of concern in some countries, with a widening gap between rural and urban areas and the rich and poor in urban centres. Traditional economic growth approaches, foreign debt, structural adjustment and increasing trends towards globalisation have also contributed to exacerbating poverty in the Region. One of the major factors impeding economic growth is weak governance and accountability. Compared to other regions, the Arab region scores low on the index of governance quality, relative to the OCED East Asia and Latin America. Governance and accountability require strengthening the rule of law, protection of property rights, control of corruption, greater public accountability and strengthening of institutions. In response to calls for economic restructuring and reform, many countries have undertaken since the late eighties serious steps towards fiscal reforms. However, most of the reforms are still government-led while the role of the private sector and that of the public remains relatively small.

## **B. Human Settlement and Sanitation**

Analysing the issue of adequate shelter in the region can hardly be separated from challenges related to unemployment, poverty and military conflict. More than two-thirds of the population lives in low-income countries and 70 million live under the poverty line. The average unemployment rate in the region is 22% (up to 60% in Gaza and the West Bank) in the Arab, but is highly varied between countries. Informal settlements surround major urban centres in the region and continue to expand.

Civil unrest and military conflicts have forced migration of populations within countries as well as across political boundaries, creating refugee camps often lacking infrastructures, social and economic support systems.

National land use plans and population distribution strategies have been developed and initiated in many Arab countries such as Egypt, Lebanon, Bahrain, Qatar, Jordan, Saudi Arabia among others. A systematic inter-linkage has been established between urbanization problems, agricultural development, coastal zone management and environmental management. It is increasingly evident that national plans are based on intensive surveys, assessments and GIS tools to implement upgrading and rehabilitation, or clearance in limited cases, of designated areas, according to transparent criteria, prioritisation process, timely and financially secured arrangements. While opportunities for consultation with local communities have increased, mechanisms could be regularized and improved. Special



attention is also being paid to devising national plans for disaster readiness; particularly flash flooding of rivers, severe sandstorms and drought conditions.

Decentralization arrangements have been pursued in certain countries to strengthen local ownership of planning and implementation of development strategies and programs. However, more capacity building is needed to train local and national officials in analytical and management tools, as well as in collecting the necessary data to prepare and implement plans. Indeed, while the legal and institutional framework is gradually being strengthened in terms of land use planning, however implementation and enforcement still lag behind. The formulation of databases and efforts to narrow the digital gap through information support systems could help to overcome these constraints.

Sanitation in the Arab region is a major challenge under the rapid growth in economic and social development. Over 154 million persons in the Arab region did not have access to improved sanitation facilities at the end of 2000. Increasing agricultural, industrial and urban development and population growth over the next 25 years will require significant investment to expand the capacity of existing sanitation networks to meet current and future sanitation needs.

Political conflicts in the Region remains an ongoing challenge to improving sanitation service delivery. Other difficulties are posed by increasing water demand, uncontrolled discharge of domestic, industrial and agricultural pollutants, scarcity of financial resources, and inadequacy of the management and operational capabilities. Water pollution still poses problems for health in many countries of the region. Strategies have been thus instituted in some rural areas to reduce pesticide leaching into water supplies by using safer pesticides and adopting alternative application techniques. Inadequate sanitation infrastructure also imposes adverse impacts on natural ecosystems.

Access to sanitation services and wastewater treatment has gradually improved. Appropriate sanitation schemes exist in most metropolitan centres of high-income countries in the region. Notable progress has been achieved in treated wastewater recycling, especially in severely water scarce countries. Several Arab countries (e.g., Egypt, Jordan and Gulf states), have integrated wastewater reuse into their national water schemes with emphasis on recycling industrial cooling water and reuse of treated municipal liquid waste for irrigation purposes. In support of these efforts, wastewater reuse regulations have been adopted.

Modest results have been achieved in providing sanitation facilities in rural areas in the Arab region. However, the maintenance of these facilities is oftentimes neglected due to lack of funds and appropriate machinery for rural use. Nonetheless, several countries have expanded access to services through government spending and partnership with the private sector. Affordability of service varies, but social and political considerations still govern the pricing system, and separate tariffs are set for different users. As secondary cities emerge and decentralize urbanization, new investments in sanitation are being diverted from primary to secondary cities.

## **C. Industrial Development**

### **1. Industry and Environment:**

Industrial development remains as a vital component of the development processes of the Arab Region providing an important source of national income through trade, creating jobs and adding to the value of primary products. The interest of Arab industry in the preventive approach to control environmental pollution has been rising continuously; and there is a detectable trend of shifting from end-of-pipe treatment to more proactive methodologies including cleaner production and at-source waste minimization. In order to nurture such tendency, a coordination mechanism between CAMRE, UNEP/ROWA, UNIDO, ALO and AIDMO has been established to develop an Arab Strategy to promote and implement Cleaner Production and Sustainable Consumption in the Arab Region (conforming to Abu Dhabi Declaration 2001). The regional CP strategy involves technical support to the establishment of National Cleaner Production Centres (NCPCs) and capacity building to raise awareness and capacity in government agencies, industrial support agencies and the industry. Currently, there are NCPCs in Morocco, Tunisia, Jordan, and Lebanon. Furthermore, Egypt, United Arab Emirates and Syria are in the process of developing their NCPCs.

Voluntary initiatives in industry including EMS, Corporate Citizenship, Global Compact, Global Reporting Initiatives, Responsible Care and the WSSD International Sectoral Initiatives have also been gaining momentum among Arab industrialists. The increasing awareness and demand from industry and governments in recent years have opted UNEP to offer technical support and training throughout the region to Small and Medium Size Enterprises (SMEs) to improve their environmental management systems (EMS) performance. The training included elements of CP, EMS (ISO 14000), voluntary initiatives and emergency response; and consisted of 5 Executive Briefings conducted in 2002-2003 and 6 Training Workshops held in 2003. The capacity building benefited more than 70 companies and a number of ministries (Environment and Industry) and national industrial organizations. Additionally, several initiatives relevant to the Industrial Estate Management (EIM) and the Awareness, Preparedness for Emergencies at Local Level (APELL) programme have been introduced in the region. Currently, Egypt and Yemen are developing their environmental and industrial emergency programmes, pursuing the linkage between APELL and EIM. Furthermore, the APELL applications in Maritime Transport and Ports and Terminals operations have also been discussed between UNEP and ROPME-MEMAC, and was agreed to continue promoting the programme in the region. Currently, the feasibility of establishing a Regional APELL Centre is being explored with member states and the Secretariat of the Gulf Cooperation Council (GCC).

### **Regional Environment and Industry Programme**

Due to mainly industrialization, the Arab Region has historically witnessed many gains in human health and development, from life expectancy expansion to per capita income increase, to education and training progress. However, during the same period, impacts on natural resources depletion and environmental degradation rose dramatically as the scope and intensity of industrial (and urban) activities increased. Fortunately, there has recently been increasing awareness of the diverse and complex environmental problems caused by industrialization, and their impacts on achieving sustainable development in the Region. And indeed there is an unmistakable trend by (especially large) Arab industry to reverse the inherited deterioration and take social and environmental responsibility seriously.

Many bright examples may be cited to depict how Arab industries are integrating environmental considerations into industrial development and implementation:

- The Arab Cement and Building Materials Industry (through the AUCBM's Board Council) has just adopted the new international initiative on Sustainable Building and Construction (SBC)
- The Arab Oil & Gas and Refining Industry (through the involvement of OAPEC) has just adopted the WSSD Clean Fuel initiative (CFI).
- The Arab SMEs have been keen on incorporating the components of Environmental Management Systems (EMS) into their day-to-day operations. About 70 companies have been recently trained on the ISO 14001, and the majority is committed to pursue the ISO certification.

## **2. Chemicals and Waste Management:**

Public concern over the management of solid and hazardous waste has markedly increased over the past few years in the Arab region. Vocal public concern has also been witnessed regarding proposed incinerators to burn medical and industrial waste near residential areas.

Signing and ratification of relevant MEAs, including Basel, Rotterdam and Stockholm Conventions are still actively pursued in the region, and the principles of Life-Cycle-Assessment (LCA), and the Cradle-to-Grave (and Cradle-to-Cradle) are gaining popularity in the development of integrated regional strategy on chemicals and wastes management. Most Arab States are signatories to both Basel and Stockholm Conventions. However, Rotterdam status is still limited in the region.

Yemen has developed its National Hazardous Waste Strategy & work-plan (NHWS) under Basel Convention in 2003. The level of bilateral/multilateral cooperation between Arab States on chemicals & waste management is still constrained, and an integrated regional approach is direly needed. Another issue facing most GCC countries regarding the GEF eligibility criteria for financial funding under the Stockholm Convention (and others) may also have counter-productive effects on conforming to MEAs in the future.

## **3. Energy and Transport:**

It is of importance to note that the per capita consumption of energy in some Arab States continues to be among the highest in the world, consequently generating high emissions of Green House Gases (GHGs) and traditional air pollutants from both stationary and mobile sources. Nonetheless, several regional stockholders, including CAMRE, UNEP/ROWA, ESCWA and OAPEC have been working on developing an Arab Energy Strategy within the framework of the (Water, Energy, Health, Agriculture and Biodiversity) WEHAB initiative

launched in the WSSD in Johannesburg, advocating energy efficiency and alternatives, as well as cleaner fuels and technologies. In this regard, the Environment and Energy 2003 Conference & Exhibition was convened in Abu Dhabi-UAE, 2-5 February 2003, and crowned by the Abu Dhabi Declaration on Environment and Energy issued jointly by the Arab Ministers of Energy, Oil and Environment. This declaration is undoubtedly a clear indication of genuine concern and new inclination to deal sensibly with this vital but sensitive issue for the region. For the Conference, UNEP/ROWA produced a report document, titled "Energy & Environment: A Framework for Action in the Arab Region".

