

# NATURAL RESOURCES AND THE ENVIRONMENT STRATEGIC APPROACHES FOR THE NEAR EAST BUREAU



**BUREAU FOR THE NEAR EAST  
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**



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# NATURAL RESOURCES AND THE ENVIRONMENT STRATEGIC APPROACHES FOR THE NEAR EAST BUREAU

## EXECUTIVE SUMMARY

The Near East Bureau's Environment and Natural Resources Strategy has been formulated in accordance with guidelines set forth by the Agency's Environmental Strategy Framework, and reflects existing programs and the current environmental and natural resource issues facing the Near East region.

### CRITICAL ISSUES IDENTIFIED

The most critical environmental challenges facing this arid region are primarily associated with water resources. The region is plagued by water shortages and deficits, while the degradation of water quality increases at an alarming rate -- further exacerbating the problem of water availability. Water, as well as other natural resources, are being used in an increasingly unsustainable manner due to unrestrained urban and industrial growth; a poor appreciation of conservation and environmental protection; and inadequacies in technical and regulatory infrastructure to protect and manage these resources.

The rate of population growth throughout this region is among the highest in the world resulting in rapid degradation of limited and fragile water and arable land resources. Climate, access to limited water and arable land, proximity to trading routes and access to existing infrastructure along the Mediterranean shores and major rivers has resulted in urban populations being clustered in these areas throughout the region.

Due to the transnational nature of water resources in the region, many of the water issues are the cause, and continuation of, geopolitical instability. Prospects for lasting regional peace will depend heavily on resolving transnational water issues -- issues that for some countries threaten their future existence.

The region has reached a critical crossroads in its history and individual countries are beginning to recognize the strong relationship between sound environmental and natural resources management and economic development. This recognition of the importance of sound environmental management is beginning to surface in the form of a proliferation of individual country environmental strategies such as those evolving in Egypt, Jordan, and Morocco.

This current situation provides an excellent opportunity for the Near East Bureau to respond to the challenge of developing and carrying out a comprehensive strategy for ensuring the economic growth of the Near East countries. The "opportunity" is in

promoting sustainable economic growth by sound economic management of natural resources and the environment through more efficient production and use of natural resources that reflect market forces.

The treatment of transnational issues in the Near East may involve countries of different regional bureaus and/or countries that do not receive AID assistance. This situation complicates the development of effective regional activities. For this reason, the Near East Bureau will explore opportunities to cooperate with other international donors and NGO's in order to broaden the opportunities for regional approaches and strengthen the effectiveness and credibility of such approaches.

## **ENVIRONMENTAL CONSTRAINTS**

The priority issues of environment and natural resources that have been identified for the Near East Bureau are embodied by four of the five critical constraints to development outlined in the Strategy Framework. These constraints and their priority for the Near East region are:

- 1. Degradation and Depletion of Water Resources**
- 2. Urban and Industrial Pollution**
- 3. Environmentally Unsound Energy Production and Use**
- 4. Unsustainable Agricultural Practices**

## **STRATEGIC OBJECTIVES**

The environment and natural resources issues outlined in the constraints to development give rise to the following four strategic objectives:

- 1. Foster efficient resource use and conservation, especially water and energy.**
- 2. Promote the concept of waste minimization and pollution prevention in resolving problems facing the industrial and agricultural sectors in ensuring air, soil and water quality.**
- 3. Increase accountability and local empowerment in addressing environmental and natural resource issues.**
- 4. Foster private sector solutions and policy at the local, national and regional levels.**

## **APPROACHES IDENTIFIED**

The Near East Bureau has identified four strategic approaches to achieve the objectives based on criteria that are most applicable to the environmental and natural resource issues of the region and hold the most promise for successful and effective intervention.

These include:

- 1. Providing technical support to Missions on the environmental and natural resources dimensions of their projects and programs, including environmental assessments.**
- 2. Identifying and implementing regional and common approaches to resolving environmental problems and resource management, including cooperation with other donor organizations.**
- 3. Providing support for critical policy reforms and development of institutional capability in environment and natural resources, with priority towards water resources.**
- 4. Providing support for promoting environmental services expertise and technologies in the Near East region that is available from the U.S. private sector and academic institutions.**

# NATURAL RESOURCES AND THE ENVIRONMENT STRATEGIC APPROACHES FOR THE NEAR EAST BUREAU

## I. INTRODUCTION

### 1. Strategy Focus for the Near East Bureau.

The Near East Bureau has oversight responsibility for A.I.D. field programs in Morocco, Tunisia, Egypt, Israel, Lebanon, Jordan, Yemen, West Bank/Gaza, and Oman. The Near East Bureau's goal is to foster healthy, growing economies in the region enjoying widespread democratic freedoms, the rule of law, and peaceful and cooperative inter-country relations. Embodied in this broad goal of healthy, growing economies is the necessity to promote environmentally sound, long-term economic growth by assisting developing countries to conserve and protect the environment and manage their exploited resources for sustainable yields.<sup>1</sup> Therefore, the focus of the Near East Bureau's Environment and Natural Resources Strategy is on fostering environmentally sound activities in the pursuit of sustainable economic growth and development for the region.

### 2. Historical Perspective of the Near East Bureau and its Environment and Natural Resources Strategy.

#### 2.a. An Environmental Strategy in the Context of A.I.D. Resource Allocation:

U.S. foreign policy interests in the Near East play a critical role in determining the level and allocation of A.I.D. assistance. Allocations, which are dominated by issues of regional stability, the peace process, human rights and sustainable economic development and political development. Proposed country allocation levels for FY1993 are presented in Table 1.

#### 2.b. Country Budget Priorities:

In recent years, budget allocations for environment projects have primarily been targeted for large capital projects in Egypt (Table 2). These projects are due to be completed in the next few years. USAID environmental programs, with the exception of Egypt, most often consist of small-scale interventions being undertaken as integral components of priority program activities, rather than stand-alone environmental projects. As stated in

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<sup>1</sup>see A.I.D. Policy Paper Environment and Natural Resources, 1/88, PN-AAV-464

TABLE 1. COUNTRY LEVELS AND RANKING. FY 1993  
ANNUAL BUDGET SUBMISSION. NEAR EAST BUREAU<sup>1</sup>

COUNTRY	PROPOSED FY93 BUDGET LEVEL (MILLIONS)
ISRAEL	1200
EGYPT	815
MOROCCO	40
JORDAN	30
NE REGIONAL	29
WEST BANK/GAZA	25
OMAN	15
LEBANON	10
YEMEN	10
TUNISIA	10
TOTAL	2184

<sup>1</sup> Annual Budget Submission, FY-1993, NEAR EAST, A.I.D., Washington, D.C. July, 1991.

**USAID Morocco's Action Plan 1992-1995 (December 1991):**

*... USAID believes that this cross-cutting approach towards the environment is appropriate for Morocco, given competing program priorities and current Moroccan capacity and resource constraints for addressing environmental concerns...*

Clearly, U.S. foreign policy interests, as reflected in country funding levels and Budget priorities, as well as, congressional mandates and earmarked appropriations for foreign aid, define the boundaries in which Mission, and therefore Bureau, environmental activities and interventions can and will occur.

