

Egypt Environmental Sector Assessment
Final report
Volume I

March 1998

for USAID/Cairo

EPIQ
International Resources Group, Prime Contractor

Task order no. OUT-PCE-8-802-96-00002-00
Contract no. PCE-I-00-96-00002-00

This title page was copied by the cataloger from the paper original

Contents

Volume I

Preface	v
Acronyms	vii
List of Scientific Acronyms and Units of Measurement	ix
List of Tables and Figures	xi
Executive Summary	xiii
1. Introduction	1
1.1 Methodology	2
1.1.1 Rapid Review	2
1.1.2 Participatory Process	2
1.2 Outline of the ESA Report	4
2. Overview of the Egyptian Environmental Sector	5
2.1 Macroeconomic Setting	5
2.2 Industrial Pollution	7
2.2.1 Environmental Impact of the Industrial Sector	9
2.2.2 Health Impact of the Industrial Sector	13
2.3 Municipal Solid Waste	15
2.3.1 Environmental Effects of MSW	16
2.4 Energy/Energy Efficiency	17
2.5 Environmentally Sustainable Tourism	22
2.5.1 Cultural Heritage	23
2.5.2 Natural Heritage	24
2.5.3 Risks to Cultural and Natural Resources Associated with Tourism	25
2.5.4 Risks to Tourism Associated with Environmental Factors	25
2.6 Other Environmental Sectors	26
2.6.1 Land and Water Resources	26
2.6.2 Municipal Water Supply	29
2.6.3 Urban Air	29
3. The Current Environmental Policy Framework	33
3.1 Overview of Environmental Policy, Legal and Institutional Framework	33
3.1.1 Environmental Policy Framework	33
3.1.2 Legal Framework for Environmental Management	36
3.1.3 Institutional Framework for Environmental Management	40
3.2 Policy Formulation and Implementation in Specific Environmental Sectors	49
3.2.1 Industrial Pollution	49
3.2.2 Municipal Solid Waste	53

3.2.3	Energy/Energy Efficiency	55
3.2.4	Environmentally Sustainable Tourism	58
3.2.5	Other Environmental Sectors	60
4.	Environmental Policy Constraints	65
4.1	Structure of Economic Incentives	65
4.1.1	Pricing of Natural Resources and Environmental Services	65
4.1.2	Incentives for Pollution Reduction	68
4.2	Institutional Capabilities	71
4.2.1	Information and Analysis	71
4.2.2	Institutional Strengthening Needs	72
4.2.3	Sustainable Funding for Management and Protection	73
4.2.4	Public Awareness	74
4.3	Barriers to Environmental and Natural Resource Investments	75
4.3.1	Project Preparation Capabilities	75
4.3.2	Affordable Financing	75
4.3.3	Access to Investment Opportunities	77
4.3.4	Constraints on Imported Environmental Equipment	79
5.	Overview of Policy Reform Program Strategies	81
5.1	Overview of the Individual Sector Strategies	82
5.1.1	Institutional and Legal Reforms	82
5.1.2	Industrial Pollution	84
5.1.3	Municipal Solid Waste	85
5.1.4	Energy/Energy Efficiency	86
5.1.5	Environmentally Sustainable Tourism	87
5.2	Overall Goals of the Assistance Strategy	89
5.2.1	Ensuring Sustainable Development	89
5.2.2	Promoting Environmental and Health Benefits	90
5.3	Major Challenges and Crosscutting Themes of the Assistance Strategy	90
5.3.1	Overcoming Institutional Inertia and Capacity Constraints	91
5.3.2	Strengthening Private Sector Incentives	93
5.3.3	Crosscutting Themes	96
5.4	Assistance Tools for Implementing the Policy Reform Program	102
6.	Institutional and Legal Reforms to Complement Sectoral Programs	105
6.1	Consolidate Environmental Management at the National Level	106
6.1.1	Ensure Incorporation of Environmental Considerations into National Development Planning	106
6.1.2	Strengthen Capacity in Existing Environmental Institutions	107
6.1.3	Adopt Effective Mechanisms for Inter-ministerial Coordination	108
6.1.4	Develop the Environmental Protection Fund	109
6.1.5	Disseminate Environmental Information	

	to the Public	109
6.2	Decentralize Core Environmental Management	
	Functions to the Local Level	110
6.2.1	Establish and Operationalize the RBOs	111
6.2.2	Reinforce the Environmental Management	
	Units in the Governorates	112
6.2.3	Reinforce the Environmental Divisions	
	in Industrial Cities	113
6.2.4	Foster Public Participation and NGO Investment	
	in Local Environmental Management	113
6.3	Strengthen the Local and Regulatory Framework	
	for Environmental Management	114
6.3.1	Complete the Regulatory and Administrative	
	Framework for Law 4/1994	115
6.3.2	Integrate Implementation and Enforcement	
	of Environmental Laws	115
6.3.3	Build Capacity in the Legal Infrastructure	116
6.3.4	Assess the Need for Revisions and Additions	
	to Environmental Legislation	117
7.	Policy Reform Program for Industrial Pollution	119
7.1	Strengthen Implementation and Enforcement Capabilities	121
7.2	Promote Industry Compliance	124
7.2.1	Support Development of Industrial Pollution	
	and Compliance Programs	125
7.2.2	Support the Financing of Industrial	
	Environmental Investments	127
7.3	Expand and Improve Public Awareness to Support	
	Institutional Strengthening and Industry Initiatives	130
8.	Policy Reform Program for Municipal Solid Waste	133
8.1	Analysis of the Demand for and Costs of	
	Providing MSW Services	134
8.1.1	Measuring Willingness-to-Pay for MSW Services	134
8.1.2	The Cost of Alternative Levels of Service	135
8.1.3	Financing Mechanisms and Incentives	136
8.2	MSW Policy Reforms and Assistance Program	137
8.2.1	MSW Management Regulations	137
8.2.2	Strengthen Implementation and	
	Enforcement Capabilities	138
8.2.3	Financing, Funding and Cost Recovery	139
8.2.4	Private Sector MSW Services	140
8.2.5	Public Awareness and Participation	141
9.	Policy Reform Program for Energy and Energy Efficiency	145
9.1	Energy	
145		
9.1.1	Establish Independent Regulatory Authority	
	for Energy Sector	145
9.1.2	Restructure Energy Sector	146
9.1.3	Revise MOP CNG Conversion Strategy	147

9.1.4	Introduce a Policy and Legislative Framework for Renewable Energy	149
9.1.5	Develop a Cogeneration Policy	150
9.2	Energy Efficiency	150
9.2.1	Policy Group	153
9.2.2	Capacity and Awareness Group	154
9.2.3	Implementation and Financing Group	155
10.	Policy Reform Program for Environmentally Sustainable Tourism .	159
10.1	Development of a National EST Strategy	160
10.1.1	Sustainable Program for Tourism Development	160
10.1.2	Strategy for Sustainable Management of Antiquities and Cultural Resources	162
10.2	Improved Protection and Management of Natural and Cultural Resources	163
10.2.1	Improved Capacity to Manage Protected Areas	163
10.2.2	Clarify and Coordinate Enforcement Roles	164
10.2.3	Remediation of Damaged Natural Resources	164
10.2.4	Decentralize Antiquity Site Management	166
10.3	Incentives for Environmentally Sound Tourism Development . . .	166
10.3.1	Improve Structure of Incentives for Land Development	167
10.3.2	Improve Linkages between the EIA Process and Development	167
10.3.3	Increase Capacity for Environmental Design	168
10.4	Sustainable Financing for Protection and Management of Natural and Cultural Resources	169
10.4.1	Financing for Natural Resource Protection and Management	169
10.4.2	Private Sector Financing for Antiquity Site Restoration . .	171

Volume II

Annexes

- A. Scope of Work
- B. The Role of Non-governmental Organizations in the Environmental Field
- C. Project Profiles
- D. Donor Assistance to the Egyptian Environmental Sector
- E. Participation Panel Meetings
- F. Policy Roundtables
- G. List of Meetings and Field Trips

Preface

The Egypt Environmental Sector Assessment (EESA) team would like to express its appreciation and gratitude for the guidance and cooperation provided by the EESA Steering Committee members: Dr. Tarek Genena, Director of the Technical Cooperation Office for the Environment/Egyptian Environmental Affairs Agency (TCOE/EEAA), Dr. Magdy Saleh, Senior Advisor to the Tourism Development Authority (TDA), Mrs. Mary El Bahgoury, Consultant for Research and Quality to the Minister of Petroleum, Dr. Ibrahim Abdel Gelil, former Chairman of the Organization for Energy Conservation and Planning (OECF) and current Chairman of the EEAA, and Mr. George Deikun, Mr. James Goggin and Ms. Salwa Wahba from USAID/Egypt.

The team also would like to thank the many people who participated in the policy roundtables and participation panels, arranged meetings and field trips for the team and gave freely of their time in meeting with the team and providing valuable suggestions and comments. The team has worked diligently to ensure that the most recent and accurate information has formed the basis for the assessment. Any oversights and remaining errors in the report are those of the authors.

List of Acronyms

BOOT	Build/Own/Operate/Transfer
C&D	Construction and Demolition
CAPMAS	Central Authority for Public Mobilization and Statistics
CEE	Central and Eastern Europe
CEOSS	Coptic Evangelical Organization for Social Services
CIDA	Canadian International Development Agency
CMS	Compliance Management System
CNG	Compressed Natural Gas
DANIDA	Danish International Development Agency
DRTPC	Development Research and Technological Planning Center
DSM	Demand Side Management
ECEP	Energy Conservation and Environmental Protection Project
ED	Environmental Division
EDC	Electricity Distribution Company
EEA	Egyptian Electricity Authority
EEAA	Egyptian Environmental Affairs Agency
EEAP	Egyptian Environmental Action Plan
EEPP	Egyptian Environmental Policy Program
EESA	Egypt Environmental Sector Assessment
EGPC	Egyptian General Petroleum Corporation
EHP	Environmental Health Project
EIA	Environmental Impact Assessment
EIMP	Environmental Information and Monitoring Project
EMS	Environmental Management System
EMU	Environmental Management Unit
EOS	Egyptian Organization for Standards
EP3	Environmental Pollution Prevention Project
EPIQ	Environmental Policy and Institutional Strengthening Project
ERSAP	Economic Reform and Structural Adjustment Program
ESCO	Energy Service Company
EST	Environmentally Sustainable Tourism
FEI	Federation of Egyptian Industries
FSU	Former Soviet Union
FY	Fiscal Year
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEF	Global Environment Facility
GOE	Government of Egypt
GOFI	General Organization for Industrialization
IMF	International Monetary Fund
ISO	International Standards Organization
KAP	Knowledge, Attitudes and Practices
KfW	Kreditanstalt für Wiederaufbau
LEAP	Lead Exposure Abatement Project
LPG	Liquid Propane Gas
LRMC	Long-run Marginal Cost
MALR	Ministry of Agriculture and Land Reclamation
MHUUC	Ministry of Housing, Utilities and Urban Communities
MIMW	Ministry of Industry and Mineral Wealth
MOEA	Ministry of State for Environmental Affairs

MOEE	Ministry of Electricity and Energy
MOHP	Ministry of Health and Population
MOI	Ministry of the Interior
MOP	Ministry of Petroleum
MPWWR	Ministry of Public Works and Water Resources
MSW	Municipal Solid Waste
NGO	Non-governmental Organization
NREA	New and Renewable Energy Authority
O&M	Operation and Maintenance
OECD	Organization for Economic Cooperation and Development
OECP	Organization for Energy Conservation and Planning
PPP	Polluter Pays Principle
RBO	Regional Branch Office
ROI	Return on Investment
SCA	Supreme Council of Antiquities
SME	Small- and Medium-sized Enterprises
SO	Strategic Objective
SWM	Solid Waste Management
TCOE	Technical Cooperation Office for the Environment
TDA	Tourism Development Authority
TIMS	Tabbin Institute for Metallurgical Studies
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tanks
VCR	Voluntary Challenge and Registry
WHO	World Health Organization
WTP	Willingness-to-Pay

List of Scientific Acronyms and Units of Measurement

b/d	Barrels per Day
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
GWh	Gega Watt Hour
kgoe	Kilogram Oil Equivalent
Ktoe	Kilo Ton Oil Equivalent
kWh	Kilo Watt Hour
LE/m ³	Egyptian Pound per Cubic Meter
MJ	Mega Joule
mmt	Million Metric Tons
MW	Mega Watt
PM	Particulate Matter
SO	Strategic Objective
SS	Suspended Solids
TDS	Total Dissolved Solids
TOE	Tons of Oil Equivalent
TSP	Total Suspended Particles
TSS	Total Suspended Solids
ug/m ³	Microgram per Cubic Meter

List of Tables and Figures

Table	Page
1. Economic Indicators for Egypt	6
2. Per Capita Income Growth	7
3. Egypt's Primary Industrial Sectors	8
4. Concentrations of Air Pollutants in Greater Cairo	10
5. Industrial Wastewater Discharges of Major Public Sector Industries in Egypt	11
6. Relative Health Risks from Industrial Pollution in Greater Cairo	14
7. Primary Energy Consumption per Unit of GDP	18
8. General Energy Indicators	18
9. Oil Sector Statistics	19
10. Refinery Production of Petroleum Products	20
11. Natural Gas Production and Consumption	21
12. Foreign Tourism in Egypt	22
13. Tourism Revenues in Egypt	23
14. Principal Environmental Laws, Decrees and Regulations	37
15. Institutional and Legal Policy Reforms, Measures and Assistance Tools	118
16. Industrial Pollution Policy Reforms, Measures and Assistance Tools	131
17. Municipal Solid Waste Policy Reforms, Measures and Assistance Tools	143
18. Energy/Energy Efficiency Policy Reforms, Measures and Assistance Tools	158
19. Environmentally Sustainable Tourism Policy Reforms, Measures and Assistance Tools	173

Box

1. Designated Protected Areas in Egypt	24
2. National Environmental Policy	34
3. Impediments to Implementation of Law 4/1994	38
4. Organization of the EEAA	41
5. Greater Cairo Regional Branch Office	46
6. Environmental Management Units	47
7. Environmental NGOs in Egypt	48
8. Projects to Support Development of an Independent Regulatory Authority	146
9. Projects to Support Energy Sector Restructuring	148

Figure

1. Institutional Framework for Environmental Management	42
---	----

EXECUTIVE SUMMARY

Background

The USAID Mission in Egypt plans to initiate a five-year Egyptian Environmental Policy Program (EEPP) that will consolidate and build on the experiences of past project assistance and provide overall direction for policy reforms throughout the environment sector. USAID requested the Environmental Policy and Institutional Strengthening Project (EPIQ) Consortium to conduct an assessment of the regulatory, policy, and institutional constraints to improved management and protection of Egypt's environment. This assessment enumerates recommendations for policy reforms and supporting project assistance that the USAID may consider in developing the EEPP. This assessment, referred to as the Egypt Environmental Sector Assessment (EESA) has been conducted simultaneously and closely coordinated with the design of a monitoring and evaluation plan, a public awareness assistance plan, and a training needs assessment

Methodology

The EESA was initiated in March 1997. Throughout the preparation of the EESA, the EPIQ team has actively sought the participation of Egyptian counterparts and elicited their comments and suggestions during meetings, participation panels, and roundtable discussions. The USAID also convened a steering committee to oversee the development of the EESA and ensure that a broad array of views was reflected in the report. During the first of three phases of work, the team identified current environmental problems, assessed the policy, legal, and regulatory framework for environmental management, and reviewed the scope of donor assistance in the environmental sector. During the second phase, the team developed and presented at a series of "policy roundtables," a set of policy initiatives and supporting technical assistance projects for four key environmental subsectors: industrial pollution, municipal solid waste, energy and energy efficiency, and environmentally sustainable tourism. In the final phase of the work, the team reviewed comments from the roundtables and drafted the final report.

Problems, Progress, and Policy Challenges

The Government of Egypt (GOE) faces a daunting challenge in mitigating the severe threats to its natural resources and environment. Key environmental problems which have not been adequately addressed include: water pollution from industrial, municipal, and agricultural sources; air pollution from stationary industrial and commercial sources and from mobile sources; improper disposal of municipal and industrial solid waste; and over development and inadequate protection of natural and cultural resources.

These environmental problems result in human health impacts including premature deaths, chronic illness and respiratory discomfort; economic costs including losses in

income, extra treatment costs for water supply, and the costs of lost work days and medical costs due to illnesses related to pollution exposures. Based on the experiences in other countries, there appear to be substantial economic benefits associated with reducing pollution levels, even after accounting for the costs of control.

To reverse the current trends, the GOE has made significant progress in articulating national environmental policies to address these problems. In particular, Law 4 was enacted in 1994 and set in place a process and time frame for addressing air and water pollution. In addition, the substitution of leaded gasoline in urban vehicles and the development of natural gas supplies and a distribution network have significantly reduced emissions of lead, and sulfur dioxide and nitrogen oxide, respectively. However, there is still considerable scope for the GOE to design and implement a wide array of policies, strengthen the institutions upon which an effective environmental management program depends, and create appropriate incentives for polluters to reduce their discharges to air, water, and land.

In the four major environmental subsectors that have been assessed by the team, a number of similar or crosscutting policy problems has emerged:

Weaknesses in institutional capabilities to develop and implement environmental policies. Problems include lack of commitment to develop and/or enforce policies to protect the environment, lack of trained staff and resources, poor coordination within and between institutions, and ambiguities in implementation and enforcement roles and responsibilities, between national, regional and local authorities.

Barriers to entry for the private sector in selected markets for goods and services. As Egypt continues its transition from a centrally planned economy dominated by publicly owned firms in key economic sectors (banking, construction, refining, chemicals, etc.) to a market economy, there is a need to expand private sector roles in providing goods and services. Current laws, regulations, or policies may limit private sector participation in supplying energy services and environmental services such as wastewater treatment and solid waste disposal services.

Absence of proper incentives that would encourage offenders to reduce their pollution. These weaknesses are of four types: (1) price distortions in markets that do not discourage excessive use of natural resources and lead directly to greater production of pollution; (2) subsidies in environmental services costs that discourage the polluter from considering cost-effective treatment, or waste minimization, options; (3) lack of guidelines for environmentally sound practices in new construction; and (4) lack of monitoring, inspection, and enforcement to determine non-compliance with environmental requirements.

Deficiencies in information dissemination and educational programs. This shortcoming is evident among the general public regarding issues such as solid waste disposal and awareness of existing laws and regulations among businesses. Related issues include inadequacies in the flow of information and the need for educational programs to improve attitudes and foster environmentally sensitive behavior.

Strategic Framework

The policy reform program focuses on two major challenges: (1) overcoming the institutional inertia and barriers to the development and implementation of appropriate environmental policies; and (2) strengthening private sector incentives to use natural resources and the environment in a manner consistent with the principles of sustainable development and the *polluter pays principle*. The policy reform program must also demonstrate visible and significant improvements in environmental quality to galvanize public support and sustain political commitment to environmental laws and institutions. Given the inherent time lags in developing and implementing policy reforms, strategic use of financial resources and instruments can help catalyze and accelerate investments in pollution reduction. Thus, the EEPP would support the GOE initiatives to identify and evaluate policy reforms and provide technical and financial assistance to ensure that policy reforms are reinforced by effective compliance programs carried out by appropriately trained staffs. Crosscutting themes underlying the policy reform program include the following:

Foster Public-Private Partnerships. Partnerships between the public and private sectors can provide a mechanism for identifying solutions to environmental problems that might not be possible if government makes decisions in isolation. In addition, by bringing the private sector to the table, government may be able to secure a greater commitment from the private sector to implement measures that have been mutually agreed. One of the difficulties that governments face in developing regulatory programs is limited access to information about polluters. By involving the private sector, the burden of collecting information can be shifted from government.

Encourage Systemic and Comprehensive Policy Reforms and Management. Often incremental changes may be easier to achieve but in the long run yield fewer benefits, and in many cases, these incremental changes are more difficult to sustain without the fundamental, systemic policy reform. Preparation of environmental management systems at the municipal level and adoption of comprehensive regulations covering all aspects of solid waste management are examples of policy reforms that are systemic or comprehensive in scope.

Support Policy Reforms with Public Awareness and Education Programs. Establishing broad-based awareness among a diversity of public or stakeholder target audiences is critical to achieving substantive policy reform. As a starting point, public awareness should be viewed in the context of behavioral change, not simply as an

informational mechanism intended to sensitize the general public to the importance of something called environmental reform. All public awareness campaigns or programs should have measurable objectives that can be reached by determining and increasing awareness levels that lead to, and result in, attitudinal and behavioral change.

Sector Policy Reform Strategies

For the four proposed environmental sector strategies described below to have their intended impact on environmental management in Egypt, the GOE will have to undertake a number of institutional and legal reforms. Although the GOE has made progress in recent years, especially in enacting Law 4/1994 and in establishing the Egyptian Environmental Affairs Agency (EEAA) and the Ministry of State for Environmental Affairs (MOEA), it has yet to establish a credible environmental management program. The GOE will need to address the serious resource, capacity, and inter-institutional constraints that prevent effective environmental management, delegate more decision-making in implementation and enforcement of environmental programs to the level of government closest to the problems and open this decision-making process to greater public and NGO participation.

Industrial Pollution

The critical challenge in the industrial pollution sector is making the transition from a largely unregulated environmental state to a fully functional compliance program, requiring facilities to meet standards for air emissions and wastewater discharges. Egypt has environmental laws and executive regulations in place that cover the range of production activities and pollution sources encountered in Egypt, but lacks the institutional capabilities to identify sources, monitor compliance, and take enforcement actions to address non-compliance. On the side of the potential regulated community, there is only limited awareness of their responsibilities and obligations under Egyptian law.

Under Law 4/1994, the date for facilities to comply with requirements in the Law (and other environmental laws such as Law 48/1982), March 1998, is rapidly approaching. Neither the EEAA nor industries are prepared for Law 4/1994 to take effect. Although there is a waiver provision in Law 4/1994 for a two-year extension in the compliance schedule, most of Egypt's facilities have not applied for these extensions nor were they aware of the need to have applied by August of this year. Ideally, given the general lack of awareness of Law 4/1994 requirements and the EEAA's lack of adequate staff and preparation to manage the compliance program, the GOE would consider postponing the

compliance schedule for all facilities by one year to allow time to prepare for implementation.

The proposed assistance strategy for industrial pollution would focus on three broad policy reforms: (1) strengthening implementation and enforcement capabilities of the EEAA and other environmental enforcement authorities; (2) expand industry's capacity to assess, finance, and implement compliance investments; and (3) expand and improve public awareness. Progress in all three areas is necessary to attain acceptable compliance levels, reduce industrial pollution, and improve environmental quality.

Policy Measures In order for the EEAA to initiate an effective environmental compliance program, several specific needs have been identified. The EEAA must develop a facility emissions inventory, prepare a list of violations, develop an enforcement strategy, and capabilities to conduct inspections and certify inspectors. The EEAA and the GOE, more generally, must make a commitment to recruit and train an adequate number of compliance program personnel and inspectors to deal with the large number of regulated entities and place these staff in offices at the national and regional levels as appropriate.

To foster compliance among facilities, a combination of incentives could be offered including rewards for voluntary compliance, reductions in tariffs and customs on pollution control equipment, development of "soft" financing capabilities in the National Environmental Protection Fund, and provisions for tax incentives to encourage development of domestic environmental equipment and service industries.

Municipal Solid Waste

A combination of changes will be needed to solve Egypt's MSW problems. There is a basic need to improve awareness of the problem among households and businesses and to determine the types and quality of services for which customers are willing to pay. Also, appropriate regulations must be developed for a comprehensive MSW management system and Egypt must deal with some of the chronic MSW problems such as identifying the best equipment to be used (lowest capital and O&M costs), given the functions of the equipment and diversity of working environments, improving maintenance programs to keep equipment operating, and exploring solutions to the transport and disposal weaknesses in current systems. Some of the problems with MSW management systems could be addressed through private sector contracting, assuming adequate revenues can be raised to cover these firms' costs.

Policy Measures Even though MSW is a local problem, leadership in developing a comprehensive system of waste management and encouraging greater involvement of the private sector in providing MSW services must come from the EEAA and the GOE. To move to a more effective MSW management approach, the EEAA should develop Law

4/1994 Implementing Regulations covering all aspects of the solid waste cycle, create and maintain a national data base of MSW operations, and establish the capacity to enforce MSW management regulations. The EEAA should also assess the obstacles to cost recovery and greater role for private sector MSW service companies. To encourage greater private sector involvement, amendments to the public procurement law and tax and tariff incentives may be required.

Energy and Energy Efficiency

Egypt has made significant progress in removing subsidies in energy prices and switching to cleaner, environmentally more desirable fuels. The GOE's policy of substituting cleaner natural gas for liquid fuels has become an integral part of its energy development plan. The success of natural gas exploration has reduced environmental impacts and enabled Egypt to export a larger proportion of its petroleum products, thus improving its balance of payments. National energy policy must continue to evolve to encourage additional development of the natural gas distribution network and renewable energy sources. Policy reforms to stimulate private sector investment and greater competition in the energy sector will reduce the costs of providing energy, thereby strengthening the competitive position of Egyptian businesses.

Egypt has also initiated efforts to develop a national energy efficiency policy. If Egypt can address many of the current institutional and market barriers to implementing energy efficiency investments, substantial benefits may be realized by end users. The estimated energy efficiency benefits that could be achieved through a comprehensive program may be as high as 5,244 GWh per year within ten years. This is equivalent to about 11 percent of the 1995/1996 electricity sales in Egypt. No country in the world has achieved a sustained increase in energy efficiency without policy reform to encourage that improvement. Thus, a comprehensive program of regulations, incentives, and public awareness and education will be needed to realize the potential savings resulting from reduced energy use.

Policy Measures There is a strong interrelationship between energy and energy efficiency policy. To realize the full benefits of energy efficiency programs, the GOE needs to continue making progress toward a competitive energy sector. Although the creation of an independent regulatory authority and continued attention on restructuring and privatization of the energy sector fall outside of the EEPP, they are essential components of the GOE's energy sector reform program. The GOE also needs to make progress in the areas of policy and legislative reform for renewable energy and cogeneration. The major reform needs concern continued work on a national energy efficiency policy, led by the Organization for Energy Conservation and Planning (OECPP).

Environmentally Sustainable Tourism

Under the auspices of the Mubarak-Gore Partnership, considerable resources have focused on improving awareness and building capacity to manage and protect the natural and cultural resources of the Red Sea, its coastline, and inland areas. The USAID-funded Environmentally Sustainable Tourism (EST) project has assisted in the preparation of plans for protectorate management and tourism and infrastructure developments, financed the purchase and installation of mooring buoys, creation and training of a ranger program to patrol and police the new Red Sea Islands National Park, and cooperated with officials, business, and NGOs on programs to expand public awareness, train workers and businesses, and empower NGOs. Most important, from the perspective of sustaining environmentally sound development of the tourism sector, the EST program collaborated with officials, businesses and NGO in the development of a “Policy Framework for Developing an Environmentally Sustainable Tourism Strategy for the Egyptian Red Sea Coast”

To build on these initial efforts in the Red Sea and promote EST at the national level, Egypt needs to develop a long term strategy which is based on a set of policies which provide appropriate incentives to visitors and businesses to protect the resource base, encourages lead ministries and agencies to develop coordinated implementation plans for protection of the resource base, and includes a commitment to adequate staffing and resources to execute the strategy.

Policy Measures The long range goal of the tourism sector should be to adopt policies and implement programs that ensure that tourism development and practices promote the greatest sustainable level of benefits from the use of natural and cultural resource. A major step would be the drafting of an EST strategy component for the National Plan for Sustainable Development. In the short and medium term, a number of policy reforms should be taken. The GOE needs to expand protectorate status for coral reefs and take a more proactive anticipatory approach to other natural resources that could require protection in the future. Expansion of protectorate status needs to be complemented by strengthening of the institutions to protect and manage natural resources and cultural sites, with a commitment to providing sustained financing. The GOE needs to review the current structure of incentives for environmentally sound development and policies related to land development and planning and make appropriate policy reforms to ensure protection of the resource base. In the area of cultural resources management, the greatest needs appear to be development of policies to facilitate adaptive re-use and private sector financing of restoration and provide for greater decentralization of site management that might include special protection designation and closer cooperation with the surrounding communities.

Chapter 1

Introduction

The Government of Egypt (GOE) faces a daunting challenge in mitigating the severe threats to its natural resources and environment. To reverse the current trends, the GOE has made significant progress in articulating national environmental policies to address these problems. In particular, Law 4 was enacted in 1994 and set in place a process and timeframe for addressing air and water pollution. However, there is still considerable scope for the GOE to design and implement a wide array of policies, strengthen the institutions upon which an effective environmental management program depends, and create appropriate incentives for polluters to reduce their discharges to air, water, and land.

The United States Agency for International Development (USAID) environment program was initiated in Egypt in 1992. From the program's inception, the major focus of assistance was on the *project* as opposed to the *policy* level. While this approach resulted in successes, project implementers have often identified policy and institutional impediments which, if they could be eliminated, would result in even greater benefits and more widespread adoption of practices (e.g., energy efficiency or pollution prevention measures). As USAID's environmental assistance program has matured, there has been an increasing emphasis placed on assistance designed to address the regulatory, policy, and institutional reforms needed to promote environmental quality. Examples of *policy* initiatives include the Sector Policy Reform III (SPR III) benchmarks stipulating the preparation of a lead smelter action plan and Lead Exposure Abatement Plan (LEAP), and the Environmentally Sustainable Tourism (EST) program, initiated as a component of the Mubarak-Gore Partnership. In the case of LEAP and EST, these policy initiatives have been strategically coupled to project technical assistance to enhance the potential for policy changes.