Many Arab countries have expanded road networks at the national and regional level and have further developed and upgraded their public transit systems. Policy approaches in the region have focus mainly on switching to fuel types that are less polluting, such as unleaded fuel and natural gas alternatives. Urban air pollution has correspondingly improved, although the number of vehicles in use continues to increase. Effort is also being made to introduce more sustainable fuels in power generation. Worth mentioning is that all GCC countries and few other Arab States have phased out leaded gasoline in 2003, the rest are planning to follow the same responsible direction at different pace. Many promising examples may also be cited from the Arab region on diligent efforts undertaken towards using cleaner fuel and transport technologies and thus curbing of the atmospheric emissions. Egypt, for instance has recently retrofitted the majority of its mass transport vehicles to utilize natural gas rather than traditional fueling systems. Lebanon has also banned all old diesel vehicles from entering major urban areas, and legislated their replacement with newer gasoline driven engines. Nonetheless, sulphur and other components and pollutants are still high in fuel, causing continuous deterioration in air quality, especially in major cities, in high density urban centres.

On another front, CDM projects under Kyoto Protocol are earning acceptance in the region and are being pursued, particularly in Egypt, Jordan, Lebanon, Palestine, Syria and Yemen, with special emphasis on carbon sinks. With this in mind, a proposal to establish a West Asia Centre of Excellence in Energy for Sustainable Development in the region (as a part of the Global Network on Energy for Sustainable Development) is being discussed.

#### **4. Trade and Environment:**

The key concern in the region is for Arab States to have fair and competitive access into the international market. The perception in the region is that unjust constraints and hurdles have been put in place by the developed world on the expense of developing countries' interest, including those of environmental nature. However, a lack of bilateral/multilateral trade cooperation and economic integration between the Arab States is still the major dilemma facing the region. This integration is no longer a luxury, but it is a crucial necessity for the region's sustainable development in light of the fast proliferating globalization around the world.

Globalization and its implication to the Arab Region may limit or constrain the potential to achieve sustainable development. Therefore, the Arab Region needs to rearrange (reform) its economic and institutional situations to deal with globalization, and to create a Regional Arab Block based on the common and strong cultural, civilization, social and economic base. The establishment of an Arab economic entity requires strengthening the elements of the Greater Arab Free Trade Area, and seeking regional integration to create a large market for Arab

products. It will also support the negotiating position of the Arab countries with other regional and economic blocks and WTO.

A regional Trade and Environment capacity building 5-year programme is being developed in partnership between UNEP, CAMRE and ESCWA with the key objective of enhancing the competitiveness of Arab goods in the global market, while satisfying environmental protection standards. Scope, activities and funding mechanisms have also been identified. In this regard, a regional workshop on The Environmental Impacts of Trade Liberalization (especially in the environmental sector) was convened recently in Cairo, 4-5 December 2003.

## **5. Sustainable Tourism and Eco-Tourism:**

The Arab region is rich in tourism resources including archeological, natural, religious and scenic sites. The region is not only the cradle of civilization, but has been as well the cross road between civilizations, which has left numerous important legacies of human history. Naturally, the region composes of diverse terrestrial eco-systems, including deserts, mountains, forests, coastal areas and fertile meadows. Approximately 24 million tourists come to the region annually (3.4% of the world total) with a rate of growth of about 9.4% (World Tourism Organization, 1990-2000). Cooperation and integration are still lacking between Arab Tourism and Environment Ministries. Although, signs of unsustainable tourism development and deteriorations especially in coastal zones are propagating through out the region, few responsible projects can also be cited of positive and environmentally friendly trend (e.g., the Red Sea Sustainable Tourism Initiative, RSSTI). With this in mind, and through regional partnership, stakeholders have been advocating an Arab approach towards sustainable tourism, including development of policy guidelines and a regional strategy for sustainable- and eco-tourism and capacity building within the tourism sector for sustainable development. In this regard, a major international conference was held in Egypt 2003, two regional symposiums were conducted in Bahrain and Lebanon 2002, among other activities. Building on such works, publication of two Arab Manuals on Sustainable & Eco-Tourism, concentrating on Hotel Operations are under publication.

### **D. Agricultural Development**

Agriculture and food production remain a significant contributor to the national economy of most countries of the Arab Region averaging 12-13 percent of regional GDP. This belies the importance of agriculture as a significant driver impacting various aspects of sustainable development, namely labour, rural-to-urban migration, water use, land management, research and technology development, food security, as well as society and culture.

Although considerable efforts have been made by the countries of the Region to improve field management techniques, yet, most of the cropping patterns adopted under rain fed and irrigated conditions need to be developed along innovative trends.

Agricultural protectionism continues throughout the Region, as does heavy subsidisation of irrigation water (the primary user of freshwater in the Region) and agrochemicals, which has lead to unsustainable patterns of agricultural production. This has rendered the sector inefficient and particularly vulnerable to trade liberalisation agreements that seek to eliminate agricultural subsidies and reduce tariffs. However, reform in the agricultural sector depends also on progress made internationally through the WTO negotiations towards setting standards and norms on an equitable basis.

Fisheries are an important economic sector to selected countries in the Arab Region such as Morocco, Tunisia, Mauritania and Oman. In 1998, the total fish exports of the Region stood at 431 thousands tons (966 million dollar revenue), more than half (56.2) was from Morocco. Fish landings have increased in most countries of the Region since 1990 (between 1990 and 1999, fish production increased from 1,859 thousands tons to 2,639 thousands tons), but with significant increases in fishing effort. This brings into question the sustainability of the fish stock in regional seas. Fisheries resources have become increasingly threaten by over-fishing, habitat destruction, and increased coastal and marine pollution emanating from land-based sources as well as increased ship traffic.

### **III. The State of the Environment and Policy Analysis in the Arab Region**

#### **1. Fresh Water Resources**

The water resources in the Arab Region are scarce and thus countries have given high priority to the development and management of these resources. All the countries of the region have developed national water plans keeping within the broad lines of Agenda 21. Although, planning is still not conducted within an integrated framework for conventional water resources (rainfall, surface water, and ground water) and non-conventional resources (desalination of sea water and treatment of industrial and domestic wastewaters), the access to water resources and services has improved. Percentage rates of water used in different sectors in every country indicate that the rates of water consumption in the Arab region are 6.9 per cent for domestic use, 5.1 per cent for the industrial sector, and 88 per cent for the agricultural sector. Water consumption per capita is 800 cubic metres, whereas average domestic use of water is about 40 litres daily per person. The agricultural sector remains the major user of water resources in fourteen Arab countries. (Roufail, 2003)

The problems of water utilisation emerge in the day to day handling of water in various sectors. Both water quantity and quality are problematic for the region. A low level of efficiency can be noted in the utilisation of water in all sectors that use water, and especially in agriculture. This has generated a range of problems such as water logging salinity, low productivity and infertility of soil and the deterioration of the quality of ground water.

In most Arab countries effective national institution frameworks have been set up to meet the demand for water resources management. However, water governance remains fragmented among ministries, which generate conflicts of interest, lack of standardization of specifications and criteria, dispersal of information and excess expenditure. In view of the need to improve coordination, several Arab countries have established coordination mechanisms for institutional frameworks in the water sector that are responsible for formulating water policies and elaborating plans and strategies (e.g., Bahrain, Morocco, UAE). Decentralization of water management is also emerging in some instances, complemented by the establishment and maintenance of water databanks at the governorate or local level.

Participatory approaches to dealing with the water sector have emerged in some countries. The best example of this is the system of *faggar* (small wells and canals in Syria and Jordan) and the system of *falagg* (with user associations determining water allocations in Oman,

UAE, Yemen and Saudi Arabia), the *canal system* in Egypt, and the agricultural drainage water authorities in Saudi Arabia.

Most Arab countries have recently given their attention to water legislation to ensure sound implementation of water policies and sound management of this important resource. Most of these countries have agreed on the principles of Islamic water law. While the enforcement of water regulations has improved, problems persist. These include high consumption rates, network leakage, limited scale treatment and recycling, poor irrigation practices and lack of cost recovery policies, and other institutional reforms measures.

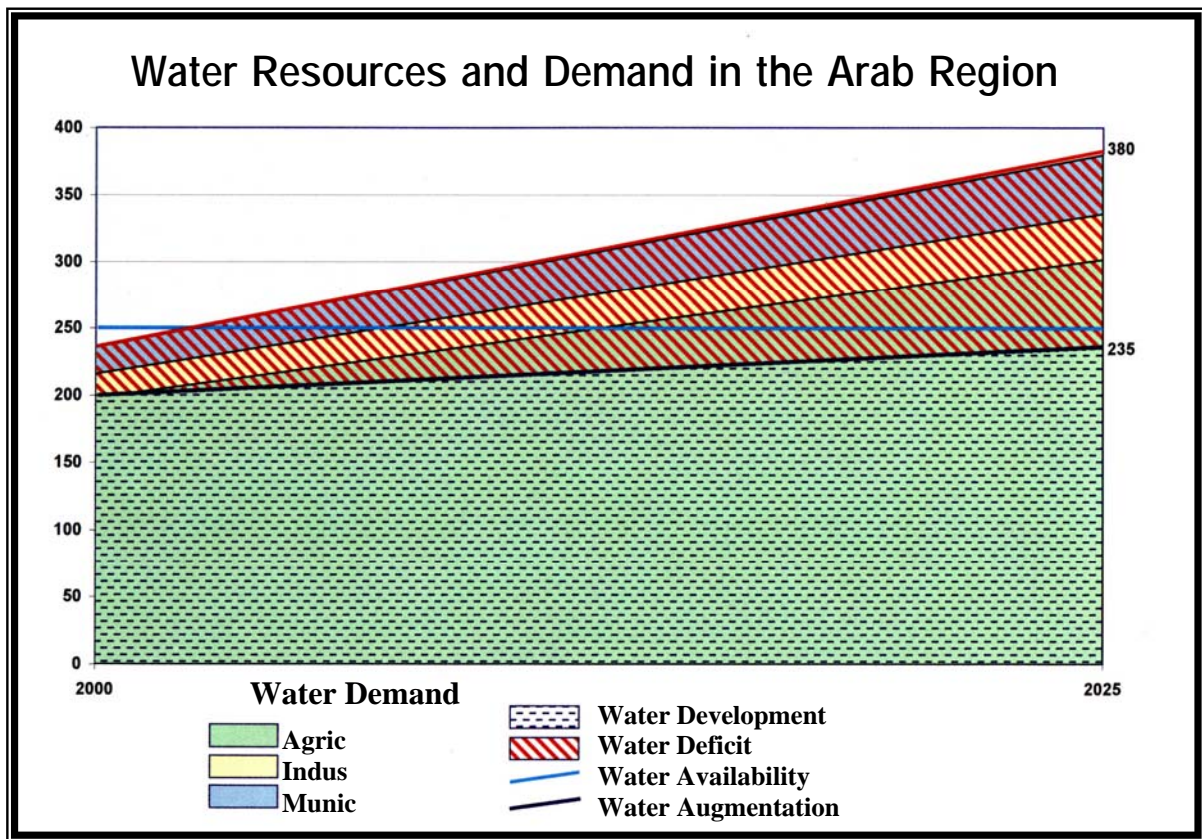


Figure 3. Water Resources and Demands in the Arab Region. (Source: ACSAD)