**2.c. The A.I.D. Mandate:**

In December 1990, the A.I.D. Administrator presented a series of Agency-wide-initiatives which called for imaginative and flexible responses in four areas: support for democracy, a business and development partnership, a family initiative and an environmental initiative. In continuing endorsement of an environmental initiative, the A.I.D. Environmental Strategy Framework was approved by the Administrator in December 1991.

As stated in the Agency's Environmental Strategy Framework paper<sup>2</sup>:

*... the Agency for International Development ... administers aid programs that combine an American tradition of international concern and generosity with the active promotion of America's foreign policy interests. These assistance programs are designed to help developing countries realize their full national potential through individual initiative, the creation of jobs and income, the development of open and democratic societies, the establishment of free and dynamic markets, and the wise use of their natural resource base...*

(emphasis added)

Mismanagement of natural resources and environmental degradation is one of the primary constraints to development. This problem has been identified in many developing countries and is reflected in the A.I.D. policy paper on environment and natural resources.<sup>3</sup>

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<sup>2</sup>A.I.D. Environmental Strategy Framework, Approved by the Administrator December 31, 1991.

<sup>3</sup>See A.I.D. Policy Paper: Environment and Natural Resources, April 1988, PN-AAV-464.

## 2.d. The Need for a Near East Environment and Natural Resources Strategy:

Currently, the Near East region is at a turning point. A strategic focus on environmental and natural resource issues is now beginning to evolve in the region. Traditionally, there has been a lack of an environmental ethic throughout the region, as is evident by the critical lack of NGO's oriented towards environmental and natural resources issues within the countries. Likewise, there is a lack of regulatory and enforcement capability with respect to thwarting environmental degradation and fostering sustainable natural resource management. In some cases environmental regulations have become law, yet, a commitment to the "environmental cause" is missing leading to weak enforcement that has undermined their impact.

However, awareness of environmental degradation is growing due to the magnitude and severity of environmental problems facing the populations of the region. This awareness is being manifested in country-wide and internally-initiated environmental and natural resource strategy papers and environmental action plans that are emerging throughout the Near East region.<sup>4</sup> Projects are also emerging that specifically address the need for increased environmental awareness. The emergence of "green party" political activism is also evident in many of the Near East countries and is putting environmental issues at the forefront of governmental debate. In addition, other assistance and development organizations have encouraged recipient countries to formulate environmental strategies and/or action plans. For example, as a result of negotiating Egypt's Structural Adjustment Loan with World Bank, the government of Egypt has committed itself to developing an "Environmental Master Plan" that will include a country environmental profile and an environmental action plan. This current situation provides an excellent opportunity for the Near East Bureau to respond to the challenge of developing and carrying out a comprehensive strategy for ensuring the economic growth of the Near East countries. The "opportunity" is in promoting sustainable economic growth by sound economic management of natural resources and the environment through more efficient production and use of natural resources that reflect market forces.

## 2.e. Previous and Current A.I.D. Projects:

There are thirty years of development experience behind the Agency in environmental and resource-related issues in the Near East region. Prior to becoming a separate autonomous regional bureau in October 1991, the Near East region had been combined with Asia and most recently with Europe. The nature of this multi-regional bureau (consisting of geographic areas that crossed the boundaries of some of A.I.D.'s current regional bureaus) necessitated partial focus on discreet regional (i.e. Near East) issues. This limited focus on "Near East" issues was reflected in strategies developed for

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<sup>4</sup>Most notably are the recent initiatives put forth by Egypt, Jordan, and Morocco.

TABLE 2. ENVIRONMENT PROJECTS IN THE NEAR EAST REGION\*

PROJECT	PROJECT TITLE	(Col. 1) LOP (\$000)	(Col. 2) AC/SI CODE <sup>1,2</sup>	(Col.3) % LOP	(Col. 4) FY 91 ACTUAL (\$000)	(Col. 5) FY 92 REQUEST (\$000)	(Col. 6) LOP IN ENVIRONMENT (\$000) <sup>4</sup>
<b>REGIONAL</b>							
398-0158	REGIONAL COOPERATION	25,000	EVWR	70	2,756	3,850	17,500
398-0365	PROJECT IN DEVELOPMENT AND THE ENVIRONMENT (PRIDE)	19,000	EVMP	100	1,700	2,300	19,000
<b>EGYPT</b>							
263-0173	CAIRO SEWERAGE II	816,000	EVUP	100	39,159	69,000	816,000
263-0174	CANAL CITIES WATER/WASTEWATER II	380,000	EVUP	100	60,000	65,000	380,000
263-0211	UNIVERSITY LINKAGES II	20,000	EDEI/BDV <sup>5</sup>	-	250	—	N/A
263-0220	PVO DEVELOPMENT PROGRAM	9,000	EVMP	5	150		450
<b>JORDAN</b>							
27-0288	ENVIRONMENTAL SERVICES DEVELOPMENT	5,000	EVMP EVWR	70 10	—	1,750 250	3,500 500
<b>MOROCCO</b>							
608-0213	WATER RESOURCES MANAGEMENT	15,000	EVSC EVWR AGLS/REF	20 30 -	— — —	1,600 2,400 160	3,000 4,500 N/A
<b>OMAN</b>							
272-0105	OMANI-AMERICAN JOINT COMMISSION II	12,000	EVMP DAS/CLZ	15 -	600 80	— —	1,800 N/A
272-0106	FISHERIES DEVELOPMENT AND MANAGEMENT	20,000	EVMP EDID/CLZ	55 -	6,300 916	— —	11,000 N/A
<b>TUNISIA</b>	PRESENTLY HAS NO ENV. PROJECTS						

PROJECT	PROJECT TITLE	(Col. 1) LOP (\$000)	(Col. 2) AC/SI CODE <sup>1,2,3</sup>	(Col.3) % LOP	(Col. 4) FY 91 ACTUAL (\$000)	(Col. 5) FY 92 REQUEST (\$000)	(Col. 6) LOP IN ENVIRONMENT (\$000) <sup>4</sup>
YEMEN	PRESENTLY HAS NO ENV. PROJECTS						
WEST BANK/ GAZA	PRESENTLY HAS NO ENV. PROJECTS						
LEBANON	PRESENTLY HAS NO ENV. PROJECTS						
<b>TOTAL</b>		1,321,000			111,911	146,310	1,257,250

NOTE: THIS TABLE WAS CONSTRUCTED USING DATA FROM USAID/OPS/FM FOR THE PROJECTS REPORTED AS ENVIRONMENTAL TO CONGRESS.

\*\*ITALICS = NOT AN ENVIRONMENTAL ACTIVITY CODE.

1-ENVIRONMENT ACTIVITY CODES: EVMP = MANAGEMENT, PLANNING & POLICY; EVSC = SOIL CONSERVATION; EVUP = URBAN AND INDUSTRIAL POLLUTION;  
EVWR = WATER RESOURCES.