In Fiscal Year (FY) 1998, the USAID Mission in Egypt plans to initiate an Egyptian Environmental Policy Program (EEPP). The five-year EEPP will consolidate and build on the experiences of past project assistance and provide overall direction for policy reforms in key environmental subsectors. USAID has requested the Environmental Policy and Institutional Strengthening Project (EPIQ) Consortium to conduct an assessment of the regulatory, policy, and institutional constraints to improved management and protection of Egypt's environment and develop recommendations for policy reforms and supporting project assistance. This assessment will provide input to USAID in developing the EEPP. This assessment, referred to as the Egypt Environmental Sector Assessment (EESA), has been conducted simultaneously and closely coordinated with tasks undertaken by other USAID contractors. These include the design of a monitoring and evaluation plan (Environmental Health Project/EHP), a public awareness assistance plan (GreenCOM), and a training needs assessment (Development Training 2/DT2 Project).

1.1 Methodology

The EESA was initiated in March 1997 and involved three phases of work. During the first phase, the team identified current environmental problems, assessed the policy, legal, and regulatory framework for environmental management, and reviewed the scope of donor assistance in the environmental sector. The first phase culminated with the preparation of an interim report, discussed in Section 1.1.1. During the second phase, the team developed a set of policy initiatives and supporting technical assistance projects. This work focused on four major environmental sectors: industrial pollution, municipal solid waste, energy and energy efficiency, and environmentally sustainable tourism, as well as a few additional initiatives related to the problems of urban air pollution, lake pollution, and underground storage tanks. The team also conducted institutional analyses of major stakeholders and environmental non-governmental organizations (NGOs). Both analyses have been incorporated into the various chapters of the EESA, and the NGO analysis is also presented in Annex B. During the third phase, the team prepared the EESA report in draft and final versions after receiving feedback from Egyptian counterparts on the proposed policy “strategies.” As discussed in Section 1.1.2, the assessment team benefited from numerous discussions with Egyptian counterparts, donors, and USAID staff and consultants.

1.1.1 Rapid Review

This report, submitted to USAID in June 1997, contained the preliminary findings for Phase 1 work. It was divided into five sections: (1) overview of the Egyptian environmental sector; (2) analysis of the overall and sectoral environmental policy framework; (3) review of donor technical and financial assistance for the Egyptian environment; (4) elaboration and analysis of successes and weaknesses in current environmental policies; and (5) proposed policy initiatives to be considered for the EEPP and an initial assessment of the impediments to be overcome in implementing proposed policy reforms. In addition, three annexes were attached to the report: Annex A included the project scope of work; Annex B included summaries of donor interviews, projects, and reports; and Annex C included summaries of the five participation panels that have been convened prior to the Rapid Review. The EESA team received a substantial number of comments from the steering committee, other USAID staff, and staff of the USAID-funded Environmental Pollution Prevention Project (EP3). These comments have been addressed in revising sections of the Rapid Review that appear in the EESA Report.

1.1.2 Participatory Process

During meetings prior to the EESA, USAID advised the assessment team to work closely with Egyptian counterparts to ensure the effective exchange of information and ideas. This “participatory” approach is reflected in the design of the assessment and has involved the creation of a steering committee to provide oversight and guidance, numerous meetings, a series of participation panels, and roundtable discussions.

Steering Committee

The steering committee, organized by USAID, included Dr. Tarek Genena,

Director of the Technical Cooperation Office for the Environment/ Egyptian Environmental Affairs Agency (TCOE/EEAA), Dr. Magdy Saleh, Senior Advisor to the Tourism Development Authority (TDA), Mrs. Mary El Bahgoury, Consultant for Research and Quality to the Minister of Petroleum, Dr. Ibrahim Abdel Gelil, Chairman of the Organization for Energy Conservation and Planning (OECF), and Mr. George Deikun, Mr. James Goggin and Ms. Salwa Wahba from USAID. The steering committee met regularly with the assessment team over the course of the EESA. Steering committee members provided comments on the Rapid Review (discussed below), participated in the roundtables, and reviewed the EESA Report.

Meetings

Starting in late March, the EESA team conducted a series of meetings with Egyptian officials, NGOs, researchers, and industry representatives, other donors, and USAID staff and contractors. The purposes of these meetings were (1) to identify key reports, laws, policies, and regulations; (2) to review the scope of recent and ongoing donor assistance; and (3) to discuss obstacles to environmental improvements, policy reforms, and project ideas. A list of persons and institutions contacted and field trips taken by team members over the course of the assessment is provided in Annex G. The team conducted interviews with donor representatives to learn about donor assistance to the environmental sector, collect papers and reports describing donor projects, and elicit their views of critical barriers to policy reforms. Donor interviews and tables summarizing donor assistance to the Egyptian environmental sector are provided in Annex D.

Participation Panels

The EESA team conducted a series of eight participation panels with Egyptian stakeholders to obtain their views on priority environmental issues and key barriers to solving these problems, and to discuss alternatives for regulatory, policy, and institutional reforms. Five of the participation panels were held outside of Cairo. Panels in Port Said, Alexandria, and Minya focused on a wide range of local environmental issues while panels in the cities of 10th of Ramadan and 6th of October, two of Egypt's six new industrial cities, addressed industrial pollution issues. The three panels in Cairo focused on the topics of municipal solid waste, public awareness, and management of cultural resources, respectively. Summaries of the eight panels, including lists of participants, are provided in Annex E.

Policy Roundtables

Following the completion of the first three phases of the assessment, four policy roundtables were organized with the assistance of the steering committee. The policy roundtables provided the assessment team with the opportunity to present their preliminary recommendations for policy reforms and supporting technical and financial assistance and to receive feedback from Egyptian experts. The four policy roundtables covered energy and energy efficiency, industrial pollution, municipal solid waste, and environmentally sustainable tourism, respectively. A list of persons who participated in the four policy roundtables is provided in Annex F.

1.2 Outline of the EESA Report

The EESA Report is divided into two volumes. Volume One includes ten substantive chapters. **Chapter 2** provides an overview of the environmental sector in Egypt. It includes an introductory section on Egypt's economic reform program and sections describing the following sectors: industrial pollution, municipal solid waste, energy and energy efficiency, environmentally sustainable tourism, and other environmental problems including urban air pollution, and land and water resources management. **Chapter 3** describes the current environmental policy legal and institutional framework and the policy formulation process for each individual environmental sector. Current obstacles to effective environmental policy are enumerated in **Chapter 4**. Three types of obstacles are identified: flaws in the structure of economic incentives to utilize natural resources and the environment efficiently; deficiencies in the institutions that set, implement and enforce environmental policies; and market failures that deter companies from making environmental investments.

The remaining six chapters of Volume One focus on the policy reform program that is recommended by the assessment team. The overall strategy is presented in **Chapter 5**. Program goals, overarching challenges, crosscutting themes, and assistance tools are described. **Chapter 6** describes institutional policy reforms and associated technical assistance. Policy reform strategies for individual environmental sectors - industrial pollution, municipal solid waste, energy and energy efficiency, and environmentally sustainable tourism - are presented in **Chapters 7 through 10**. Separate strategies for the other environmental sectors discussed in Chapters 2 and 3 were not prepared, based on the relative level of interest in the problems, the likelihood that the EEPP would prioritize the problems and provide assistance, and a view that some of the problems could be incorporated into one of the four sector strategies. In addition, some issues, such as water allocation and agriculture are already the focus of other USAID assistance programs.

Volume Two includes seven annexes: EESA Scope of Work (Annex A), the environmental NGO analysis (Annex B), project profiles and summary tables (Annex C), a list of donor interviews and summary tables for donor projects (Annex D), summaries of the eight participation panels (Annex E), a list of participants in the four policy roundtables (Annex F), and a list of all persons contacted, field trips and meetings (Annex G).

Chapter 2

Overview of the Egyptian Environmental Sector

This Chapter describes the sectors, which are directly or indirectly linked to the environment in Egypt. The first section provides an overview of the macroeconomic setting. Macroeconomic policies and the performance of Egypt's economy are closely linked to environmental quality. Subsequent sections focus on the following environmental sectors: industry (including municipal wastewater); municipal solid waste; energy; environmentally sustainable tourism; and other environmental sectors (urban air, land and water resources). Each of these sections provides a brief overview of the sector and describes how the sector impacts the environment or is impacted by pollution from other sectors. This overview is not intended to provide an exhaustive review of each sector, but only to provide adequate background to follow the assessment.

2.1 Macroeconomic Setting

The linkages between the national economy and natural resource and environmental sectors are very important. Land, water, energy, and natural resources are vital inputs into the agricultural and industrial sectors. Natural and cultural resources provide the major attractions for foreign tourists. Exports of oil and the tourism industry are major sources of foreign currency. Indirectly, the economy also is the major stressor of the environment, as for instance, production in the industrial and agricultural sectors contributes to pollution of the air and water and the generation of solid and hazardous waste. Consumption activities lead to production of solid waste and create demand for wastewater treatment services.

A strong economy can be a key factor in the protection of the environment as profitable businesses can better afford to invest in environmental protection. Similarly, high per capita incomes imply a greater ability to pay for environmental services such as solid waste collection and disposal and wastewater treatment. In addition, higher incomes are strongly correlated with higher demand for environmental quality.

During the period, 1975-1985, Egypt experienced high rates of economic growth. This was followed by a five-year period of economic stagnation characterized by large balance of payments deficits, chronic inflation, high budget deficits, and excessive foreign debt. In the spring of 1990, Egypt initiated efforts to restore growth and reduce unemployment when it launched its Economic Reform and Structural Adjustment Program (ERSAP). With the support of the International Monetary Fund (IMF), the World Bank, and international donors, the ERSAP focused on macroeconomic stabilization, reduction of inflation rates, structural adjustments to encourage medium and long-term economic growth.

During the period 1990-1995, Egypt cut its budget deficit and liberalized foreign exchange and interest rates. Egypt negotiated a \$20 billion debt relief and rescheduling agreement with the 17 creditor governments of the Paris Club, introduced changes in capital markets, banking, and income tax law, liberalized energy prices, and took steps

toward improving incentives for private sector development and initiated a program of privatization. The other key area of economic policy reform has been trade liberalization.

In 1994, Egypt signed the General Agreement on Tariffs and Trade (GATT). In 1995, Egypt joined the World Trade Organization. Closer trade ties have been pursued with the European Community, the United States (US), Japan, and Russia. Overall, these reforms have led to the rapid improvements in the Egyptian economy, as reflected in real Gross Domestic Product (GDP) growth, reduced inflation rates, and the declining ratio of external debt to GDP during the period 1990-1991 to 1995-1996 (Table 1).

Table 1
Economic Indicators for Egypt

Year	Real GDP Growth	Inflation Rate	Investment as % of GDP	External Debt as % of GDP
1990-91	3.6%	14.7%	16.0%	107.7%
1991-92	1.9%	21.1%	17.0%	89.5%
1992-93	2.9%	11.1%	16.7%	69.2%
1993-94	3.9%	9.0%	15.1%	58.0%
1994-95	4.7%	9.4%	16.9%	55.7%
1995-96	5.0%	7.2%	13.9%	49.2%

Sources: Ministry of Planning, Ministry of Finance and Central Bank of Egypt

As Egypt continues its efforts to achieve even higher sustainable rates of growth, it faces several problems. First, unemployment rates are hovering at around ten percent. With the labor force expanding at 2.8 percent per year, an additional half million new workers must be absorbed into the work force annually. Second, Egypt needs to increase the levels of domestic savings and investment. A recent World Bank report notes that countries which have enjoyed sustained growth rates of over 5 percent have ratios of investment to GDP of over 27 percent compared to Egypt's rate of 17 percent for the period, 1980-1993 (Table 2) (33). The rate of investment is critical to the development of Egypt's export market, its ability to compete in domestic markets with foreign interests, and progress in improving the environment. The third problem is Egypt's reliance on exogenous resources including remittance income, Suez Canal revenues, oil and gas exports, and foreign assistance. All of these sources of income are sensitive to exogenous shocks.

The World Bank report identifies three areas of policy which are key to sustaining higher rates of growth in Egypt: (1) continued trade liberalization, reduction in tariff rates and non-tariff constraints to trade; (2) reduction in the government's fiscal deficit (with privatization being a key to new sources of revenue and reduced government expenditures resulting from reduced subsidies to public sector enterprises), government consumption, and inflation; and (3) increase in the rate of savings through the provision of strong incentives for long-term private savings.

Table 2
Per Capita Income Growth (1980-1993)

Country	Per Capita Growth (%)	Investment to GDP Ratio (%)
China	8.2	41.0
Korea	8.0	34.0
Thailand	6.5	40.0
Singapore	5.8	44.0
Hong Kong	5.4	27.0
Indonesia	4.1	28.0
Malaysia	3.7	33.0
Egypt	2.3	17.0

Source: The World Bank, Arab republic of Egypt Country Economic Memorandum - Egypt: Issues in Sustaining Economic growth Summary Report, 1997

2.2 Industrial Pollution

Modern industrial development began in Egypt in the early 1950s, expanding Egypt's industrial base beyond the level required to process agricultural products. Overall, the industrial sector continues to grow in Egypt, though some sectors are compressing due to increasing competition resulting from trade liberalization policies. As of 1994, the industrial share of Egypt's GDP was 21.1 percent, with manufacturing accounting for 14.7 percent (34). It is estimated that Egypt has 22,000 industrial facilities, less than 1,000 of which are large publicly-owned enterprises. The private sector began expanding in the 1980s and has accounted for most of Egypt's industrial growth. The newer private industries tend to be small- to medium-sized enterprises (SMEs), which with the exception of tanneries and small electroplating industries generate less pollution than the larger public sector enterprises. Public sector enterprises account for more than one-half of the national industrial output and two-thirds of non-agricultural production. Anecdotal evidence suggests public sector enterprises account for more than 60 percent of industrial pollution. Many of the large public sector enterprises have few or no pollution controls. In addition, decades-old production processes and technologies result in inefficient utilization of natural resources, raw materials, and other inputs, further exacerbating pollution problems.

Egypt embarked on an ambitious program of public sector restructuring and privatization in 1991. Although certain strategic industries are likely to remain in the public sector, the privatization of other large enterprises has progressed more slowly than anticipated. While the precise timetable for privatization is uncertain, it appears that most of the privatization will be accomplished within ten years and perhaps considerably sooner. In order to privatize a public sector enterprise, the GOE must make the operation attractive to investors. Typically, this means reducing bloated payrolls, making necessary investments to modernize the operation and reducing pollution to acceptable levels. The GOE or the buyer depending upon the individual circumstances may initiate these changes.

Table 3 describes the distribution of industries based upon industrial category

within the 26 geographical regions of Egypt. The three smallest sectors in terms of number of facilities (metals, mining, and petroleum) are dominated by public enterprises and account for a large proportion of GDP. Each of Egypt's 26 governorates has some industrial activity, although most industry is concentrated in Lower Egypt. Over 45 percent of Egypt's industrial facilities are located in the vicinity of Cairo including Helwan, south of Cairo, and Shoubra El-Kheima, Mostorod, and Abu Zaabal, north of Cairo. Shoubra El Kheima alone has over 1,300 SMEs, such as metal foundries, electroplating, food processing, detergent, and soap manufacturing, textile and paper production, and glass industries. An additional 40 percent of industry is based in Alexandria with the remainder of facilities divided among the 24 other governorates. Several new industrial cities (i.e., 10th of Ramadan, Sadat City, 6th of October, New Amriya, El Obour, Borg el Arab, and Noubareya) have been created to attract Egypt's new private industry. Of these, 10th of Ramadan and 6th of October currently have the greatest industrial concentration. Continued industrial development in the vicinity of Cairo and Alexandria will be difficult, as the urban infrastructure is already overburdened. World Bank studies during the 1990s indicate that the two largest cities of Greater Cairo and Metropolitan Alexandria, which account for over 80 percent of the industrial activity in Egypt, are the most polluted in Egypt (34).

Table 3
Egypt's Primary Industrial Sectors

Industrial Sector	No. of Industries	No. of Industries as a Percentage of Total Industries
Food Processing	2,946	17.0%
Textiles	4,340	25.0%
Chemicals	2,446	14.0%
Engineering	5,956	34.0%
Building Materials	1,664	9.5%
Metals	10	.057%
Mining	60	.34%
Petroleum	12	.069%
TOTAL	17,434	100%

Source: An Environmental Profile of Egyptian Manufacturing Industries. June 1996

According to the World Bank, the major polluters in Egypt are predominately facilities in the metallurgical, chemical, refinery, cement, and pulp and paper industrial sectors. Food, engineering, textile, and tannery industries, representing both larger public enterprises and medium and small scale private industries, also contribute to the pollution in Egypt (34).

The majority of industrial sector employees work in the private sector. Currently, the textile industry accounts for more than 60 percent of all industrial employment. Industrial employment is declining as a result of public enterprise restructuring and declining demand for Egyptian-made textiles.

Coupled with this, migration from rural to urban areas has been the trend for at least 20 years, and often informal, unorganized communities are formed near the outskirts

of areas of high industrial activity. These informal communities face a host of social (e.g., overcrowded conditions, drug abuse, and crime) and environmental (e.g., lack of potable water, sewerage, solid waste collection) problems (34).

2.2.1 Environmental Impact of the Industrial Sector

Industrial impacts on the environment include air emissions (to both the atmosphere and workplace), wastewater discharges, and solid and hazardous waste disposal. As noted above, public enterprises tend to generate more pollution than private sector facilities, and since their annual operating budgets are financed out of the state budget and through holding companies, public enterprise managers continue to have little flexibility to make environmental investments.

Air Emissions

Currently, there is no comprehensive ambient air monitoring network or data base that provides reliable estimates of air pollution, although this data will be available in the future from Danida's Environmental Information and Monitoring Project (EIMP). Limited ambient air data collected from at least 85 monitoring sites located throughout 15 governorates show that in Egypt's industrial areas (i.e., Greater Cairo, Helwan, and north of Cairo, and Alexandria), international ambient standards are generally exceeded for particulates, sulfur dioxide (SO₂), nitrogen oxides (NO_x) and lead (34).

Air emission data from industrial sources are not readily available, as emission monitoring is not regularly practiced in most industries. Some limited data is available from a recent World Bank study that quantified industrial emissions from the Egyptian steel industry (34). Emissions from 14 lead smelters of varying sizes in Cairo are high and are estimated at over 500 tons per year from 14 smelters (34).

Other large point sources in Greater Cairo and Alexandria include the metallurgical (ore and scrap-based steel plants, ferro-alloys, copper, lead, and aluminum smelters), chemical (including refineries), and cement industries. Air pollution from these industries comes from both process and combustion sources. Sixty percent of the cement industry consists of wet-process plants, which tend to produce more pollution than dry-process plants, in addition to consuming twice as much energy. Particulate emissions from these plants range between 600 to 250,000 tons per year. Likewise, refineries are also a major source of SO₂, NO₂ and volatile organic compounds, though the limited data that are available are based on emission factors (34).

Ambient concentrations of air pollutants in Greater Cairo were reported in a 1994 study funded by USAID (31). These ambient concentrations were drawn from a number of studies over several years, employing different sampling frames (Table 4) and as a result, can only be viewed as illustrative of actual concentrations observed in the Greater Cairo area. The ambient concentration of carbon monoxide reported in these studies were within acceptable ranges most of the time. Overall, particulate concentration levels in Cairo were at least five times higher than US standards or World Health Organization (WHO) guidelines and higher than any other major city in the world. At intervals, the

reported concentrations of other pollutants (SO₂, NO_x, lead and ground-level ozone), exceeded standards.

Table 4
Concentrations of Air Pollutants in Greater Cairo (µg/m³)

Pollutant	Concentration		US Standard		WHO Guideline	
	Range	Frequency	Value	Frequency	Value	Frequency
Sulfur Dioxide	40-156	annual mean	80	annual mean	40-60	annual mean
Particulate Matter	349-857	annual mean	75	annual mean	60-90	annual mean
Nitrogen Oxides	90-750	hourly mean	100	annual mean	320	hourly mean (NO ₂)
Carbon Monoxide	1,000-18,000	hourly mean	40,000	hourly mean	10,000	8-hour mean
Lead	0.5-10	annual mean	1.5	quarterly mean	0.5-1.0	annual mean
Ground-Level Ozone	100-200+	hourly maximum	235	hourly maximum	150-200	

Source: Comparing Environmental Health Risks in Cairo, Egypt. Volume Two: Technical Annexes. Project in Development and the Environment (PRIDE) September 1994.

Energy Use

Currently, most of Egypt's industrial activities depend on traditional fossil fuels derived from petroleum, including mazout (a heavy fuel oil characterized by high sulfur content). Unlike natural gas, the burning of these oil fuels results in high levels of SO₂ and particulate emissions. Consumption for petroleum products by public sector industries in 1989 was 3.5 million tons/year, with the metallurgical sector accounting for approximately 30 percent of this total. Industrial energy consumption, from both light and heavy industry, accounts for 26 percent of Egypt's total energy use.

Industrial Water and Wastewater

Factories in Greater Cairo and Alexandria account for 40 percent of the industrial water use in Egypt. Most of this water (20, 22), is used for process cooling. In 1989, the Ministry of Industry and Mineral Wealth reported the amount of water used by 330 major plants in primary industrisectors. The food industry used the greatest quantity (46 percent), the chemical industry used 19 percent, the textile industry used 18 percent, and the metal, mining and engineering industries accounted for the remaining 17 percent. Together, these plants used almost 640 million cubic meters/yr. of water. Estimates for 1990 show that industrial consumption accounted for almost five percent of Egypt's fresh water use (9).

Like air emission data, industrial wastewater discharge data is also difficult to quantify, since industries or authorities perform no regular effluent monitoring. It is

estimated, however, that Egypt's major public sector industries discharge 540 million cubic meters/year of industrial wastewater into the River Nile and its canals. Table 5 summarizes industrial wastewater discharge for the largest categories of public sector facilities. Few industries have efficient pretreatment systems, and many industries still discharge untreated effluent into receiving water bodies, such as industries in the Canal Cities (i.e., Suez, Port Said, and Ismailia). Special attention should be given to industries discharging effluent into Egypt's seven "black spot" areas (17). These areas or water bodies, identified in the National Environmental Action Plan in 1992, have been seriously degraded because of water pollution. They include two lakes (Maryut and Manzala), the heavily industrialized northeast region of Cairo, and the West and East Cairo sewerage systems drains into which industrial and domestic wastewater from greater Cairo is discharged. Serious deterioration of receiving waters has resulted in the loss of fisheries (e.g., Lake Manzala) and contributed to the growth of water hyacinths thus limiting navigation on the River Nile, as well as decreasing tourism in some areas.

Table 5
Industrial Wastewater Discharges of Major Public Sector Industries in Egypt (1990)

Industrial Sector	Number of Facilities	Wastewater Discharge (millions of m ³ /year)
Chemicals	35	42
Fertilizers	6	46
Metals	15	93
Oil and Soap	35	59
Pulp and Paper	11	41
Sugar	13	136
Textiles	72	81
Other	134	42
TOTAL	321	540

Source: INWQMN-Technical Report No.2, RIGW and NRC

The cost of water treatment and distribution has not been fully borne by end users due to government subsidies that support operation and maintenance costs for both water and wastewater treatment. Traditionally, water supply costs have been insignificant compared to overall plant operating costs, and as such, industries have had little incentive to conserve water. On average, industries are billed one Egyptian Pound per cubic meter (1LE/m³) for water, which depending on location, is approximately 70-80 percent of the full cost to provide water, not including wastewater treatment (10).

No reliable data is available to determine if treatment of industrial discharges has improved in recent years. The recent trend is to reuse as much of the effluent as possible for land reclamation, however, these industrial effluents must be thoroughly treated before use. Even in situations where advanced treatment is available, farmers often tap into the treatment plant piping network before treatment is complete. The GOE is beginning to discuss the possibility of water shortages and are reluctant to promote any donor projects where effluent is discharged to the Mediterranean Sea (10).

Municipal Wastewater

In Egypt, only 77 percent of urban (and five percent of rural) populations are connected to sewerage systems. About one-fifth of the rural population relies on cess pits and vaults to contain sewage. These systems are rapidly infiltrated by groundwater in many locations. The remaining 75 percent of the rural population has no access whatsoever to toilet facilities, except public pour-flush facilities at the mosques.

Hence, managing wastewater flows has broad environmental implications. Inadequate sewage capacity can result in blockages and back up into the streets and even into ground level homes and businesses. Human fecal material is a source of parasitic, bacterial and viral organisms, which if ingested or spread by vectors can cause health problems. In extreme cases, sewage backups may force businesses to close and residents of ground floor dwellings to abandon their homes.

If households have no sewer connection gray water from washing dishes, laundry and bathing may be dumped into the streets providing an environment for the breeding of populations of mosquitoes, flies, and other insects, bacterial microbes and viruses.

Furthermore, the inadequate treatment capacity of existing wastewater treatment plants typically results in discharges of untreated wastewater into drains. These drains often lead into and cause incalculable damage to resources with economic value (e.g., Lake Maryut, Lake Manzala, Lake Qarun, and the Nile). While the some users may be inconvenienced by sewage backups, more damaging consequences may result to the environment and to the health of others exposed to untreated or inadequately treated wastewater.

In large parts of Egypt, particularly in regions with a high water table (e.g., the Nile Delta), neither vaults nor cess pits function well because they become infiltrated by groundwater. Usually, waste is manually removed using a shovel and bucket and carried to donkey carts or vacuum trucks and subsequently discharged into manholes, drains or canals. The high cost of removing waste often results in users waiting until the vaults or pits are full or overflowing into the streets before emptying them.

The disposal of untreated sewage, whether by donkey carts, dumping, vacuum trucks or overloaded treatment plants, degrades the regional and the national environment. The harmful impact of Alexandria's sewage on Lake Maryut and on the Mediterranean shores has attracted considerable attention in the Egyptian media. Less recognized, but by no means less damaging, is the practice of disposing of wastewater in drains, most of which empty eventually into Delta lakes, though some also discharge directly to the Nile (e.g., Minya's Itsa drain and the Beni Bekhit drain in Beni Suef). In Fayoum, the El-Bats drain empties into Lake Qarun harming lake quality, neighboring wetlands and migratory bird habitat.

The actual cost of municipal wastewater treatment, in relation to the cost billed to the industrial user, cannot be accurately calculated because its collection and treatment varies widely and because billing for water and wastewater treatment is generally combined. Some governorates are attempting full cost recovery of water and wastewater treatment operation and maintenance costs, and have been more effective than others. Cost recovery, on average, varies according to the end user. Residential users pay only ten

percent, while commercial, retail, and industry end users pay 80 percent. Tourism facilities (including hotels) pay 120 percent towards full cost recovery. However, even if full recovery of operation and maintenance fees is sought by a governorate, the rate of collection can be low (10). In the Canal Cities (i.e., Port Said, Ismailia, and Suez), Provincial Cities, and Secondary Cities, however, the authorities have been able to recover 100 percent of their operation and management (O&M) costs for wastewater treatment (19).

Even if wastewater collection and treatment is provided to a community, industries will not necessarily be connected to the system. For example, in Port Said, USAID recently completed construction of a primary treatment plant and co-composting facility. Since many industries are not connected to the municipal collection system, they bypass this treatment facility and continue to discharge untreated or partially treated wastewater to canals which ultimately discharge to Lake Manzala. In contrast, most of the industries in Alexandria are connected to the municipal collection system and discharge untreated industrial effluents for treatment at the primary treatment plant. Furthermore, Alexandria's proposed upgrade of its primary wastewater treatment plant to secondary treatment require that some industries pretreat their effluent prior to discharge. USAID is supporting this initiative but requires that Alexandria wastewater authorities collect user fees that will fully cover secondary treatment operation and maintenance costs.

Solid and Hazardous Waste

Total annual industrial solid waste generation is 0.2 to 1 million tons/year, excluding non-hazardous wastes from cement, steel, and mining (which is estimated to be three to five percent of the total municipal solid waste generated annually). Approximately eight million tons/year of all solid waste produced (municipal plus industrial) will require disposal.

It is estimated that less than 50,000 tons of hazardous waste is produced annually by Egyptian industries, but these wastes are disposed of together with industrial solid waste. At present, Egypt has no facility for disposal of hazardous industrial waste, though Danida has recently completed two feasibility studies for siting hazardous waste landfills in Greater Cairo and Alexandria (20). Currently, such wastes are deposited in unlined landfills, which may not pose a high risk of contaminating groundwater in dry climates or areas with low water tables, but do pose a significant risk in the Delta region.

2.2.2 Health Impact of the Industrial Sector

Data on industrial pollution and the effects of industrial pollution on the health of the impacted residential population have not been compiled comprehensively for Egypt.

Estimations of the effect of polluted water suggest that it is causing immediate and long-term health impacts for communities. The WHO has estimated that 90,000 Egyptians, mostly children, die each year from contaminated water. Lack of adequate solid and hazardous waste management disposal can cause disease and negatively impact both the environment and the tourism industry. Industrial air emissions have been shown to have direct impacts on human health (34).

The USAID-funded risk assessment study, discussed earlier, estimated health risks from industrial pollution in greater Cairo (31). Air and water pollution cause the most significant health problems. Chemicals in drinking water also pose significant health risks. Health effects due to exposure to airborne particulates and lead can be primarily attributed to industrial point sources. Until recently, vehicular traffic was also a significant source of airborne lead emissions, but the introduction of lead-free gasoline throughout Egypt earlier this year should all but eliminate this source. The World Bank reports that blood lead levels are higher in Cairo than in any large city in the world except for Bangkok. Children living in the vicinity of lead smelters are especially at risk (34). A list of relative health risks from industrial pollution in Greater Cairo is provided in Table 6. Similar health hazards may be observed in Egypt's other industrial areas.