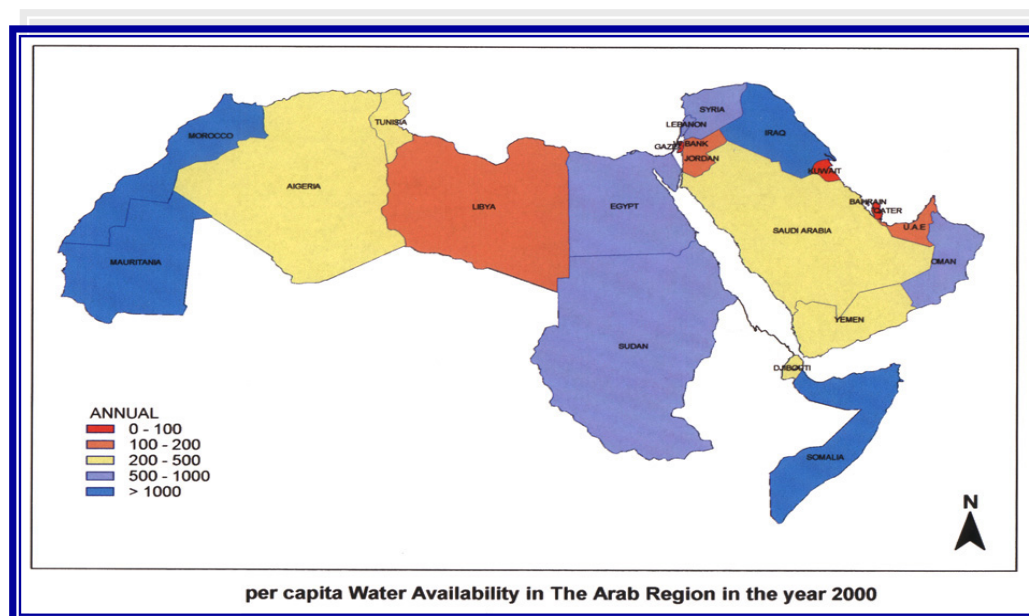


Figure 4. Per Capita Water Availability. (Source: ACSAD)

Water policies vary significantly between Arab countries, particularly with regard to tariff structures and the extent to which cost recovery is sought. However, important strides have been made to increase financial incentives and instruments to encourage water use efficiency.

Tangible progress has been achieved in the development of water resources, particularly through rainwater harvesting, desalination and improving irrigation efficiency. Research and development in desalination continues to increase, as do new investments. Six GCC countries produce about half the world desalination power. The Arab region as a whole produces about 60 per cent of global output (about 2,000 million CM/year). Arab countries increasingly recognise the importance of water networks, monitoring and data in making and implementing water plans. (Roufail, 2003)

The problem of shared water resources remains as a major issue in the region threatening its stability and creating a potential for conflict. Recently, tension grew between Israel and Lebanon on the waters of Wazani and Hasbani Rivers in Lebanon.

About 60% of water resources in the Arab region originate from outside the region, which gives rise for tension on the exploitation of this scarce resource. Until now, conventions and agreements on sharing and management of water resources (including surface and groundwater) have not been signed by riparian countries.

However, an important progress has been made on this issue within the region between Syria and Lebanon, where the two countries have signed an agreement on sharing the Great Southern River Basin Water. The agreement is based on the "UN convention on the Law of Non-Navigational uses of International Water courses", and in accordance with its principles of equitable and reasonable utilization and participation, no significant harm, obligation to cooperate, and exchange of data (Jaber, 2002).



### **Water Institutional Reforms and a Shift towards Demand Management in the Region**

By all measures, the Arab region is considered one of the most water-stressed areas in the world, and its long-term water situation is becoming increasingly uncertain. Water balances either have already slumped into serious deficit in some countries, or are moving steadily towards that direction. The main water challenge in the region is a management challenge. The water problem can be greatly offset by improving management capacity.

It is recognized that the ability to implement many of the modern concepts of water management is significantly hindered, in many countries of the region, by inadequate capacity of the existing water management institutions. Indeed, concepts such as integrated management, decentralization, privatization and the shift of water management focus towards controlling the demand, have been embraced by most countries and incorporated into revised water policies which these countries have developed over the past decade or so. Often, however, what remains to be done is to develop the institutional capacity for implementation of these policies.

Inappropriate institutional arrangements manifested by fragmentation of water authorities constitute a major constraint in the management of water resources in the Arab Region. However, in Oman, Yemen, Palestine, and more recently Saudi Arabia, single water ministries charged with the responsibility of all aspects of water resource have recently been established. This institutional arrangement is expected to enhance the effective management of water resources. For example, in Saudi Arabia, three ministries were dealing with water resource management and development, namely, the Ministry of Planning, Ministry of Agriculture and Water Resources and Ministry of Municipalities. To consolidate and to lead the government efforts in the water sector, Saudi Arabia announced in 2003, the establishment of the Ministry of Water and Electricity, bringing together two vital aspects of the Kingdom's economy under one ministerial roof. The new Ministry is to be responsible for all water and wastewater related departments and agencies in the Kingdom.

Furthermore, two major steps have been taken in the GCC countries that will enhance regional cooperation in the field of water and is anticipated to improve the water situation. The first is the formulation of the "GCC Water Cooperation Committee" in mid 2002; with its members are the water ministers of the different GCC countries. The committee main agenda is the integration and harmonization of the water policies in the region. The second major step taken was in the coordination of research and development in the field of desalination. The GCC have more than 60% of the total world desalination capacity with major investments in this sector, and desalinated water represents the principal source for providing drinking water to its urban centres. It is anticipated that this coordinated intensive research will help acquiring and indigenizing desalination technology in the region, and more importantly in reducing the unit production cost of desalination and treatment and modify per capita freshwater share in the domestic sector in the region.

In the past three decades, water authorities in the region have concentrated their efforts on "supply augmentation", and to a lesser extent, on demand management, conservation, and protection. However, in the last few years, a clear shift towards the latter management approach, supported by public awareness campaigns, has been made in most of the countries (WHO/UNEP, 2001). However, this shift has been made with varying degrees among Arab counties, and in a fragmented implementation manner. Furthermore, the absence of effective regulations and water pricing policies has contributed to the wastage of water and has affected the effectiveness of these measures in most of the countries.

## **2. Marine and Coastal Areas**

In 2003, the coastal zones of the region continue to be under various degrees of stress as a result of major demographic shifts from rural to coastal urban areas, intense urbanization, land-filling, tourism, and dumping of untreated waste. To meet the growing demand for

urbanization and recreational activities, dredging and land reclamation have been intensifying in most countries of the region. These trends will continue and intensify as new projects have been approved and executed.

The Marine environment is increasingly threatened by land-based sources of pollution. In some countries, the challenge is primarily from major rivers that discharge domestic and municipal wastes, agricultural chemicals, and hazardous industrial substances into the sea. While in the GCC countries, the challenges are from oil-related, industrial, and desalinization plants spills and discharges. Fish kill phenomena have been observed over the recent years along the North Western part of the Gulf including the Eastern Coast of Saudi Arabia, Kuwait and some of the Iranian ports. Findings suggest that eutrophication manifested as red tides and depletion of oxygen as a probable causes.

The Region seas are considered to accommodate one of the heaviest ship traffic in the world. For example, around 12,000 ships enter the ROPME Sea region, out of which 8,000 are tankers transferring and discharging large amounts of ballast water. Of the world's exported oil, 60% is transported through the Strait of Hurmuz. The discharged water introduces invasive marine species that could cause irreversible damage to marine ecosystems. A regional plan to minimize the transfer of harmful aquatic organisms and pathogens in ships ballast water was adopted in a meeting in Iran, October 2003. Progress has also been made towards the establishment of reception facilities for oily waste and other wastes, and the implementation and enforcement of MARPOL 73/78, especially in the Gulf area. Countries of the Region are all taking parts in major action plans organised in the three regional seas; the Mediterranean, Kuwait and Red Sea & Gulf of Aden Action Plans.

Physical alteration and destruction of habitats, by activities such as dredging, land filling, mining, quarrying are major threats to most countries of the Red Sea. Land-based pollution is relatively high in the Mediterranean compared to the other regional seas. In an assessment of land-based activities in the Gulf, ROPME has identified sewage, oil pollution, and physical alteration of habitats, industrial effluents, solid waste and litter dumping as the major sources of pollution in the area.

### **Protection of Biodiversity in the Marine Environment of the Arabian Seas**

#### **i) Coral Reefs**

In corporation with the International Coral Reef Action Network (ICRAN), a series of project proposals will be developed for activities in the ROPME and PERSGA regions to strengthen coral reef management. A Regional Seas Programme Officer has been recruited by UNEP will coordinate these activities, in close liaison with ROPME, PERSGA, the ICRAN Coordinating Unit (ICU) and the UNEP Coral Reef Unit (CRU).

#### **ii) Development of Biodiversity Protocols and Protected Areas.**

The final draft of the Regional Action Plan for the conservation of Coral Reefs in the Arabian Seas Region has been developed by PERSGA in cooperation with UNEP/ROWA, ROPME and National Commission for Wildlife Conservation and Development (NCWCD) in Saudi Arabia.

Meetings have been held to discuss the Technical and Legal Aspects of the Regional Strategy for Biodiversity and Protocols for the Establishment of Protected Areas in the ROPME and PERSGA region in order to protect the valuable biodiversity of our marine environment. Both organizations are in the process of finalizing and signing the Protocol.