2-OTHER ACTIVITY CODES: AGLS = LAND USE AND SETTLEMENT; EDEI = HUMAN RES. DEVELOP. FOR EDUC. INST. EDID = HUMAN RES. DEVELOP. FOR  
INDIVIDUALS; PDAS = PROJECT DEVELOP. AND SUPPORT.

3-SPECIAL INTEREST CODES: REF = REFORESTATION; CLZ = COASTAL ZONE AND ISLANDS; BIV = BIODIVERSITY.

4-LOP IN ENVIRONMENT (COL.6) = [(LOP (COL.1) X AC/SI% (COL.3)]/100.

**TABLE 3. ENVIRONMENT-RELATED PROJECTS IN THE NEAR EAST REGION\*\***

PROJECT	PROJECT TITLE	(Col. 1) LOP (\$000)	(Col. 2) AC/SI CODE <sup>1,2</sup>	(Col. 3) % LOP	(Col. 4) FY 91 ACTUAL (\$000)	(Col. 5) FY 92 REQUEST (\$000)	(Col. 6) LOP IN ENVIRONMENT (\$000)
<b>EGYPT</b>							
263-0100	ALEXANDRIA WASTEWATER SYS.EXPANSION	389,460	HEWH	100	87,005	—	389,460
263-0132	IRRIGATION MANAGEMENT SYSTEMS	340,000	AGIR	100	15,000	19,000	340,000
263-0140	SCIENCE & TECHNOLOGY FOR DEVELOP.	136,750	EYMP	40	—	4,000	54,700
263-0176	WATER/WASTEWATER INST. DEV.	15,000	HEWH	100	5,000	—	15,000
263-0193	CAIRO WATER III	104,000	HEWH	100	8,000	—	104,000
263-0194	ALEXANDRIA ELECTRIC	50,000	INPO	100	9,000	—	50,000
263-0202	AGRICULTURAL PRODUCTION CREDIT	308,000	AGMP	90	31,500	45,000	277,200
263-0211	UNIVERSITY LINKAGES II	20,000	EDEI/EFF	-	500	—	N/A
263-0215	POWER SECTOR SUPPORT	251,000	INPO/EFF	-	67,000	—	N/A
263-0220	Two Development Program	9,000	ACIM HEWH	5 5	150 150	— —	450 450
263-0224	POWER SECTOR SUPPORT PROGRAM	300,000	INPO	100	—	50,000	300,000
<b>JORDAN</b>							
278-0288	ENVIRONMENTAL SERVICES DEVELOPMENT (WATER QUALITY IMPROVE. & CONSERV.)	5,000 (20,000)	HEWH	20	—	500	1,000
<b>MOROCCO</b>							
608-0193	ENERGY DEMAND MANAGEMENT	7,000	EYMP	100	—	3,000	7,000

PROJECT	PROJECT TITLE	(Col. 1) LOP (\$000)	(Col. 2) AC/SI CODE <sup>1,2</sup>	(Col. 3) % LOP	(Col. 4) FY 91 ACTUAL (\$000)	(Col. 5) FY 92 REQUEST (\$000)	(Col. 6) LOP IN ENVIRONMENT (\$000)
608-0213	WATER RESOURCES MANAGEMENT	15,000	AGIR <i>AGLS/NRM</i>	10 20	— —	800 1,440	1,500 N/A
OMAN							
272-0106	FISHERIES DEVELOPMENT AND MANAGEMENT	20,000	<i>EDID/NRM</i> <i>PSMG/NRM</i>	- -	320 1,718	— —	N/A N/A
OMAN (cont)							
272-0140	WATER RESOURCES DEVELOPMENT (active)	75,000	N/A	-	n/a	—	—
TUNISIA	PRESENTLY HAS NO ENV.-RELATED PROJECTS						
YEMEN	PRESENTLY HAS NO ENV.-RELATED PROJECTS						
WEST BANK/ GAZA	PRESENTLY HAS NO ENV.-RELATED PROJECTS						
LEBANON	PRESENTLY HAS NO ENV.-RELATED PROJECTS						
<b>TOTAL</b>		<b>2,045,210</b>			<b>227,061</b>	<b>123,740</b>	<b>1,540,760</b>

\*\* NOTE: THIS TABLE WAS CONSTRUCTED EVALUATING POTENTIAL ENVIRONMENTALLY-RELATED AC/SI CODES FROM SPECIFIC PROJECTS AND ATTRIBUTING THESE SEGMENTS TO AN ENVIRONMENTAL ACTIVITY.

ITALICS = ENVIRONMENT-RELATED SPECIAL INTEREST CODE.

1- ACTIVITY CODES: AGIR = IRRIGATION; AGLS = AGRICULTURAL LAND USE & SETTLEMENT; AGMP = AGRICULTURAL MANAGEMENT, PLANNING & POLICY; AGPM = PEST MANAGEMENT; EDEI = HUMAN RES. DEVELOP. FOR EDUC. INST. EDID = HUMAN RES. DEVELOP. FOR INDIVIDUALS; EYMP = ENERGY MANAGEMENT, PLANNING & POLICY; HEWH = WATER QUALITY & HEALTH; INPO = POWER; PSMG = ADMINISTRATION & MANAGEMENT.

2-SPECIAL INTEREST CODES: EFF = ENERGY EFFICIENCY; NMR = NATURAL RESOURCES MANAGEMENT.

3-LOP IN ENVIRONMENT IN ENVIRONMENTALLY-RELATED USAID PROJECTS IS THE MAXIMUM POSSIBLE ALLOCATION OF THE LOP IF THE WHOLE ACTIVITY CODE IS CONSIDERED ENVIRONMENTAL (BASED ON OUR APPRAISAL) BUT IN ACTUAL OPERATIONS THIS DOES NOT NECESSARILY FOLLOW. LOP IN ENVIRONMENT (COL 6.) = [LOP(COL.1) X AS/CI(COL.3)]/100.

addressing broad environmental and natural resources issues over these multi-regional areas.<sup>5</sup>

Projects have ranged from the development of wildlife preserves in Jordan to large capital-intensive infrastructure projects, particularly in Egypt to expand water delivery systems and develop sewage and wastewater treatment facilities. A listing of current and recently completed projects that are deemed environmental based on AC/SI codes (Table 2) and those that are environment-related (Table 3) have been included.

## II. PRIORITY ISSUES OF ENVIRONMENT AND NATURAL RESOURCES IN THE NEAR EAST

The A.I.D. Environmental Strategy Framework has identified "five critical environmental constraints" to development. These include: 1) loss of tropical forests and other habitats critical to biological diversity; 2) unsustainable agricultural practices; 3) environmentally unsound energy production and use; 4) urban and industrial pollution; and 5) degradation and depletion of water and coastal resources. With the exception of biological diversity, issues of environment and natural resources that have been identified for the Near East Bureau are embodied by four of these critical constraints to development and are listed below in order of priority.