Table 6
Relative Health Risks from Industrial Pollution in Greater Cairo

Pollution	Estimated Health Effects	Level of Severity
Air pollution: particulate matter ; toxic pollutants	3,000 to 16,000 deaths per year. 200 to 700 cancers per year.	Severe
Carbon monoxide	Significant cardio-pulmonary effects in highly exposed occupations.	Medium
Indoor air pollution: kerosene and biomass use for heating and cooking	Respiratory symptoms and illness.	Medium
Sulfur dioxide	Respiratory symptoms for general population in limited areas, mostly impact on asthmatics and sensitive age groups.	Mild
Particulate matter	3,000 to 16,000 deaths; 90 to 270 million restricted activity days per year.	Variable
Nitrogen oxides	Respiratory symptoms in the general population.	Mild
Water pollution: chemical contamination, except lead, of drinking water	3 to 470 cancers per year.	Severe
Solid and hazardous	Modest contribution to microbiological	

Source: Comparing Environmental Health Risks in Cairo, Egypt, USAID, September 1994

2.3 Municipal Solid Waste

Municipal solid waste (MSW) comprises the range of solid waste materials produced in Egyptian homes and businesses as a consequence of everyday activities. The heterogeneous composition of MSW and the volume of MSW generated vary according to socioeconomic level and the nature of business. Because of the extent of improper dumping and collection rates of less than 100 percent, it is difficult to quantify the amount

of MSW generated each year. Estimates of MSW generation in Egypt are approximately in the range of ten million tons per year (6,18), although the actual amount is almost certainly much greater. Generally, MSW can be characterized as having a high level of organic material content (15,31) and low average per capita generation rate (6,18). These physical properties influence the impact of MSW on the Egyptian environment.

Direct physical activities integral to this sector further define MSW. Physical activities associated with MSW include: generation of MSW; collection and transportation (either utilizing collection vehicles or through integration with transfer stations utilizing specialized transfer vehicles); various treatment methodologies, such as separation of materials for recycling, composting, and co-composting; and ultimate disposal, such as landfilling or incineration. Accordingly, the subject of MSW management covers a broad and complex range of materials and activities.

MSW collection is considered the most significant solid waste management problem in Egypt, with the lack of environmentally-secure ultimate disposal, i.e. landfills, also recognized as a major problem. One reason that collection is a major problem is that the task is so massive. Only a fraction of the MSW generated is properly collected. The magnitude of the job overwhelms available capacity. The problem with landfills is more technology-related as the basic capability to build and properly operate landfills is lacking.

Current collection practices vary widely and associated costs have not been compiled and analyzed in a comprehensive manner. In affluent areas that can afford to financially support public cleanliness, large capacity trucks manned by uniformed crews collect waste. In other areas the streets are too narrow to allow the use of modern equipment and collection is done by smaller vehicles such as pickup trucks and donkey carts. Because residents in many areas cannot afford to pay for collection and disposal services, it is often not provided.

Generally, MSW collection is considered the most significant solid waste management problem because solid waste litter is so visually apparent (7). Solid waste is spread over streets, empty lots, roadsides, and other public areas, and often times it is burned once large volumes accumulate on the streets or vacant lots. Even the dumps that do function as MSW disposal sites often burn the waste to reduce its volume.

Cost recovery presents a major impediment in structuring a sustainable solid waste management system as identified by both public and private sector firms (5,12, 30). There is simply not enough money available to furnish and sustain the staff, equipment and infrastructure necessary to manage MSW nationwide. Although attempts are being made to better manage resources by privatizing MSW services, success in this area has been limited.

Revenues to cover the cost of MSW management come primarily from two sources. These two sources are collection and disposal fees paid by households and commercial generators, and a two percent cleansing tax levied on household rents. There is also revenue generated from the sale of recycled materials that indirectly support collection costs, certain environmental fines, and transfers from general revenue funds. However these revenues are either minor, inappropriate or not structured and therefore

cannot be relied upon. In summary, MSW revenues are insufficient to cover costs, and fall short of what is needed to support technical, administrative, and related capabilities, whether supplied by public or private entities.

Within this wide range of activities, the large number of associated or affected organizations, the sheer volume of very difficult-to-handle material to routinely manage, and the lack of a basic cost-recovery or economic support system, it can be readily appreciated that the MSW sector is highly complex, and that designing proper solid waste management systems presents a tremendous challenge.

2.3.1 Environmental Effects of MSW

The MSW problem is highly visible, serious and growing. Unfortunately, the problem is much more significant than the visual or aesthetic eyesore that results from improper disposal practices. MSW pollution is a serious environmental problem facing Egypt. Proper management of MSW is required to avoid public health problems, maintain a clean living environment, and control the environmental impacts directly and indirectly associated with MSW. The quantity of MSW will increase as population increases. Typically MSW generation increases faster than population growth alone would suggest (18). This is because there is a relatively faster population growth in urban areas than in rural areas and cities tend to have higher waste generation rates.

The lack of a comprehensive, effective, disciplined MSW management program contributes to the serious environmental problems that exist today. For instance, a large volume of MSW is never collected. The result is that uncollected MSW accumulates in various public areas where it putrefies and is routinely burned. Material, which is picked up and transported for disposal, is usually placed in open-burning dumps. Open-burning dumps are even part of composting and recycling operations, where it would be expected that sensitivity to environmental impacts would preclude this damaging practice (2,37).

The environmental impact of current practices includes the unsightly appearance of many Egyptian neighborhoods and villages, unsanitary living conditions, and increased air pollution due to uncontrolled open burning. Cairo in particular has an intense air pollution problem to which MSW pollution contributes significantly. The problem of open burning is ubiquitous and observed whenever the system of collection and proper disposal is limited. The open burning of MSW at dumps and on the streets generates particulate matter and other air pollution. The EHP study of particulates levels in Greater Cairo found that more than 30 percent of the fine particulate fraction, the most damaging type of particulate matter, is due to uncontrolled burning of solid waste (11,29).

Another current practice, with significant environmental consequences, is the dumping of MSW in the Nile River and its connecting system of water distribution canals. This obviously degrades water quality. While secondary to health issues, waterway dumping and open burning result in unsightly pollution impacts, which could have an impact on tourism (30).

Options appear limited. Less polluting but more technically complex MSW treatment methodologies such as composting have achieved limited success. Recycling

activities, with few exceptions, are conducted at the most basic level of subsistence scavenging, as exemplified by the Zabbaleen (garbage collectors) communities in Cairo. Members of the Zabbaleen communities live in squalid, unsanitary and physically dangerous conditions (31). Epidemics and large community fires have been experienced. One Zabbaleen dump site reportedly shifted and crushed several Zabbaleen homes, resulting in loss of life.

A further aspect of this problem is the inclusion of hazardous and medical wastes in the Egyptian MSW stream (17,27). In many countries, these wastes are considered separate waste streams with their own management, health and environmental considerations. The typical practice in Egypt, however, is to commingle these distinct waste streams, causing further environmental problems. Hazardous wastes, for example, can be highly polluting to land and water. Combining medical wastes with the more generic municipal solid wastes exposes large numbers of people to disease.

While not directly a component of MSW, construction and demolition (C&D) debris is associated with this sector. The extent to which C&D debris is spread across Egypt is very striking, particularly along roadsides. While not a major public health or air pollution concern, the negative aesthetic impact is considerable. Management techniques are available to handle this highly visible waste problem as part of a comprehensive waste management program.

In summary, the most serious and dangerous impact of the combined waste mismanagement relates to health issues, which are numerous. The physical and health dangers to scavengers such as Zabbaleen, who work and live with their families in the midst of putrefying wastes, is one example. Insects, vectors and disease breed in waste dumps. Mixed organic waste fed to animals in unsanitary conditions has spread disease (36). Canal dumping and poorly constructed dump sites almost certainly contaminate water supplies. Burning waste injects massive amounts of fine particulates into the air. Fine particulate matter is closely associated with serious respiratory problems. Unseparated medical waste, which if manually handled may be pathogenic. The physical and health dangers are real, immediate, and extensive, and alone argue most strongly for comprehensive waste management programs.

2.4 Energy/Energy Efficiency

A reliable supply of energy is essential to the economic and social development of a country. Energy shortages hinder growth in industrial expansion and GDP. Additionally, pollution arising from the inefficient production and delivery of energy resources imposes a high cost on the economy, constrains future development, and is a significant threat to the environment.

Egypt currently has a reliable supply of energy, but population and economic growth will put pressure on the energy supply infrastructure. It is currently forecast that over the next five years, GDP will grow at an annual rate of about 4.5 percent (35). As shown in Table 7, Egypt's GDP has historically grown in close proportion to total primary energy consumption. Demand for primary energy doubled from 17 million tons of oil equivalent (TOE) in 1982 to 33 million TOE in 1995, and is forecast to reach 47 million

TOE in 2000 (3).

Table 7
Primary Energy Consumption per Unit of GDP

Year	Total Primary Energy Consumption (ktoe)	GDP (million 1984/85 LE)	Primary Energy per Unit GDP (MJ/LE)
1983/84	23,599	32,511	30.4
1984/85	24,978	34,754	30.1
1985/86	25,403	36,318	29.3
1986/87	26,858	37,771	29.8
1987/88	27,905	39,697	29.4
1988/89	28,217	41,563	28.4
1989/90	29,648	43,558	28.5
1990/91	30,520	45,170	28.3
1991/92	30,848	46,028	28.1
1992/93	30,604	47,151	27.2

Source: OECF

General energy indicators are shown in Table 8. Interestingly, over the past three years, while population and GDP have grown, energy intensity and per capita primary commercial energy consumption have decreased (although total primary energy consumption has increased). This indicates that measures to improve the overall efficiency of the energy sector are having some success.

Table 8
General Energy Indicators

Indicator	1992/93	1993/94	1994/95
Population (millions)	57.3	58.7	60.1
GDP (1991/92 million L.E.)	134.3	139.6	146.1
GDP per Capita (1991/92 L.E.)	2,343	2,377	2,430
Energy Intensity (kgoe/'000 L.E.)	234.0	231.0	221.0
Electricity Intensity (kWh/'000 L.E.)	289.0	290.0	296.0
Per Capita Primary Commercial Energy Consumption (kgoe)	549.0	548.0	538.0

Source: Egypt Energy Statistics 1995, OECF

Oil dominates Egypt's current primary energy production market with 74 percent of production, while natural gas accounts for 22 percent, and hydropower generated from the River Nile accounts for the remaining four percent. Industry accounts for 50 percent of energy consumption, while transportation has a 29 percent share, and households and commercial entities have an 18 percent share. Oil also dominates energy consumption patterns with 58 percent of market share. Natural gas accounts for 34 percent of energy consumption and hydropower for eight percent (26).

At present, Egypt is a substantial oil producer, and is a net exporter of petroleum

products. Oil exports are extremely important to the economy in terms of balance of trade and foreign exchange. Crude oil and refined-product exports accounted for nearly 60 percent of merchandise exports in fiscal year 1992 (12). Recent exploration efforts in Egypt have been a huge success, with 12 oil and 20 natural gas discoveries in 1996, and five oil and nine natural gas discoveries through the first four months of 1997 (8).

Statistics related to Egypt's oil sector are shown in Table 9. In 1994/95, Egypt produced 44.3 million metric tons (mmt) of oil, of which 17 mmt were exported in the form of oil and petroleum products. Crude throughput at Egypt's eight refineries was 26.9 mmt. Refined petroleum products include fuel oil, gas oil/diesel, gasoline/naphtha, kerosene/turbine, bitumens, propane/butagas, and others (Table 10).

Table 9
Oil Sector Statistics
('000 mmt)

	1992/93	1993/94	1994/95
Production	44,800	45,186	44,292
Imports (Petroleum Products)	701	446	200
Total Exports	17,016	17,876	16,957
Oil Exports	10,262	9,459	7,973
Petroleum Products Export	6,754	8,417	8,984
Electricity Generation	3,043	2,225	2,348
Refineries	24,913	26,010	26,913
Total Final Consumption	14,837	14,709	15,362
Industry	5,060	5,139	5,351
Household & Commercial	2,646	2,464	2,530
Transport	5,859	5,846	6,098
Agriculture	131	108	101
Non Energy Use	1,141	1,152	1,282

Source: Egypt Energy Statistics 1995, OECP

Table 10
Refinery Production of Petroleum Products
('000 mmt)

	1994	1995
Crude Throughput	25,508	27,303
Products		
Propane/Butagas*	410	459
Gasoline/Naphtha	4,355	4,526
Kerosene/Turbine	2,186	2,021
Gas Oil/Diesel	5,255	5,838
Fuel Oil	12,075	12,065
Bitumen	682	740
Coal	141	156
Basic, Special Oils	226	235
Others	159	184
TOTAL	25,489	26,224

Source: Ministry of Petroleum, Egyptian General Petroleum Corporation, 1995 Annual Report

Egypt's eight petroleum refineries have a total capacity of 524,000 barrels per day. Refinery modifications and upgrading in 1995 and 1996 added modestly to capacity. In 1995 refinery throughput averaged about 80 percent of capacity at about 400,000 b/d. An economically efficient level of capacity utilization would be between 85 and 90 percent. Plans to add another 100,000 b/d refinery currently are on hold. Several of the refineries are too small to be profitable under present and anticipated future conditions in the world petroleum market. The refineries have limited catalytic cracking capacity resulting in low yields of light products and high yields of heavy products. The potential to reduce sulfur in fuels is limited without additional investment in desulfurization capacity.

Egypt has undertaken a number of projects in an effort to increase its oil refining capacity and elevate the quality of its petroleum products to international levels. Given surplus refining capacity in Egypt and the world, the economics of some of these projects will be marginal at best. In 1995 alone, 12 refining and processing projects were underway. These projects related to efficiency improvements, production of unleaded gasoline, rerefining of back oils, production of products for the domestic market, etc. (6). For environmental reasons, the sulfur content by weight for gasoline is limited to 0.08 percent, and for diesel fuel (gasoil) to 1.2 percent, high levels by the standards of Western Europe or the US (7).

Egypt's oil resources are supplemented with natural gas. Recoverable natural gas reserves have increased dramatically in recent years, and in fact, natural gas has become Egypt's "fuel of choice" in the local market. Natural gas, a clean energy source, is the core of Egypt's energy strategy to safeguard the environment. Natural gas lines are being extended throughout Egypt and industries are given incentives to convert all possible operations to natural gas.

Natural gas production and consumption characteristics are shown in Table 11.

* Butagas figures exclude butagas produced from natural gas.

Natural gas production and consumption increased by 18 percent over the two year period from 1992/93 to 1994/95. Electricity generation accounts for 69 percent of total natural gas consumption, while industry accounts for 16 percent. Households account for only one percent while a further 14 percent of consumption is for non-energy uses such as fertilizer production.

Table 11
Natural Gas Production and Consumption
(‘000 mmt)

	1992/93	1993/94	1994/95
Production	8,226	9,151	9,710
Consumption	8,210	9,110	9,661
Electricity Generation	5,294	5,858	6,214
Industry	1,236	1,353	1,442
Household	81	88	113
Non Energy Use	1,245	1,258	1,299

Source: Egypt Energy Statistics, OECP

Egypt has a long history of utilizing hydro power, a renewable energy resource. Hydro power accounts for four percent of total primary energy production in Egypt. The installed hydro power capacity is 2,805 MW (compared to 1995/1996 maximum electricity demand of 8,491 MW), and about 11.5 million kWh of energy is produced by hydro power plants annually (4). Today, virtually all of the Nile’s energy potential has been exploited.

Biomass fuel, another renewable energy source, is used extensively in rural areas. Agricultural residues derived from cotton, maize, and dung, in addition to other biomass fuels, provide about one-half of the fuel used for cooking needs in rural areas (liquid propane gas and kerosene meet much of the remainder of rural domestic energy consumption needs). The total annual consumption of biomass fuels in Egypt is estimated to be about 4.7 million TOE (3).

Energy production, delivery and consumption can impact on all environmental media, including air, land and water. The production of petroleum products and combustion of fossil fuels to produce electricity and heat contribute to environmental pollution. Exploration, extraction, and transport of oil to refineries pose potential risks to the environment. Air and water pollution are associated with the refining of crude oil. With expansion of natural gas supplies and the distribution system, most power plants have switched from oil to natural gas. Where oil is used in power generation substantial quantities of particulates and sulfur dioxide are produced in comparison to the amounts generated from the use of natural gas. There are also increased emissions of harmful substances such as heavy metals in wastewater discharges.

Fossil fuel combustion contributes to the threat of global climate change. Egypt is among 160 parties (as of mid 1996) to ratify the United Nations Framework Convention on Climate Change (UNFCCC) which requires parties to develop national inventories of greenhouse gas emissions, and to remove them through the use of sinks and measures to adapt to, or mitigate climate change. Although not committed to a specific level of emission reduction, Egypt's policy is to take actions which reduce greenhouse gas emissions and that make economic sense. The energy sector accounted for 71 percent of

all greenhouse gas emissions in 1990/91 when expressed as equivalent carbon dioxide emissions (OECP estimate).

2.5 Environmentally Sustainable Tourism

Egypt has one of the fastest growing tourism industries in the world based on its rich cultural and natural heritage. Cultural assets include the Pyramids, Valley of the Kings and Abu Simbel, while the natural resource of greatest attraction is the rich coral ecosystem of the Red Sea. The number of foreign tourists and the number of tourist nights spent in Egypt have increased three-fold and two-fold, respectively since 1985 (Table 12), based on preliminary estimates of four million tourists in 1996. By the year 2000, the number of foreign tourists is expected to increase to between 5.8 and 6.0 million. The growth in tourism has not been steady and has been influenced by external factors, for example, the Gulf War in 1990-1991 and internal political strife such as the fundamentalist upsurge in 1993 and 1994. Downswings in demand due to political factors have serious economic ramifications. For example, using a conservative estimate that one visitor day generates revenue of US\$125/day, the decline in tourism in 1993 resulted in a loss of over US\$800 million (assuming no change from 1992 levels rather than an increase according to growth trends).

Table 12
Foreign Tourism in Egypt

Year	No. of Tourists (000s)	No. of Tourist Nights (000s)	Nights per Tourist
1982	1,423	9,301	6.5
1985	1,518	9,007	5.9
1988	1,969	17,863	9.0
1990	2,600	19,942	7.6
1991	2,214	16,230	7.3
1992	3,206	21,835	6.8
1993	2,507	15,089	6.0
1994	2,581	15,432	5.9
1996 (Jan-June)	1,714	10,289	6.0

Source: CAPMAS

Estimates for the number of domestic tourists are unreliable as many Egyptians visiting sites stay with friends or relatives. Also, the number of foreign tourist is overstated because business travelers are included as tourists (the decline in the average nights per tourist can be partly explained by growth in domestic tourism, which is only counted if it involves hotel accommodation, and shorter stays for business travelers).

The tourism industry contributes significantly to the country's foreign exchange earnings and is considered to be Egypt's second largest source of hard currency behind remittances from abroad. Since 1982, tourism revenues have increased nearly 10-fold from

\$304 million in 1982/83 to \$3 billion in 1995/96 (Table 13).

Table 13
Tourism Revenues in Egypt

Year	Revenues (million US\$)
1982/83	304
1985/86	315
1989/90	900
1991/92	2,529
1994/95	2,298
1995/96	3,009

Source: Central Bank of Egypt

Through June 1996, employment in the tourism industry (direct and indirect) totaled 263,000 employees. Of this total number of employees, 116,705 were employed in hotels and resorts (direct employment), 84,600 were employed in tourism establishments and another 62,295 were employed in travel agencies, shops and bazaars, and as tour guides (28). TDA officials estimate that each new hotel room creates five new jobs. Direct employment represents about seven percent of the total Egyptian work force. TDA estimates indicate an overall 65 to 70 percent hotel occupancy rates over the year. Many Red Sea and Cairo international hotels have higher occupancy, particularly those, which have successfully attracted the package tour trade.

2.5.1 Cultural Heritage

It is estimated that there are 10,000 antiquity and cultural sites in Egypt. This represents over two-thirds of the world's antiquities. The Tourist Map of Egypt lists over 160 cultural sites of interest, ranging from Pharonic antiquities to Coptic Monasteries. Five regions of Egypt can be identified: (1) Lower Egypt - Delta to Dahshur; (2) Middle Egypt- Fayoum to Assiut; (3) Upper Egypt - including Assiut to Abu Simbel; (4) Sinai and the Eastern Desert; and (5) the Western Desert. Five UNESCO World Heritage Sites have been designated: Abu Mena; Ancient Thebes; Islamic Cairo; Memphis (including the necropolis and pyramid fields); and Nubian monuments (Abu Simbel and Philae).

The Nile Valley, running from Sudan in the south to the Mediterranean Sea in the north, represents one of the world's richest collections of antiquities, particularly the sites at Giza, Luxor and Aswan. The majority of visitors to Egypt visit Giza to see the Pyramids and Sphinx. Outside of Cairo, the most popular destination is Luxor. Smaller numbers of tourists visit the lesser known antiquity sites, however, data on popularity of the smaller sites are not systematically collected at the national level by the Supreme Council of Antiquities (SCA).

Tourism growth near the major antiquities sites, although much less rapid than in the coastal regions of Egypt, is expected in the future. TDA proposals include the development of 18 new hotels in the Nile Valley to meet the expected increase in tourism demand in Upper Egypt.

2.5.2 Natural Heritage

Egypt has 13 protected natural heritage sites, which have been described, by region in Box 1. At the present time, only a few protected areas are used heavily by tourists while some areas, such as Wadi El Assiuty and Gebel Elba are essentially only designated, with no development or on-site management. The most popular protected sites are Ras Mohamed and Nabq National Parks near Sharm el Sheikh, which are frequented by divers and snorkellers; and St. Catherine's Monastery. The Red Sea Islands Protectorate was declared in 1995 and covers most of the islands and associated reefs between the Sudanese border and Hurghada in the north.

Box 1 Designated Protected Areas in Egypt

Lower Egypt

There are two geological heritage sites near Cairo, Hassana Dome and the Petrified Forest. Lake Manzala, at Tannis, is an important wetland habitat for migratory birds and El Om Ayed, a Mediterranean biosphere reserve.

Middle Egypt

In this region two wadis are protected areas, Wadi El Assiuty, near Assiut, noted for wildlife, and Wadi Rayan including the lakes, desert springs and dune systems in Fayoum.

Upper Egypt

Saluga and Ghazal Islands in the Nile River, Aswan, are protected areas of undisturbed vegetation and fauna.

Sinai, the Red Sea and the Eastern Desert

Abu Ghalum and Ras Mohamed National Park are desert, coastal and coral reef systems which have been protected. Gebel Elba and Nabq are reserves consisting of mangroves, desert landscapes, and wildlife in the southern Sinai, Red Sea coastal border. In north Sinai, Bardawil Lagoon, El Zaranik, a important wetland for migratory birds and St. Catherine's Reserve is a mountain desert ecosystem with wildlife. The recently designated Red Sea National Marine Park comprises several islands and their surrounding ecosystems to the south of Hurghada.

Egypt's principal natural resource attractions, the beaches and many of the richly biodiverse coral reefs, are presently not designated as protected areas, although some of these natural resources near Sharm El Sheik and Hurghada have been protected recently. Most popular are the beaches and coral reefs near the Red Sea resorts, Sharm El Sheikh and Hurghada, which because of their beauty and relatively close proximity to Europe attract many weekly package tours. A George Washington University tourism market study estimates overall, about 12 percent of foreign visitors (almost 455,000 individuals in 1996) to Egypt visit the Red Sea and Sinai beaches (14).

For the Red Sea coast, a four to ten-fold increase in the number of hotel rooms has been forecast to accommodate additional visitors. TDA's target for resort development includes 200 new tourist centers to be built by 2017 in the Red Sea region and 40 in the Gulf of Aqaba (28). Currently there are 12,935 rooms available in Red Sea hotels, of which 11,612 have been rated three to five stars. At present, an additional 5,435 rooms are being constructed of which 4,000 are designated three to five stars and are targeted to accommodate foreign tourists.

The interrelationship between Egypt's cultural and natural resources is complex,

yet critical to the sustainability of its tourism sector, and the resources on which it depends. For instance, if the cultural and natural resources are degraded or destroyed, the motivation for tourists to visit Egypt will be diminished or eliminated. Already there is a growing concern for the state of the resources on which tourism depends and several, interlinked factors, including tourism itself, undermine the sustainability of the cultural and natural resource sector.

2.5.3 Risks to Cultural and Natural Resources Associated with Tourism

Although tourism has a significant potential for contributing to Egypt's economic growth, this potential may not be realized if the tourism development adversely affects the resource base. Development construction, the demand of hotel and tourism services, plus the direct impact of tourist numbers increasingly endanger cultural and natural resources.

The fragile coastal and reef ecosystems are easily damaged by intensive use by visitors and the development of tourist facilities. Landfilling of coastal zones, to provide sandy beaches, destroys reefs and increases sea water turbidity destroying flora and fauna. The dumping of construction waste causes visual pollution and may contribute to health hazards. Increasing demands for fresh water supplies initially by construction sites, then later on by hotel services, strain the capacity of existing infrastructure systems and draw down aquifer resources. Strip development of coastal areas is difficult to accommodate and places additional stress on infrastructure systems. Inadequate treatment of waste water, which contaminates coastal and river sites can adversely affect the quality of fresh water and contribute to the spread of disease.

Tourist buses contribute to air pollution and therefore the degradation of national monuments, while their presence imposes visual pollution and destroys the ambiance of and value of destinations to tourists. Harmful gas spills, noise, waste and reef destruction by anchoring are a consequence of tourist boats. The direct impact of intensive tourist use leads to the physical erosion of antiquities and their sites, and the destruction or disturbance of reef habitats. Pilferage and vandalism by tourists is also , particularly in the Valley of the Kings, Luxor.

2.5.4 Risks to Tourism Associated with Environmental Factors

Tourism is sensitive to changes to any of Egypt's cultural, natural and economic assets. Risks affecting the levels of use, quantity and quality of any of a wide range of resources (water, air, fauna, flora, communities, and antiquities), and the country's basic infrastructure, may impinge on tourism. Direct or indirect actions taken by other sectors such as industry or agriculture, which share these resources with tourism, may affect the sustainability of tourism.

Air pollution from industrial sources and motorized transport cause aesthetic and chemical degradation of antiquities, in addition to affecting the structural integrity of the antiquities due to the effect of vehicle vibrations. The Giza Pyramids and Sphinx, in particular, are at risk. Marine pollution, particularly oil, threatens reef ecosystems and spoils beaches. Beaches near Alexandria, notably, were contaminated by sewage.

Constraints on water availability limit plans for new tourist construction sites and cause supply disruptions to existing resorts. Increased irrigation and discharge of municipal wastewater has raised water tables, resulting in damage to structures and threatening damage to others. Levels of humidity also directly threaten the disintegration of monuments such as Abu Simbel. Disposal of solid waste primarily causes visual pollution, although seepage of leachate to ground and surface waters, and air pollution through burning causes ecosystem destruction and health concerns. Both local residents and the tourists themselves may be at risk. In Cairo, air pollution also contributes to human respiratory problems while stomach and intestinal illnesses result from unsafe drinking water and improper food handling, storage, and preparation are a problem in tourist areas. Skin ailments result from swimming in water sources contaminated with industrial or municipal waste.

The above stresses jeopardize cultural and natural resources, the settings in which they are located and ultimately the tourist industry. While some work has been done to document degradation at selected sites, little systematic work has taken place to analyze the sensitivity of the physical structures to these stresses, or to document the sensitivity of the tourism industry to different types and levels of degradation. Generally these are understood to reduce the value of the tourism experience and are hypothesized to reduce both numbers of visits and levels of expenditure per visit.

2.6 Other Environmental Sectors

2.6.1 Land and Water Resources

Only a small portion of Egypt is arable land suitable for agricultural activity, but it accounts for about 20 percent of GDP and employs about 37 percent of the work force. The actual area of cultivated land is unknown since the most recent census of agricultural activity was in 1961. Best estimates place it at about 7.5 million feddans (31,500 km²) or about three percent of Egypt's total land area of 238 million feddans (1.002 million km²). During the 1980s agricultural exports (about \$700 million/year) were one-fifth of imports (\$3.6 billion/year) (13). This shortfall in agricultural output is of great concern to the Government of Egypt, particularly in light of the present high rate of population growth.

One of the problems facing the Egyptian agricultural sector is that currently over half of Egyptian agricultural land consists of plots of less than two feddans (about two acres). A combination of population growth, and a number of additional forces have led to a reduction in the average size of agricultural land holdings. Small holdings are an important barrier to productivity improvement and impede the implementation of water allocation in agriculture. Islamic inheritance laws, government ceilings on the maximum size of land holdings, and limits on the maximum rent that owners could charge to tenants have all served as a disincentive for owners to rent land. Law 96/1992, which was designed to increase land rents to market levels by 1997, should help to increase the average size of land holdings.

Conflicts between alternative land uses are likely to be a growing problem in the future. Urban encroachment represents an important factor affecting agricultural output,

with annual losses in the range of 15,000 to 30,000 feddans. These problems, which undermine the prospects for expanding domestic agricultural output, are a great concern to the government and have led to the development of projects such as the New Valley development (Toshka) in southern Egypt.