### 3. Land Degradation

The Arab Region is characterized by dry, harsh climatic conditions and limited natural resources of water, soil and vegetation. The levels of water scarcity in most of the countries in the region are among the highest in the world. Rainfall is limited and erratic and the region experiences frequent droughts. Soil erosion by water and wind, salinization of soils, deterioration of the natural vegetation of rangelands and forests, depletion of biodiversity, climate change and sand encroachment all contribute to land degradation, which is reducing the land productivity and ultimately threatening the livelihoods of the population in the region.

Out of the total area of the Arab region (14.1 million km<sup>2</sup>), 14.5% are usable for agriculture, with 4.2% currently in use. This includes areas that use rain-fed irrigation for cereals, with productivity that is generally lower than the international levels; irrigated areas which produce over 70% of the total agricultural output, in spite of its relatively small size; natural grazing areas which cover over 0.5 billion hectares. An environmental assessment of the relative distribution of suitability of lands for various agriculture practices by ACSAD has shown that 11% is suitable for agriculture (rainfall up to 400mm), 20% are semi dry to dry and marginal lands with rain fall ranging from 100-400 mm which is relatively suitable for agriculture; and 89% are areas with rainfall of less than 100mm which are mostly deserts or desertified areas suitable only for grazing. Most of these areas are threatened by desertification due to anthropogenic activities leading to desertification including overgrazing. Overgrazing is responsible for about 26% of the desertification that is taking place, whereas 21% of the total area is threatened by desertification due to forest/shrub clearing operations, compared to 2% and 1% of the total area lost annually due to salinization and urban expansion respectively.

The appropriate management of land resources is a key element in the sustainable development of the region. The appropriate management of water resources is essential in order to combat land degradation and conserve soils and vegetation. Poor irrigation and drainage management results in salinization of productive soils. Over exploitation of groundwater is one cause of salt-water intrusion in aquifers that threatens the limited sources of fresh water. While the use of water of marginal quality to maintain or improve vegetation cover is an attractive option in some areas, appropriate measures are needed to prevent land degradation by soil salinization. Similarly, the appropriate management of rangeland and other vegetative resources is essential in order to conserve biodiversity and prevent soil erosion by wind and water, as well as to maintain the inherent productivity of the resource base for future generations.

The appropriate management of rangeland, forest and other vegetative resources is essential in order to conserve biodiversity and prevent soil erosion by wind and water, as well as to maintain the inherent productivity of the resource base for future generations. Although considerable national efforts have been undertaken by the countries in the region, and by international, regional and sub-regional organizations, the problem of continuing land degradation and desertification is still a serious threat to the livelihoods of the people of Arab

region. It also has serious environmental, economic and social implications that could negatively affect the social and political stability of the region.

The issue is local as well as regional and global. An integrative approach to local solutions should contribute to regional and global welfare as well as conservation of unique ecosystems in Arab region. An immediate need is capacity building of local, national and regional institutions through demonstration and technology transfer of appropriate interventions that are best suited to the particular environments.

Building upon the global strategy to combat desertification through the implementation of the United Nations Convention to Combat Desertification (UNCCD), which aims at combating desertification and mitigating the effects of drought in countries experiencing serious drought and/or desertification with a view to contributing to the achievement of sustainable development in affected areas two sub-regional programmes have been developed in cooperation with member states, UNCCD secretariat, Global Mechanism (GM/UNCCD) and other partners in the region. This is in accordance with Article 11 of the UNCCD stipulating the development of regional (RAP) and sub-regional (SRAP) action programmes. Achieving this objective involves long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level.



Figure 5. Rehabilitation of the watershed area in Aram'a - Lahej, Yemen the total area of the project is about 4000 ha

#### **Sub-Regional Action Programme (SRAP) for West Asia**

Following a series of meetings, the West Asian countries have indorsed on 2000 a SRAP to Combat Desertification and to mitigate the effect of Drought in West Asia to strengthen cooperation in the sub-region.

The SRAP focuses on two strategic domains, common to all member countries of the sub-region, which provide for effective sub-regional cooperation in addressing common problems and in promoting experience and innovation sharing between stakeholders. In strategic terms, water resources and their sustainable management are a key issue for the future development of the sub-region. Similarly,

vegetative cover, particularly forests and rangelands, and its sustainable management are a key concern in combating land degradation. Accordingly, the SRAP operates through two thematic networks (TNs):

TN1: Sustainable Water Management

TN2: Sustainable Management of Vegetative Cover

Subsequently, the GM/UNCCD made available, through the SRAP Coordinator, UNEP Regional Office for West Asia (ROWA), US\$150,000 to support SRAP implementation in West Asia, including conducting Inventory Studies and preparing a Regional Database on Sustainable Water and Vegetation Cover Management, and preparing a proposal for pilot projects on integrated natural resource management in the region.

Comprehensive project document on Integrated Natural Resource Management for Combating Land Degradation in West Asia, covering proposed pilot sites in all member countries, has been developed. Within the framework of the Thematic Networks, the proposal aims to establish representative pilot projects to address the issues of land degradation, and to demonstrate sustainable, environmentally friendly and socially acceptable interventions to combat land degradation in West Asia.

Implementation of comprehensive pilot projects in all SRAP West Asia member countries is dependent upon securing funds, which are likely to come from several sources. It is proposed, therefore, that the project be implemented in phases as funds become available.

Start-up activities are currently being implemented supported by funds of US\$ 350,000 committed by the Global Mechanism of UNCCD. These funds, however, are not sufficient to support activities in all participating member countries. Accordingly, criteria by which to prioritize start up activities were developed in consultation with ICARDA, ACSAD, and the Global Mechanism of the UNCCD.

Four countries have been selected in which to start implementing pilot projects. These are Lebanon and Yemen for the mountainous areas and Syria and Jordan for rangeland rehabilitation. Furthermore, as the funds are insufficient to support activities beyond four years, this sub-project lays out the activities that will be conducted in the four sites over an initial period of four years within the context of the overall project. It is expected that during this time additional funds will be secured.

### **Sub-Regional Action Programme (SRAP) for the Arab Maghreb Union (AMU)**

The member countries of the Arab Maghreb Union (AMU) were able to initiate their process of preparation of the sub regional action programme as early as the month of October 1994, when the first international meeting on desertification control in the Maghreb was held in Rabat, Morocco. In November 1995, in Tunis, the AMU Secretariat also organized an information workshop for the Maghreb on the implementation of the Convention.

Eight priority action areas were identified and selected for the SRAP process following the preliminary consultations (October 1994) which were held in the context of the implementation of the Convention:

- Sustainable management of transboundary natural resources;
- Coordination of programmes to develop alternative energy sources;
- Cooperation for the management and control of efforts to combat pests and plant and animal diseases;
- Capacity-building;
- Scientific and technical cooperation;
- Early warning system;
- Exchange of experience and information;
- Fostering an enabling environment.

The strategy adopted to achieve the objectives of the SRAP essentially follows a comprehensive and prudent approach based on the links between the AMU secretariat strives to work with the countries of the sub-region to integrate efforts to combat desertification in national strategies for the elimination of poverty and the improvement of the quality of life in Maghreb as a whole.

An initial meeting organized by the AMU secretariat in Rabat in April 1997, attended by the AMU experts in order to review the preliminary actions designed to allow the activities making up the SRAP to be launched.

The establishment of a sub -regional desertification control fund has been planned to support the implementation of the SRAP; this fund should receive contributions from the member States of AMU and the cooperation partner. The financing requirements for the project for the establishment of a SRAP coordinating unit have been evaluated at US\$1,295,750; financial assistance is sought for US\$ 925,000 of this sum.

Several provisions of the Convention relate to the creation of indicators to monitor progress made in the implementation of the Convention, and so a proposal for a matrix of indicators relating to the implementation and monitoring of the SRAP has been initiated, with assistance from OSS, inter alia.

#### **4. Biodiversity**

In spite of being limited in terms of species richness, biodiversity in the Arab Region has exceptional value when considering the variability of ecological, chemical and genetic characters of the species “intraspecific diversity” which provides a wealthy stock of biological resources that can be utilized through biotechnology techniques to serve agricultural, medicinal and industrial purposes.

The unique and highly vulnerable biodiversity of the Arab Region is at serious risk from increased human activities. The main environmental issues of concern over biodiversity in the Arab Region are the degradation and/or destruction of habitats and the loss of species.

The underlying threats of biodiversity in the Region include population growth, agricultural and urban expansion to ecologically important areas, poverty and unsustainable use of biota, industrial pollution, and macro-scale stress such as drought. Mismanagement of rangelands, over-grazing, over fishing, hunting and hostilities have generated additional pressures.

Dredging and coastal infilling arguably represent one of the greatest environmental threats, particularly in the ROPME Sea region, where more than 40% of the coastline has now been developed. Human activities have also impacted parts of the PERSGA region. Major environmental effects of dredging and infilling include direct loss of often highly productive shallow-water habitat; and sedimentation leading to degradation particularly of photosynthetic ecosystems such as coral reefs, seagrass and macroalgal beds. Early bioeconomic assessments in the ROPME region indicated that even small bays may constitute valuable economic as well as ecological resources. Nevertheless, the high value placed on certain marine ecosystems and renewable resources is supported by actual landings by shrimp fisheries in the ROPME region. These assessments also demonstrate that habitat loss by factors such as dredging and infilling carry not only ecological but also major economic consequences, and need to be included in cost-benefit analyses of new development projects.

The constraints for the conservation and protection of biodiversity and habitats include; water scarcity, land degradation, poverty, weak enforcement of regulations and conventions, and lack of financial resources in most countries. In terms of achievements, there are ongoing schemes of establishing protected areas and biospheres in most countries of the Region. Moreover, most countries of the Region have become parties to the international biodiversity conventions, including the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Migratory Species (CMS) and to a lesser extent the RAMSAR Convention on Wetlands.

### **The Arab Region Millennium Ecosystem Assessment**

The Millennium Ecosystem Assessment (MA) is an international project, which is a 4-year “multi-scale” integrated assessment, launched in 2001. It is designed to meet the needs of decision-makers for scientific information on the links between ecosystem change and human well being. More specifically, the MA is interacting closely with the Parties to the Convention for Biological Diversity (CBD), the Convention to Combat Desertification (CCD), and the RAMSAR Wetlands Convention (RAMSAR Convention) in order to contribute to the fulfilment of their assessment needs.

The MA focuses on how changes in ecosystem services have affected human well-being; how ecosystem changes may affect people in future decades; and what types of responses can be adopted at local, national, or global scales to improve ecosystem management and thereby contribute to human well-being and poverty alleviation.