As can be seen, highest priority has been given to the constraints imposed by the degradation and depletion of water resources. The environmental problems and challenges faced in water resources issues for the region are far-reaching and impact on every sector of society. Likewise, the depletion and degradation of water resources is attributable to the activities of multiple sectors of society. The most notable contributors to the degradation of water resources include the agriculture, industry and urban sectors. Unsustainable activities in agricultural production, including inefficient water utilization and pesticide and nutrient loading of surface and subsurface water resources poses a major threat to water quality and supply. Untreated wastes generated by the rapidly expanding urban and industrial sectors has contributed substantially to the pollution of water supplies throughout the region. Hence, the degradation and depletion of water resources is at the forefront of the environmental constraints to development because water issues are at the root of unsustainable agricultural practices and urban and industrial pollution -- two of the other environmental constraints identified. A brief overview of the specific issues pertaining to the four environmental constraints identified follows.

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<sup>5</sup>See Toward an Environmental and Natural Resources Management Strategy for ANE Countries in the 1990's. January, 1990. Submitted by CDIE and EWRI.

## 1. Degradation and Depletion of Water Resources.

Many Near East missions and the nations to which they provide assistance have concluded that the degradation and depletion of water resources is the most critical issue facing their respective countries.

This concern is illustrated by the following excerpts from mission and country documents:

*... the principal priority is to discover and increase the supply of water ...*

(National Environmental Strategy for Jordan, 1991)

*...The water resources of Oman are limited and are recognized as the principal constraint on additional growth in both the agricultural and municipal and industrial sectors of the society...*

(T. . Mukherjea, 1986, Doc. 2311D)

*... high quality water is the most critical natural resource constraint for this semi-arid nation... A major emphasis of Moroccan economic planning remains, therefore, maximizing development of the country's water resources... This emphasis directly reflects the historically highest-level priority the government attaches to this critical resource and its effective management and use...*

(Morocco, 1991, PID 608-0213)

Water availability is clearly recognized as the leading constraint to continued economic development in the region. In general, water resources are extremely limited throughout the region. There is currently a water deficit in some areas and widespread deficits (shortages) are anticipated within the next ten years. Agricultural production, industrialization and urbanization, as well as tourism, are all being adversely affected by both the degradation in water quality and shrinking supply of useable water. However, these sectors of society are also the primary contributors to, and origins of, water pollution and misuse. Increasing degradation of existing water resources, through mismanaged irrigation systems, ill-conceived cropping systems and unabated industrial waste discharge, has jeopardized long term sustainability of quality water for the region and further exacerbates the problem of current and future water availability. The availability of a clean water supply in developing countries is also recognized as an important issue of environmental health and is reflected in the Research and

Development Bureau's Environmental Health Strategy.<sup>6</sup> Because the Near East region countries have, in aggregate, one of the highest rates of population growth in the world, tremendous pressure is being levied on existing water resources (Table 4). All Near East countries, except Oman, have on-going A.I.D. financed family planning activities and their impact is being experienced now. Rapid urbanization and industrialization marked by residential development, resettlement, and immigration (most notably in Israel, Jordan, and Iraq) are also adding to the problems of limited water resources and water quality. Additional demands for water will also increase as standards of living improve due to substantial increased water usage per capita associated with increased living standards, as observed in other developing countries that have raised their standard of living.

The water resources crisis is also being manifested in the deterioration of the general public's health. As was stated in the A.I.D. Policy Paper: Domestic Water and Sanitation (A.I.D., Washington, 1983):

*...The combination of unsafe drinking water and inadequate sanitation facilities constitutes one of the major causes of death and disability among the poor in developing countries. Safe, convenient water supply and adequate sanitation is a fundamental component of broad-based economic growth strategies...*

In Morocco, for example, despite adequate levels of per capita income and per capita caloric consumption, mother, infant and child mortality rates are much higher than in other similar middle income countries. One of the major causes of mortality is infectious disease related to water and sanitation. In Morocco, less than 20% of the rural population has access to potable water and sanitation services.<sup>7</sup>

Due to the transnational nature of water resources in the region, many of the unresolved water issues contribute to geopolitical instability. Prospects for lasting regional peace will depend heavily on resolving transnational water issues -- issues that for some countries hold their future existence in the balance.

## 2. Urban and Industrial Pollution.

Urban and industrial pollution have been targeted as the second priority constraint to achieving sustainable development (i.e. maintaining the natural resource base and ensuring environmental quality), particularly in the context of urbanization and

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<sup>6</sup>See Towards a Healthier Environment: A Strategy for Environmental Health in LDCs, R&D/Office of Health, August 1991.

<sup>7</sup>World Resources (1990-1991), WRI, Oxford University Press, 1990.

TABLE 4. POPULATION TRENDS IN THE NEAR EAST COUNTRIES<sup>1</sup>

Country	Total 1990  (millions)	Average Annual Population Growth			Density (per./1000 ha) 1989	Average Annual Labor Force Growth 1980-1990  (%)	Urban Population as % of Total Population		
		Total '1985-1990) (%)	Urban (1960-1990) (%)	Rural (%)			1960	1975	1990
EGYPT	54.1	2.55	3.3	1.8	530	2.6	37.9	40.3	44.7
JORDAN	4.3	3.94	4.7	1.1	461	4.4	42.7	55.4	68.1
MOROCCO	25.1	2.56	4.3	1.5	549	3.2	29.3	37.8	48.5
OMAN	1.5	3.34	7.9	3.7	67	3.8	3.5	6.1	10.6
TUNISIA	8.2	2.35	3.6	1.1	514	3.1	36.0	47.6	54.3
YEMEN	8.0	3.03	9.3	1.5	598	2.9	3.4	11.0	25.0
(WORLD)	5292.2	1.73	2.6	1.4	398	1.9	34.2	38.5	42.7

<sup>1</sup> Adapted from World Resources 1990-1991, The World Resources Institute, Oxford University Press, New York.

industrialization. The region is marked by an exploding population and emerging cities which is placing tremendous pressure (both directly and indirectly) on the environment and natural resources. Table 4 illustrates the high population growth rates and growth in urban populations for Near East countries. Urbanization presents a formidable problem, particularly for Egypt, Jordan and Morocco. Infrastructure and transportation problems are not only compounding societal stresses on the environment and natural resource base, but also impeding the effectiveness and overall success of development efforts.

Pollution, as a result of increasing urbanization and industrialization, has been and continues to be a critical issue for the region. The emergence of urban and industrial pollution is not a recent phenomenon in the region, but has only recently reached crisis proportions. The situation in Egypt offers a compelling case for addressing the constraints to development relating to urban and industrial pollution. In greater Cairo, the population has doubled in the past 25 years while urban infrastructure has expanded only fitfully. The overtaxing of water delivery systems and wastewater treatment facilities, combined with poor maintenance has led to significant deterioration of the urban water supply. Although incidents of streets being flooded by sewage have been substantially reduced due to earlier USAID-funded interventions, enormous problems still exist in the treatment of sewage and wastewater in urban environments.

With respect to industrial pollution, many of the Near East countries are now seeing the negative ramifications of substantial industrial growth on their natural resources, especially water. It is generally believed that Egypt's problems began with the implementation of the first industrial five-year-plan (1959-1964)<sup>8</sup> which was modeled after the Soviet Bloc initiatives. Growth industries like iron and steel, cement, textiles, chemicals, fertilizers, food processing, and petroleum contribute unchecked pollution to the nation's water, soil, and air. Recent GOE surveys found 227 industrial facilities discharging uncontrolled polluted water into the Nile and its tributaries.