Land and water resources are closely linked and limitations on Egypt's agricultural activities are primarily the result of limited water resources. The Nile Waters Agreement of 1959, between Egypt and the Sudan, allocates water between the two countries in proportion to populations. Based on average annual flow for the Nile of 84 billion cubic meters at Aswan (1900-1959), the agreement allocated 55.5 billion cubic meters to Egypt, 18.5 billion cubic meters to Sudan. The remaining 10 billion cubic meters account for evaporation and other losses in Lake Nasser.

Maintaining an adequate water supply for Egypt will involve finding additional sources of water to meet additional demands. Growth in urban and industrial demand for water plus the diversion of approximately ten percent of the Nile River's flow to the New Valley will require a reduced rate of use in other areas (16). Externally, Ethiopia is planning to raise the level of some dams and divert more water for agricultural use, possibly reducing the amount of water to be allocated between Egypt and Sudan. To counteract these increased demands and reduced supplies, a few measures have been or could be considered.

The Aswan High Dam has a capacity of 130 billion cubic meters (90 billion cubic meters live storage) enabling Egypt to store the Nile's annual flow and assuring that excess flows in years of greater abundance can be used during years of relative scarcity. The High Dam enables Egyptian authorities to manage the Nile River to eliminate floods and increase agricultural production. With these benefits have come some disadvantages. The elimination of flooding has caused a huge reduction in sediments formerly carried downstream, thereby reducing land fertility, and creating a higher water table which leads to a damaging build-up of soil salinity. The high water table also causes damage to the foundations of antiquities due to water infiltration and the disintegration of the lime stone used for building.

Some augmentation of the Nile water supply may be feasible, though at costs which are prohibitively expensive for agricultural use. Short-run increases in effective water supply are possible from higher rates of groundwater withdrawal (costs range from LE 0.01 to 0.05 per cubic meter in the Western Desert), reuse of municipal wastewater and irrigation drainage water (LE 0.01 per cubic meter), and irrigation improvement projects (LE 0.03 to 0.25 per cubic meter). Opportunities for augmenting supplies from all of these sources are limited. Less limited in terms of potential availability, desalinization of sea water, at a cost of LE 3.0 to LE 6.0 per cubic meter may be too expensive for agricultural and some industrial uses (23).

Current annual extraction of 3.5 billion cubic meters of groundwater from the Nile Valley and Delta aquifers could be increased but this supply is not an additional resource as it is recharged from the Nile. Vast supplies of non-renewable groundwater supplies also exist in the Western Desert at great depths; preliminary estimates of total storage in this area are approximately 40 billion cubic meters. In the New Valley about 1 billion cubic meters can be recovered economically each year and limited quantities of groundwater are

also available in Sinai.

To ensure that water is available for developments such as the New Valley, the Egyptian government has indicated that water intensive agricultural activities such as rice cultivation will bear the brunt of reduction. Historically, agricultural users have not paid for water, a policy that has encouraged cultivation of water intensive crops and excessive water use. 1990 estimates from the Ministry of Public Works and Water Resources (MPWWR) report that agriculture receives 49.7 billion cubic meters annually, or about 84 percent of total water use in the country (24). Recently, the GOE has introduced gradual reductions in water subsidies and a small minority of farmers now pay nominal fees for water delivery. These payments however, generally represent only a portion of the operating and maintenance costs of water delivery and no charges are imposed or contemplated to reflect the scarcity value of water (i.e., a demand-based allocation system).

Water quality is a growing concern in Egypt. While water quality of the Nile above the Aswan High Dam is generally considered good, recent population settlements above the High Dam are a concern as they are likely to adversely affect lake water quality. The quality of Nile River water from the Aswan High Dam to the Delta has deteriorated since the mid 1970s. Dissolved oxygen (DO) and total dissolved solids (TDS) levels are nearly stable, but other monitored parameters show adverse changes.

Among the concerns for water quality are the following: (1) some agricultural drains discharge directly to the Nile; (2) raw sewage is deposited into agricultural drains; (3) raw and only primary-treated sewage from Cairo drains to Lake Manzala; (4) primary-treated sewage and agricultural drains from the Fayoum flow to Lake Qarun; and (5) industry releases untreated and inadequately treated effluents into sewage systems and drains. Groundwater resources also are being contaminated by polluted surface lagoons, agricultural activities and municipal sewage.

Water-intensive cultivation practices have adversely affected soil quality. Soils have become waterlogged, water tables are now very near the surface in many areas and a growing stratum of soils are contaminated with salts. At least 30 percent of agricultural lands are believed to be saline. Agricultural activities also threaten a number of important wildlife resources in Egypt, such as Lake Manzala and Lake Qarun.

Over the longer term, land and water available for agricultural activities will decline as industrial and municipal use increases. Development of new agricultural areas such as the New Valley may offset land losses but finding sufficient water at a reasonable cost may be impossible. Consequently, strategies for sustainable agriculture in Egypt must account for the likelihood of declining land and water resources. Higher valued crops eventually must replace wheat, rice and other commodity-type crops (1).

2.6.2 Municipal Water Supply

In Egypt, the water supply is limited and often unreliable. Approximately 85 percent of the urban population is connected to a water supply which is invariably of poor quality. Typically, the distribution system cannot satisfy peak demands. This occurs most frequently in multi-story buildings, where users on higher floors cannot obtain

water from their taps. In some cases water has to be rationed. In apartment blocks, residents commonly install pumps in order to obtain adequate supplies. To meet water needs, many users store water overnight or augment available supplies with purchased water (21).

Residents without a water service are forced to find other alternatives such as purchasing bulk water from street vendors, or carrying water from nearby dwellings with service, from public taps (standpipes) where long queues are often encountered, or from water supply canals. In some cases, a mix of these alternatives is used. Unlike in rural areas, few urban dwellers are likely to obtain drinking, cooking or bathing water from drainage canals, although clothes and utensils may be washed there.

All of these compensating actions involve financial cost and/or personal time. Survey results indicate that users would be willing to pay substantial sums to have a more reliable service, or to maintain the reliability of water supply systems that are not currently experiencing such problems (32). The results are consistent with other studies that examine potential cost savings from improved service (25).

A universal and reliable public water supply to households generates several benefits. Health risks associated with using canal water are reduced and, the discomfort and time wasted collecting water would be avoided. Sometimes users are required to make payments to individuals who break the faucet and then offer to open it with a wrench. A 1993 Dutch study reported that 61 percent of public taps in Fayoum had broken faucets, 88 percent had defective platforms, 79 percent had no gutter, and 86 percent a muddy or dirty environment (21). Another benefit of installing public water connections is the reduction of physical effort and discomfort that accompany frequent trips to obtain water. For those who buy vended or bottled water, savings come in the form of reduced costs for these services. Household water services typically cost less than one-half the cost of buying water from street vendors.

Apart from being unable to meet the water supply demands of the public, municipal water authorities are increasingly faced with problems of water quality. In the Nile Delta (e.g., Alexandria) there are problems with TDS levels, principally salts, in raw water supplies. The main cause of the TDS problem is the introduction of irrigation drainage water into the fresh water canals to augment flow. Treatment capabilities in Alexandria will not be able to process the intake water if these trends continue. The only recourse for Alexandria then will be expensive investments in reverse osmosis or other technologies to treat salty water.

2.6.3 Urban Air

Rapid industrialization before environmental regulations limiting industrial emissions were in place, coupled with high vehicular emissions, have resulted in serious air quality problems in Greater Cairo and Alexandria. Air quality in Greater Cairo contains the highest levels of particulate matter and lead in the world. Typically, particulate matter levels are measured at about five times the US standard and other world norms.

A 1994 USAID-sponsored analysis of ambient air quality and associated health risks in Cairo concluded that the fine particle fraction (under 2.5 microns in diameter) of particulate matter is the principal health concern. The major contributors to this fraction are: the combustion of heavy fuel oil or mazout (13.3 percent); the use of diesel fuel in vehicles (34.6 percent); re-entrained street dust (14.4 percent); and vegetative and trash burning (33.4 percent). High levels of particulate matter are believed to cause around 10,000 to 25,000 premature deaths annually in Cairo, and increase hospital admissions and absences from school and work. For the coarse fraction of particulates that cannot be inhaled, desert dust and re-entrained road dust were much larger contributors. While these particles may soil clothes and cause visibility problems, they are not a major health issue. One limitation of the study is that it is difficult to generalize for the whole year. The research was conducted during the winter months when the prevailing winds were from the north but during the summer months the prevailing winds are from the south (31).

Lead also is a major concern in the air of Greater Cairo, and in the past, ambient lead concentrations were high enough to reduce the intelligence quotient (IQ) of children by an average of 4.25 points. Lead exposure also increases kidney disease and hypertension among adults. In 1996, the GOE acted to remove lead from gasoline sold in all major urban areas in the country and has succeeded in providing unleaded gasoline to satisfy 80 percent of consumption nationwide. This dramatic achievement should reduce ambient concentrations by about 50 percent. Similarly, the loss in IQ amongst children should be reduced to about 2 to 2.5 points. However, lead smelters located in and near Cairo still pose a major risk to public health.

Law 4/1994 and its regulations, coupled with donor support, should result in continued improvement in air quality in Egypt's urban areas. In 1995, the EEAA conducted a substantial campaign to make the public aware of the risks of impaired urban air quality, and outlining measures concerned citizens could take to reduce their exposure. Under USAID/Egypt's Environment Sector projects, a number of feasibility studies were conducted to identify measures that, if implemented, would have the most immediate and significant impact on improvements in Egypt's urban air. Feasibility studies were conducted on converting Cairo's public bus fleet to compressed natural gas (CNG), limiting impacts of lead smelters, and vehicle emissions testing. Many of these measures will be implemented in the near future with assistance from USAID and other donors. For example, the USAID-sponsored Cairo Air Improvement Project plans to address five key issues: vehicle emissions testing; CNG conversion in the public transport sector; lead smelter pollution abatement; public awareness; and air quality monitoring.

References

- Beaumont, P., 1994. *"The Myth of Water Wars and the Future of Irrigated Agriculture in the Middle East"*, International Journal of Water Resources Development, Vol.10, No.1.
- Damietta Field Trip, May 1997.
- DANIDA, November 1995. *"Overall Sector Analysis of the Renewable Energy and Energy Conservation Sector in Egypt"*.
- Egyptian Electricity Authority/Ministry of Electricity and Energy, (1995/1996). *"Annual Report of Electric Statistics"*. Arab Republic of Egypt.
- Egyptian Environmental Affairs Agency, March 1997. *"Ten Year Plan for Environmental Protection 1997-2007"*.

- Egyptian General Petroleum Corporation, Ministry of Petroleum, 1995. *"Annual Report"*.
- Egyptian General Petroleum Corporation, Ministry of Petroleum, 1995. *"Quality Control/Operations"*.
- El Banbi, H., Minister of Petroleum, *"Growing Energy Needs of Emerging Economies: Challenges and Ambitions"*. Arab Republic of Egypt.
- Energy Conservation and Environmental Protection Project, 1994. *"Environmental Auditing Manual"*.
- Egypt Environmental Sector Assessment, August 1997. *"Roundtable Discussion on Industrial Pollution: Participants' Response"*.
- Egypt Environmental Sector Assessment, May 1997. *"Participation Panel on MSW: Participants' Response"*.
- ESMAP, 1996. *"Arab Republic of Egypt Energy Sector Assessment Report"*.
- Gamal, A. and Samie ,A., March 1997. *"Environmental Strategies for Development and Management of Agricultural Land in Egypt"*, Draft.
- George Washington University, 1997. *"Hotel Capacity and Growth Strategies for the Red Sea Coast - Analysis Report"*. Winrock International and USAID, Environmentally Sustainable Tourism Project.
- Gesellschaft fur Technisches Zusammenarbeit, September 1992. *"Solid Waste Management for the City of Aswan"*. Grimm, K., Einwag, P. & Sheriff, Y.
- Government of the Arab Republic of Egypt, Cabinet of Ministers, March 1997. *"Egypt and the 21st Century"*.
- Government of the Arab Republic of Egypt, May 1992. *"Environmental Action Plan: Arab Republic of Egypt"*.
- Japan International Cooperation Agency, March 1995. *"Basic Design Study Report on the Project for Improvement of Solid Waste Management in Alexandria in the Arab Republic of Egypt"*. Jachiyo Engineering Co., Ltd.
- Meeting with Canal Cities Project Representative, May 1997.
- Meeting with DANIDA Representative, August 1997.
- Meeting with Environmental Health Project Representative, April 1997.
- Ministry of Public Works and Water Resources, 1981. *"Industrial Water Use and Wastewater Production"*.
- Ministry of Public Works and Water Resources, 1996. *"National Level Strategies and Policies for Utilizing Egypt's Water Resources"*, WRSR Publication Series No.1, Winrock International.
- Ministry of Public Works and Water Resources, Water Research Center, 1995. *"Information Bulletin"*.
- Organization for Economic Cooperation and Development, 1994. *"Applying Economic Instruments to Environmental Policies in OECD and Dynamic Non-Member Economies"*. Paris.
- Organization for Energy Conservation and Planning, 1995. *"Egypt Energy Statistics"*.
- Technical Cooperation Office for the Environment/ Egyptian Environmental Affairs Agency, March 1995. *"Draft Environmental Strategies"*.
- Tourism Development Authority, Ministry of Tourism, 1997. *"National Strategy for Planning the Tourism Sector"*.
- USAID, August 1996. *"Environmental Health Project: An Assessment and Source Apportionment of Airborne Particulate Matter in Cairo, Egypt: Activity Report No. 22, Volume 1"*.
- USAID, February 1997. *"Action Plan for the Establishment of a Solid Waste Management System in the Cities of Hurgada, Safaga and Quseir"*. Winrock Int.
- USAID, September 1994. *"Comparing Environmental Health Risks in Cairo, Egypt"*.
- USAID, 1995. *"Cairo Water and Wastewater Economic Benefits Analysis"*. Hoehn & Krieger.
- World Bank, *"Arab Republic of Egypt Country Economic Memorandum - Egypt Issues in Sustaining Economic Growth: Summary Report"*.
- World Bank, April 1996. *"Egyptian Pollution Abatement Project. Staff Appraisal Report"*.
- World Bank, March 1997. *"Arab Republic of Egypt Country Economic Memorandum Statistical Index, Volume IV"*.

Zabaleen Field Trip, May 1997.

Zagazig Field Trip, May 1997.

Chapter 3

The Current Environmental Policy Framework

This chapter presents a brief analysis of the environmental policy framework currently in place in Egypt. It begins with an overview of the current policy, legal, and institutional framework for environmental management. This is followed by a more detailed analysis of policy formulation and implementation in specific environmental sectors.

3.1 Overview of Environmental Policy, Legal, and Institutional Framework

3.1.1 Environmental Policy Framework

The most recent articulation of the role of environmental policy in Egypt's national development planning is contained in a speech given by President Hosni Mubarak on March 15, 1997, at the ceremony launching the New Delta Project. Entitled *Egypt & the 21st Century*, the speech amounts to a statement of Egypt's national development strategy. The hallmark of the speech's discussion of the environment is its commitment to sustainable development:

“In all cases, we are required at present and in the future, to incorporate the environmental dimension into our political, economic, and production plan. ... Thereby, a human and economic basis will be established for sustained development, aspired to achieve a better life for Egyptian citizens”.

In the speech, Mubarak commits the GOE to maintaining a “clean and well-preserved environment”, specifically identifying as priorities the conservation of agricultural land, the protection of the Nile River and other fresh water resources from pollution, the expansion of natural protectorates in order to maintain environmental and biological diversity, the restoration of clean air, and extension of sewerage systems in order to protect human health in urban areas. Further, the speech cites the need to raise public awareness on the environment and gives recognition in this regard to the valuable “input by individuals and non-governmental organizations interested in environmental affairs” (6).

Prior to this statement, Egypt's national environmental policy was last elaborated in the *National Report on Environment and Development* prepared for the United Nations Conference on the Environment and Development in Rio de Janeiro in 1992 (9). This report, compiled by a select group of Egyptian scientists and experts on the environment, grounded Egypt's environmental policy in the fundamental principles of sustainable development and sound environmental management (Box 2). The report then identified 14 priority environmental programs, ranging from the management of fresh water resources and the protection of soils on agricultural lands to controlling urban air pollution and properly managing solid and hazardous waste.

Box 2

National Environmental Policy

Source: National Report on Environment and Development, 1992

The same year, the GOE completed and published the Egyptian Environmental

Egypt's environmental policy supports all programs for sustainable development that have allowed for environmental considerations. This policy is based on five main axes to form an integrated structure that seeks to achieve sound management of the environment, and organize and enhance the output of its renewable and non-renewable systems. These five axes are:

Sustainable Development: The policy is guided by the results of the environmental feasibility studies on production and service projects, with special emphasis on the environmental dimension to remedy any negative aspects of such projects, to provide the necessary allocations, to firmly deal with any obstacles that may cause delay or prevent implementation, to rationalize utilization of natural resources in the interest of present and future generations, and to have a more scientific environmental concept in all development sectors which would achieve the balance between economic and environmental conservation.

National Strategy: Egypt has drawn up a national strategy for sound environmental management based on national reports on environmental conditions in the country.

Nature Conservation: Egypt has been greatly concerned with the issue of sustaining natural resources and conservation of environmental systems and maintaining their continued output and productivity on land and in sea and fresh waters.

Environmental Assessment: Egypt implements a policy compatible with the Egyptian environment when assessing the environmental implications of any development projects, especially in the fields of industry, urban planning, and tourism, with a view to attaining a sustainable development founded on sound environmental criteria.

Private Sector: Egypt supports the private sector activities and initiatives for environmental welfare, encourages all contributions to environment management programs and is particularly concerned with scientific societies, women and youth.

Action Plan (EEAP), which was prepared with technical and financial assistance from the World Bank and other donors. The EEAP, which serves as the basis of national environmental policy, identified and analyzed the critical environmental issues of the country, specifically pollution and degradation of natural resources, air pollution, solid waste management, cultural heritage, and institutional strengthening. More importantly, the EEAP also identified a number of appropriate policy and institutional actions, as well as an investment program, to address these issues (7). Since 1992, the GOE and several of the donors have undertaken initiatives to implement a number of the actions and investments identified in the EEAP. For example, the GOE enacted the environmental law, Law 4/1994, which established the EEAA. Several of the donors have supported institution-building projects designed to strengthen the new agency and assist it in undertaking its environmental responsibilities. A donor-supported Technical Cooperation Office for the Environment (TCOE) was created for that purpose.

At present, the EEAA is beginning to exercise its national policy formulation and coordination responsibilities. Through the TCOE, it is in the process of preparing its first series of environmental strategies addressing key issues in environmental management, e.g., regional capacity building, industrial wastewater and air pollution, energy, urban air pollution, and municipal solid and hospital waste, etc. (8). USAID, in the context of the EESA, has conducted roundtable discussions on energy/energy efficiency, industrial

pollution, municipal solid waste management, and environmentally sustainable tourism. These discussions should provide useful input to EEAA's strategy development.

In the final analysis, however, environmental policy in Egypt is formulated and implemented by a number of national level institutions, including not only the EEAA but the Ministry of Health and Population (MOHP), the Ministry of Agriculture and Land Reclamation (MALR), the Ministry of Public Works and Water Resources (MPWWR), and others. Currently, there is no effective mechanism, other than the Cabinet of Ministers, for coordinating the policy formulation process, although the EEAA is charged with this responsibility by the environmental law, Law 4/1994. The result is a critical lack of coordination in policy formulation at the national level, particularly given the institutional weakness of the EEAA compared to some of the traditional, more powerful sector ministries. The recent creation of the new Ministry of State for Environmental Affairs (MOEA) may redress this institutional coordination issue by putting environment for the first time on an equal plane with the other ministries in the Egyptian Cabinet. The full implications of this elevation of environment to ministerial status remain to be seen, however, because ministerial status in, and of itself, will not overcome the entrenched jurisdictional conflicts that exist in the Egyptian government with respect to environmental management.

At least in some cases, it appears that environmental policy decisions are made at the highest levels of government, even by the President of Egypt himself. For example, the decision to remove the lead from gasoline sold in Cairo was made by President Mubarak, based on a commitment made to Vice President Gore of the United States under the Mubarak-Gore Partnership. This may be the exception, however, rather than the rule, for there are only a few examples where environmental considerations are systematically incorporated into national decision-making at the highest levels of government or that they provide a basis for national development planning. While there is a commitment to the *principle* of sustainable development, the *practice* of sustainable development lags behind. For example, the New Delta Project has not undergone any systematic environmental analysis, i.e., no environmental impact assessment (EIA) was performed for the project, nor has there been any public discussion of its potential social and environmental benefits and costs. Developments like the New Delta Project may well provide Egypt significant economic benefits, e.g., dispersing the population away from the Nile Valley, but they will no doubt entail significant environmental costs as well, e.g., diverting additional water from the Nile River. Before Egypt commits itself to this sort of development in the 21st century, it will need to determine if such projects are economically, socially and environmentally sustainable.

No institutional analysis would be complete without some examination of how the GOE's national budget is allocated across the national ministries and local institutions, with environmental management responsibilities. Unfortunately, the national budget has not been available to the EESA team, so no budget analysis has been possible.

3.1.2 Legal Framework for Environmental Management

Over the last three decades, Egypt has adopted a substantial body of environmental

laws, decrees, and regulations addressing various aspects of environmental protection and natural resources management (Table 14). While much remains to be done to refine and complete this legal framework, the existing laws and regulations provide the GOE with adequate legal authority to begin the sort of environmental planning, pollution prevention and control, and natural resources management that the country desperately needs. Implementation and enforcement of this framework, however, have not proven effective to date largely because of fragmented institutional responsibilities, failures in inter-institutional coordination and fundamental weaknesses in institutional structure and capacity. Moreover, what appears to be lacking is the political commitment at the highest levels of government to implement and enforce the legal framework in order to ensure effective environmental management.

The most recent and comprehensive of the environmental laws, Law 4/1994, established the EEAA, created the Environmental Protection Fund to finance environmental management activities, and addressed several significant legislative gaps in the legal framework for environmental protection neglected by the earlier water pollution and waste management laws. Specifically, the law provides the EEAA broad authority, among other things, to regulate air pollution, control hazardous substance and waste management, and control discharges to marine waters. Furthermore, the law gives the EEAA an array of tools for implementing and enforcing these provisions, including traditional regulatory controls (e.g., emissions' standards for air pollutants), economic instruments, EIAs, and compliance monitoring (e.g., record keeping requirements), inspection and enforcement (e.g., penalties, closures, and imprisonment) authorities.

Despite these significant advances, however, Law 4/1994 does not give the EEAA any licensing authority for implementing environmental standards (this authority remains with the traditional sector ministries whose licenses do not routinely incorporate environmental conditions or requirements), nor does it give the EEAA authority to take administrative responsibility in enforcing actions against violations of the law or its regulations (there is no authority to impose a penalty or to order corrective action without going to court). The law requires the EEAA to use the traditional legal process, i.e., report the violation to the police, present it to the district attorney, and, where the case warrants further action, to bring a legal action in court. Given the Egyptian legal system, however, with its tremendous backlog of cases and lack of experience with complex environmental issues, there is no reason to expect this legal process to support timely and effective enforcement of the law.

Table 14. Principal Environmental Laws, Decrees and Regulations

Environmental Law	Date	Authority	Decrees/Regulations	Implementing Agency
Law No. 4 on Environment	1994	Establishment of EEAA and Environmental Trust Fund; requirement of EIA, regulation of air pollution, hazardous waste management, and marine pollution	Decree No. 338 of 1995 (Executive Regulations)	Ministry of State for Environmental Affairs EEAA
Law No. 117 on Cultural Heritage	1983	Preservation and management of cultural heritage	Presidential Decree No.2828 of 1971 (cultural heritage)	Ministry of Culture SCA
Law No. 102 on Natural Protectorates	1983	Designation and management of natural protectorates	Decrees designating sites	MOEA EEAA
Law No. 124 on Fisheries	1983	Management and protection of fisheries and marine animals		Ministry of Agriculture and Land Reclamation
Law No. 48 on Protection of Nile and its Waterways	1982	Control of pollution of surface waters	Decree No. 8 of 1983 (standards for wastewater discharges to surface waters)	Ministry of Public Works and Water Resources
Law No. 137 on Labor	1981	Control of work place safety and environment		Ministry of Manpower and Immigration
Law No. 27 on Public Water Sources	1978	Protection of public water sources for drinking and domestic purposes	Decree No. 27 of 1966 (Supreme Committee for Water) Annex IV of 1975 (Standards for potable water)	Ministry of Health and Population Supreme Committee for Water
Law No. 31 on Public Cleanliness	1976	Control of solid waste management (amends Law No. 38 of 1967)		Ministry of Housing, Utilities, and Urban Communities
Law No. 66 on Transport Air Pollution	1973	Control of air pollution from transportation sources	Decree No. 864 of 1969 (Supreme Committee) Decree No. 470 of 1971 (ambient air standards)	Ministry of Health and Population Supreme Committee for Protection of Air
Law No. 38 on Public Cleanliness	1967	Control of solid waste management (including hazardous waste)	Decree No 134 of 1968 (waste from domestic and industrial sources)	Ministry of Housing, Utilities, and Urban Communities
Law No. 53 on Agriculture	1966	Regulation of purchase, importation, and handling of pesticides	Decree No. 50 of 1966 (registration and licensing requirements)	Ministry of Agriculture and Land Reclamation

Law No. 93 on Wastewater and Drainage	1962	Control of wastewater discharges and drainage to public sewers	Decree No. 643 of 1962 (standards for wastewater discharges to public sewers)	Ministry of Housing, Utilities and Urban Communities
---------------------------------------	------	--	---	--

The EEAA has promulgated regulations (Executive Regulations, 1995) implementing the air pollution, marine discharge, and EIA provisions of the law and is in the process of completing regulations for controlling the management of hazardous substances and wastes. The law grants industry a three-year grace period (until March 1998) in which to comply with the new standards. An additional two-year extension is available to those industries that submit an application by August 1997, and prepare a Compliance Action Plan demonstrating their progress in meeting the standards by the end of 1997. Even this period may not provide enough time, however, to bring the previously uncontrolled industrial community into compliance, and the EEAA will likely be faced with significant industrial non-compliance. Estimates of current compliance rates are not available but are likely to be extremely low. Moreover, some of the pollution control standards in the Executive Regulations appear too stringent to be attainable by Egyptian industry and, thus, may be unenforceable. There remain a number of other administrative impediments to effective implementation and enforcement of Law 4/1994 (Box 3).

Box 3

Impediments to Implementation of Law 4/1994

Despite the progress made in promulgating the Executive Regulations, a number of administrative impediments remain for full and effective implementation and enforcement of Law 4/1994:

The EIA Permanent Review Committee must be established before the EIA review process can function effectively (Article. 14 of the Executive Regulations).

The tables of hazardous substances/wastes must be issued by the various ministries before the permitting and management provisions of the law can be implemented (Article 25 of the Executive Regulations).

A decree must be issued by the Minister of Interior determining in which governorates the vehicle emissions standards shall apply (Article 37 of the Executive Regulations).

The conditions for granting a permit for the construction of an establishment within the prohibited zone in coastal areas must be established before these coastal zone protection provisions can be implemented (Article. 59 of the Executive Regulations).

Water pollution, addressed separately by Law 93/1962 and Law 48/1982, is implemented by the Ministry of Housing, Utilities and Urban Communities (MHUUC) and MPWWR, respectively. Regulations promulgated under the former law, set standards and specifications for wastewater discharged to public sewers while regulations under the latter, set water quality standards for receiving water bodies and effluent standards for wastewater discharges into the Nile River and other waterways. These standards are designed to be implemented and enforced through wastewater discharge permit systems administered by the two ministries, but in reality no effective implementation or enforcement has ever taken place. Protection of public drinking water supplies, including promulgation of public health and quality standards for potable water, is provided under Law 27/1978, administered by the MOHP.

Solid waste management, including collection, treatment, and disposal, is covered by Law 38/1967 and Law 31/1976. Solid waste management is the responsibility of local authorities, which may license collection and specify disposal sites under regulations promulgated by the MHUUC. Prior to Law 4/1994, there was no specific regulatory authority for industrial solid or hazardous waste. The EEAA is just beginning the process

of identifying and regulating hazardous waste under its new legislative a. Similarly, the regulation of the purchase, importation, and use of agricultural pesticides under Law 53/1966 is administered by the MALR.

Prior to Law 4/1994, air pollution had been regulated by a number of different laws and decrees, as well as by a number of different ministries and agencies, including the MOHP, the MHUUC, and the Ministry of Industry and Mineral Wealth (MIMW). Few of these laws or decrees dealt specifically with air pollution control measures, none specified penalties or enforcement procedures. Under Law 4/1994, the EEAA for the first time has promulgated air quality goals and emissions standards, for both vehicles and industrial sources of air pollution, that may be monitored and enforced. Controls for the workplace environment are provided under Law 137/1981, which authorizes the Ministry of Manpower and Immigration to specify requirements for interior environmental conditions in the workplace.

With respect to management of natural resources, the designation and management of natural protectorates is authorized by Law 102/1983, which is also administered by the EEAA. Law 102/1983 provides a comprehensive definition of natural protectorates (including geological formations, wetlands, coral reefs, coastal areas, and mountain ecosystems); authorizes measures for their study, management and protection; and prohibits certain activities, such as fishing, hunting, damaging living organisms or natural features, polluting the soil, water, or air, etc., in such areas. To date, some 16 sites have been designated natural protectorates, and four additional ones are currently being proposed for designation. Although Egypt does not have specific biodiversity legislation, it has signed a number of important international conventions for the conservation of biological resources, including the Biological Diversity Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Convention on Wetlands of International Importance (Ramsar). In addition, fisheries and other marine resources are regulated under Law 124/1983, which is administered by the Ministry of Agriculture and Land Reclamation.