The Arab Region Millennium Ecosystem Assessment is a sub-global assessment of the Global Millennium Ecosystem Assessment lead by UNEP/ROWA and the Millennium Secretariat. The project will be implemented in three sites in the Arab region, namely; the Assir National Park, Saudi Arabia; the Sinai Peninsula, Egypt and the Tafilalt Oasis, Morocco. It will be conducted in collaboration with national partners lead by the Presidency of Metrology and Protection of Environment in Saudi Arabia, the Suez Canal University in Egypt and the National Observatory for the Environment in Morocco. The project is funded by the generous contribution of the Kingdom of the Saudi Arabia.

The initial phase will pave the way for widespread adoption of integrated assessment approaches in the Arab region, including national and local assessments. The objective is to develop, within one framework, a coordinated and integrated regional collaborative multi-scale effort of assessment for the region, to prepare the ground for decision-makers with a view to the comprehensive and sustainable management of the natural environment. The assessment is examining the impact of social and economic development on the ecosystem, and would recommend appropriate policies and actions to protect and effectively manage the ecosystem in the region.

## **5. Atmosphere**

### **a) Urban Air Quality**

Urban air pollution is emerging as a serious problem facing not only major cities but also many medium size cities in the Region. Such cities are experiencing air pollution with gases and particulates and lead at levels often exceeding the WHO guidelines. Urbanisation, industrialisation, and energy production are the main driving forces leading to air pollution problems.

The main sources of air pollution in the Region are energy and industrial production and vehicular emissions, which tend to expand with economic growth. Vehicle emission is

considered the most prevailing source of air pollution amounting to 90 percent of CO emission, due to poor maintenance, aged cars, low quality fuels and poor traffic management and road conditions. Stationary sources, such as outdated power generation stations, refineries, fertilisers' plants, cement manufacturing, and thermal water desalination and power plants also significantly contribute to air quality deterioration, especially where low fuel quality power is used.

### **b) Ozone Layer Depleting Substances**

The Montreal Protocol on Substances that deplete the Ozone Layer was drawn up under the guidance of UNEP in September 1987. The Protocol identified the main Ozone Depleting Substances (ODSs) and set specific limits on their production and consumption levels for all member countries to the Protocol. The Protocol has been continuously updated by meetings of the Parties to reflect changes in scientific evidence and technological development. Four amendments to the Protocol have been adopted, London 1990, Copenhagen 1992, Montreal 1997 and Beijing 1999. The amendments cover the addition of new ODSs, initiating the financial mechanism of the Protocol, updating control measure as well as other decisions related to strengthening policy and legal measures.

Developing countries which become parties (all Arab countries) acting under Article 5 of the Protocol were enabled –conditioned by establishment of a national country program- to get benefit of the:

- Financial and technical support provided through the Multilateral Fund of Montreal Protocol.
- Technology transfer opportunities available through the international cooperation channels established under the Protocol and implemented by the international organizations and bilateral agencies working under the Protocol.

As of October 2003, the status of ratification of Montreal protocol and its amendments in the Arab states is as follows:

- 20 Countries ratified Montreal Protocol and act as a party to it, the two Arab countries that are not parties are Iraq and Palestine.
- 18 Countries ratified London Amendment.
- 17 Countries ratified Copenhagen Amendment.
- 11 Countries ratified Montreal Amendment.
- 3 Countries ratified Beijing Amendment.

The following table summarises the status of compliance towards Data reporting of ODS consumption, ODS control measures and establishing licensing system for ODS:



Party	Compliance towards Data Reporting of ODSs consumption	Compliance towards ODS control measures	Compliance towards establishing licensing system for ODS
1. Algeria	Only N.R 2002	Complied	-
2. Bahrain	Complied	Complied	√
3. Comoros	Complied	Complied	-
4. Djibouti	N.R. base year, 2001 & 2002	Pending	-
5. Egypt	Only N.R 2002	Complied	√
6. Jordan	Complied	Complied	√
7. Kuwait	Complied	Complied	√
8. Lebanon	Complied	Requested revision of MBr baseline years consumption	√ (Expected to be enforced early 2004)
9. Libyan Arab Jamahiriya	Only N.R 2002	Non-compliance for CFCs	-
10. Mauritania	N.R. 2001 & 2002	Complied	-
11. Morocco	Complied	Non-compliance for HBFCs	√
12. Oman	Complied	Complied	√
13. Qatar	Complied	Non-compliance for CFCs & Halon	√
14. Saudi Arabia	Complied	Complied	√
15. Somalia	N.R. base year, 2001 & 2002	Pending	-
16. Sudan	Complied	Complied	-
17. Syrian Arab Republic	Complied	Complied	√
18. Tunisia	Complied	Non-compliance for MBr	√
19. United Arab Emirates	Complied	Complied	√
20. Yemen	Complied	Non-compliance for CFCs, Halon & MBr and requested revision for baseline years consumptions of all ODSs	√ (in progress of issuing complete legislative package for ODS control)

N.R: not reported

√ represents establishment of Licensing System.

- no licensing system in place.

Although most of Arab countries comply with 1999 and 2002 freeze control measures for CFCs, Halon and MBr, the trend of reduction since 1999 does not reflect the smooth anticipated compliance towards 2005 cut off control measures for some substances. The low cost of ODS compared with alternatives has contributed in this trend significantly during the last three years, however the absence of national ODS licensing, incomplete or non-enforced legislation considered the main cause of such trend. Countries with complete enforced ODS legislation in place are moving towards compliance with 2005 & 2007 control measures with minimal non-compliance risks.

The challenge of the growth of thriving black market in illegal shipments of CFCs and Halon was not anticipated when Montreal Protocol was signed. In mid 1990s illegal material accounted for up to 15% of the world trade in CFCs. By the end of 1999 where control measure started to be in place for developing countries the international illegal trade in ODS also shifted towards these countries. It is noted that the effect of this illegal trade in developing countries is much more than developed countries nowadays due to reasons of the international surplus of CFCs production, cheap prices of CFCs compared to alternatives,

difficulties in practical identification of CFCs on the border in most developing countries and lack of trained customs officials as well as insufficient coordination with environmental national authorities.

In 2002, UNEP restructured its organizational system for better responding to evolving needs of developing countries during the compliance period. Its overall vision and strategy was reoriented into the Compliance Assistance Programme (CAP). A major feature of CAP strategy is to move away from disparate project management approach towards integrating and direct approach of implementation. This is through providing a team of professionals with appropriate skills and expertise. UNEP now has been regionalized the delivery of services and programs using the capacities built in its regional offices for obtaining the prompt professional support to developing countries.

CAP aims to provide backstopping function for policy advice, compliance guidance, assistance to develop and enforce legislation, training, technical support, coordinating bilateral and multilateral activities and raising the level of awareness among stakeholders. The long-term goal of CAP is build and strengthens country-driven compliance efforts. There are two CAP teams serving the Arab States, one CAP team for West Asian Arab countries based in the UNEP Regional Office for West Asia and the other CAP team for African Arab countries based in UNEP Regional Office for Africa. CAP capacity in West Asia Office-ROWA- has been built by the end of 2002 and through 2003 providing professional policy and technical services through the Regional Coordinator, Refrigerant Management Plan (RMP) Officer and Halon Management Officer.

### **c) Climate Change**

In the Arab Region, fossil fuel burning represents the largest source of Greenhouse Gases (GHGs). Due to climate conditions and increased development efforts, the Gulf Region witnessed a sharp rise in consumption of energy and has become one of the highest per capita commercial energy consumers in the world. There is however positive signs that these rates will decline as more oil companies adopt zero emission flaring methodologies in their oil operations. Expansion in the use of natural gas in power/desalination plants over oils will also further reduce GHGs emissions (following UAE initiative).

While burning of fossil fuel is blamed for climate change, scientific uncertainties are still cited in the debate. For example, the Asian Brown Cloud (ABC) has been investigated recently (UNEP, Centre for Clouds and Chemistry & Climate, 2002) indicating that atmospheric particulate matter may also be a contributing factor to the phenomenon.

The impact of climate change on the Arab Region has not been fully examined. In fact, climate change could aggravate the Region's vulnerability to natural disasters, which include, in addition to drought and food shortage, flash floods, and pest infestations. However, a more comprehensive approach to mitigation is required in order to ensure that the socio-economic impact on Arab countries, including oil-producing countries are reduced and compensated, in implementation of Marrakech Agreement.

## **IV. Extreme Events**

While more work is needed to fully elaborate the rate and consequences of climate change in the region, the intensity and increased frequency of extreme weather events in the region give

signs that climate change/variability may be in the region reflecting the global trends. Record high rainfall amounts, high and low temperatures, prolonged droughts, sand storms, heat waves, and most importantly temporal precipitation shift may suggest the beginnings of climate change era in the region.

After seven years of continuing severe droughts in the region, the cycle of drought has been interrupted in 2002-2003 with a record rainfall, in which levels exceeded the normal in most countries of the region. Heavy rain flooded rivers and agricultural areas in Jordan, Lebanon, Morocco, Oman, Sudan, Syria and Tunisia in 2002 and 2003 (figures 6 and 7). The unexpected severity of such meteorological events coupled with inadequate anticipatory measures, caused life losses, a dam collapse in Syria, destruction of fish farms, large areas of agricultural lands and irrigation networks.