Industrial growth in Jordan's Zarqa River Basin has led to increased pollution of the main river and, subsequently, the King Talal Reservoir. Wastes from industries such as refineries, textile factories, paper mills, tanneries, steel mills, and chemical plants have found their way into this major storage reservoir as evidenced by the high levels of mercury, lead, cadmium, chromium, arsenic, nickel and selenium found in the reservoir.

Environmental "hot spots" (locales of concentrated, yet conceivably diverse, industrial activities that are experiencing intensified environmental degradation) have been identified in many of the region's countries. These "hot spots" are the result of unregulated industrial growth in previous years.

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\*See Dept. of State AIRGRAM, from Cairo, April 24, 1990. A-005.

**TABLE 5. CHANGE IN COMMERCIAL ENERGY CONSUMPTION. (1977-87)<sup>1</sup>**

<b>COUNTRY</b>	<b>1987 CONSUMPTION LEVELS</b>	
	<b>Total Consumption Change (1977 = 100)</b>	<b>Per Capita Change (1977 = 100)</b>
<b>EGYPT</b>	<b>111</b>	<b>167</b>
<b>JORDAN</b>	<b>293</b>	<b>131</b>
<b>IRAN</b>	<b>135</b>	<b>93</b>
<b>TURKEY</b>	<b>156</b>	<b>121</b>
<b>SYRIA</b>	<b>199</b>	<b>193</b>
<b>ISRAEL</b>	<b>158</b>	<b>132</b>
<b>LEBANON</b>	<b>154</b>	<b>150</b>
<b>OMAN</b>	<b>2,044</b>	<b>1,289</b>
<b>YEMEN</b>	<b>244</b>	<b>193</b>
<b>TUNISIA</b>	<b>163</b>	<b>127</b>
<b>MOROCCO</b>	<b>153</b>	<b>125</b>
<b>IRAQ</b>	<b>170</b>	<b>122</b>
<b>SAUDI ARABIA</b>	<b>631</b>	<b>402</b>

<sup>1</sup> Compiled from World Resources 1990-1991, The World Resources Institute, Oxford University Press, New York.

Clearly, there is growing focus within A.I.D. on ensuring the sustainability of current and future development in A.I.D. assisted countries. However, conspicuous failure of past urban and industrial sector growth to embrace ideals of sustainability, as is evident by the environmental "hot spots" and the lack of concurrent infrastructure development with urban growth, requires re-examination of how the Agency can bring sustainability to the existing sectors, where and when possible.

### 3. Environmentally Unsound Energy Production and Use.

The continued expansion and industrialization of the economies of countries in the Near East, along with rapid urbanization and population growth, have greatly increased energy usage and demand (Table 5).<sup>9</sup> The growth rate for energy consumption is particularly high in many of the Near East countries and is expected to continue into the next century. Increased demand for energy is primarily for liquid fuels in relation to growth in the transportation sector.<sup>10</sup> Each one percent increase in GDP between 1980 and 1986 required an increase in energy inputs of 1.5 percent in Egypt; and 1.8 percent in both Jordan and Tunisia. Of major concern is the ability of Near East countries to meet growing energy demands in light of limited non-renewable energy resources; the deterioration of existing energy utility performance; and increasingly severe environmental constraints. The question of how the region will meet its growing energy demands in an environmentally sustainable manner is capturing increased attention.

Even though there are considerable fossil fuel reserves (oil and natural gas) in the region, it is generally felt that future sustainability will include the development of renewable energy resources. Renewable energy resources of potential importance to the region include: hydroelectric; solar; biomass-derived fuel; wind; geothermal; and ocean energy. The production and consumption of energy from renewable sources, with some exceptions, are activities generally believed to be less harmful to the environment (versus non-renewable energy), particularly with regard to their low level of atmospheric emissions such as acid rain precursors (sulfur dioxide and nitrogen oxides) and greenhouse gases (carbon dioxide and methane). Although the practicability of various renewable energy technologies has been demonstrated, economic viability of these technologies must be considered on a case-by-case basis.

Most of the countries the Near East region lack the technical, financial, and institutional capacity to not only improve existing power sector performance but also to explore and develop alternative energy sources such as renewables. Efforts to strengthen public and private sector capability to design, procure, install, operate, maintain and evaluate

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<sup>9</sup>Compiled from World Resources 1990-91. The World Resources Institute, 1990. Oxford University Press, New York.

<sup>10</sup> Information provided by the Research Dept., Gas Research Institute, Washington, D.C. (1991).

renewable energy technologies that have potential commercial use are just beginning in the region. For example, the Government of Egypt has recently established the Egyptian New and Renewable Energy Development and Utilization Authority (NREA) -- a first step in meeting the future challenges of meeting energy demand.

In addition, efforts are being made in the area of energy conservation. Morocco's Energy Demand Management Analysis Support Project (608-0193) was designed to increase productivity by reducing energy waste and improving efficiency of energy use in Morocco.

#### **4. Unsustainable Agricultural Practices.**

It is becoming evident throughout the Near East region that the historical increases in agricultural production observed over the past several decades (in part, due to the substantial intervention and assistance from A.I.D.) cannot be sustained simply by cultivating and irrigating more land and increasing fertilizer and pesticide inputs. At the same time, growing populations and changing consumer demand require a renewed effort to increase agricultural production. As mentioned above, under the constraints imposed by the degradation and depletion of water resources, the agricultural sector is having a major impact on water resources throughout the region. The uneconomic use of fertilizers in a manner detrimental to water quality is a common occurrence in many of the countries in the Near East region. Morocco, Jordan, Egypt have all been plagued by continued deterioration in the quality of water used in agriculture.

The extent of agriculture's impact on water resources is directly related to the proportion of the total water resource that is dedicated to agriculture in most of the Near East countries (Table 6). Improving the efficiency of water use in agricultural production; reducing the discharge of fertilizer and pesticides into water resources; and reducing the rate of siltation and salinization of fresh water resources are all priority issues to be addressed in realizing a sustainable agriculture for the region. The Pest Management Guidelines that have been developed in the Agency provides a tool by which information can be disseminated to A.I.D. personnel on the design and implementation of environmentally sound pest and pesticide management activities.

### III. STRATEGIC OBJECTIVES, APPROACHES AND THE CRITERIA FOR DEVELOPING SOLUTIONS.

#### 1. STRATEGIC OBJECTIVES:

The environment and natural resources issues outlined in the constraints to development give rise to the following four strategic objectives:

##### 1.1. Foster efficient resource use and conservation, especially water and energy.

The current and projected deficits in water and energy resources necessitates focusing on ensuring that these resources are used in the most efficient manner. Undoubtedly, with respect to water, the trans-regional implications for modification in water use and/or allocation by any individual Near East region country must be considered on a continuous basis.

##### 1.2. Promote the concept of waste minimization and pollution prevention in resolving problems facing the industrial and agricultural sectors in ensuring air, soil and water quality.