Protection of Egypt's cultural heritage is authorized under Law 117/1983, which provides the Ministry of Culture's SCA with authority to effectively protect Egyptian antiquities. The law provides a clear definition of what constitutes an antiquity, defines the SCA's role in their protection, and authorizes regulations controlling their registration and preservation, as well as excavation and exhibition in Egypt and abroad. Under the law, antiquities are considered public property and trade in antiquities is absolutely prohibited. The law provides significant penalties for enforcing this prohibition.

Egypt's record in implementing and enforcing these laws is mixed. With limited exceptions, violations of the environmental laws go undetected and requirements go largely unendorsed. This is true for a number of reasons. Firstly, monitoring and enforcement responsibilities under the environmental laws are often fragmented among regulatory institutions, licensing agencies, police authorities, etc. at both the national and governorate levels of government, to the effect that no single institution can take enforcement action effectively. Secondly, this fragmentation of responsibilities necessitates a high degree of inter-agency coordination for effective management, yet few formal mechanisms for such coordination exist. Coordination, if it occurs, is informal at best. Third, the limited institutional structure and inadequate capacity in most environmental agencies, at both the national and governorate level, places a real constraint on effective

compliance monitoring and enforcement. For example, the EEAA has only one of its Regional Branch Offices (RBO) in operation nationwide and it has such limited capacity (see below) that it cannot effectively monitor and enforce environmental regulations. Moreover, at the governorate level the Environmental Management Unit (EMU) is often no more than an environmental advisor to the governor, with no more capacity or authority than to advise.

Unfortunately, some of the constraints to effective implementation and enforcement do not appear to have been remedied in Law 4/1994. The new law, for example, authorizes the Minister of Justice to designate “judicial law officers,” specifically for purposes of enforcing the law, along three separate lines of authority; (1) the EEAA and its RBOs; (2) the EMUs under the governor in each governorate; and (3) a special unit of Environment and Water Police under the Ministry of Interior. At present, the Ministry of Justice has begun putting this nationwide enforcement system in place, having designated as “judicial law officers” several high-ranking officials within the EEAA and the Greater Cairo Regional Branch Office, the Directors of the Environmental Management Units in the governorates, and a number of officers in the Environment and Water Police in the Ministry of Interior and its Security Departments in the governorates. Unfortunately, there is currently no mechanism for effectively coordinating the enforcement activities of these various enforcement units, nor have they developed a coherent strategy for effective enforcement of the law.

On the other hand, Article 103 of Law 4/1994 gives all citizens and organizations concerned with protection of the environment the right to initiate legal actions to enforce the law. This provision marks the first time such authority has appeared in Egyptian environmental legislation, and the fact that at least one NGO, the Friends of the Environment Association in Alexandria, has used legal action effectively in the past (even prior to enactment of Law 4/1994) suggests that citizen actions under Article 103 may prove to be an effective tool for enforcement in Egypt.

3.1.3 Institutional Framework for Environmental Management

Egypt is still in the process of establishing a comprehensive institutional framework for environmental management. Under the current framework, environmental management responsibilities are shared by a wide array of government institutions at the national (i.e., the MOEA, the EEAA, and a number of sector ministries, agencies, and special organizations), regional (i.e., RBOs of the EEAA, the regional directorates of a number of sector ministries), and local (i.e., EMUs in each of the 26 governorates, Environmental Divisions (EDs) in the new industrial cities, and other special organizations) levels of government (Figure 1). In addition, a number of supporting institutions, such as scientific institutes, universities, and NGOs, play a role in environmental policy formulation and implementation. A brief description of these institutions and their roles in environmental management follows.

At the national level, the recently established MOEA has the portfolio for environment in the Egyptian Cabinet of Ministers. Within the new ministry, the EEAA has the responsibility for setting national policy on the environment and coordinating environmental management activities within the government. The EEAA's functions, as established by Law 4/1994, include, among other things, preparing legislation, decrees,

and regulations as needed to protect the environment; conducting studies and formulating the national plan for environmental protection; setting requirements for EIAs of projects; monitoring compliance with standards and norms and coordinating enforcement actions; managing natural protectorates; and promoting environmental education (Box 4).

Box 4

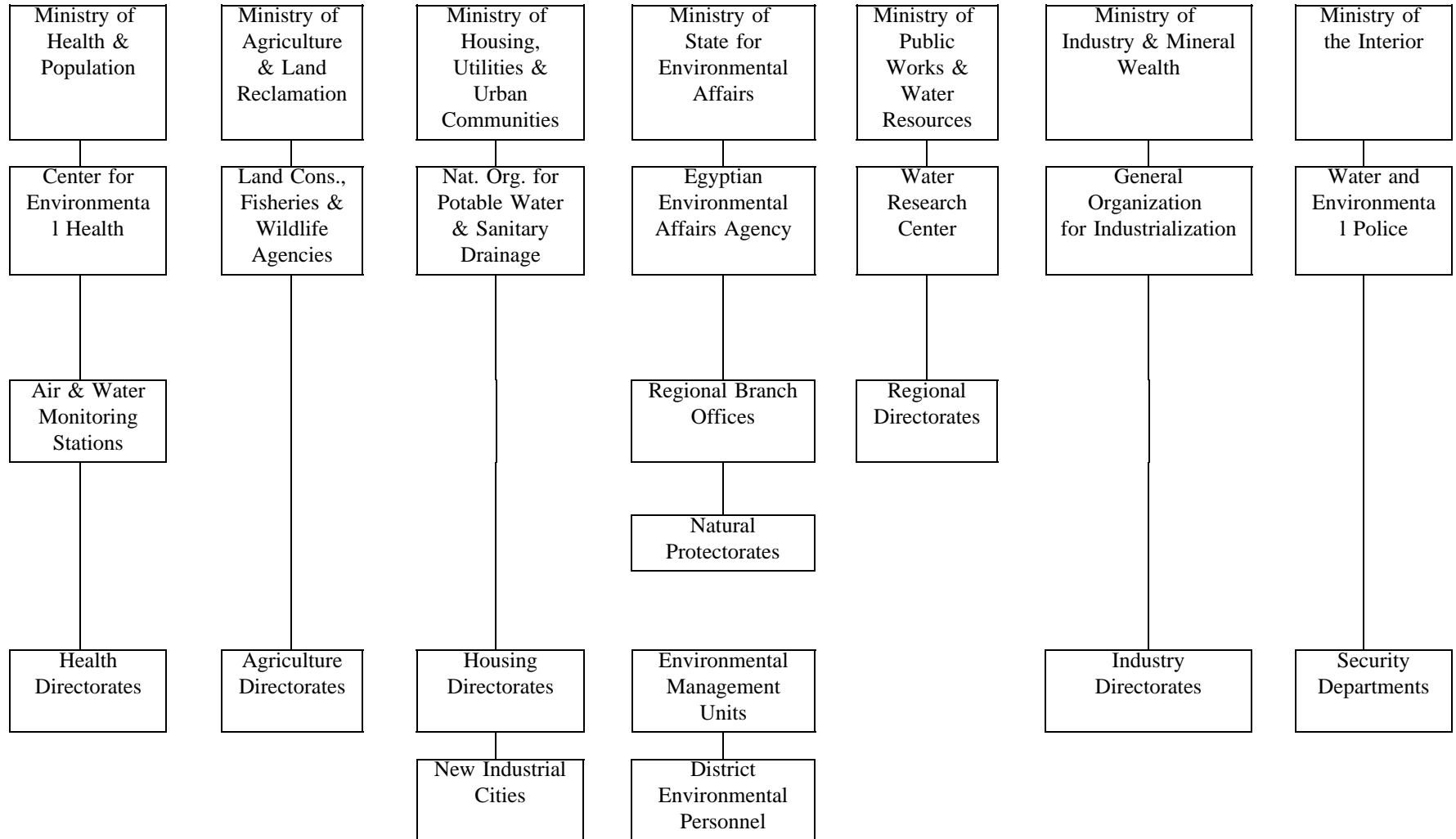
Organization of the EEAA

To carry out the functions specified in Law 4/1994, the EEAA has organized itself into three technical sectors: Environmental Quality, Environmental Management, and Nature Protection. The Environmental Quality sector is primarily responsible for setting policies, plans, and programs for determining permissible standards related to water, air and land. The sector also maintains a database of environmental information, available data, reports and research studies. Environmental Management sector is setting up the national program for environmental impact assessment. It supports the use of the latest technology in all its directorates for Coastal and Marine Management, Hazardous Substances and Waste Management, and Environmental Development. The responsibilities of the Nature Protection Sector are divided into two main areas: Biodiversity and Natural Protectorate Management. The former includes the protection and preservation of biodiversity in coordination with other responsible authorities and concerned institutes; the latter is responsible mainly for the planning and management of natural protectorates.

There are three additional sectors of EEAA, which are more administrative in nature: Financial and Administrative Affairs, Information and Computer Center, and Branch Affairs. The Financial and Administrative Affairs division is responsible for setting general policy and programs in the financial field and for follow-up and implementation. The Branches Affairs sector is a liaison department between the EEAA and its RBOs, coordinating environmental activities and facilitating contacts among the different sectors. The task of raising the level of awareness for environment protection issues falls under the Central Department for Environment Information and Public Awareness, where the use of media, educational programs, etc., are used as a means to achieve this goal.

The notable omission in this initial organizational structure is a sector for compliance monitoring and enforcement. The EEAA recognizes this omission and is in the process of establishing an enforcement unit responsible for monitoring compliance, performing inspections, and enforcing Laws 4/1992 and 102/1983.

Figure 1: Institutional Framework for Environmental Management



Among other things, Law 4/1994 established an Environmental Protection Fund to be administered by the EEAA for financing its environmental activities and programs. The Executive Regulations expand the sources of revenue for the fund and specify the activities and programs for which fund resources can be expended. Potential revenue sources are broadly defined. Most important in terms of the potential magnitude of revenues are provisions for a share of the 25 percent surcharge on travel tickets issued in Egypt, receipts from protectorate entrance fees, and levies against ships which damage coral reefs in the Red Sea. From start-up in 1995 through May 1997, approximately LE 26 million from entrance fees and \$2 million in fines on foreign ships had been collected. Revenues have been used to finance the EEAA's new building, establishment of the RBOs, and management of the Protectorates. Although revenues are being collected and disbursed, the Fund is not fully operational. Financial and administrative regulations have been developed but not yet approved and a Fund Manager and staff have not been appointed although the EEAA is actively recruiting a Fund Manager.

Law 4/1994 also provides the EEAA with authority to review EIAs prepared for new (or expansions of existing) projects. Under the process established by the law, the competent licensing authority, usually a sector ministry, determines whether the proposed activity requires an assessment. Where an assessment is required, the EEAA evaluates the assessment report and provides environmental clearance for the proposed activity to the licensing authority. The law does not require public input or participation in this EIA review process. The EEAA has the authority to monitor compliance with any conditions or standards imposed, or environmental impact mitigation measures required. Environmental impact assessments are required by Law 4/1994 and projects cannot be licensed without completion and approval of the EIA. However, there are no provisions for implementation monitoring and use of sanctions if the project proponent fails to take mitigation measures proposed in the EIA.

In addition to the MOEA and the EEAA, as many as 15 sector ministries share or exercise environmental management responsibilities. The most important among these are the MOHP, MALR, MHUUC, MIMW, MPWWR, and the Ministry of the Interior (MOI). Many of these responsibilities and activities, e.g., monitoring environmental health, management and protection of water resources and biological diversity, were being carried out long before the creation of the MOEA and the EEAA.

The MOHP is generally responsible for the public health sector, including the prevention and control of environment-related health problems and diseases. The MOHP's sector for Preventive Affairs includes departments for environmental health, occupational health and food control; its Center for Occupational and Environmental Health is charged with setting environmental health policy and monitoring air pollution, water quality, and soil contamination, as well as training environmental and occupational health staff and undertaking relevant studies and research on local problems. The center operates, through 37 stations, the national air-pollution monitoring network and the national water-pollution monitoring network, through ten sampling stations. The MOHP implements Law 27/1978 for protecting the supply of water for drinking and domestic purposes and established standards for potable water in 1975. The MOHP also implements Law 66/1973 for controlling air pollution from transportation sources and established ambient air standards in 1971. The MOHP has a Health Directorate in each of the governorates to monitor and implement its policies and programs.

The MALR has general responsibility for the agricultural sector in Egypt, including regulation of pesticides used for agricultural purposes, as well as responsibility for management and conservation of Egypt's agricultural land, wildlife, and biological resources. The MALR implements Law 53/1966 regulating the purchase, importation, and handling of pesticides and issued pesticide registration regulations in 1966. To assist in its pesticide research and control, the MALR operates the Central Laboratory for Agricultural Pesticides. The MALR's Desert Research Center performs research on the geological and geophysical, water, plant and animal resources of the desert areas. The Land Conservation Agency prevents topsoil stripping and protects the land from degradation. The Fisheries and Water Resources Agency manages and conserves the nation's fisheries resources, implementing Law 124/1983. The MALR's Wildlife Service manages the country's biological conservation program and coordinates closely with the EEAA's National Biodiversity Unit in the protection of these resources within natural protectorates. The MALR has an Agriculture Directorate in each of the governorates to monitor and implement its policies and programs.

The MHUUC is responsible for the organization and planning of cities and towns in Egypt, including the provision of water supply, sewage collection and treatment (implementing Law 93/1962), and solid waste management (implementing Law 38/1967 and Law 31/1976). Within the MHUUC, the National Organization for Potable Water and Sanitary Drainage is charged with the design and construction of water supply and sanitation systems for cities and towns, and the General Organizations for Sewage and Sanitary Drainage in Cairo and Alexandria undertake the design and construction of sewerage systems and wastewater treatment facilities for those cities. The MHUUC also has responsibility for the planning and construction of the new industrial cities, like the 10th of Ramadan and 6th of October Cities, and for ensuring that their water supply, sanitation, and waste management systems comply with environmental legislation and regulatory requirements. To carry out its policies and programs, the MHUUC has Housing Directorates in each of the governorates and EDs in each of the new industrial cities.

The MPWWR is responsible for maintaining and protecting all public water resources in Egypt, including the Nile River and its waterways, lakes, springs, and ground water. The MPWWR has broad authority under Law 48/1982 to regulate and control sources of water pollu. Its Water Research Center, which conducts water quality monitoring and control activities, includes institutes for water distribution and irrigation systems, agricultural drainage, sedimentation and hydraulic systems, development of water resources, weed control and maintenance of irrigation canals, groundwater, effects of the High Dam, mechanical and electrical systems, field survey and coastal protection. The MPWWR has authority to issue regulations setting water quality standards and discharge limitations, to inspect facilities causing water pollution, to take samples and to analyze water quality, and to advise polluters on ways of reducing water pollution. The MPWWR has promulgated standards for industrial wastewater discharges and has teams of water engineers in its seven Regional Directorates along the Nile River who perform facility inspections and report violations to the police. In addition, the MPWWR has an extensive water-monitoring network in place and has its own laboratories for monitoring and analysis.

The MIMW is responsible for overseeing the licensing and operation of the private sector industries in Egypt. These include, among others, the cement, sugar, food processing, textiles, and chemicals industries. Within the MIMW, the General

Organization for Industrialization (GOFI) supervises pollution control, safety, and health issues in industry through its General Department for Environmental Protection and carries out studies and research on recycling of wastes and water, and clean technologies and processes. It also ensures that new plants include industrial waste treatment units. MIMW Decree No. 380 of 1982 requires compliance with all applicable environmental laws, regulations, and standards as a condition for granting industrial licenses. A clause to this effect has been written into all industrial licenses granted by the MIMW, further committing the industry to taking the necessary preventive measures, such as installing necessary control equipment, to prevent pollution to the environment. However, GOFI does not perform any inspections at industries and, therefore, does not monitor whether industries are actually in compliance with these license requirements. As the licensing authority, GOFI has the authority to revoke a license for environmental violations but has never actually done so.

The MOI, Egypt's national police force, has for some time maintained the Inland Water Police, a special police force for enforcement of Law 48/1982 and protection of the environment in general. The Inland Water Police provide guidance to citizens and take enforcement actions for violations of the environmental laws. Law 4/1994 provides additional authority for this environmental police force, specifying that the MOI shall form a police force specialized in environmental protection within the ministry and in its Security Departments in the governorates (Article 65 of the Executive Regulations). This new Environment and Water Police force, which now has 78 enforcement officers in the central MOI and an additional 90 officers in the governorates, charged some 3,000 violations of environmental laws in 1996. Whether these charges actually resulted in environmental prosecutions or in the imposition of sanctions, such as fines or imprisonment, is not known. In principle, police officers in the Security Departments in the governorates should collaborate closely with the Environmental Management Units in performing their duties, but there is little evidence that this collaboration actually takes place.

At the regional level, the EEAA is in the process of establishing RBOs throughout Egypt. As an extension of the EEAA, each RBO will be responsible for collecting and analyzing environmental information, preparing local environmental action plans, administering and managing natural protectorates, operating local monitoring stations, preparing afforestation programs, launching pilot projects, disseminating EEAA guidelines for environmental protection, and screening EIAs. The RBO will work closely with the EMU in each Governorate to ensure proper implementation and enforcement of EEAA policies and programs. A total of eight RBOs have been planned throughout Egypt, in Greater Cairo, Alexandria, Middle Delta, Eastern Delta, Canal Zone, Red Sea Governorate; Upper Egypt-North Zone and Upper Egypt-South Zone. To date, only the Greater Cairo RBO has been established and is in operation (Box 5); the remaining seven have yet to be fully operational.

Box 5
Greater Cairo Regional Branch Office

Established in 1995, the Greater Cairo RBO is the first of the EEAA's RBOs to begin operations; it covers the three governorates of Greater Cairo, Giza and Fayoum. The Greater Cairo RBO has a limited staff, consisting of a General Director and four other professionals, organized into departments for environmental management, environmental quality, and media and public relations. An additional four persons staff the RBO's laboratory and investigations unit.

Its responsibilities are two-fold; (1) to implement and enforce Law 4/1994 and its regulations; and ((2) to incorporate environmental considerations into regional development. Implementation of this second responsibility is demonstrated in the case where the Greater Cairo RBO's mobilization of public opposition was able to successfully prevent a cement factory from establishing a new facility in an urban area and to get it to locate farther in the desert.

As a means of leveraging its scarce resources, the General Director of the RBO has set up a "consultative committee for environment" at a regional level. The "consultative committee" brings together representatives from the four EMUs and the governorate level directorates of the Ministries of Health, Agriculture, Labor, Industry, Tourism, etc. The committee meets on a monthly basis and is the means by which problems and constraints facing the RBO are reviewed and directed to the Governor in question for action. Evidence of the effectiveness of this committee is seen in the case where, at the behest of the Greater Cairo RBO, lead smelters with emissions exceeding permissible limits were closed down for 15 days by a governor. The smelters were only allowed to resume operations after changing to natural gas.

At the local level of government, each of the country's 26 governorates has established an EMU pursuant to Law 43/1979 on Local Governance. Eight of these EMUs were established during the 1980s to address the harmful effects of local development on the environment and advise local officials on mitigating the environmental and public health hazards of unplanned development. The EMUs report administratively to and are financed by the governorates, while they look to the EEAA for technical support in their work. Under 1982 guidelines of the Central Agency for Organization and Administration, the EMUs are charged with coordinating agencies within the governorate on trans-boundary environmental problems, reviewing environmental laws and policies, analyzing local environmental problems and proposing solutions to them, mobilizing technical and financial resources to address environmental problems, and promoting public awareness and grass-roots initiatives on environmental protection. Under the existing institutional framework, these EMUs represent the primary local authority on environmental issues and, in many cases, operate as the executing agencies for the EEAA's environmental policies and programs. Unfortunately, the history of the EMUs (Box 6) has largely been one of limited institutional capacity and weak inter-institutional coordination, to the extent that there is little effective environmental management at the governorate level at this time. In the case of the new industrial cities, specially-created EDs, not the EMUs, are responsible for administering environmental policies and programs. Unlike the EMUs, and furthermore, these EDs report administratively and depend financially on the central MHUUC not the governorate. The mechanisms for ensuring coordination between these Environmental Divisions and the EMUs, unless the EEAA and its RBOs, remains unclear, and to date there is no evidence that these Environmental Divisions are any more effective than the EMUs in performing environmental management functions at the local level.

Box 6

Environmental Management Units

The organization and operations of the EMUs vary considerably across the 26 governorates in Egypt. In Alexandria, for example, the EMU consists of only eight persons but relies on additional environmental officers in each of the city's eight districts. The EMU is actively informing the industrial community of Alexandria of the requirements of Law 4/1994 and paying visits to selected individual companies to identify their environmental problems and propose effective solutions. The EMU is also enforcing the 200-meter setback for new coastal development and preparing to enforce the Governorate's new restrictions on the use of horns. Finally, the EMU plays an active role in preparation and review of local EIAs.

In Minya, on the other hand, the EMU has a staff of 12 who perform inspections and provide advice on compliance with Law 4/1994 for the entire Governorate. Any violations detected through these inspections are reported to the police, but the EMU makes no effort to follow up on enforcement of the law thereafter. The EMU's staff of engineers lacks even basic training in environmental management, much less EIA, compliance monitoring, or enforcement. At present, the EMU does not have a vehicle and its offices lack even basic equipment.

In Port Said the EMU has a staff of seven who follow up on compliance with the environmental laws, focusing on water and air pollution and solid waste management. Unfortunately, the EMU has been largely ineffectual in protecting Lake Manzala from serious deterioration over the years as a result of municipal and industrial wastewater pollution and improper solid waste management.

All three EMUs indicate confusion over the division of responsibilities and the means of coordination with the RBOs. The EMUs have received some training in their functions from the EEAA but require additional training in order to be able to perform their functions effectively. All the EMUs need equipment, both office and technical, to operate efficiently.

The division of responsibilities and mechanisms for coordination among these regional and local institutions remains unclear. Law 4/1994, unfortunately, does not specify the responsibilities of the RBOs to be established by the EEAA nor does it even mention, much less define, the roles of the EMUs. For the existing framework of national, regional, and local institutions to function effectively, the responsibilities of the institutions at each level need to be clearly defined and the areas and mechanisms for inter-institutional coordination must be clearly identified. The EEAA recognizes the urgency of this task and is preparing guidance (with assistance from the Organizational Support Program) to address this issue. Ideally, this guidance will decentralize the core environmental management functions of planning, implementing, and enforcing Law 4/1994 to the local level. Thus, the EMUs, once they acquire adequate institutional capacity and financial resources, should be the focal point for environmental management at the local level, taking the lead in implementing the policies and programs of the EEAA and assuming local planning, initial EIA screening, compliance monitoring and enforcement functions. The EMUs will bring the considerable authority of the governors to bear, in carrying out these functions. The RBOs, as regional representatives of the EEAA, should provide guidance and technical assistance to the EMUs in carrying out EEAA policies and programs, address any environmental concerns with national or trans-boundary implications, and offer monitoring and analytical support through their laboratory facilities. The RBOs will play a critical role in building capacity in the EMUs and will backstop those EMUs where capacity remains weak.

In terms of supporting institutions, Egypt benefits from having a number of scientific institutes (e.g., the Academy for Scientific Research and Technology, the National Research Center, the National Institute for Oceanography and Fisheries Research) with research capabilities and universities (e.g., Ain Shams University, the University of

Cairo, the American University in Cairo, the University of Alexandria) with good environmental science and engineering programs at both the undergraduate and graduate levels. These institutions provide basic scientific research on environment and training in such environmental fields as agriculture, civil engineering, public health, and environmental sciences at the diploma, Master and Ph.D. levels, and perform basic environmental research on pollution and its impacts. Each year these universities graduate students trained in water supply and sanitation, air pollution, and solid waste management. The university environmental research programs provide substantial analysis of environmental degradation and application of cleaner technologies to control pollution problems. In addition, members of the science and engineering faculties participate in policy formulation and review of EIAs through the EEAA. These faculties also provide a pool of available consulting capacity for performing EIAs for public and private sector projects.

Egypt also has a number of NGOs actively participating in the environmental arena. Estimates are that more than 60 environmental NGOs are working on various aspects of environmental management in Egypt, on issues ranging from public awareness and environmental education to garbage collection and community self-help programs (Box 7). Annex B contains a brief analysis of NGOs active in the environmental arena in Egypt. Law 4/1994 recognizes the importance of NGOs in environmental management, requiring three representatives from the NGO community on the Board of the EEAA and providing authority for NGOs to bring legal action to enforce its environmental requirements. The EEAA has established an Environmental NGO Steering Committee, consisting of representatives from 15 NGOs and the EEAA, to promote and coordinate NGO involvement in environmental management. Further, *Egypt & the 21st Century* cites the valuable input of environmental NGOs in the promotion of environmental protection in Egypt (6).

Box 7 **Environmental NGOs in Egypt**

Among the more important NGOs working on environmental issues in Egypt are the Friends of the Environment Association in Alexandria, the Coptic Evangelical Organization for Social Services (CEOSS) in Upper Egypt and the Association of Enterprises for Environmental Conservation (AEEC). These NGOs have taken very different approaches to addressing environmental concerns.

The Friends of the Environment Association has played a critical role in raising public awareness on environmental issues in Alexandria. It has been a leader in promoting environmental education and providing training in such topics as EIA, nature conservation, historic preservation, etc. In addition, the Friends of the Environment Association is a pioneer in bringing legal action to address environmental issues, and winning significant environmental cases before Law 4 had even been enacted.

CEOSS, on the other hand, has played a more direct role in helping communities deal with environmental problems on the ground. It has worked directly with poor villages in donor-assisted programs for improving water supply and sanitation facilities, upgrading waste management practices, and installing better technologies for controlling indoor air pollution problems. Its community-based programs have improved the lives of hundreds of people in many of the poorest communities in Upper Egypt.

AEEC is essentially composed of members of the business community and aims to promote the development of environmentally sustainable business opportunities. A relatively new organization, its envisioned role is to create a bridge between Egyptian industrialists and environmental concerns.

3.2 Policy Formulation and Implementain Specific Environmental

Sectors

3.2.1 Industrial Pollution

Policy Formulation

Various ministries have policy and regulatory authority over Egypt's 22,000 industries. As a result of the ERSAP program, 314 public sector industries have been organized into 17 financial holding companies governed by the Ministry of Public Enterprise. Most of the remaining public industries are governed by the MIMW, though some report to the Ministry of Petroleum (MOP), the MOHP, and the MHUUC. Private sector industries are under the general jurisdiction of the MIMW. They also participate in the quasi-governmental Federation of Egyptian Industries (FEI).

The EEAA is responsible for setting environmental policies and coordinating environmental affairs among ministries generally, including those controlling industrial activities in the country. As noted above, the EEAA is preparing a series of draft environmental strategies, including ones addressing industrial pollution problems like wastewater and air pollution. The EEAA has significant new authorities over industry under Law 4/1994, including the authority to require industries to keep records of the environmental impact of their activities, to collect and analyze samples to ensure that standards are being met, and, in the case of a violation, to shut down a facility within 60 days if the violation has not been corrected. To date, very few factories have been shut down for environmental violations (one exception is a lead smelter in Ezbet Mekawy, after a significant effort by local NGOs), and the EEAA reports that at least during the initial period of enforcement of Law 4/1994, factory shutdowns will probably be handled by the governorates or special local authorities.

The following ministries and agencies play a role in policy formulation and implementation with respect to industrial pollution:

Air Pollution: the EEAA; the MOHP; the Supreme Committee for Protection of Air from Pollution; the MHUUC; the MIMW; the EMUs in the governorates.

Water and Wastewater: the MHUUC; the Supreme Committee of Water; the EEAA; the MOHP; the MPWWR; the MIMW; the MALR; the MOI; the Ministry of Marine Transport; the MOP; the Ministry of Justice; the Ministry of Tourism; the Academy of Scientific Research and Technology; the Sea Ports Authorities; the EMUs in the governorates; and the Suez Canal Authority.

Industrial Toxic Substances and Workplace Safety: the MIMW, the Ministry of Manpower and Immigration, the MOHP, the Center for Occupational Health, the MHUUC, the MPWWR, the MOI, and the MALR.

As also noted above, a number of laws apply to industrial pollution. Law 4/1994 and its Executive Regulations provide for overall protection of the environment by requiring compliance with all existing regulations and establishing new requirements and/or standards for EIA, hazardous substance and waste handling, air emissions (vehicle, factory, fuel sources, workplace, and public places, including smoking), ocean dumping,

and noise pollution.

Law 93/1962 regulates the discharge of sewage into public sewers. The discharge of industrial effluent into public sewers is prohibited except by permit. Permits are issued by the MHUUC if effluents meet the criteria specified in Decree No. 643. (Criteria are specified for: temperature; pH; TDS; TSS; BOD; COD; sulfides; cyanide; phosphate; nitrate; fluoridates; phenol; ammonia; chlorine; SO₂; formaldehyde; oils; silver; mercury; brass; nickel; zinc; chrome; cadmium; and solder.) If an effluent fails to meet these standards, the agency in charge of the sewer works has the authority to require that enterprises provide treatment for their effluent prior to discharge to the sewer system. The MOHP has the responsibility to biannually collect and analyze effluent samples at designated laboratories to ensure the industry is fulfilling its permit conditions. The MHUUC, with approval from MOHP, specifies the standard methods for analysis of samples. If an industry's permit conditions are exceeded, it has six months to specify a method of treatment or its permit is revoked. Penalties can also be issued for violations, the strictest being three months imprisonment and a fine of LE 100. Authorities indicate, however, that violations under Law 93/1962 are rarely issued.