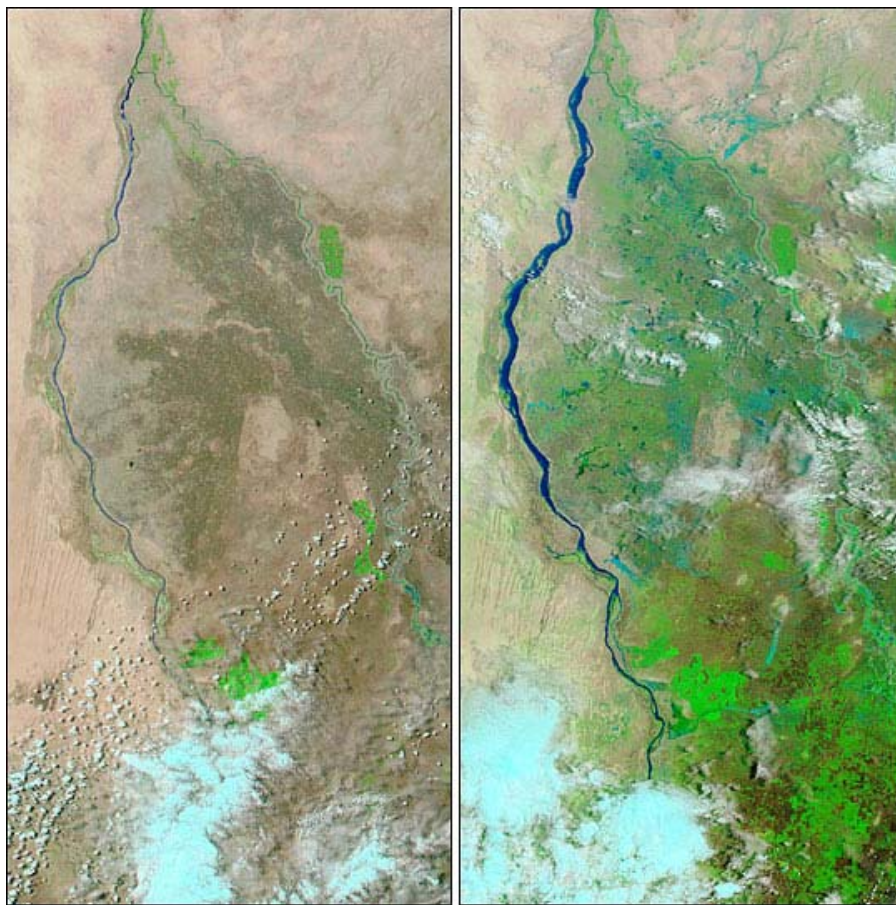


Figure 6. Heavy rains in Sudan flooded the White Nile between August 3 and 11, 2003.

(Source: NASA)

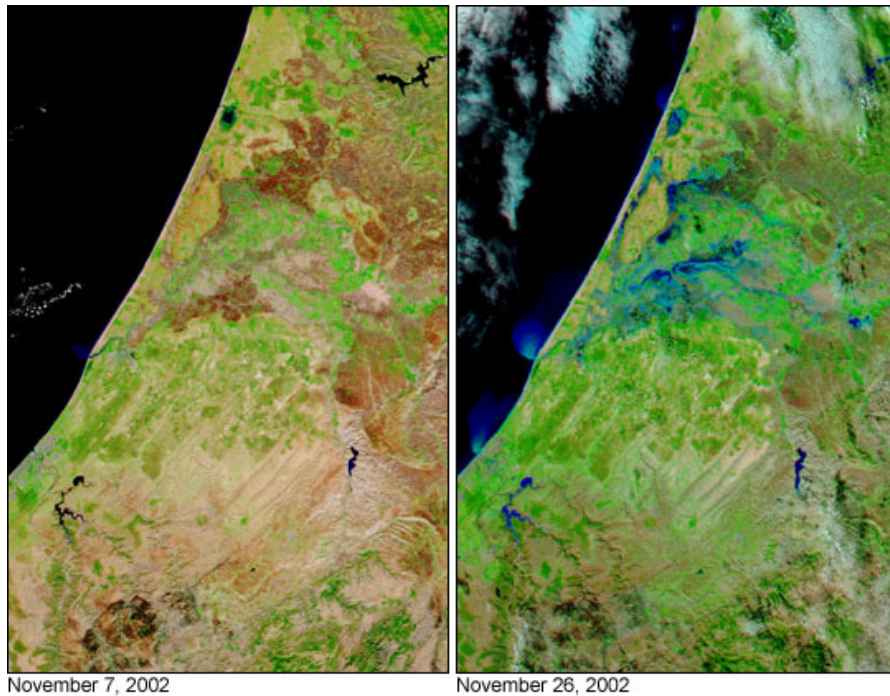
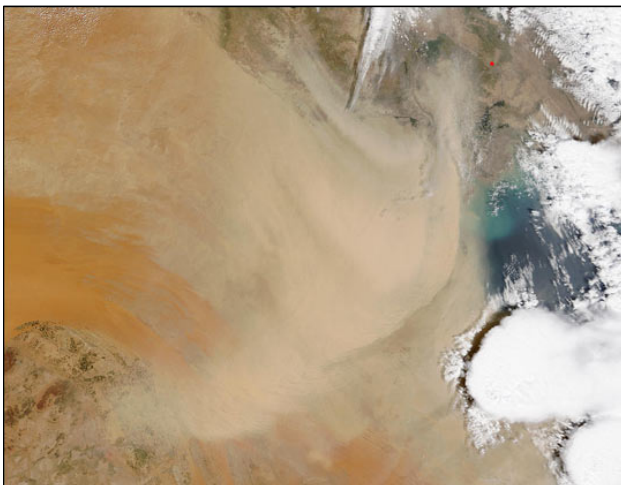
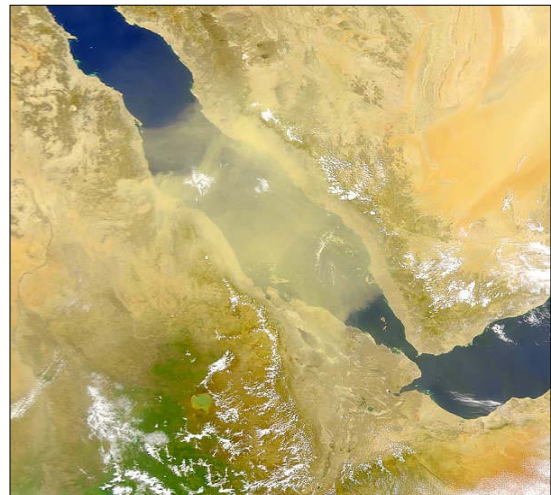


Figure 7. Unusually heavy rains hit Morocco in late November 2002, giving rise to floods that killed more than 60 people. (Source: NASA)

The frequency of dust and sand storms has increased in number and intensity in 2003 (figure 8). The phenomena were recorded over large areas in the region in 2003, from Morocco to Oman. During Iraq war, stirring soils and disturbing surfaces equilibrium by off road vehicles and tanks during military preparation and operations coupled with wind speeds (Touz winds) reached up to 70 km/hr may have contributed to the development of massive sandstorms that covered skies of West Asia for several days. Health hazards were mounted in some countries. These storms increase the risk of respiratory, eye and skin diseases.



Satellite Image (MODIS) of Sand Storm over the Gulf. April 16, 2003

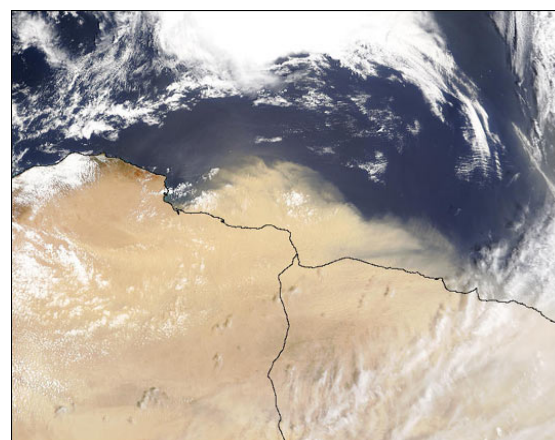


Satellite Image (MODIS) of Sand Storm over the Red Sea



#### **Dust off Morocco**

Thick streams of tan dust blow northward off the shores of Morocco into the Atlantic Ocean. November 4, 2003.



#### **The Great Sand Sea**

A dust storm is spilling sand out over the Mediterranean Sea off the coast of Libya (left) and Egypt (right) on May 28, 2003.

Figure 8. Sand Storms in the Arab Regions (Source: NASA).

Heat waves struck the region late August adding new dimensions to the impact of extreme events on national economy. Temperatures reached 40°C in some areas blamed for unfavourable farming conditions leading to a reduction in agricultural productivity and water shortages in Jordan. Hot spots were quite often recorded in the skies of the Arabian Peninsula sub-region. High temperatures associated with heat waves may have caused persistence of smog pollutants especially in the morning hours where thermal heat inversion occurs in most cities of Gulf countries.

Forest wildfires are a recurring phenomenon in the Eastern Mediterranean forest vegetation of which people-caused fires account for 90% of the causes. However, in recent years, there has been a gradual increase in the number of wildfires' extent, intensity, and possibly its frequency. In 2003, forest fires occurred in Saudi Arabia, Syria, and Lebanon.

## **V. Emerging Issues and Emergency Response**

Through its pioneering post assessment work in the Balkans, UNEP has established the Post Conflict Assessment Unit (PCAU) in Geneva to assist countries in the assessment of environmental damage resulting from conflicts and wars and to elaborate options for mitigation measures and capacity building for the affected country in dealing with the aftermath of military conflicts. Accordingly, UNEP has carried out assessments in Afghanistan, the Occupied Palestinian Territories and Iraq.

In carrying out its assessment and capacity building work, PCAU draws on the expertise from the various UNEP Divisions, Out-posted Units and Regional Offices as well as from other specialized UN agencies. On the political level, UNEP activities in the areas of emergency

response and post-conflict assessments are coordinated with the relevant regional ministerial forums and organizations.

In the Arab region, the partnership developed between CAMRE, UNEP and ESCWA since the preparatory process of the WSSD, should be further enhanced to address emerging issues and emergency response in order to insure the political support, transparency and judicious usage of expertise and resources.

#### **Addressing the Environmental Situation in Iraq**

In late April 2003, UNEP published its *Desk Study on the Environment in Iraq*, aimed at providing a timely overview of key environmental issues in the context of the recent conflict. Due to the conflict situation, it was not possible to conduct field assessments and the study was rapidly compiled from published and online information sources as well as satellite data. Despite these limitations, the report set out the general environmental context and provided guidance on the next steps for addressing key environmental challenges.

Prior to the Donors' Conference in Madrid a progress report entitled *Environment in Iraq: UNEP Progress Report* was published on 20 October 2003, to provide updated information about the evolving environmental situation in Iraq, with a view to highlighting priority areas for action. In addition to other sources, it draws its information from two fact-finding missions that UNEP was able to field to Iraq in July and August 2003. The report included recent information and examples of industrial pollution 'hotspots' that need to be scientifically assessed and, depending on the results, cleaned up as quickly as possible. It also contained an update on developments in the Mesopotamian Marshlands and described the former and current environmental administration in Iraq, as well as the UNDG (United Nations Development Group) process.