With continued unchecked and uncontrolled growth in the urban and industrial sectors of the Near East region, increased emphasis on the environmental implications (i.e. soil, water and air pollution) of this growth will be needed and solutions will be sought. The traditional approach to dealing with environmental pollution in these sectors in developing countries, including the U.S., has been toward controlling and managing wastes after they are generated. Emphasis has been placed on developing pollution level standards, promulgating regulations and enforcing laws which has primarily promoted emphasis on "end-of-pipe" solutions.<sup>11</sup> However, strongly enforced end-of-pipe requirements and vigorously regulated hazardous waste disposal requirements have not solved environmental pollution problems. Current thinking has placed greater emphasis on the prevention of pollution and reducing the amount of waste generated in primary industrial activities. This concept, referred to as "pollution prevention" (also termed waste reduction/minimization, source reduction, and front-end environmentalism) embodies a complete and systematic method of assessing a manufacturer's

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<sup>11</sup>For a thorough description of the pollution prevention paradigm, see Prosperity Without Pollution, J.S. Hirschhorn and K.U. Oldenburg (ed.). 1991, Van Nostrand Rheinhold, New York.

**TABLE 6. SECTORAL WITHDRAWAL OF WATER RESOURCES<sup>1</sup>**

COUNTRY	Residential	Industry	Agriculture	Irrigated Land as % of Total Crops
	----- % of Total -----			
EGYPT	7	5	88	100
JORDAN	29	6	65	11
IRAN	4	9	87	39
TURKEY	4	6	90	8
SYRIA	7	10	83	12
ISRAEL	16	5	79	64
LEBANON	11	4	85	29
OMAN	3	3	94	87
YEMEN	5	2	93	48
TUNISIA	13	7	80	5
MOROCCO	6	3	91	15
IRAQ	3	5	92	32
SAUDI ARABIA	45	8	47	36

<sup>1</sup> Compiled from World Resources 1990-1991, The World Resources Institute, Oxford University Press, New York.

production and/or processing system for opportunities to minimize the generation of waste products. Steps to be taken in this method include 1) good housekeeping, 2) recycling and reuse, 3) materials substitution, and 4) process modification. The attractiveness of the pollution prevention philosophy is in its applicability to resolving both existing urban, industrial, as well as agricultural pollution problems and in providing an environmentally sound basis for further developing these sectors in an environmentally and economically sustainable manner.

**1.3. Increase accountability and local empowerment in addressing environmental and natural resources issues.**

Providing local people with access to resources, education, and decision-making is an essential step toward sustainable management of natural resources. Unlike centralized authority, local empowerment of the responsibility for management of natural resources is advantageous in that the (local) community possesses the experience to manage resources effectively and retains the incentive for effective management. In addition, communities that earn their livelihood from indigenous resources tend to be more acutely cognizant of the issues and subtleties of the resource and, therefore, more receptive to improving management capacity.

**1.4. Foster private sector solutions and policy reform at local, national and regional levels.**

Many of the host countries in the Near East region lack the human and institutional capacity to design and implement environmental and natural resources programs. Often, there is insufficient training, technical knowledge, and resources in both public and private sectors to analyze problems adequately, develop alternatives to misguided practices, and effectively influence government policy. The private sector within the country should play a major role in providing solutions to environmental problems. Promoting privatization and private sector involvement in issues of environment and natural resources management will ensure greater efficiency in addressing these issues. Promotion of the private sector's role as the primary source of funds for environmentally sound development will also foster long term and ongoing commitment to these issues.

**2. APPROACHES TO ACHIEVING THE OBJECTIVES:**

The Agency's Environmental Strategy Framework states that regional strategies need to be designed to ensure that 1) decisions in the allocation of A.I.D. resources are both rational and defensible; 2) the strategies consider the five environmental constraints to development in which interventions can have a significant impact; and 3) the strategies

reflect the boundaries of the five problem areas. Three broad categories of approaches have been identified in the Environmental Strategy Framework on which the regional bureaus are to focus. These include: 1) *strengthening human/institutional capacity and building public awareness*; 2) *reforming unsustainable economic and environmental policies and procedures*; and 3) *encouraging private sector participation in promoting environmentally sound development activities*.

The Near East Bureau has identified four strategic approaches based on criteria that is most applicable to the environmental and natural resource issues of the region and hold the most promise for successful and effective intervention to achieve the objectives stated above. These include:

1. Providing technical support to Missions on the environmental and natural resources dimensions of their projects and programs, including environmental assessments.
2. Identifying and implementing regional and common approaches to resolving environmental problems and resource management, including cooperation with other donor organizations.
3. Providing support for critical policy reforms and development of institutional capability in environment and natural resources, with priority towards water resources.
4. Providing support for promoting environmental services expertise and technologies in the Near East region that is available from the U.S. private sector and academic institutions.

Each of the four strategic approaches that are being advanced here by the Near East Bureau are mechanisms through which the Agency's three broad categories of approaches outlined above can be fulfilled. The Near East Bureau's focus will be tailored to fit the needs of these particular countries while being fully consistent with the Agency's global objectives.

- 2.1. Providing technical support to Missions on the environmental and natural resources dimensions of their projects and programs, including environmental assessments.

AID Washington's effectiveness, as a development-assistance agency, is manifested in its ability to facilitate actions by the missions. Therefore, guidance to, support for, and cooperation with, Near East missions in their environmental activities will be a primary

effort for the Near East Bureau. The Bureau's environment and natural resources strategy is in concert with the strategies of the individual missions and reflects themes from each of the mission's strategies. The Washington Bureau office must act as a clearinghouse for information and technical resources (especially U.S. private sector based) to the missions regarding issues of environmental and natural resource significance. Many of the issues that are being brought before the Missions by their host governments will require decisions that will impact well into the next century and have far-reaching consequences. Current knowledge and state-of-the-art thinking and technologies must be immediately accessible to the Missions. This is the challenge before the Near East Bureau. This challenge will become ever more critical as the issues of environmental protection, natural resource management, and appropriate intervention take on ever increasing significance.

There are a number of AID Washington projects that are already actively supporting the regional mission efforts in environmental and natural resources activities. Two of them are highlighted here:

PRIDE (Project in Development and the Environment) is the primary environmental assistance project available to Near East Bureau. PRIDE's goal is to promote sound environmental and natural resource policies and programs in support of long-term sustainable economic growth. The project's purpose is to assist missions and host country institutions, through the Bureau offices, to identify and address critical environmental issues that threaten economic growth, public health and ecological sustainability through a broad range of technical assistance resources. Another objective of this project is to mobilize the host country private sector and NGOs to provide cost effective solutions to these problems. PRIDE aims to act as a catalyst to stimulate Mission environment and natural resources activities, support Missions with technical assistance in areas of environmental concern, and to help the Missions define their environmental strategies. PRIDE is operated out of Near East Bureau, Washington and has both core funding and buy-in capacity.