Law 48/1982 establishes standards for effluent discharges to the Nile and other surface waters. The provisions of the law and Decree No.8 of 1983 pertaining to industrial facilities include: (1) specification of the minimum out fall distance from a potable water intake; (2) licenses (2 year renewal) for discharging treated wastewater into groundwater; (3) licenses (2 year renewal) for discharging cooling water into waterways; (4) fees for not meeting license specification; (5) applications for effluent discharge for new and existing facilities; (6) the MPWWR, the MOHP, and the MOI surface water police; (7) establishment of MPWWR responsibilities (e.g., maintain register of all licensed and unlicensed effluent discharges, license notifications and withdrawals, inspection, and sample collection); (8) establishment of MOHP responsibilities (e.g., collection and analysis of samples at least every three months); (9) water quality standards for irrigation and discharge; (10) prohibition of other ministries and municipalities from issuing an operating license to facilities without an effluent discharge license; and (11) limitations on effluent discharge licenses for facilities less than two km from the shoreline. Maximum penalties specified under Law 48/1982 are imprisonment of not greater than one year and a fine not exceeding LE 2,000.

A large number of laws have also been established concerning industrial air emissions prior to Law 4/1994. Presidential Decree No. 864 of 1969 mandated the MOHP to study sources of air pollution, develop a general policy, and set air quality standards. MOHP Decree No.470 of 1971 amended by Decree No. 240 of 1979 set standards for ambient and workplace air, including 47 gases and vapors, 36 dust and suspended matter, dust fallout, and industrial ores. Decree No. 380 of 1982 specified conditions for public and industrial buildings and required that all new industrial facilities install air pollution control equipment. Law 498 and Implementing Decree 8 of 1983 limited sulfur content in industrial fuels used near urban areas, established standards for industrial boilers, specified stack heights, workplace noise limits, permissible limits for indoor air pollution, and emission standards for refineries. Law 4/1994 acknowledges that industries must conform to all existing laws governing their operations and specifies maximum limits of outdoor air pollutants, permissible limits for industrial emissions, maximum limits of gas and fume emissions from industries.

Legislation regarding indoor air quality is either coupled with ambient or industrial air quality legislation, as noted above, or is included with occupational health and safety requirements. Private facilities tend to have better working conditions than the larger, older public enterprises, though smaller shops are often completely negligent of workers' rights and may employ children as young as 13 years old. Additional information regarding the compliance of industrial facilities with regulations and worker acceptance of using personal protection equipment in the workplace can be obtained by interviewing donors working directly with industrial facilities. Existing legislation includes; Law 137/1981 which is a labor law specifying workplace air quality; the Ministry of Manpower Decree No. 55 of 1983 concerning precautions and conditions for workplace health and safety; Law 27/1981 which regulates workplace conditions in mines; and Law 4/1994 which establishes maximum limits for pollutants in workplaces (Annexes 6, 7, and 8 of Decree 338).

The siting of new facilities is regulated under the EIA requirements specified in Law 4/1994. Owners of the proposed facility must prepare and submit an EIA, according to the EEAA specifications, to the licensing authorities and the EEAA outlining the environmental impacts of the proposed operations. Projects with satisfactory EIAs will be granted an operating permit. Owners of an unsatisfactory ruling have 30 days to file an appeal. Industrialists generally agree that the EIA process will assist them in their planning process by requiring them to evaluate the need for environmental investments prior to operation.

A number of laws and decrees govern the management of municipal wastewater. These include: Law 93/1962, which regulates waste water discharged to public sewers and requires sampling and analysis in laboratories approved by the MOHP; MHUUC Decree No. 643 of 1962, which sets specifications and standards for wastewater discharged to public sewers; Law 48/1982, which regulates discharges of wastewater to the Nile River, its waterways, and other surface waters; and MPWWR Decree No. 8 of 1983, which sets regulations, standards, and specifications for treatment of waste water before discharge into surface waters.

Implementation

Law 4/1994 requires that industries comply with all existing and new environmental regulations by February 1998, three years after the promulgation of the Executive Regulations in February 1995. At least one two-year extension to the compliance period is possible if industries file an extension request with the EEAA by August 1997. Industries must include a compliance schedule in all extension requests, indicating specific milestones that must be achieved during the extension period. Some donors (e.g., Finnida) are assisting industries in filing for the Law 4/1994 compliance extension. In most cases, the regulations that industries are requesting compliance extensions for under Law 4/1994 are the same regulations that they should have been in compliance with, for years, under existing regulations. The EEAA has no capacity to review extension requests or to inspect industries to ensure that they have achieved the milestones specified in a filed compliance schedule.

Both public and private industries need access to soft financing or grants for financing environmental investments. Law 4/1994 establishes a National Environmental

Protection Fund. It will be financed by state budget allocations, donor grants, fees and fines from industries. The EEAA reports that, in the future, revenues may be available to industries for environmental investments.

Presently, no environmental funds have been established in Egypt to help industries finance environmental investment, though some bilateral donors (notably KfW) are providing soft loans and grants to selected industries. Finnida has just begun its pollution prevention program and is trying to gain access to World Bank funds for participating industries. The USAID-funded EP3 offered a workshop in September 1994 entitled "Financing Energy Efficiency Projects", though only a limited number of industrialists attended. The World Bank plans to establish a Pollution Abatement Fund where individual industries would be eligible for soft loans for qualifying pollution abatement projects. Loans could exceed US\$ 5 million, and 20 percent grants are possible if the simple pay back period is estimated to be more than one year. The fund has not yet been set into operation because the Bank has not yet selected its local handling bank.

Enforcement of environmental regulations has been inconsistent throughout Egypt. Currently, enforcement is generally carried out at the governorate level by local authorities or the EMUs. Enforcement is occasionally the responsibility of a specially formed authority, such as the Suez Canal Authority in the case of Port Said, or the 10th of Ramadan City Authority in the case of the 10th of Ramadan City.

While Laws 93/1962 and 48/1982 set forth adequate provisions for protecting Egypt's waters from industrial discharges, enforcement of these laws is inconsistent, if it takes place at all. Fees and charges are rarely enforced by regulating bodies, depending primarily on the interest of the governorate, and less often paid by the industry. Among both private and public sector industries compliance rates are low. Self-monitoring of effluents or periodic monitoring of effluents by local authorities is not routinely practiced. Many of these enforcement actions will probably be assumed by Regional Divisions of the EEAA, though shared authority is being discussed in cases where governorate authorities have been reasonably effective.

To date, enforcement of environmental regulations has depended on the power of responsible ministries, as well as the interest of officials in local Governorates. The EEAA plans to work with existing ministries and agencies coordinating enforcement activities. Confusion regarding environmental enforcement authority is a primary concern for industries that acknowledge the importance of compliance with environmental regulations.

Water quality monitoring is conducted by the Drainage Research Institute for drainage water in the Nile River. Other institutions involved in monitoring water quality do so for health considerations and include the National Research Center, the Nile River Institute, the MOHP and the Groundwater Research Institute. Also, many monitoring activities are carried out as a result of specific projects, but coordinating this information is difficult since monitoring locations and substances monitored are quite scattered.

To date, implementation and enforcement of Laws 93/1962 and 48/1982 have not been effective for protecting the Nile and other surface waters from serious pollution. Some of the wastewater discharge standards issued under the laws are viewed as overly ambitious, while other standards are much too lax or inconsistent. For these and other

problems, these water pollution laws have yet to be effectively enforced.

3.2.2 Municipal Solid Waste

Policy Formulation

There are two primary levels of authority at which solid waste management policy is established in Egypt. Formal policy development takes place at the central government level. Solid waste management planning and implementation takes place at the regional or local levels. General solid waste policy has been established by the MOEA through the EEAA. Waste management policy in specific circumstances is established by other ministries, e.g., the MHUUC for municipal guidelines, the MIMW for industrial solid waste, and the Ministry of Tourism for waste generated by the tourism sector. In the final analysis, however, the EEAA is recognized as the cognizant body for solid waste management planning and implementation.

A number of laws address solid waste management. These include:

Law 38/1967, which addresses public cleanliness, regulates the collection and disposal of solid wastes from houses, public places, commercial and industrial establishments, and also imposes a cleanliness tax on all housing units not exceeding two percent of the rent.

MHUUC Decree No. 134 of 1968, which provides guidelines for management of wastes from domestic and industrial sources, including specifications for collection, transportation, composting, incineration, and land disposal.

Law 31/1976, which amended Law 38/1967.

Law 43/1979, the Law of Local Administration, which provided that city councils are responsible for "physical and social infrastructure" effectively delegating responsibility for infrastructure functions.

Presidential Decree No.284 of 1983, which established the Cairo and Giza Cleaning and Beautifying Authorities and charges them with collection and disposal of garbage, including construction wastes.

Law 4/1994, which provides the EEAA with authority for regulation of hazardous material and wastes.

The EEAA has prepared a national action plan for waste management and is currently in the process of writing detailed municipal solid waste environmental regulations, apparently using US regulations as one guideline. The EEAA regulations will reportedly address technological as well as operational issues, so the intended scope is quite comprehensive (4). Given resource restrictions at the EEAA and the TCOE, the schedule for completion of these regulations is problematic.

Implementation

Overall very little is being accomplished in solid waste management and associated pollution control on a national basis in Egypt, the evidence of which is widespread. Much of what is being done is being accomplished through regional initiatives. For example, the governorates now have established local EMUs to address environmental issues on the local level. The existence of the EMUs, which are typically severely limited in their

capabilities and resources, at least provides evidence that regional governments are willing to independently undertake solid waste management and pollution control programs and activities (3).

Further examples include the formation of two special-purpose authorities that have been established to undertake waste management activities in specific circumstances. These are the Cleansing and Beautification Authorities established by Presidential Decree for both Cairo and Giza. Another example is the successful Zamalek community-based effort. Although not a formally delegated waste management agency, the Zamalek organization functions on a specific basis to provide effective management of solid wastes on the island of Zamalek. Further, under the EST project USAID developed an extensive solid waste study, remedial and management program for selected cities in the Red Sea Governorate as part of the overall program developed to protect the environment of the Egyptian Red Sea tourist areas (10). Finally, some Governorates are taking specific actions to solve their solid waste problems, such as Alexandria's ongoing search for privatization options.

These scattered, essentially ad hoc efforts certainly have not been undertaken within the framework of a national solid waste management policy, thus their long-term effectiveness and sustainability are questionable. However, these ongoing efforts very effectively demonstrate that the solid waste problem is recognized as a serious problem in many sectors of central and regional governments, and that serious work is underway to tackle the problem. All of these efforts constitute "work in progress". Some of the work components are more advanced than other components. Collection and composting are at a more advanced stage of development overall than are transfer station and landfill operations, for example. However they are a good base upon which to build. The key element missing is the national policy framework through which this work can be comprehensively developed and consistently applied, even enforced where required.

National solid waste management policy formulation, associated regulatory program development, and delineation of implementation procedures and organizations, has been very limited. Solid waste management activities, where undertaken, are not being done within the framework of a national solid waste policy. A national solid waste management policy should include regulations promulgated at the national level that will enable local authorities to operate or regulate operation of a solid waste management system; model systems for the collection and transport of solid wastes, as well as landfill design and management; provisions for recovery of costs through user charges or other fiscal mechanisms; and enabling regulations to facilitate privatization of solid waste services, particularly collection and transport). It is problematic to consider how this essential public service can be realistically provided on a comprehensive basis without a national solid waste management policy being formalized and articulated, with associated regulatory and enforcement functions in place, all of which will require the active support of the GOE.

A comprehensive solid waste management program, combined in some cases with limited remedial activities, has been identified as a priority issue by numerous Egyptian national and local government officials, administrators, academics, the press and other visible environmentally-knowledgeable individuals (4).

3.2.3 Energy/Energy Efficiency

Policy Formulation

The MOP and the Ministry of Electricity and Energy (MOEE) are responsible for Egypt's energy sector. Each ministry has its own five-year plan, which covers the period from 1998 to 2003. To date, the EEAA has had little involvement in the energy sector, but is likely to play an important role in both the policy-making and implementation of less polluting energy technologies in the future. As noted above, the EEAA is currently drafting environmental sector strategies for a number of key sectors, one of them being energy.

Within the MOP, the key agency for policy formulation is the OECF, which is responsible for integrated energy planning within an economic framework. The Board of Directors of the OECF are the decision-makers, and include representatives from the MOEE, the Egyptian Electricity Authority (EEA) and the New and Renewable Energy Authority (NREA), and other stakeholder groups, including banks. Of the 11 board members, eight are from other ministries and stakeholders. Among its functions, the OECF conducts energy planning studies, undertakes studies and implements projects for improving the efficiency of energy use in Egypt, develops and manages energy information systems at the national level, develops energy professional expertise at the national level, and promotes awareness of the significant role that energy plays in various economic sectors by mass communication media.

Within the MOEE, the key policy agencies are the EEA, which is responsible for the generation and transmission of electricity throughout the country, and NREA, which is responsible for planning and implementing renewable energy programs. The NREA is responsible for identification and evaluation of new and renewable energy sources and for execution of studies aimed at identifying fields where renewable energy sources can substitute for conventional energy sources. It is also responsible for suggesting appropriate standards and specifications for equipment, for conducting performance and field tests, and for providing training and consultancy services. The NREA also implements all agreements between Egyptian authorities and foreign agencies in the field of renewable energy. The NREA does the planning for renewable energy and inputs the information to the OECF for incorporation into the overall energy planning strategy.

The MOP's current policy is to devote attention to energy conservation measures and to diversify energy sources for prolonging the life of Egypt's petroleum reserves, saving part of this reserve for export abroad. The entity within the MOP, which is primarily responsible for petroleum and natural gas in Egypt, is the Egyptian General Petroleum Corporation (EGPC) along with its various subsidiaries. Although the EGPC plays a role in policy formulation it essentially institutionalizes policies and prices established by the government.

In 1996, the OECF produced a National Strategy for Improving Energy Efficiency in Egypt as input to the MOP's five-year plan. The strategy, in principle, has been incorporated into the plan, although the key players must still be identified. The strategy addresses the institutional capacity building needs, and legislation, required to give the OECF the authority to set up and implement the strategy and develop national standards for energy-consuming commodities. It also specifies the training and education needed

for schools and universities as well as for developing the necessary expertise to support the strategy, the publicity program required to make the public aware of the significance of energy efficiency, and the coordination necessary to develop a package of financial tools to encourage investment in energy efficiency projects.

The MOEE's current policy is to make optimal use of available national sources to produce electric energy with special emphasis on hydroelectric sources and natural gas, to rationalize the consumption of electrical energy, to identify and evaluate new and renewable sources of energy, to support the utilization of new and renewable energy and assist in systems development and local production, and to improve and reduce losses in the transmission network.

Implementation

Energy Pricing - The most important energy policy issue in Egypt concerns pricing. Currently, the GOE sets prices for each consumer category for all fuels consumed in-country, including electricity. Therefore, there is no price competition at the retail customer level; neither is there an independent regulatory body to replicate the effects of a competitive marketplace. In the latter part of 1996, the Government reached agreement with the International Monetary Fund to raise the price of oil products and natural gas to international levels, and to adjust electricity prices to cover long-run marginal costs by mid-1999. Currently, GOE officials claim that oil product prices average roughly 80 percent of international levels. Similarly, the average electricity tariff reflects 80 percent of the full long-run marginal cost of supply. Where Egypt stands in terms of natural gas prices is not as clear. There has been a great deal of discussion in recent years concerning the appropriate benchmark for gas pricing, which is complicated by the fact that there is no clear international market for natural gas.

Energy Competition and Privatization - It is important that energy prices be raised to international levels. However, if sustainability of pricing is to be achieved, competition must be introduced through privatization and restructuring efforts, and in those sectors where competition is not feasible, an effective regulatory authority must be established. Competition is the most effective regulator of prices, ensuring that appropriate amounts are consumed in terms of the overall economic interests of the country. An independent regulatory authority can be established to replicate the effects of a competitive marketplace when it is not feasible to introduce competition.

In Egypt's oil and gas sector, upstream activities such as exploration and drilling have been privatized while downstream activities such as refineries and marketing are a mix of public and private sector responsibility. Even in the downstream activities where the public sector is still a significant player, public sector companies are forced to compete with the private sector for market share.

While the GOE maintains ownership of all oil and gas reserves in the country, a cost and profit sharing arrangement, of 50 percent, has effectively encouraged private companies to explore for oil and gas, with 46 oil and gas discoveries in 1996 and 1997 (through the first four months) alone. Via its subsidiary, Petroleum Pipeline Corporation, the EGPC controls 100 percent of oil transportation. Oil refining is executed by a

combination of seven EGPC refineries. In addition, MISR and COOP, EGPC subsidiaries, in addition to five private companies including Shell, Mobil and Exxon undertake seventy percent of marketing oil products. About 98 percent of retail outlets are owned and operated by franchised private dealers but the outlet point and issuing of outlet licenses is administered by EGPC (2,5).

The EGPC, controls 100 percent of natural gas exploration and drilling activities through its subsidiaries, Petroleum and Pipeline Corporation (PPC) and Egyptian National Gas Company (Gasco). Gasco has assumed responsibility for the operation, maintenance, and expansion of the natural gas grid. The EGPC intends to gradually privatize Gasco with a public share offering anticipated in late 1997 (1). Another of EGPC's subsidiaries, Petrogas, is the lone distributor and marketer of natural gas and liquid propane gas (LPG) in Egypt, while EGPC is a majority shareholder in Egypt gas which has a monopoly in gas connections and maintenance (5). Two new gas companies with private sector participation have recently been formed to promote gas utilization in the transportation sector. The Natural Gas Vehicle Company owned by Egypt Gas, Amoco and ENPPI and GasTech owned by Egypt Gas, IEOC and Petrojet introduce private sector participation in downstream gas operations (2).

While a level of competition has been introduced into the oil and gas sector, the electricity sector is void of competition. The EEA, is divided into seven zones, which are collectively, responsible for monopolizing the operation and maintenance of the generation and transmission facilities located within their jurisdiction. The EEA generates and transmits electricity throughout the country, and sells power directly to about 50 large industrial customers, and eight distribution companies. The distribution companies, which are differentiated on a geographical basis, currently reside under the Ministry of Public Enterprises. Compounding the problems deriving from the lack of competition is the fact that there is no independent regulatory body in place to replicate the effects of a competitive marketplace. Although the electricity sector currently lacks competition and a functional regulatory body, the government is taking steps to restructure, and introduce competition in the industry.

A Presidential Decree approving the formation of a regulatory authority for urban service delivery in the power sector was signed in September, 1997. The mandate, terms of reference, and rules and regulations for the new authority must be finalized before it can operate as a fully functional body. In addition, the EEA recently requested proposals from potential private sector developers for building, on a build/own/operate/transfer (BOOT) basis, the next new generating station for service in 2002. This would be the first generating station built by private sector interests in Egypt's history. Furthermore, potential development related to the electricity sector concerns privatization of the distribution companies. The GOE is expected to release the details of a study reviewing privatization alternatives for two of the eight distribution companies.

3.2.4 Environmentally Sustainable Tourism

Policy Formulation

Policy development in tourism is compartmentalized, with respective authorities

setting policy within the narrow limits of their mandates. The potential for setting priorities, establishing urgent and medium-term action plans, and addressing negative impacts of environmentally unsustainable tourism development patterns and other activities on the natural and cultural resource base is diminished by the fragmented authority. These rigidities in structure have been overcome on the subnational level, in the development of the Policy Framework for the Red Sea, an initiative under the Mubarak-Gore Partnership. This USAID-supported initiative brought together the EEAA and the TDA, governorate authorities, private tourism operators, and NGOs in a collaborative effort to chart a sustainable, environmentally sensitive path for future development of tourism in the Red Sea region. A comparable and comprehensive effort to develop national policy for effective protection and development of cultural and natural resources would likely require leadership and support at the highest level of government.

The main institutions responsible for managing and conserving Egypt's natural and cultural heritage are the EEAA, the MALR, the Ministry of Tourism and its TDA, and the Ministry of Culture with its SCA. The EEAA is responsible for management and conservation of the country's 16 natural protectorates and for conservation and management of biological diversity. In carrying out these responsibilities, the EEAA collaborates closely with the MALR, particularly its Fisheries Agency and Wildlife Service. Within the Ministry of Tourism, the TDA has responsibility for promoting the tourism sector. It designates properties near natural heritage sites for development, reviews development applications, and assists developers in design and construction. Egypt's cultural heritage is protected by the Ministry of Culture, within which the SCA is responsible for the management of monuments, artifacts, and heritage sites.

Law 102/1983 governs the management of natural heritage sites. It provides a definition of natural protectorates and bans certain activities within such sites. Among the prohibited activities are hunting and fishing, destruction of coral reefs, construction, and polluting activities. As noted above, Egypt also has joined many international conventions, such as the African Convention on the Conservation of Nature and Natural Resources, the Convention on Wetlands of International Importance, the World Heritage Convention, the Convention on International Trade in Wild Flora and Fauna, the Bonn Convention, and the Barcelona Convention. Lake Manzala, the largest wetland in North Africa and the most important fishery in Egypt, has been designated as a wetland of international significance under the Ramsar Convention.

The 1992 EEAP is the most complete of the various documents prescribing significant changes in the management of Egypt's cultural and natural heritage sites. The EEAP, and many other assessments, document serious concern over site planning; site stabilization (arrest of subsidence or erosion); levels of site management and maintenance; lack of visitor management; protection and restoration; protection from contamination and erosion; and lack of on-site decision authority.

Furthermore, some policies exist which constitute the building blocks for sustainable tourism development. An example is the document "Environmental Guidelines for Development in the Coastal Areas" produced by the EEAA, which covers most of the principal stresses associated with development and construction. Although many of the design and construction standards seem enlightened, enforcement is extremely difficult because some policies are unrealistic and also differ from those specified by the EEAA. In contrast to this document is another produced by the TDA, "Investment in Egypt

1996,” which advertises “minimum” environmental standards applicable to development projects, which investors interpret as “minimal” requirements for safeguarding the environment.

There is consensus that there is need for both restoration and anticipatory action to arrest the continuing deterioration of Egypt's cultural heritage due to on-site and off-site stresses. Most stakeholders identify the SCA as the key actor with potential to address these issues; it is also seen by most as the principal barrier to resolution of such issues. The SCA, unfortunately, is believed to lack the power or political will to take steps to impose order and management on cultural artifacts and sites. All funds for the preservation of cultural heritage flow through the SCA, however, these funds are not always adequate to meet the needs of all projects and sites requiring financial support.

Implementation

On paper, Egypt has a progressive suite of legislation and institutions designed to protect critical ecosystems. Many of these have been established with donor assistance in recent years. A system of natural protectorates, with 16 designated areas, is in place, with four additional marine protectorates proposed. In practice, however, studies have documented a serious lack of capacity in key management areas. For example, much of the southeastern corner of Egypt has been designated as a natural protectorate, but in fact no boundaries have been posted, there are no on-site managers or rangers, and there is essentially no expression of the protected area on the land.

In theory, capacity building seems essential, but gaps exist in areas ranging from baseline information, monitoring, site management, maintenance, enforcement and regulation, to boundary control, zoning, control of tourist use and access, identification and protection of key assets. Several reviews by different agencies (e.g. Danida, the Canadian International Development Agency, USAID, NGOs and the GOE's own EEAP) document these shortfalls.

In particular, the reef system along Egypt's Red Sea shore is viewed by most analysts to be in peril. There are a few specific initiatives in place to address this concern, but little overall control to prevent cumulative environmental effects (spills, contamination, filling, anchoring, illegal poaching, etc.) from gradually degrading the resource. The first step towards protection, designation as a protected site, is in place for several of the most accessible reefs, but overall management is insufficient to safeguard the key functions, which caused the sites to be designated. The protection system remains incomplete, while there are rangers present in the Sharm El Sheikh and Hurghada areas, large areas of the south coast remain unpoliced. Ranger training and policing as yet does not extend to the snorkeling fleet or to fishers who also are the source of shells, coral and other sea life for illegal trade to tourists.

In the absence of government control, the USAID-supported Red Sea Policy Framework rightly identifies the private sector as key to implementation of any sustainable environmental programs. While the role of private sector interests in tourism is clearly important, the private sector can play a critical role in financing restoration and protection of cultural resources through adaptive reuse, a concept practiced around the world and introduced on a demonstration basis as part of the Red Sea Policy Framework.

Demand is increasingly the driving force in the international tourism sector as these private establishments are predominantly associated with an international clientele, which is sensitive to environmental concerns (e.g. German tourists). Hotels serving domestic tourists or southern Europeans feel less need to be visibly clean or green.

Most resort properties are privately developed by Egyptian companies. Once completed, they are then leased to management companies (e.g. Sofitel, Hilton). If the hotels do not meet international standard, they may be leased to a local manager and leased or sold as a two/three star property to be marketed to the Egyptian tourists. Internationally managed hotels frequently change managers, who typically spend only two years at any one property. In this situation, owners have little direct involvement in day-to-day operations and, as a consequence, authority and action are very dispersed.

Usually, the management stops at the boundary of the property, with visible debris adjacent. Despite the feedback from some European clients that the general lack of maintenance and environmental management off-site detracts from their experience, the tourist numbers have continued to grow, attracted by the unique assets. While some managers are interested in investment in more energy efficient or cleaner technologies, many are reluctant to incur costs for changes, which will not demonstrate profits during their term of management.

3.2.5 Other Environmental Sectors

Policy Formulation

Urban Air - The main institutions responsible for the protection of air quality include the MOHP and its Supreme Committee to Protect Air against Pollution, the MOI, the EEAA, the Ministry of Transportation, the Agency for Urban Planning, the OECP and local authorities in the various governorates. Each of these institutions has had a role in policy formulation with respect to air pollution.

Presidential Decree No. 864 of 1969 set up the Supreme Committee to Protect Air against Pollution within the MOHP. Its role was to study air pollution issues and to formulate a pollution abatement policy. In Decree No. 470 of 1971, the MOHP issued standards for ambient and workplace air. In addition, Law 3/1982 addresses air pollution concerns in specifying the areas where roads, public squares and gardens should be established, as does Law 66/1973 in regulating traffic and vehicle exhaust.

A number of industrial sectors came under further regulation for air pollution through decrees issued by the Ministry of Industry during the 1980s. Law 148 has rules governing emissions from workshops, public buildings and public utilities.

Law 4/1994 gives the EEAA new and expanded powers to protect ambient air quality, including the use of economic measures to phase out the use of lead in gasoline and the authority to establish a nationwide monitoring system. Annexes 5 and 6 of the Executive Regulations to Law 4/1994 contain ambient air standards for several pollutants (generally the same pollutants for which the US has established national ambient air quality standards) as well as stack emission concentration limits for approximately 20

pollutants.

Land and Water Resources - The main institutions with responsibilities for management of land and water resources are the MALR and the MPWWR.

The MALR oversees agricultural cooperatives and extension services and initiates and implements research and development programs, including the projects in the New Valley, desert areas, and all irrigation canals. Several semiautonomous authorities are linked to the ministry; the Executive Authority for Land Improvement Project; which is involved in the amelioration of lands through soil drainage, the Fishery Authority, which oversees Nile River and lake fisheries; and the Agricultural Research Center, which has several separate research institutes, including the Soil and Water Research Institute. The Public Authority for Land Reclamation has responsibility for planning works on new lands.

The MPWWR has the Water Research Center, which includes a number of important institutes for research and policy analysis, the Groundwater Research Institute, the Drainage Research Institute, the Aswan High Dam Side Effects Research Institute, the Weed Control and Channel Maintenance Research Institute, and the Water Distribution and Irrigation Methods Research Institute.

The MALR, in cooperation with the MPWWR, oversees the national program for land reclamation and, jointly, they determine agricultural production targets, crop allotments, and the allocation of water.

Other important ministries and agencies in the field of land and water resources include; the MHUUC; the Ministry of Planning; the Ministry of Finance; the Academy for Scientific Research and Technology; and the EEAA. The National Organization for Potable Water and Sanitary Drainage within the MHUUC plays a key role in planning, designing and developing the facilities for water supply and municipal wastewater disposal.

Several laws and resolutions affect water pollution, water allocation, and land use. As noted above, Law 93/1962 prohibits the discharge of liquid effluents from public authorities or industrial plants without a license from the sewerage authorities. Similarly, it must be demonstrated that the facility meets the health standards issued by the authority. Effluent samples must be taken periodically and analyzed by designated laboratories. In situations that endanger public health, the governor has the authority to halt effluent discharge. Pursuant to Law 27/1978, which concerns public water resources, the MOI issued Resolution No. 380 of 1982, which requires the owners of industrial facilities to obtain licenses for equipment necessary to prevent pollution, and the MPWWR issued Resolution No. 43 of 1986, which imposes standards for discharges from the commercial fleet and house boats into the Nile River.

Law 48/1982 prohibits the discharge of oil or grease from the river fleet into the Nile River and all of its branches and canals. Also, it directs the MALR to impose controls on pesticide and chemical use necessary to satisfy standards issued by the MOHP. Further, it instructs the MPWWR to protect the Nile from pollution by herbicides. It also

directs the Water Surface Police, affiliated with the Ministry of Interior, to conduct periodic raids along the Nile River, and its branches, to assist responsible authorities in enforcing the law. Law 48/1982 also specifies effluent discharge standards.