Based on these studies, UNEP concludes that there are a number of serious environmental problems in Iraq that require immediate attention. These include environmental contamination exacerbated by military actions as well as looting of sites holding nuclear and toxic materials. Iraq has also long-standing environmental problems, such as the destruction of the Mesopotamian Marshlands and pollution from the oil and chemical industries.

Since February 2003, UNEP has hosted in Geneva six roundtable meetings on the environment in Iraq. There has been wide participation in these meetings by different UN agencies, non-governmental organizations, scientific and academic institutions and development agencies. These roundtables have provided a forum for different stakeholders to coordinate their activities and to inform each other on the development and progress of different programmes and projects in Iraq.

Next steps for action by UNEP include the following:

1. UNEP will offer training/capacity building of the staff of the Iraqi Ministry of Environment in locations outside (e.g. Amman or Bahrain).
2. UNEP continues to exchange information with the environmental administration of Iraq, in an effort to compile relevant information available on potential environmental "hot spots" sites in Iraq. This "environmental databank" will be useful in the short term for the envisage UNEP scientific fieldwork and in the long term for the environmental administration.
3. UNEP will provide its environmental analyzing capacities, including the use of remote sensing, to address environmental concerns, such as the degradation of the Mesopotamian marshlands. In addition, UNEP will facilitate access for the Iraqi environmental administration to get laboratory services needed outside Iraq, when needed.

4. UNEP will promote contacts and cooperation with regional bodies and organizations, such as ROPME. This could also include approaching Iraqi neighbours to discuss working on common environmental problems as a result of conflicts in the region.

UNEP can also assist the Iraqi environmental administration in getting prepared in the near future to join international environmental conventions.

5. UNEP will continue to convene Round Table-meetings on the environment in Iraq. The VI Round Table took place on 21 November 2003 in Geneva and was attended by HE Mr. Abdul-Rahman Sidiq Kareem, the Minister of Environment of the Interim Administration of Iraq.

6. UNEP will make preparations for comprehensive field studies, which will take place once the security and political conditions permit; resulting in a quality needs assessment report for the benefit of the Iraqi people.

### **The State of Environment in the Occupied Palestinian Territories**

UNEP's Governing Council adopted decision GCSS.VII/7 on "Environmental situation in the Occupied Palestinian Territories", at its Seventh Special Session/Global Ministerial Environment Forum, in Cartagena, in February 2002. By this decision, the Governing Council requested the UNEP Executive Director to prepare a desk study outlining the state of the environment in the Occupied Palestinian Territories and to identify major areas of environmental damage requiring urgent attention.

The Executive Director launched the Desk Study process during a visit to the region shortly afterwards, when he met with the highest-level environmental and political authorities. In order to carry out the Desk Study, a team of UNEP experts was established, with qualifications in the following priority areas: water quantity, water/soil quality; waste water; solid waste, hazardous waste; environmental administration; biodiversity; and land use. Over the summer and autumn of 2002, UNEP undertook four missions to the area. A literature review was carried out, covering thousands of the most recent scientific reports. Over 250 regional and international experts were interviewed, including environmental officials, non-governmental organization representatives, municipal authorities, academic and research institutes, and international organizations active in the area. In addition, sites visits took place in major town and cities throughout the West Bank and Gaza. The Desk Study included new satellite image analysis and cartographic work.

The Executive Director's report Desk Study on the Environment in the Occupied Palestinian Territories was submitted to the UNEP Governing Council at its 22nd Session in Nairobi, February 2003. The Governing Council welcomed this report, and requested UNEP, among others things, to: implement the recommendations of the Desk Study; act as a facilitator, and also an impartial moderator when requested by both parties, to assist in solving urgent environmental problems with a view to achieving common goals; to continue coordinating the activities of UNEP in the area, including on facilitating identifying technical and financial solutions to implement the recommendations, promoting capacity-building programmes, encouraging technology transfer, and promoting the participation of the Palestinian Authority in relevant meetings and processes of multilateral environmental agreements.

The Desk Study identifies acute environmental problems that have arisen as a result of the ongoing conflict as well as problems stemming from long-term inadequate resource allocation and environmental management.

The Desk Study found that, although there has been much debate during recent years on water resources in the region, the rapid deterioration of the water resources remains of concern. Soil and groundwater pollution is caused mainly by agricultural practices (notably the use of inorganic

fertilizers, pesticides and herbicides), localized industrial activities (organic pollutants, heavy metals), and inadequate or improper disposal of wastewater and solid waste (including hazardous materials). In addition, many years of over-pumping have resulted in seawater intrusion of groundwater, especially in Gaza.

The Desk Study noted that the separation wall would not only separate people from their wells and agricultural lands, but would also be likely to have a negative impact on the environment, for example by fragmenting the ecosystems and disconnecting natural ecological corridors.

The report also noted that in the current conflict situation, the Israeli military has re-occupied various parts the Palestinian areas at different times, and therefore the Palestinian Authority has had difficulty in carrying out its responsibilities on land-use planning. As a consequence of the occupation, the security demands make land-use planning a very complex process, with access restricted to some designated waste sites.

The work of Joint Environmental Expert Committee has been on hold since the beginning of the second intifada. The UNEP report recommends the re-establishment of this trans-boundary environmental cooperation at the expert level.

The report concludes that, despite the current political difficulties, environment should be addressed urgently in order to preserve natural resources and establish a safe environment for future generations. To address these issues, the Desk Study makes 136 recommendations on a broad range of environmental topics.

Since February 2003, UNEP has undertaken consultations on the next implementation phase. Eight priority recommendations for initial implementation have been identified. Following this, UNEP convened a trilateral technical meeting on environmental issues in Geneva in July 2003, attended by Palestinian and Israeli delegations. This meeting discussed the next steps to be undertaken by UNEP under each of these eight priority recommendations.

As one of the first activities, UNEP will convene a capacity building training seminar on communication for officials of the Palestinian Environmental Quality Authority, which will take place in Amman, Jordan, from 13-18 December 2003.

## **VI. International and Regional Conventions and Agreements Supporting Sustainable Development**

### **1. MEAs and Regional Environmental Agreements**

In the Arab Region, the interest and political commitment to MEAs have been reflected in the signing, ratifying and accession to of over 64 international and Regional environmental conventions and agreements. Among the most important MEAs are the three Rio conventions with sustainable development focus, the United Nations Convention to Combat Desertification (UNCCD), the Convention on Biological Diversity (CBD), and the United Nations Framework Convention on Climate Change (UNFCCC).

Implementation of MEAs in the Region however has been rather modest for many countries due to the lack of adequate resources (financial, technology, human). The Montreal Ozone convention has achieved the most successful level of implementation in the Region, which shows the Region's commitment towards global environmental issues when financial resources and technical support is made available. On the other hand, conventions of



primary interest to the Region, especially CCD and CBD, have not achieved significant progress. Regional conventions and agreements (such as the Regional seas conventions) have achieved a greater level of compliance by countries of the Region.

Agenda 21 has been the most widely accepted and effective soft law that is guiding environmental management in the Region. The large number of MEAs has been a main obstacle to compliance and enforcement of multilateral agreements in the Region. Governments have thus become overloaded by reporting requirements of the growing number of conventions. Other key barriers, hindered the implementation of MEAs in the Region include lack of adequate finance and appropriate technologies, insufficient institutional capacity, difficulty in adopting adequate environmental policy, and organisational culture.

## **2. Linkages between Agreements**

Developing a linkage between the global agreement secretariats and the UN specialised agencies is necessary in order to support the efforts of developing countries, including Arab countries, towards achieving sustainable development. If clustering of the large number of MEAs is to be considered, it should not affect the benefits that current MEAs offer to developing countries. An effort is underway to implement a pilot project in West Asia (in cooperation with ACSAD), in which 3-4 countries will be selected to carry out case studies on the development of an integrated approach towards the implementation and compliance with the biological conventions (Biodiversity, RAMSAR, CITES and CMS). Addressing the chemical conventions (POPs, Basel and PIC) has also been suggested as another area where a linkage is possible.

## **VII. Key Cross-Cutting Challenges**

### **1. Governance for Sustainable Development**

Governance is a challenging prerequisite to achieve sustainable development. It includes strengthening the institutional and legal frameworks, nurturing equitable participation in decision-making and promoting effective participation of the civil society and the private sector in the decision making process.

The main challenge facing most decision-makers in the Region is policy integration, namely how to effectively formulate, integrate and implement multi-sectoral sustainable development policies. These difficulties are exacerbated by the predominantly centralised, yet compartmentalised nature of governance in the Region. In regard to policy instruments, the Region relies heavily upon regulatory mechanisms rather than economic instruments and voluntary arrangements.

As for governance towards achieving sustainable development in the Arab region, the implementation of the Arab Initiative provides an opportunity to elaborate a mechanism that allows the League of Arab States to coordinate the efforts of the various ministerial bodies and government agencies responsible for social/economic development and environmental protection and monitor progress made in this direction. CAMRE may want to consider taking a leading role by suggesting that the Ministers responsible for the environment in Arab countries become the national coordinators for sustainable development. The establishment

of a parallel national mechanism would facilitate such a coordinating mechanism in implementing national sustainable development strategies and programmes.

The increasing interest in environmental law by Arab countries is an encouraging sign towards the full integration of MEAs and regional legal instruments into national legislation. The establishment of the Arab Regional Centre for Environmental Law (ARCEL) in Kuwait and the development of joint programmes of cooperation with UNEP and other UN agencies with a view of enhancing capacity building efforts in the area of environmental law is a recent and encouraging development in the region.

Furthermore, while national environmental management and sustainable development processes have improved throughout the Region, local initiatives have remained limited. The limited decentralisation of legislative and financial powers is a major obstacle for formulating and financing the implementation of sustainable development in most countries of the Region.

### **Arab Initiative on Sustainable Development**

The League of Arab States adopted a comprehensive regional approach, through the Council of Arab Ministers Responsible for the Environment (CAMRE) and other specialized Ministerial Councils, and in cooperation with international, regional and Arab organizations. This regional Approach was known as the Sustainable Development Initiative in the Arab Region and was declared during the WSSD 2002 held in Johannesburg, South Africa. The initiative summed Arab achievements towards sustainable development and underlines the challenges, obstacles and difficulties, facing Arab countries towards achieving sustainable development.