WASH (Water and Sanitation for Health) is a project established to provide guidance for host governments, agencies and Missions on issues of water supply, sanitation, vector-borne disease control, and solid waste and wastewater management. Activities focus on identifying environmentally based health issues and diseases, and determine the possible interventions to assess, reduce, and manage these risks. WASH also focuses on training, institutional development, hygiene education, finance, community participation and information exchange in urban and rural populations. WASH is operated out of R&D Bureau, Washington and has both core funding and buy-in capacity.

Other projects that function to support mission activities include the Irrigation Support Project for Asia and the Near East (ISPAN) and the Environmental Pollution Prevention Project (EP3).

**2.2. Identifying and implementing regional and common approaches to resolving environmental problems and resource management, including cooperation with other donor organizations.**

Many of the environmental and natural resource issues facing the Near East region are transnational in nature. Identifying the sources of water and air pollution and appropriate mitigation, establishing water storage and multi-purpose facilities, and selecting among different water supply augmentation methods are all examples of issues that have transboundary implications. The significance of the transnational dimension of many of the environmental and natural resource issues within the region is that regional solutions are imperative and that international cooperation is essential. Orchestrating regional solutions is complicated by the fact that there is often a lack of awareness of crossboundary environmental problems among the countries of the region.

Due to the artificial breakout of Near East countries in the Agency, transnational issues may involve countries of different regional bureaus and/or countries that do not come under AID assistance. This situation greatly aggravates developing effective regional activities. For this reason, the Near East Bureau will explore opportunities to cooperate with other international donors and NGO's in order to broaden the opportunities for regional approaches and strengthen the effectiveness and credibility of such approaches.

Identification of common approaches to environment and natural resources problem issues is directly related to promoting regional efforts. It is becoming too expensive to handle problems on a country by country basis due to the fact that donor funds are becoming more limited. Assistance activities by AID will be deemed successful, in part, when broad (regional) application and/or implementation can be realized from such activities. Likewise, consideration of regional impacts from AID activities will also be critical when environment and natural resources issues such as water supply and quality are directly or indirectly involved.

**2.3. Providing support for critical policy reforms and development of institutional capability in environment and natural resources, with priority towards water resources.**

Countries who have come to adopt the strongest environmental protection standards, and who lead in the formulation of international treaties on environmental and natural resource issues, are those countries in which the scientific and technical communities are strongest and actively involved in directing government policy. As Peter Haas states:

*...As international vulnerabilities and complex interstate flows become more acute with the globalization of the world economy and mounting interdependence, groups able to attenuate the accompanying uncertainty for decision makers may become increasingly important in identifying problems, setting agendas, and proposing and enforcing domestic and foreign policies, particularly for issues with a large scientific and technical component...<sup>12</sup>*

In recognition of the critical role that scientific/technical institutions (both public and private) play in formulating policy, the Near East Bureau is acting to strengthen the capacity for policy analysis and planning that incorporates environmental costs, cost-effectiveness, and alternative supply options for energy and water resources, through training and encouraging linkages with U.S. academic institutions. In addition, the Bureau will strive to identify and support policy incentives and regulatory reforms that promote pollution prevention in the industrial, urban, and agricultural sectors.

**2.4. Providing support for promoting environmental services expertise and technologies in the Near East region that is available from the U.S. private sector and academic institutions.**

The U.S. private sector and its academic institutions have renowned expertise and experience in many fields relating to management of the environment and natural resources. For example, in the field of pollution prevention, the U.S. private sector leads the world and can play a critical role in bringing this new technological approach to developing countries.<sup>13</sup> A.I.D.'s Environmental Pollution Prevention Project (EP3) is an innovative project proposed by AID/R&D which will focus specifically on promoting urban and industrial pollution prevention in developing countries and will utilize the expertise found in the U.S. private sector. Through private sector involvement, this project will create the necessary conditions for proper urban and industrial pollution management in developing countries by providing: 1) knowledge of the means for pollution prevention and control; 2) familiarity with the advantages of cleaner production methods; and 3) assistance to introduce industrial processes and equipment innovations that minimize waste generation.

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<sup>12</sup>In, Saving the Mediterranean: the Politics of International Environmental Cooperation. 1989, Columbia University Press, New York.

<sup>13</sup>Some of the leaders in instituting pollution prevention concepts include 3M Corporation, Dow Chemical, DuPont, B.F. Goodrich, and Monsanto.

In addition, the Private Sector component of the PRIDE project is promoting environmentally beneficial actions by the private sector and NGO's in Near East countries. Through a cooperative agreement, PRIDE is working closely with the World Environment Center (WEC) and its International Environment and Development Service (IEDS) to provide U.S. private sector expertise to Near East private and public sector firms through factory assessments, training, and information sharing.

Not only will the Near East Bureau encourage the U.S. private sector to provide the necessary technical assistance and act as a mechanism for technology transfer, opportunities will be sought to promote the marketing of U.S. private sector products and services in, for example, the areas of pollution prevention, solid waste and wastewater management, renewable energy technologies, and water resources management.

The Near East Bureau will also actively solicit U.S. academic institutions for participation in planning, implementing, and evaluating development activities that impact on the environment throughout the region.

#### IV. BACKGROUND INFORMATION ON THE NEAR EAST REGION

This section provides a brief overview of background information on the Near East region that is pertinent to developing and guiding strategic environmental interventions by A.I.D. Historically, the resource management policies and development activities of neighboring (non-AID) nations have often influenced local socio-economic conditions and environmental and natural resource issues throughout the rest of the Middle East. Hence, non-AID countries are included to complete the assessment of priority issues facing AID assisted countries. Cyprus and Turkey are also considered in the analysis because of their special social/political/economic as well as geographic relationship to the region.

The AID assisted countries of the Near East are dispersed widely within an area extending almost 1/4 of the distance around the globe. The group of nations that occupies this vast area is generally referred to as the Near East. The term "Middle East" is also used to identify the region, however, this term usually does not encompass the Maghrebian countries (i.e. Morocco, Tunisia, and Algeria). As a group, these countries constitute over 9% of the world land area. Arid to semi-arid conditions predominate in the region and prevailing north-south winds bring limited precipitation in most areas. The scarcity of precipitation in the region is dramatic with annual precipitation totals falling below the average 200mm needed to sustain an effective dryland agriculture. Limited precipitation, often combined with steep hills and infertile soil, strongly affects the availability of water, the productivity of the land, and effectively narrows the potential for commercial agricultural enterprises.

Population growth throughout the region is among the highest in the world. World Bank estimates that by the year 2000 the region will have 336.9 million inhabitants, representing an increase of 55% from 1983. Because of the high growth rates within the region, between 40 and 50 percent of the population is 15 years old or younger. Only three Middle Eastern nations have populations where this age group represents less than 40% of their inhabitants. Two thirds of all Middle Eastern nations have male literacy rates that fall below 75% while female literacy rates are substantially lower, falling below 12% in some Gulf States. On a regional basis, literacy rates are highest in urban centers of the Levant (75%), intermediate in North Africa (50%) and lowest in the Gulf States (<40%).