A number of laws place restrictions on land use, particularly the use of agricultural lands. Law 59/1979, for example, defines new urban communities and provides guidelines on how they are to be sited. The law places limitations on the use and sale of agricultural and desert lands. Law 3/1982 deals with urban planning and restricts certain activities on agricultural land. Law 116/1983 regulates new industrial development and housing to reduce adverse impacts on agricultural land. Because bricks are made from clay and require skimming of topsoil, the law restricts the use of red bricks and forbids establishment of new brick factories near the Nile River.

Implementation

Urban Air - Air quality concerns in Egypt, date back several decades. Unfortunately, air pollution abatement initiatives promoted by the myriad of institutions involved in policy formulation have been uncoordinated for the most part. With the exception of the recent phase out of lead in gasoline, progress has been difficult to detect as air quality (particularly in Cairo) has exhibited a steady deterioration over time. USAID's Cairo Air Project, projected at US\$ 60 million over five years, should focus Government efforts at abating air pollution in Cairo.

Land and Water Resources - Water quality monitoring is conducted by the Drainage Research Institute for drainage water in the Nile River. Its monitoring addresses agricultural needs such as TDS and does not consider pollutants such as organic matter, nutrients, bacteria and toxic compounds, which are of greater concern for public health. Other institutions involved in monitoring water quality do so for health considerations and include the National Research Center, the Nile River Institute, the MOHP and the Groundwater Research Institute. Many monitoring activities are carried out as a result of specific projects (particularly donor-funded), but coordinating this information in a scientific fashion is difficult since longer-term trends are absent and monitoring locations and substances monitored are quite scattered.

To date, implementation and enforcement of Law 48/1982 has not met expectations for protecting the Nile River and other surface waters from serious pollution. Some of the effluent discharge standards issued under the law are widely viewed as overly ambitious, while other standards are much too lax or inconsistent. For these and other problems, Law 48/1982 has yet to be effectively enforced.

Enforcement of the laws restricting land use, particularly the prohibition on skimming agricultural land for brick production, has proven problematic. For this reason, new incentive-based measures are being contemplated for the future.

References:

Economist Intelligence Unit, 2nd Quarter 1997. "Country Report: Egypt".

- Environmental Sector Assessment, July 1997. "*Roundtable Discussion on Energy/Energy Efficiency: Participants' Response*".
- Environmental Sector Assessment, May 1997. "*Port Said Participation Panel: Participants' Response*".
- Environmental Sector Assessment, May 1997. "*Solid Waste Participation Panel: Participants' Response*".
- ESMAP, 1996. "*Arab Republic of Egypt Energy Sector Assessment Report*".
- Government of the Arab Republic of Egypt, Cabinet of Ministers, March 1997. "*Egypt and the 21st Century*".
- Government of the Arab Republic of Egypt, May 1992. "*Environmental Action Plan: Arab Republic of Egypt*".
- Technical Cooperation Office for the Environment/ Egyptian Environmental Affairs Agency, March 1995. "*Draft Environmental Strategies*".
- UNCED Conference, 1992. "*National Report on Environment and Development*".
- USAID, February 1997. "*Action Plan for the Establishment of a Solid Waste Management System in the Cities of Hurghada, Safaga and Quseir*". Winrock Int.

Chapter 4

Environmental Policy Constraints

This chapter examines the key constraints and weaknesses in policies that impede effective environmental management and efficient utilization of natural resources. It focuses on policy constraints grouped into three categories: flaws in the structure of economic incentives to utilize resources and the environment (*Section 4.1*); weaknesses in institutional capabilities (*Section 4.2*), and barriers to environmental investment (*Section 4.3*).

4.1 Structure of Economic Incentives

The assessment team has identified two types of flaws in the structure of economic incentives that contribute to inefficient use of natural resources and excessive levels of pollution. These include distortions in prices for water and wastewater, energy, land, and solid waste collection; and the lack of incentives to reduce pollution or mitigate potential damages associated with development.

4.1.1 Pricing of Natural Resources and Environmental Services

Water, land, and energy are essential inputs to virtually all economic activities. Decisions on how much and what to produce depend on the relative costs of inputs, the range of production opportunities and the prices of the goods and services produced. Wastewater and solid waste disposal services, where they are available are also vital factors of production, with associated costs that may be lower than the costs of on-site treatment or solid waste disposal.

Assuming there is some scope for substituting between factors of production and for shifting to alternative production processes to take advantage of changes in demand, the availability of one or more resources or waste services at subsidized prices may lead to excess production. Since pollution and waste levels tend to increase with increasing production, subsidized prices of inputs or artificially high output prices can lead to inefficient economic production and greater environmental consequences than would be expected in the absence of these price distortions.¹

Water and Wastewater Pricing

The pricing of water and wastewater services (which are usually combined in a single bill for residential, commercial, and industrial customers) has also been heavily subsidized. Ideally, wastewater charges should cover both capital and O&M costs. Both water and wastewater treatment plant construction has received substantial financing assistance from the donor community, reducing the share of total costs to be recovered from user charges. However, there appears to be an unwillingness (so far) of the GOE and management authorities in many cities to charge users the full cost of service. In Cairo, nominal charges for water and sewer service run about 35 percent of operating and

maintenance costs (and nothing toward capital cost recovery). If the MHUUC does not recover at least all of O&M costs, water and wastewater systems are likely to suffer from lack of maintenance and eventually fall into disrepair. Some provincial and canal cities, as well as Alexandria, are doing better in recovering O&M costs, but it is safe to say that no household or business in any Egyptian city currently pays full costs for either water or wastewater service.

Water prices are also heavily subsidized for agricultural users, with most farmers paying nothing for water deliveries. Free or nearly free water has been a key element of Egypt's agricultural policy for decades. In Egypt, the value of water in many important agricultural applications (wheat, rice, and cotton) is almost certainly no greater than LE 0.20/m³, whereas it is likely to be worth many times as much to industry and municipalities. Encouraging more agricultural development in the desert when water resources already are fully allocated is almost certain to lower the value of output of the Egyptian economy.

GOE, governorate, and local authorities should be encouraged to work toward elimination of subsidies for water and wastewater services. These subsidies have important ramifications for the economic sectors that demand water and discharge wastewater. For example, as a result of industrial wastewater fees levied by municipal systems, which are less than the full costs of treating these discharges, industrial facilities may opt to connect to the municipal system when other control options would actually be less expensive than fees that reflected full costs. Also, if enforcement efforts are strengthened, new industrial connections could overwhelm municipal wastewater capacity.

The elimination of subsidies, albeit gradually, is consistent with the principles of sustainable development, will stimulate greater water use efficiency, and will be needed to address growing demands for water and wastewater services. Failure to maintain these facilities will diminish interest among donors in supporting infrastructure expansion. Also, a survey of existing users shows that most are quite willing to pay higher prices for these services, rather than face gradual decline in service. Recently the GOE has attempted to introduce water user charges that would recover a portion of the costs of water delivery for certain agricultural users. This is a step in the right direction; however, water prices need further rationalization.

Energy Pricing

There has been a level of success achieved in the key policy area of energy pricing. The average price of fossil fuels and electricity has increased substantially since the late 1980s. Domestic petroleum prices average 80 percent of economic levels compared to 25 percent in 1990, while average electricity prices reflect 80 percent of long-run marginal costs (LRMC) compared to only 50 percent in 1990 (6). The GOE has reached agreement with the IMF to raise average prices of all fuels to economic levels by mid-1999.

In addition to the direct subsidization of oil products, there is substantial intra-class cross-subsidization in electricity prices. For example, residential and agricultural electricity consumers pay only about 50 percent of LRMC (low consumption residential electricity customers pay even less). As a result, these customers may be using electricity for certain

end-uses that could be better served by alternative energy forms such as natural gas. In addition, high electricity rates for commercial customers (above LRMC) remove any incentive for the electricity distribution companies to implement energy efficiency programs in this customer class. In summary, subsidies are leading to excessive energy use and the misallocation of resources, and are retarding energy efficiency initiatives in Egypt.

Even if the government raises energy prices to economic levels as specified under the IMF Agreement, it will be difficult to sustain prices at these levels, and cross-subsidization is likely to remain. Currently in Egypt, there is little competition in the energy sector, and there is no functional independent regulatory authority in place.

Another area of policy weakness relates to pricing practices for CNG and diesel. The government has set the price of CNG and gasoline at levels closely approximating economic costs. However, diesel fuel is heavily subsidized, eliminating a large component of the potential market for CNG, despite the availability of attractive financing for CNG conversions. Much of the public transportation system and the trucking industry burn diesel fuel. The GOE is reluctant to reduce subsidies on diesel fuel as its price has a direct impact on inflation and the quality of life of the poor. However, the subsidy impacts negatively on the environment, as well as on Egypt's balance of payments and foreign exchange.

Land Prices

The provision of land by the GOE for agricultural, industrial, and tourism development has been an important tool of economic development. Subsidized land prices, or rent, are used to stimulate developers to take on risks they would not otherwise assume if charged the full costs of land. These subsidies (and other sweeteners such as tax holidays and reduced import duties) can accelerate development and shift investment capital to development activities that offer rates of return that are artificially high because of the subsidies. In these cases, the government takes on the added burden of allocating land at a rate that doesn't result in flight of capital from some sectors to others.

As noted in Section 2.5, hotel and resort developers on the Red Sea coast receive substantial economic inducements to develop land. These include land prices far below market values for waterfront property (1 LE per square meter or about \$1,200 per acre), seven years to pay for the land, 10-year tax holidays, and exemptions from duties on imported equipment. These financial incentives have dramatically shortened the payback period and made development along the Red Sea financially attractive. The GOE has also required developers to make substantial progress in developing these resort properties or lose their rights to the land. The GOE has already committed to the sale of about 90 percent of the Red Sea coast. Thus, given the current incentive structure, resort development will proceed very rapidly on the Red Sea and Egypt runs the risk of seriously overdeveloping the Red Sea coast from both an economic and environmental perspective. It does not appear that some of the potential negative impacts of this development pattern have been given much consideration. If tourism growth does not keep up with capacity in accommodation, there is likely to be under-use of existing, older structures and excess capacity in infrastructure in areas which lose business to newer, more attractive developments.

Pricing of Solid Waste Disposal Services

Current funding mechanisms for waste disposal do not generate adequate revenues either to cope with continued growth in the Egyptian economy or to support operations on a sustained basis. The “prices” charged for solid waste disposal do not adequately recover operational costs and may distort incentives for recycling, reuse, and waste minimization. Lacking adequate revenues to fund MSW services, the quality of these services declines, resulting in improper and uncontrolled dumping and burning of waste. By increasing revenues, improvements in MSW services could be made that would address the environmental and aesthetic impacts of current practices. To the extent that increased revenues are raised through user charges as opposed to higher taxes, incentives for reducing the amount of waste requiring collection and disposal could be improved.

4.1.2 Incentives for Pollution Reduction

An important cornerstone of environmental policy is the *Polluter Pays Principle* (PPP) which states that polluters should pay to use the environment. The weak version of the PPP, which is endorsed by the Organization for Economic Cooperation and Development (OECD) and its members, states that polluters are responsible for meeting requirements for pollution control. The implication is that once a facility meets the required emission or discharge level or complies with a technology standard, it is not required to pay for any residual pollution. In effect, the cost of this residual pollution is internalized by the public.

Requirements for pollution reduction have associated costs. While there may be benefits from making small reductions in pollution through process changes (the so-called “win-win” solution), it is generally acknowledged that pollution reduction is a net cost to the facility. One of the challenges of an environmental compliance program is to achieve a high level of compliance. From the polluter's perspective, investments in pollution control will only be taken if the costs of non-compliance are greater than the costs of compliance. In most countries with strong environmental programs, enforcement authorities have the capacity to take actions against non-compliant facilities that, when successful, are much more costly to the polluter than simply complying. The existence of such tools provides a general deterrent to non-compliance. If environmental authorities lack appropriate sanctions and inadequate resources to detect and impose sanctions for non-compliance, the expected cost of non-compliance (value of the sanction times the probability of detection times the probability of conviction) will be considerably lower than the costs of compliance. This is the case in many developing countries and economies in transition such as those in Central and Eastern Europe (CEE) and the Former Soviet Union (FSU).

Egyptian environmental policy is at a similar stage of development as many of the economies in transition in CEE and FSU, lacking enforcement resources or a full range of economic sanctions to employ in non-compliance situations. Egypt has made only limited use of economic instruments in environmental management. These inadequacies can be divided into two general types: (1) the use of economic incentives to increase compliance; and (2) the use of economic incentives to generate revenues to finance environmental management activities or provide subsidies for environmental investment.

Compliance Incentives

As noted in Chapter 3, Egypt has a history of weak and ineffective enforcement of the control measures contained in its environmental laws. There has been no consistent record of government prosecutions for environmental violations. Moreover, even where legal actions were taken and sanctions were imposed, the fines were often too small to be effective and in many cases were not even paid. As discussed later, Egypt is in the process of developing the enforcement capabilities necessary to enable it to carry out enforcement actions under Law 4/1994. It remains to be seen whether Egypt will effectively use the enforcement authorities contained in the new law. While the law expands authority for imposing economic sanctions for environmental violations, such sanctions have never been used effectively in Egypt to encourage compliance. Also, threats of plant shutdowns for violations are deemed hollow in light of the potentially negative impact on the local economy caused by laying off workers during a shutdown.

Egypt has never effectively used economic sanctions, such as fines or penalties for non-compliance, to compel compliance with environmental requirements. Many of the older environmental laws and decrees, such as those controlling air pollution and solid waste management, did not even authorize the imposition of economic sanctions for failure to comply. Where such sanctions were authorized by law, as in Law 48/1982 for protection of the Nile River and other surface water, the amounts authorized were too small to provide an effective deterrent against non-compliance. Therefore, Law 4/1994 represents a real advance in the government's authority to use economic sanctions for non-compliance with environmental requirements, providing authority for imposing more substantial penalties for violations of the requirements of Law 4/1994 (particularly with respect to hazardous substance/waste management and marine discharges, less so with respect to air emissions) and increasing the penalties for violations of the requirements of Law 48/1982. The test, however, will come in employing these economic sanctions effectively to provide sufficient deterrent to induce industry to comply with environmental requirements.

In addition to penalties and fines, a number of other compliance incentives might be employed. Pollution and product charges, even if charge rates are not high enough to encourage polluters to reduce emissions to socially optimal levels, may encourage polluters to make some low cost investments. These charges have the added feature of generating revenues that can be used to capitalize environmental and special purpose funds that can then be earmarked for co-financing of environmental investments, thereby achieving additional reductions in pollution.

A second type of compliance incentive is the use of cross-compliance requirements. While tax holidays have been an important element to encourage industrial development, there is no coordinated and effective mechanism to ensure that facilities receiving such status are in environmental compliance. For new comp, the EIA links the establishment of the company to environmental compliance requirements, but this provision does not appear to be enforced. This may encourage strategic behavior and decisions that are not environmentally sustainable.

Development and construction have imposed costs on the entire Red Sea area, generating a trail of construction waste and debris that is discarded off-site, and has damaged the shoreline and water quality. Incentives should be implemented to encourage more environmentally friendly development and construction practices. One might link existing tax holidays or other developer benefits with requirements to prepare and submit plans indicating how construction waste is to be disposed of, and enumerating other measures to minimize damage to the coast during construction and operation.

A third type of compliance incentive involves measures to encourage voluntary compliance. Recognizing that it will be difficult for the EEAA to establish sufficient enforcement capability to address industrial compliance nationwide, there is a need to provide added incentives for polluters to undertake compliance investments. For example, a voluntary environmental ratings system with public disclosure by polluters (i.e., industry, including power stations and refineries) might be considered.

Revenue-Generating Instruments

While Egypt has created an environmental protection fund under Law 4/1994 that can receive a variety of fees (e.g., entrance fees for protected areas, surcharges on airline tickets, and penalties and fines), the potential revenue from these sources is limited in comparison to the revenues that could be collected from even modest charges on air and water pollution. For example, the Czech Republic with only 10 million people generates \$200 million from pollution charges, while Poland with a population of 39 million generates over \$400 million. In both of these countries, the revenues are re-circulated in the form of grants and soft loans (with reduced interest rates) to co-finance investments in environmental controls. To justify expansion of fund revenues in Egypt and elicit support among enterprises and the public, the Fund would need to diversify its financial support to include environmental investments, environmental education, and NGO programs, as well as administrative and capital outlays. Pollution charge programs also have the added feature of providing the impetus for identifying sources and quantifying the level of air emissions and wastewater discharges.

Through Danida's Organizational Support Programme, a number of studies have been undertaken to identify and analyze potential uses of economic instruments in Egypt to solve environmental problems. Among the environmental problems examined were hazardous hospital waste (9), construction and demolition waste (2), marine pollution (7), and marine protectorate areas (1). Three of the studies recommended the use of taxes, surcharges, licensing fees, entrance fees, and user charges to generate revenue for special purpose funds or to cover enforcement or surveillance costs (the fourth study called for the establishment of a hospital waste fund without specifying the source of revenue). In all of the proposed applications of economic instruments, the economic instrument was unlikely to directly affect behavior. However, the use of the revenues to fund management, remedial actions, or enforcement activities would contribute to environmental improvements.

4.2 Institutional Capabilities

Probably the most important set of weaknesses in environmental policy relates to the capabilities of the institutions that formulate, implement, and enforce environmental laws. In addition, institutional weaknesses in the energy sector impede effective management of energy resources. The flaws in environmental and natural resource policies are divided into four categories; the availability of information in policy-making and implementation of environmental programs; deficiencies in institutional capabilities to implement and enforce environmental regulations; problems of sustaining financing for environmental protection; and a lack of public awareness.

4.2.1 Information and Analysis

Data Base Management

One of basic building blocks of an environmental management system is a comprehensive list of facilities and sources of pollution. Such a list is necessary to determine staffing and resource needs for compliance, inspection and monitoring, and enforcement activities. Without such information, it is difficult to measure compliance rates, develop an enforcement strategy, or conduct outreach activities to inform facilities of their responsibilities.

Much of the information required for such a data base exists but has been collected by a number of ministries which have oversight or licensing responsibilities for different types of facilities. This information needs to be consolidated into a single inventory of sources that can be used by the EEAA and shared with relevant ministries.

Analyses of Policies, Programs, and Projects

The EIA process is an important tool in helping governments develop resources rationally. World experience shows that it is important for governments to require EIA information not only from the private sector but also from the government itself, in terms of its own policies and proposed actions. As noted in Chapter 3, Law 4/1994 includes provisions establishing an EIA requirement and review process in Egypt. There are, however, several deficiencies in the EIA process that has been proposed by the EEAA. First, the EIA process is only applied to individual developments carried out by the private sector. Major land and water use projects, policies, and programs of the GOE have never been through an EIA process. Second, the EIA process does not appear (Law 4/1994 is silent on this issue) to provide for the preparation of EIAs for multiple developments. In many cases, developments as a group are likely to have a large environmental impact even though individually, the impacts may be small. Thus, the EIA at the level of the individual project may not accurately reflect the potential environmental impacts. This is particularly true for tourism development. Third, there is no allowance for the public or even for other ministries and regional and local government officials to participate in the EIA review process. A more open review process would make the EIA process more credible and would contribute to improvements in the quality of EIAs.

Another weakness in environmental management in Egypt is the lack of economic analysis capabilities. At a minimum, the EEAA and other agencies that promulgate environmental regulations should be able to assess the economic (and environmental)

impacts of these regulations.

4.2.2 Institutional Strengthening Needs

Uncertainty Relating to Application of Law 4/1994

There is a great deal of uncertainty concerning the implementation and enforcement of Law 4/1994. The EEAA estimates that some 200 industries may actually apply for an extension of the March 1998 deadline for compliance and subsequently submit a Compliance Action Plan. In all, there are an estimated 900 large facilities in Egypt and some 22,000 facilities of all sizes (based on 1994 figures). It remains to be determined what will happen to those facilities that do not comply with Law 4/1994. Furthermore, it is not clear that the EEAA will know how many facilities are or will be in compliance with Law 4/1994 when it becomes effective in 1998. It is also unclear how those that are in compliance will be separated from those that are not and how the EEAA will be able to expeditiously handle the large number of requests for extensions, considering its limited technical staff.

Lack of Appropriately Trained Staff

The EEAA has not received adequate funding to develop the staffing levels required to carry out compliance monitoring and inspection activities and take enforcement actions to correct non-compliance. While there are provisions for eight EEAA RBOs, only one of these (the Greater Cairo RBO) has been set and staffed. Governorates have the authority to take enforcement actions, but the EMUs that have been established in the governorates are often no more than an environmental advisor to the Governor, with no more capacity or technical capability than to advise. Overall, the combined staff resources of the EEAA and the governorates to respond to questions about compliance, review compliance plans, verify compliance investments, and review monitoring data are inadequate to deal with an industrial sector with some 22,000 facilities.

The EEAA has received assistance from foreign donors to provide training to their staff. However, most governorate EMU staff has not received appropriate training. Thus, Egypt's regulatory and enforcement agencies have inadequate resources and few trained staff to develop environmental regulations and carry out program development, monitoring, enforcement, and follow-up activities. Very few staff at the EEAA and the RBO has been adequately trained, and it does not appear that other national institutions and departments have any capability in this regard. In addition, the EMUs at the governorate level, which should perform a significant role in implementing and enforcing national standards, remain inadequately staffed.

Ambiguity in Roles and Responsibilities for Environmental Management

As noted in Chapter 3, the role of the governorates and the new industrial cities in local environmental management, including monitoring and enforcement, is not clearly defined or well understood. Other government departments apart from the EEAA seem to have little understanding of environmental policies and programs, even though in some

cases they have been assigned environmental oversight/enforcement responsibilities for activities, including industrial facilities, under their jurisdiction. Furthermore, the role of the RBOs with assigned responsibilities for regional environmental management is not clear in relation to the roles of the governorates and local governments. Monitoring and enforcement responsibilities under the various environmental laws are fragmented among regulatory institutions, licensing authorities, etc. at both the central and governorate levels of government, with the effect that no single institution can take the full range of enforcement actions effectively. Furthermore, this fragmentation of responsibilities necessitates a high degree of inter-agency coordination for effective management, yet few formal mechanisms for such coordination exist. Coordination, if it occurs, is informal at best.

Among the major weakness in the institutions that deal with land and water resources are the absence of clearly articulated national policies and, especially, the lack of coordination among competing interests and national agencies in implementing such policies. There is a clear need to establish sector strategies, inter-agency agreements, or other mechanisms to ensure effective coordination among those institutions at the national level with environmental management responsibilities. As it now stands, the objectives and mandates of different ministries often are in direct conflict with each other; the Nile Delta lakes provide a graphic case in point. To one ministry they represent important fisheries resources, while to another they are an environmental sink. Clarifying national objectives and resolving conflicts in agency missions is key. As discussed in Chapter 2, all of Egypt's natural lake ecosystems have been degraded to some degree by pollution, modification of flow rates, and competing and conflicting demands. Greater efforts are needed to resolve land use conflicts in a fashion that is best for Egypt.

4.2.3 Sustainable Funding for Management and Protection

The lack of adequate staff and resources for carrying out environmental management activities and natural and cultural resource protection reflects both a lack of support and commitment within the government but also certain rigidities in the budgeting process. Some notable funding shortfalls are in the areas of support for RBOs, lack of staff to patrol national parks, and lack of resources for restoration and protection of antiquities and cultural sites. Donors have often stepped forward to provide financing for some of these needs. However, in the case of national parks and antiquities, there is already a mechanism in place to generate revenues in the form of entrance fees (as is the case for Ras Mohamed National Park). All revenue generated from natural parks is deposited in the National Environmental Protection Fund and can be used for general environmental purposes. These funds are not earmarked for protection and management of the park, even though in the case of Ras Mohamed revenues are more than adequate to meet the park's requirements. In the case of protection of antiquities, millions of dollars are generated through entrance fees at Egypt's major antiquity sites. This revenue, however, is not earmarked for site management or restoration projects but is part of general revenues collected each year by the Ministry of Finance.

4.2.4 Public Awareness

A critical element of effective environmental management is the public's awareness

of environmental problems, solutions, and the scope of individual and company obligations to take care of the environment. The policy constraints discussed here focus only on the lack of institutional capacity to communicate polluters' responsibilities for meeting standards, rather than the broader need for public awareness and education.

Knowledge of Law 4/1994

A recent survey funded by USAID found that 57 percent of Egyptian private and public sector industries is unaware of Law 4/1994. In the sample of 200 facilities, the survey results indicated a much higher level of awareness among public sector firms (77 percent of which had heard of the law) than among private sector firms of which only 38 percent had heard of the law (11). Given that Law 4/1994 has been in place for over three years and that facilities will be required to comply with requirements by March 1998, this lack of awareness is a major impediment to the EEAA's compliance monitoring and enforcement program. Recently, the EEAA announced that facilities could request waivers and extend their compliance dates for up to two years. But given the lack of awareness of Law 4/1994, only a small percentage of facilities submitted requests to the EEAA for waivers.

Compliance Requirements

There appears to be inadequate information available, particularly to small and medium-sized facilities, that describes violations of environmental requirements and the types of investments that facilities would need to make to satisfy compliance requirements. The EEAA has not developed a compliance monitoring program, established a user-friendly data base that would allow facilities to identify requirements that apply to them, based on the types of production activities and resulting pollution, or established capacity to respond to questions from facilities about compliance requirements.

Communication between Industry and Government

Industry has indicated that it is not aware of long-range strategies of the government regarding the environment and that this inhibits making investment decisions concerning the environment. Furthermore, as industries operate under license from specific ministries or departments, they are inhibited from making direct contact with the EEAA for advice and guidance. Representatives from non-governmental organizations have indicated a similar lack of awareness of government policies and plans regarding the environment.

4.3 Barriers to Environmental and Natural Resource Investments

The third category of constraints to effective environmental and natural resource policies are barriers to investment. These can be divided into four types: lack of information and skills to prepare and finance environmental investments; market imperfections in financing; limitations in access to markets; and constraints on trade in

the form of custom duties and tariffs.

4.3.1 Project Preparation Capabilities

At the prtime, there is a lack of demand among industrial polluters in Egypt for environmental financing. This can largely be explained by the lack of enforcement of existing environmental requirements and the fact that requirements of Law 4/1994 have not yet taken effect. In addition, it appears that facilities lack an understanding of Law 4/1994 requirements and the expertise to assess the technical options, conduct an economic analysis, and identify and secure financing. Interviews with representatives of banks, donors, and industry suggested that there is currently adequate soft financing available to meet the limited demand. Banks appear willing to support environmental projects provided loan applicants are creditworthy and willing to accept commercial terms, but don't expect interest in bank loans until environmental requirements apply and enforcement efforts are strengthened. Once the demand for financing increases, the small and medium-sized enterprises, particularly newer companies which are still servicing debt on start-up loans, are expected to have the greatest difficulties in assessing environmental requirements, preparing projects, and securing financing.

4.3.2 Affordable Financing

One of the major issues that have been raised by industry is their need for assistance in financing environmental compliance investments. In OECD countries, industry finances these investments out of working capital or secures capital in financial markets. However, in developing countries and economies in transition, industries often lack the resources to finance economically motivated capital investments, let alone invest in environmental controls. Even if financial markets are willing to service investments in environmental control equipment, the terms may be unaffordable for many industries. As a result, "soft" financing is often made available by the government or foreign donors to provide a catalyst for environmental investments.

Persons contacted in the financial sector during the EESA indicated that small and medium sized enterprises, especially those newer facilities that have incurred substantial start-up debt, will encounter the greatest difficulty securing financing for environmental investments. The problems of securing affordable financing may also be acute in the MSW sector, because of the high level of difficulty in demonstrating secure and certain cost recovery capabilities. In the case in MSW management, commercial financing is available, although perhaps inadequate to fund the full level of investment required. Modern equipment therefore cannot be procured nor applied to MSW management problems and activities unless debt financing is accessible.

The National Environmental Protection Fund, established by Law 4 in 1994, is empowered to provide assistance for priority projects that contribute to environmental improvements. However, this Fund has thus far been used to defray some of the operating costs of the EEAA. At the current time, the Fund is not organized, staffed, or financed to a level that would allow it to play a significant role as a co-financier of environmental projects. Unlike well-established environmental funds in CEE countries, Egypt's environmental fund lacks the project cycle management procedures and the

organizational structure to sustain a competitive disbursement program that would meet donor and international financial criteria for accountability and transparency.

The EEAA is in the process of establishing a reliable revenue base for the Fund. As pointed out earlier, greater use of revenue-raising economic instruments could significantly increase revenues available to the Fund. The Fund can accept donations from foreign donors, which presumably could be managed as a special account or earmarked for support of specific projects or activities. Thus far, most donor financial assistance not tied to specific projects has been channeled through commercial banks. Donor assistance may provide the capital for the loans or simply the subsidy component required for participation by the financial institution.

Some donors, such as the KfW, offer attractive financing for environmental projects, including 100 percent grant financing of environmental audits and assessments and 50 percent grant financing for environmental investments. They have recently observed a noticeable increase in the number of applications that could exhaust their current working capital in two years. Thus, given the number of industrial facilities in Egypt, efforts to strengthen the EEAA enforcement capabilities could increase the demand for environmental investments and rapidly deplete available soft financing.

Egypt's financial sector offers corporate and limited project financing at the present time but has not yet developed the sort of leasing and vendor financing that are most appropriate for energy efficiency projects and equipment purchases. As the sector matures, and as the energy efficiency industry grows, financial products should develop to meet the growing demand for energy efficiency financing. In the interim, mechanisms that facilitate the use of corporate finance for energy efficiency projects can help to build experience in energy efficiency financing.