The initiatives asserted the commitment of the Arab countries to join the international communities in implementing Agenda 21 and the objectives included in the Millennium Declaration and the outcome of the Johannesburg WSSD. It also emphasized the principle of common but differentiated responsibility. The initiative is considered as a framework for the implementation of programs and activities using the available resources through building partnerships with the stakeholders outside the region and capitalizing on partnerships inside the region emphasizing the role of civil society fora and the media. The following bullets highlight main features of the initiative:

- Peace and security
- Institutional framework
- Poverty alleviation
- Population and health
- Education, awareness, scientific research, and technology transfer
- Resources management
- Production and consumption
- Globalization, trade and investment

The Arab initiative called for the support of fair, non-discriminatory or politically motivated partnership initiatives among developing countries, and between developed and developing countries as well as between the states and the organizations of civil society and the private sector. The establishment of a plan of action for the initiative was envisaged to be based on the provisions of the Jeddah Declaration on the Islamic Perspective for Environment (2002), the Abu Dhabi Declaration on Perspectives of Arab Environmental Action (2001), the Oman Declaration on Environment and Sustainable Development (2001), the Abu Dhabi Declaration for Agricultural Development and Combating Desertification, the General Framework of Islamic Agenda for Sustainable Development (2002), and the outcome of the Amman International Forum on Environment and Sustainable Development (2001).

In the implementation process, the initiative gave priority to three areas, with projects currently being identified in cooperation with the relevant Arab and regional organizations under the program on the integrated management of water resources, the program on land deterioration and combating desertification and the program on the integrated management of coastal zones and marine resources.

## **2. Stakeholder Participation and Access to Information**

Since WSSD, public awareness of environmental issues has witnessed a remarkable upsurge in the Region. The number of environmentally oriented NGOs has dramatically increased, as has public understanding of key issues related to environmental protection and sustainable development. The complex government systems and the prevailing culture, traditions and political norms in some countries of the Region impede public participation in government decision-making processes.

Provision of higher quality information within governments has improved and there has been important progress in increasing public access to information, particularly through on-line medias. Nevertheless, public access to information regarding sustainable development remains limited.

There is no regional convention in the region such as "the Århus Convention" that guarantees the rights of access to information, public participation in decision making, and access to justice in environmental matters in order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being. A similar initiative for the Arab region is much needed.

### **Raising of Environmental Awareness**

The year of 2003, the year of freshwater, was a significant year for environmental awareness in the Arab Region with intensification and diversification of environmental programmes targeting a wide range of audience, including training programmes, environmental contests, and environmental clubs. Progress in involving youth and children is reflected in an increased participation in activities both in and outside the region. Regional Youth Council has been established by UNEP. The involvement of the media in the regional activities has also increased. An environmental law program has been established jointly by UNEP and the Arab Regional Centre for Environmental Law (ARCEL), focusing on increasing awareness among judges and integrating environmental concepts into university law curricula.

UNEP celebrated the world environment day in Beirut. It was the first time in the 30-year history of this awareness-raising event that the main celebrations have been held in the Arab world. This year's theme "Water - Two Billion People are Dying for It" was very relevant to the region, as one of its top concerns is water scarcity.

### **The Abu Dhabi Global Environmental Data Initiative (AGEDI)**

The Abu Dhabi Global Environmental Data Initiative (AGEDI), a type II partnership initiative, was launched jointly by ERWDA and UNEP on 2 September 2002 at the World Summit on Sustainable Development (WSSD) in Johannesburg, 24 August - 4 September 2002.

AGEDI's goal is the innovative implementation of the environmental data provisions of Agenda 21 and the UN's Millennium Development Goals. It was created in order to bridge the environmental

data gap between and within developing and developed countries and provide direct and cost-effective access to environmental data.

This initiative aims also at upgrading ways of monitoring environmental problems and accordingly recommends appropriate policies at the national and international level. It also seeks to resolve the problems of financial, technical and human resources in the developing countries, in addition to other problems related to lack of awareness, use of data and uniformity of environmental policies.

Central to the initiative is the use of advanced technology such as remote sensing and other devices in collecting environmental data. It is expected that the initiative would make the process of data collection much easier than it had been in the past. Regular annual reports about each region will be made available and this will definitely provide a sound basis for taking environmental decisions.

The initiative is to be implemented in three stages. The first stage involves a Strategic Implementation Plan. It will focus on data collection, management, and dissemination on the national, regional and global levels. It will also evaluate existing operational programmes emphasizing data quality, terminology, standardization, and sustainability indicators.

In the second stage, the Regional Implementation Pilot Programme to begin in West Asia, AGEDI will support the development of a UNEP assessment programme and the establishment of a Regional Centre for Environmental Information and Assessment. The third stage, a National Implementation Pilot Project, will take place at AGEDI headquarters in the Emirate of Abu Dhabi and function as a model for replication. Its primary objective will be the collection, verification, assessment and standardization of environmental data.

### **3. Environmental Education and Public Awareness**

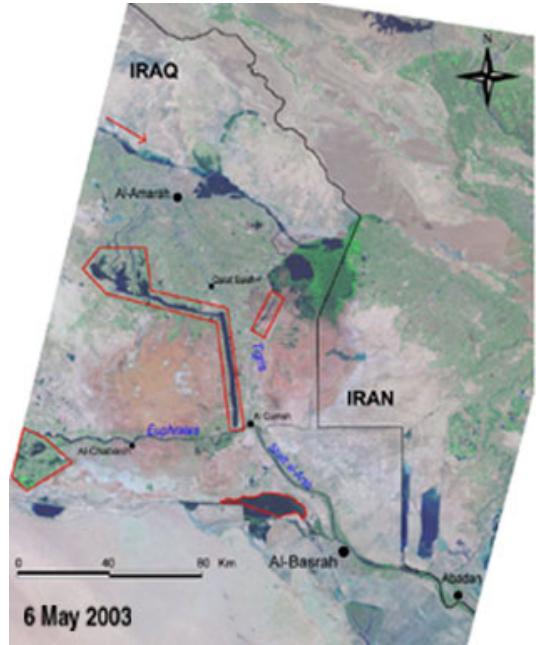
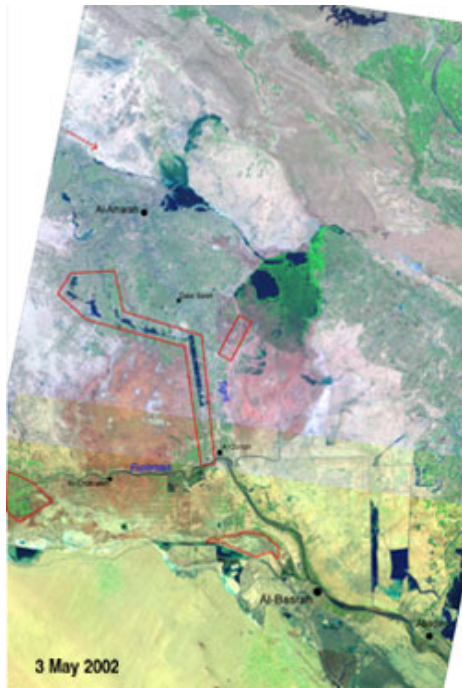
The greater majority of the Arab countries adopted and integrated environmental education in school curricula at the elementary and secondary school levels in the formal education sector as a cross-cutting theme in several courses. Activities carried out during 2002-2003 by CAMRE, ALECSO and UNEP and other regional UN agencies reflect greater interest in integrating environmental concepts into education curricula in universities and primary/secondary schools as well as in illiteracy programmes. However, there is a need to develop a long term strategy for environmental education in which global efforts and experiences are integrated into national and regional programmes. The increase in the number of civil society groups in most of the Arab countries provides an opportunity to further strengthen the participatory role of the civil society as an essential stakeholder in the planning and implementation of strategies and programmes of sustainable development in the Arab region.

#### **Mesopotamian Marshes**

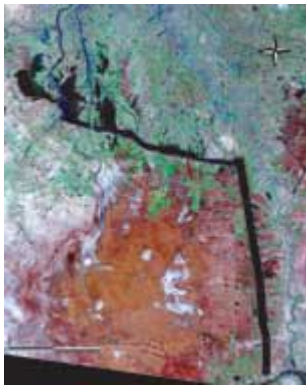
##### *Water Returns to the Desiccated Mesopotamian Marshlands*

Over the past few weeks, positive signs of environmental recovery have been emerging from the parched Mesopotamian marshlands. These changes are visible in new satellite images taken in May 2003 and which have been examined by UNEP's DEWA/GRID-Geneva. They dramatically reveal streams and waterways which have ebbed and run aground over the past decade, surge back to life and drainage canals swollen by an exceptional increase in water flows. Formerly dry areas have been inundated as floodgates are opened, embankments and dykes breached and dams emptied upstream. Heavy rains have also contributed to the rising water levels.

Ad-hoc and piecemeal interventions to modify control structures and earthworks, including by Marsh Arabs themselves, attests to their belief in the power of nature to heal itself; a view shared by many scientists. A more orderly and coordinated reinstatement of water, however, is urgently required to ensure greater coherence and long-term sustainability of these remedial efforts.



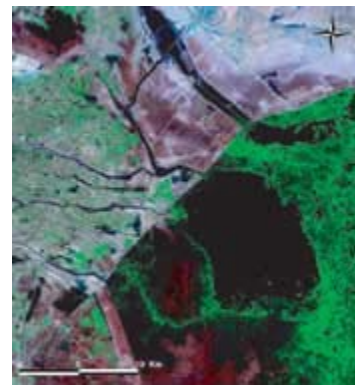
Source: GRID/GENEVA



Water surges through the 90-kilometre long and 1-2 kilometre wide west-east/north-south canal (also known as "Prosperity River"), which has reached full capacity for the first time since 1999.



The Shatt al-Muminah/Butaira distributary network, the main source nourishing the former Central marshes, is flood swollen and overflows its banks.



The two main branches of the Tigris River, the Al-Musharrah and Al-Kahla, feeding the Al-Hawizeh/Al-Azim marshes straddling the Iran-Iraq border, which had previously been cut back by drainage schemes, are now reconnected with the wetlands.