Along with high population growth rates, weather and climate, access to water, soil fertility, access to transportation and trade, and existing infrastructure all combine to encourage high population concentrations, particularly along the Mediterranean shores and major rivers. One result has been a dramatic increase in the rate of urbanization and industrialization in a relatively confined area during the past three decades.

As a result of limited arable soil resources, all A.I.D. Near East countries, with the exception of Morocco, (as well as Syria and Turkey) are net food importers. The limited cropland resources is reflected in the low ratio of cropland per capita. Worldwide, cropland per capita (in hectares) averages 0.28, yet it varies from 0 in Singapore to almost 3 in Australia. Egypt (0.05), Israel (0.10), Jordan (0.10), Lebanon (0.10), and Oman (0.03), are among only 16 nations that afford less than 1/10 hectare per person. Furthermore, population pressures, soil erosion and desertification have contributed to net decreases in cropland per capita in 7 out of 19 Near East countries in the last 10 years.

Like arable land, forest resources are extremely limited in the Near East region. Most of the existing forest is concentrated in Morocco, Algeria, Turkey and Iran, hence, indigenous forest products are minimal.

With the exception of Morocco, mineral resources in the Near East region are fairly limited. On a world scale, Morocco ranks among the top producers of antimony, cobalt, lead and manganese. More importantly, Morocco's richest mineral resource is phosphate and contains approximately 3/4 of the world's known resources and is the third leading producer after the US and the former Soviet Union. Even so, only a modest fraction of Morocco's GDP is currently derived from mineral exports. Jordan and Tunisia are known to possess rich potassium deposits. Other important minerals are present in the region in moderate amounts, notably chromite (Turkey and Iran), potash (Israel), and iron (Algeria).

At present, oil and natural gas reserves are crucial assets for some of the countries in the Near East region. Most of these non-renewable energy resources are concentrated in a few of the Persian Gulf countries. In North Africa, Algeria and Libya are important oil exporters. AID countries, such as Oman, Yemen, Morocco, Tunisia and Egypt are, or

could become, net oil and/or gas exporters, while Israel, Jordan and Lebanon have little or no oil deposits. Despite the limited non-renewable energy resources of many of these countries, energy use (consumption) has grown rapidly over the last decade. This expansion in energy use reflects rapid economic growth, increasing urban and rural electrification, and the introduction of energy-intensive industries. Energy use in Morocco, Tunisia, and Israel has increased more than 50% over the last decade while energy use in Egypt, Jordan, and Yemen has increased 110, 144, and 193%, respectively.

Despite increasing energy use and demand, exploitation of renewable energy sources, as in the rest of the world, has been very limited. Hydroelectric energy production has limited but strategic potential in portions of this water poor region. Other sources of power, such as geothermal, solar and wind hold great promise for providing energy in remote areas, but as of yet, these sources provide only small amounts of energy for Near East region countries.

All AID countries of the Near East border marine waters. Important economic sectors in the region are dependent on marine, coastal and estuarine resources, such as industrial operations, power generation, oil and mineral exploitation. Of particular importance to the region is the potential for significant economic growth of fisheries, mariculture enterprises and coastal tourism. The Mediterranean and Red Sea are of primary importance for the economic subsistence of Maghreb and Levant countries. As international waterways, the Mediterranean and the Red Sea are main commercial shipping lanes for movement of goods between Europe and the Near East. The coastal and marine habitats of the Near East are among the most ecologically sensitive in the world. In recognition of this fragility, many of these habitats are protected under several international accords for the preservation of endangered marine mammals and turtles, and critical wetlands and routes for migratory birds.<sup>14</sup>

In addition to those traditional resources already discussed, the Near East region has the unique resource of rich and diverse antiquities. Virtually no area in the Near East is devoid of archaeological remains. For centuries the region has been recognized as uniquely rich in ancient patrimony, and encompassing the birth place of three of the world's great religions. From an economic point of view, archeological sites and antiquities-related tourism are an important source of income throughout the Middle East and represents 12-20% of the annual foreign exchange earnings of several Middle East countries.<sup>15</sup>

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<sup>14</sup>The Mediterranean Action Plan, Barcelona Convention, and the Genoa Declaration all function to protect coastal and marine habitats.

<sup>15</sup>Based on estimates supplied by Department of Antiquities, Amman, Jordan and the American Center of Oriental Research.

Water, in general, is the most critical resource in the Near East region due to its scarcity, as well as its transnational nature and disregard for international boundaries (which places water resources issues in a regional context). There are a number of river basins in the Near East region that have multiple riparians. These include: 1) the Euphrates River Basin, providing water to Turkey, Syria, Iraq, and Saudi Arabia; 2) the Tigris River Basin, providing water to Turkey, Syria, Iraq, and Iran; 3) the Nile River Basin, providing water to Egypt and eight other African nations; 4) the Jordan River Basin, providing water to Jordan, Syria, Israel, the West Bank, and Lebanon; and 5) the Orantes River Basin, providing water to Lebanon, Syria, and Turkey. The Litani River Basin is located entirely in Lebanon, while the Oum er Rbia, Moulouya, and Sebou River Basins are located entirely in Morocco. Tunisia has two major rivers, the Medjerda which originates in Algeria and flows into the Mediterranean and the Miliane which flows into the Gulf of Tunis.

Numerous proposals and schemes exist that seek to provide a more equitable distribution of surface water in the region. These proposals center around diversions and interbasin transfers via dams, canals, and pipelines.<sup>16</sup>

Subsurface water resources (aquifers) are poorly documented in terms of expanse and quality throughout the region. As with surface waters, subsurface water resources often provide water to multiple countries. There is speculation that a major subsurface water resource exists in the Middle East and, if discovered and recoverable, may prove to be a future water source for the region.

With the exception of Jordan, in which 65% of its water resources are used by the agricultural sector, all of the Near East countries allocated 80% or more of their water resources to agriculture.<sup>17</sup> The substantial allocation of water resources to the agricultural sector reflects the importance placed on a strong agricultural production base within countries of the region. There is a desire to attain and/or maintain self-sufficiency in food production and ensuring the flow of hard currency through agricultural exports. Growth in the agricultural sector of all these countries is attributable to, and has been dependent on, irrigation capacity. The high priority given to agriculture in water allocation has created conflicts for water usage among other competing sectors such as municipalities, commerce, industry, and transportation.

Desalination of salt and/or brackish water has become an important technology for providing water, particularly in countries of the Arabian peninsula. The Arabian peninsula accounts for 60% of the world's estimated 6000 desalination plants.

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<sup>16</sup>A detailed description of these proposals is beyond the scope of this paper. Refer to The Source of Power by F.W. Anderson (Geographical Magazine, March 1991).

<sup>17</sup>See Table 1. Compiled from World Resources 1990-91, The World Resources Institute, Oxford University Press, New York.

**Desalination processes vary greatly in technical sophistication; capital investment, operation, and maintenance cost requirements; and efficiency. The salinity of the water going into a desalination plant is a major factor affecting overall cost of fresh water production. Generally speaking, desalination plants are still financially out of reach for most of the A.I.D. supported countries in the region. There have been instances where desalination plants were built in the region (particularly Israel) and their operation suspended due to high operating and maintenance costs.**