4.3.3 Access to Investment Opportunities

Restructuring and Privatization

Although Egypt has taken steps toward restructuring and privatization of the energy sector, there is still little incentive for entities to improve efficiency of technology and operation. The sector lacks commercial focus and competition, and the basic conditions necessary to attract private capital, such as adequate legal and regulatory regimes, and independent and transparent policy and regulatory structures.

The EGPC and the EEA, with responsibility for petroleum products, natural gas and power, exhibit “command-and-control” type relationships with other participants in their sector. Vertical integration in the sector masks the inefficiencies of various activities within the organizations. Profit margins reflecting a percentage of costs are set by government, thus assuring entities of minimum rates of return regardless of performance and operating efficiency (6). Because the government controls rates of return, prices, and

product quality, marketers of oil products are unable to meet the needs of their customers, even though consumers have expressed a desire for, and a willingness to pay for, higher quality products.

The GOE is the sole regulatory agency for the energy sector. A regulator should represent the interests of both suppliers and consumers and set tariffs on the basis of sound technical/financial criteria. As there is no formal tariff review process, some energy sector entities lack the financial resources necessary to implement more efficient and environmentally sound technologies and operating practices, and their poor financial condition makes it difficult for them to attract private sector financing for new projects.

Renewable Energy

Egypt's renewable energy strategy targets non-hydro renewable energy to supply five percent of the country's energy consumption in 2005. This high-profile goal will facilitate policy changes that support its achievement. The NREA has the mandate and capability to formulate and implement renewable energy policies. There is a strong technical foundation for renewable energy development in the country. The NREA's field testing and demonstration projects have established the feasibility and attractiveness of renewable energy technologies. Finally, there is strong demand for renewable energy policy measures among local stakeholders, including suppliers of equipment to renewable energy electricity generation projects and manufacturers of renewable energy products such as solar water heaters.

The GOE's national strategy for renewable energy contains ambitious targets for wind and solar technologies but no policy or legislative measures to achieve them. Without such measures, it is unlikely that the country will attract adequate private capital and realize its renewable energy targets or potential. Some of the key policy weaknesses include a lack of a comprehensive and results-oriented policy and legislative framework; absence of a tariff and connection policy for the EEA's acquisition of electricity generated from renewable sources; and the need for financial incentives for renewable energy development, including reduction of import duties on renewable energy equipment and tax incentives for renewable energy firms. While renewable energy is more economic than traditional alternatives in certain applications, its development is hampered by the dominant market position of those alternatives.

Another policy weakness related to the renewable energy policy framework is the lack of certification for renewable energy equipment and associated service providers. This certification is a public service that can enhance the development of nascent markets in renewable energy products. An example is domestic solar water heaters, which have a potential market in the millions while only 150,000 are in place today. The growth of this market is hampered by consumer concerns over poor quality, improper installation and inadequate maintenance. A government policy and associated program or standards certifying the quality of solar water heater design, manufacture, installation and maintenance would provide a significant boost to the local industry.

Access to Natural Gas Supplies

Investments in conversions to natural gas have been impressive but are limited by gas availability owing to limitations of the gas transmission and distribution system. For example, 80 percent of the EEA's fossil-fired generation derives from natural gas, but it could approach 100 percent if the distribution system were expanded to allow gas delivery to all of EEA's fossil-fired generating stations. In addition, supplies of natural gas to generation facilities are inadequate, necessitating utilization of mazout in facilities, which EEA has converted to dual-fired capability. In some plants, natural gas constitutes as little as 25 percent of fuel consumed, due to natural gas supply constraints. The current gas supply institutions have not been able to expand the gas supply system to facilitate greater penetration of gas in the marketplace. This is not only impacting the environment but is also limiting the amount of petroleum available for export.

The MOP is considering ways to increase private sector involvement in gas transmission and distribution in order to alleviate the gas supply problem. The new gas pipeline company, Gasco, will assume responsibility for the operation, maintenance and expansion of the natural gas grid from the Petroleum Pipeline Company (PPC) and EgyptGas. The EGPC intends to gradually privatize Gasco, with a public share offering anticipated in late 1997. Two new companies with private sector involvement, the Natural Gas Vehicle Company and GasTech, are participating in the CNG conversion program. The MOP is also considering the formation of new companies to act as local distribution companies as a means to expand gas distribution. These restructuring and privatization initiatives are an appropriate response to the gas supply problem and are consistent with recommendations made later in the report.

Lack of Awareness of Energy Conservation Benefits and Opportunities

Most of the energy-efficiency initiatives identified in the *National Strategy for Improving Energy Efficiency in Egypt* are targeted to energy end-users, which includes every individual household, business, and industry in Egypt, in addition to all government entities (8). While the government can, as discussed in greater detail below, take some direct action to influence the efficiency of energy use within Egypt, ultimately it will be actions taken by individual consumers that help the government meet its efficiency goals. (This will be most true in the short-term, while the government determines what components to include in a broad policy, and the timing for each.) Consequently, increasing consumer awareness about the overall importance of energy efficiency, and actions that consumers can take, is an important catalyst for investment and component of a national energy efficiency plan .

The Energy Conservation and Environmental Protection (ECEP) program has made significant strides toward increasing industrial consumer awareness, and the OECP has initiated a general awareness campaign, but these are ad hoc efforts, rather than part of a broader, targeted government campaign. Interviews conducted for this assessment, as well as several recent studies conducted under the ECEP project, indicate that even those end-users that understand the importance of energy efficiency are uncertain how to proceed with identifying and implementing energy efficiency measures in their industrial facilities and offices (3,4,10). Many consumers are reluctant to try new technologies, particularly those that may have an impact on their businesses, until they feel the technologies have been proven. The ECEP's successful demonstration of many industrial-

sector technologies, as well as the Alexandria Electricity Distribution Company's efforts to demonstrate residential and commercial lighting technologies can be more widely publicized to increase customer awareness of how energy efficiency technologies have been proven to perform in Egypt.

4.3.4 Constraints on Imported Environmental Equipment

The current tariff policies and structures do not recognize the value of environmental protection and energy efficient equipment in reducing damage to Egypt's environment and conserving natural resources. Different tariffs apply depending on the economic sector and destination in Egypt. Generally, tariffs of 55 percent are applied to imported goods, which do not have exemptions. Further, administrative procedures regarding customs clearances appear to be causing unnecessary delays to bringing environmentally useful equipment into service. (The USAID Sector Policy Reform Program includes customs and tariff reform as key policy measures.) While delays in processing imported equipment through customs are an inconvenience, the primary concern with tariffs is their impact on compliance costs and rates of return on investment.

The treatment of imported CNG conversion kits is a good example. The government has set the price of CNG conversion kits at LE 5,000, but the actual price of the kit, which is imported from Italy, is roughly LE 3,400. Thus the government applies a duty representing 40 percent of the cost of the conversion kit. This is limiting the number of conversions to CNG, with the attendant negative impacts on the environment and balance of payments.

A 1995 ECEP study estimates the potential size of the Egyptian energy efficiency market at LE 3.6 billion, which includes all energy end-uses, not just electricity (5). The same study indicates that even though local manufacturers and service providers expressed an interest in serving the market, it remains undeveloped. Until the local energy efficiency market develops to the point where it can support local manufacture of energy efficiency equipment and products, these items will have to be imported. This equipment currently faces high customs duties that further increase its price compared to domestically manufactured equipment, thus discouraging customers from purchasing energy efficiency equipment and products.

References:

- El Hawary, E. *"Economic Instruments for Environmental Management in Egypt: The Case of Natural Protectorates Management"*. Report prepared for DANIDA/OSP.
- El Sharkawi, A., February 1997. *"Economic Instruments for Construction & Demolition Waste Management"*. Report prepared for DANIDA/OSP.
- Energy Conservation and Environmental Protection Project, March 1997. *"Market Assessment for Energy Efficiency and Environmental Protection Services in Egypt: Final Report on Research Findings"*. Wafai and Associates for Bechtel Consulting.
- Energy Conservation and Environmental Protection Project. *"Feasibility Assessment of the ESCO Approach in Egypt. Executive Summary"*.
- Energy Conservation and Environmental Protection Project. *"Profile of Energy Business in Egypt"*. Hagler Bailly/Overseas Bechtel Inc.
- ESMAP, 1996. *"Arab Republic of Egypt Energy Sector Assessment Report"*.

Gamaleldin, Walid, March 1996. *"Economic Instruments to Address Marine Pollution"*. Report prepared for DANIDA/OSP.

Organization for Energy Conservation and Planning. *"National Strategy for Improving Energy Efficiency in Egypt"*.

Sarhan, A., April 1996. *"Economic Instruments for Environmental Management in the Field of Hazardous Hospital Waste in Egypt"*. Draft Report prepared for DANIDA/OSP.

USAID, May 1995. *"Needs Assessment for Industrial Energy Efficiency in Egypt"*. Overseas Bechtel Inc.

Wafai & Associates, March 31, 1997. *"Market Assessment for Energy Efficiency and Environmental Protection Services in Egypt,"* prepared for Bechtel Consulting under the USAID-funded Energy Conservation and Environment Project.

¹In recent years, cotton and rice prices set by the GOE were between 15 and 30 percent above world prices. The combination of subsidized water and higher than world prices results in excess production (from an economic point of view) of several relatively low-valued commodities (which on full analysis probably cost much more to produce than they are worth on world markets) and not enough agricultural land is devoted to high-valued crops.

Chapter 5

Overview of Policy Reform Program Strategies

Egypt has already made considerable progress in introducing policy reforms that contribute to improved environmental quality. Law 4/1994 has provided a framework for establishing and implementing a more effective system of environmental management. The creation of the new Ministry of State for Environmental Affairs has given environmental issues greater visibility in the government. Progress has also been made in economic sectors in reducing pollution levels. For example, the ongoing process of substituting natural gas for oil in power generation and industrial uses has led to reductions in air emissions of sulfur dioxide and particulates. Under the Mubarak-Gore Partnership, progress has been made in reducing atmospheric emissions of lead through elimination of leaded gasoline (full phase-out by December 1997), preparation of a lead exposure abatement plan, and development of a lead smelter action plan that recommended relocation of one smelter in Cairo and introduction of modern abatement technology at the other. In addition, a number of activities related to fostering environmentally sustainable tourism in the Red Sea have been undertaken under the partnership.

Nevertheless, the process of policy reform and refinement is continuous. While progress has been made, there is considerable scope for additional reforms. In all environmental sectors that have been assessed by the team, a number of similar or crosscutting policy problems have emerged: (1) weaknesses in institutional capabilities to develop and implement environmental policies; (2) barriers to entry for the private sector in selected markets for goods and services; (3) absence of proper incentives that would encourage offenders to reduce their pollution; and (4) deficiencies in information dissemination and educational programs that explain the public's limited awareness of environmental quality and protection.

Weak institutional capabilities in environmental policy development and implementation are the major barriers to achieving improvements in environmental quality. Problems include lack of commitment to develop and/or enforce policies to protect the environment, lack of trained staff and resources, poor coordination within and between institutions, and ambiguities in implementation and enforcement roles and responsibilities, between national, regional and local authorities.

As Egypt continues its transition from a centrally planned economy dominated by publicly owned firms in key economic sectors (banking, construction, refining, chemicals, etc.) to a market economy, there is a need to expand private sector roles in providing goods and services. In many cases, current laws, regulations, or policies limit private sector participation in supplying energy services and environmental services such as wastewater treatment and solid waste disposal. In some cases, such as cogeneration, the GOE need only reduce barriers to market entry and develop pricing policies for the purchase of cogenerated steam or other marketable byproducts. However, in other cases, several problems must be addressed simultaneously. For example, to address municipal solid waste problems, additional regulations pertaining to landfills as well as improved financing must complement private sector involvement.

For all environmental sectors, polluters do not have appropriate incentives to protect the

environment. These weaknesses are of four types: (1) price distortions in markets that do not discourage excessive use of natural resources and lead directly to greater production of pollution; (2) subsidies in environmental services costs that discourage the polluter from considering cost-effective treatment, or waste minimization, options; (3) lack of guidelines for environmentally sound practices in new construction; and (4) lack of monitoring, inspection, and enforcement to determine non-compliance with environmental requirements.

Finally, the low level of public awareness regarding the environment is a barrier to environmental improvement. This shortcoming is evident among the general public regarding issues such as solid waste disposal and awareness of existing laws and regulations among businesses. Related issues include inadequacies in the flow of information and the need for educational programs to improve attitudes and foster environmentally sensitive behavior.

The program of policy reform that is described in this chapter has been developed to respond to the problems enumerated above. Predictably, proposed reform initiatives across the environmental sectors have similar goals and employ similar assistance tools. This chapter has four sections that summarize the policy reform strategies for each sector, describe the overall goals, the proposed approach, and the types of assistance tools (and criteria considered in evaluating them) that could be employed in the EEPP. While we refer to the program as a policy reform program, it is in fact a program of **assistance** to the GOE, which has ultimate responsibility for formulating, reforming, and implementing environmental policy in Egypt.

5.1 Overview of the Individual Sector Strategies

To facilitate discussion of the overall assistance program, an overview of the four environmental sector strategies, and the institutional and legal reforms that complement those strategies, is provided in this section. For each sector, a short description of the proposed strategy, policy measures to be achieved through USAID assistance, and key elements of the approach are presented. Each of the sector strategies is described in greater detail in Chapters 6 through 10.

5.1.1 Institutional and Legal Reforms

For the four proposed environmental sector strategies to have their intended impact on environmental management in Egypt, it is clear that the GOE will have to undertake a number of institutional and legal reforms. Although the GOE has made progress in recent years, especially in enacting Law 4/1994 and in establishing the EEAA and the MOEA, it has yet to establish a credible environmental management program. The GOE will need to address the serious resource, capacity, and inter-institutional constraints that prevent effective environmental management. Furthermore, the GOE will need to delegate more decision-making in implementation and enforcement of environmental programs to the level of government closest to the problems and open this decision-making process to greater public and NGO participation. Finally, the GOE will have to remedy the remaining weaknesses and jurisdictional conflicts in the existing legal and regulatory

framework.

To address these issues and to complement the four sector strategies described below, the proposed assistance strategy should address three broad institutional and legal reforms: (1) strengthening environmental policy development capabilities at the national level; (2) decentralizing core environmental management functions to the local level; and (3) strengthening the legal and regulatory framework for environmental management. The GOE will have to work in all three of these areas in order to establish a credible and effective environmental management program.

Policy Measures

Specific actions have been identified for monitoring the GOE's progress in carrying out these institutional and legal reforms. The GOE needs to develop a National Plan for Environmentally Sustainable Development, as well as increase the budgetary resources committed to environmental management, institutionalize the coordination among government institutions and generate and disseminate the information necessary for effective environmental programs. A key first step in preparing a national plan is to develop a vision of the social, environmental, and economic values to be promoted and protected. To decentralize environmental management functions, the EEAA must establish and operationalize the RBOs, strengthen capabilities in the EMUs and other local agencies, and increase public participation and NGO involvement in local environmental management. Finally, the GOE will need to refiand complete its legal and regulatory framework for environmental management by finishing the framework for Law 4/1994, integrating enforcement of the principal environmental laws, building capacity and expertise in the legal community, and strengthening the environmental fund through elaboration of operating policies and procedures to complement the executive, financial and administrative regulations prepared (but not approved) to date.

Approach

A mix of technical assistance tools, including policy analysis, capacity building, training, etc., will be used to support the environmental planning, institution building, and program development and coordination recommended in the strategy. Some financial assistance may also need to be provided to furnish, equip, and supply local environmental management agencies with what they need in order to carry out their functions effectively. Cash transfers will be used in selected cases to promote the policy reforms and support necessary actions by the GOE.

5.1.2 Industrial Pollution

The critical challenge in the industrial pollution sector is making the transition from a largely unregulated environmental state to a fully functional compliance program, requiring facilities to meet standards for air emissions and wastewater discharges. Egypt has environmental laws and executive regulations in place that cover the range of

production activities and pollution sources encountered in Egypt, but lacks the institutional capabilities to identify sources, monitor compliance, and take enforcement actions to address non-compliance. On the side of the potential regulated community, there is only limited awareness of their responsibilities and obligations under Egyptian law.

Under Law 4/1994, the date for facilities to comply with requirements in the law, March 1998, is rapidly approaching. Neither the EEAA nor industries are prepared for Law 4/1994 to take effect. Although there is a waiver provision in the law for a two-year extension in the compliance schedule, most of Egypt's facilities have not applied for these extensions nor were they aware of the need to have applied by August of this year. Ideally, given the general lack of awareness of Law 4/1994 requirements and the EEAA's lack of adequate staff and preparation to manage the compliance program, the GOE would consider a gradual targeted approach combining early voluntary or mandatory compliance for the worst polluters and an extended grace period for smaller firms or postponing the compliance schedule for all facilities by one year to allow time to prepare for implementation.

The proposed assistance strategy for industrial pollution would focus on three broad policy reforms: (1) strengthening implementation and enforcement capabilities of the EEAA and other environmental enforcement authorities; (2) expand industry's capacity to assess, finance, and implement compliance investments; and (3) expand and improve public awareness. Progress in all three areas is necessary to attain acceptable compliance levels, reduce industrial pollution, and improve environmental quality.

Policy Measures

In order for the EEAA to initiate an effective environmental compliance program, several specific needs have been identified. The EEAA must develop a facility emissions inventory, prepare a list of violations, develop an enforcement strategy, and capabilities to conduct inspections and certify inspectors. The EEAA and the GOE, more generally, must make a commitment to recruit and train an adequate number of compliance program personnel and inspectors to deal with the large number of regulated entities and place these staff in offices at the national and regional levels as appropriate.

To foster compliance among facilities, a combination of incentives could be offered including rewards for voluntary compliance, reductions in tariffs and customs on pollution control equipment, development of "soft" financing capabilities in the National Environmental Protection Fund, and provisions for tax incentives to encourage development of domestic environmental equipment and service industries.

Approach

Key elements of the assistance program are anticipated to be assistance to the EEAA in developing a comprehensive compliance and enforcement program, creation of a joint EEAA/Industry working group to jointly review proposed pollution standards, develop violation codes, review compliance schedules, and assess financing needs, and a training and awareness program to prepare industry to assess technical options and undertake compliance investments. A number of complementary pilot projects are

proposed to demonstrate cost-effective environmental management approaches.

5.1.3 Municipal Solid Waste

Ineffective MSW collection and disposal has been identified as a major environmental and aesthetic problem in Egypt. As mentioned earlier, MSW services are either not provided or are plagued by frequent disruptions in collection or transport services due to equipment breakdowns and other factors. These flaws in MSW services contribute to a widespread littering problem, uncontrolled disposal in vacant lots, canals, rivers and lakes, and burning of waste piles in urban areas.

A combination of changes will be needed to solve Egypt's MSW problems. There is a basic need to improve awareness of the problem among households and businesses and to determine the types and quality of services for which customers are willing to pay. Also, appropriate regulations must be developed for a comprehensive MSW system and Egypt must deal with some of the chronic MSW problems such as identifying the best equipment to be used (lowest capital and O&M costs, given the functions of the equipment and diversity of working environments, improving maintenance programs to keep equipment operating, and exploring solutions to the transport and disposal weaknesses in current systems. Some of the problems with MSW systems could be addressed through private sector contracting, assuming adequate revenues can be raised to cover these firms costs.

Policy Measures

Even though MSW is a local problem, leadership in developing a comprehensive system of waste management and encouraging greater involvement of the private sector in providing MSW services must come from the EEAA and the GOE. To move to a more effective MSW management approach, the EEAA should develop Law 4/1994 Implementing Regulations covering all aspects of the solid waste cycle (especially standards for sanitary landfills), create and maintain a national data base of MSW operations, and establish the capacity to enforce MSW regulations. Some attention should be given to more hazardous wastes in the municipal waste stream such as medical wastes, spent batteries, and household chemicals. The EEAA should also assess the obstacles to cost recovery and greater role for private sector MSW service companies. To encourage greater private sector involvement, amendments to the public procurement law and tax and tariff incentives may be required.

Approach

While the assessment team has proposed an assistance program for MSW that identifies needed policy reforms and supporting projects, it believes that the USAID should first develop additional information on the demand for MSW services and the costs of providing these services before initiating the more comprehensive assistance program. Thus, the initial phase of assistance activities would concentrate on closing the information gap and helping the USAID prioritize MSW assistance activities. Initially, studies on measuring the willingness to pay for different types of MSW service, analyzing

the costs of alternative types of MSW services, and financing mechanisms and incentives would be undertaken. The more comprehensive program of MSW management reforms and technical assistance would include development of MSW management regulations including the establishment of standards for sanitary landfills, strengthening of implementation and enforcement capabilities, continued work on financing (from the first phase), and expanding the role of the private sector in providing MSW s.

5.1.4 Energy and Energy Efficiency

Egypt has made significant progress in removing subsidies in energy prices and switching to cleaner and more environmentally desirable fuels. The government's policy of substituting cleaner natural gas for liquid fuels has become an integral part of its energy development plan. The success of natural gas exploration has reduced environmental impacts and enabled Egypt to export a larger proportion of its petroleum products, thus improving its balance of payments. A five-fold expansion in natural gas pipelines and subsequent conversions to natural gas from other fuels has resulted in avoided emissions estimated as 4.4 mmt of sulfur dioxide, 270,000 tons of nitrogen oxides and 223 mmt of carbon dioxide (1).

National energy policy must continue to evolve to encourage additional development of the natural gas distribution network and renewable energy sources. Policy reforms to stimulate private sector investment and greater competition in the energy sector will reduce the costs of providing energy, thereby strengthening the competitive position of Egyptian businesses.

Egypt also has initiated efforts to develop a national energy efficiency policy. If Egypt can address many of the current institutional and market barriers to implementing energy efficiency investments, substantial benefits may be realized by end users. The estimated energy efficiency benefits that could be achieved through a comprehensive program may be as high as 5,244 GWh per year within ten years. This is equivalent to about 11 percent of the 1995/96 electricity sales in Egypt. No country in the world has achieved a sustained increase in energy efficiency without policy reform to encourage that improvement. Thus, a comprehensive program of regulations, incentives, and public awareness and education will be needed to realize the potential savings resulting from reduced energy use.

Policy Measures

To realize the full benefits of energy efficiency programs, the GOE needs to continue making progress toward a competitive energy sector. Although the creation of an independent regulatory authority and continued attention on restructuring and privatization of the energy sector fall outside of the EEPP, they are essential components of the GOE's energy sector reform program. The GOE also needs to make progress in the areas of policy and legislative reform for renewable energy and cogeneration. The major reform needs, for which EEPP assistance is recommended, concern continued work on a national energy efficiency policy, led by OECP.

Approach

The primary thrust of the assistance program would be concentrated on work with the OECP on components of the energy efficiency policy. The OECP has recently received a technical assistance budget of approximately \$3 million per year for five years, signaling the GOE's commitment to energy efficiency issues. This budget will only partly defray the costs of four components of the policy reform program for energy efficiency and technical assistance would allow the OECP to accelerate the development of the program. Technical assistance needs have been divided into three groups. The highest priority assistance would involve assistance to the OECP in developing the national policy and developing energy efficiency standards and energy efficient building codes. In addition, technical and possibly financial assistance would be offered to build capacity in equipment testing and labeling. Awareness and education programs and development of financing capabilities for energy efficient investments will also require technical assistance.

To the extent that there is interest, technical assistance would be provided to assist the GOE in developing renewable energy and cogeneration policies, developing renewable energy equipment certification and labeling programs, and strengthening incentives for converting diesel-fueled vehicles to CNG.

5.1.5 Environmentally Sustainable Tourism

Under the auspices of the Mubarak-Gore Partnership, considerable resources have focused on improving awareness and building capacity to manage and protect the natural and cultural resources of the Red Sea, its coastline, and inland areas. The USAID-funded EST project has assisted in the preparation of plans for protectorate management and tourism and infrastructure developments, financed the purchase and installation of mooring buoys, creation and training of a ranger program to patrol and police the new Red Sea National Marine Park, and cooperated with officials, business, and NGOs on programs to expand public awareness, train workers and businesses, and empower NGOs. Most important, from the perspective of sustaining environmentally sound development of the tourism sector, the EST program collaborated with officials, businesses and NGO in the development of a "Policy Framework for Developing an Environmentally Sustainable Tourism Strategy for the Egyptian Red Sea Coast" (2).

To build on these initial efforts in the Red Sea and promote environmentally sustainable tourism at the national level, Egypt needs to develop a long term strategy which is based on a set of policies which provide appropriate incentives to visitors and businesses to protect the resource base, encourages lead ministries and agencies to develop coordinated implementation plans for protection of the resource base, and includes a commitment to adequate staffing and resources to execute the strategy.

Policy Measures

The long range goal of the tourism sector should be to adopt policies and

implement programs that ensure that tourism development and practices promote the greatest sustainable level of benefits from the use of natural and cultural resource. A major step would be the drafting of an EST strategy component for the National Plan for Environmentally Sustainable Development, assuming the GOE pursues this recommendation in Chapter 6. In the short and medium term, a number of policy reforms should be taken. The GOE needs to expand protectorate status for coral reefs and take a more proactive anticipatory approach to other natural resources that could require protection in the future. Expansion of protectorate status needs to be complemented by strengthening of the institutions to protect and manage natural resources and cultural sites, with a commitment to provide sustained financing. The GOE needs to review the current structure of incentives for environmentally sound development and policies related to land development and planning and make appropriate policy reforms to ensure protection of the resource base. In the area of antiquities, the greatest needs appear to be the development of policies to facilitate adaptive re-use and private sector financing of restoration, and to provide for greater decentralization of site management that might include special protection designation and closer cooperation with the surrounding communities.

Approach

The proposed program for EST would continue many of the Red Sea Coast initiatives but would also shift the focus of EST from the Red Sea Coast to the national level. An important issue to be addressed will be financing options to support protection and site management activities. The EST assistance program also would be focused on strengthening incentives for environmentally sound development with technical assistance provided to help developers with resort planning and to analyze development policies and options for making them more environmentally sustainable. While the Red Sea EST program has focused some attention on cultural heritage issues (refurbishment and establishment of St. Anthony's and St. Paul's Monasteries as part-time tourist attractions), its primary thrust has been on protection of the natural resources of the Red Sea and its coastline. The proposed program would continue support for environmentally sustainable tourism in the Red Sea but shift some assistance to other natural and cultural resource problems, policies, and management issues

5.2 Overall Goals of the Assistance Strategy

The major goals of the assistance strategy are to promote the most efficient and highest sustainable use of natural resources and protect the environment of Egypt. While a program of policy reform could focus narrowly on reducing pollution through *end-of-pipe* controls, such an approach is very costly and unlikely to be sustainable. By promoting more effective use of natural resources (which leads to some immediate reductions in pollution levels, and emphasizing adoption of cost-effective approaches to pollution reduction) and fostering a better understanding of social, environmental, and economic values which are either conflicting or mutually reinforcing, Egypt will be able to address its environmental problems with the least impact on economic growth, and eventually develop its environmental services and manufacturing industry. The assistance program

will simultaneously promote the goals of sustainable development and environmental improvement.

5.2.1 Ensuring Sustainable Development

The overall goal of the USAID assistance program for Egypt is *broad-based sustainable development with increased employment and improved quality of life*. Sustainable development suggests a pattern of economic growth which ensures that future generations are no worse off than present generations in terms of the economic, social and environmental assets they possess and the living standards they enjoy (3). Sustainable development implies efficient utilization of natural resources such as energy, water, and land, as well as protection of the quality of these resources (including air). The environmental policy reform program should strive to improve the utilization of environmental and natural resources on a sustainable basis by promoting cost-effective solutions to pollution problems and incorporating principles of waste minimization, resource reuse and energy efficiency. Examples from individual sector programs include the following:

Development of renewable energy sources.

Utilization of waste heat and energy in cogeneration.

Changes in production processes and equipment specifications to reduce energy requirements, water use, and waste generation.

Improved planning of tourism developments to reduce environmental impacts and infrastructure needs.

Improved access to information to enable polluters to identify, finance, and implement least cost solutions such as pollution prevention measures, process changes, and end-of-pipe controls.

Analysis of economic, social, and environmental considerations in the tourism sector to identify growth strategies that maximize the environmentally sustainable value of the supporting natural resource base.

5.2.2 Promoting Environmental and Health Benefits

By focusing on policy reforms that will lead to environmental improvements and health benefits in priority areas, the USAID's assistance program resources will be utilized in an efficient and effective way. The environmental policy reform program will address those problems enumerated in the 1992 EEAP, which should result in significant health, and environmental damages (the EEAP is comprehensive rather than prioritized). In addition, the program focuses on protection of natural and cultural resources, one of the environmental priorities targeted for action in the Mubarak-Gore Partnership.

The USAID's *Strategic Plan for 1996-2001* includes three strategic objectives to promote environmental and health benefits. The USAID's Strategic Objective (SO) 6 is *Increased Access to and Sustainability of Water and Wastewater Services*. Policy reforms

for the industrial pollution sector support SO 6 by promoting improved enforcement of water quality standards, which would encourage facilities to connect to municipal wastewater treatment plants, or develop wastewater treatment capabilities at the facility or industry level. Improved management of industrial wastewater will result in health benefits to people who utilize drainage canals for washing and other purposes and economic benefits resulting from reduced treatment costs for downstream facilities and suppliers of water.

SO 7 - *Reduced Generation of Air Pollution and Select Related Contaminants* will be promoted by a substantial number of policy reforms that reduce air pollution and improve solid waste management. For example, emissions of particulate matter linked to respiratory illness will be reduced by switching to cleaner fuels after changes in the relative prices of natural gas and diesel or programs to promote CNG. Improved MSW waste collection practices, which eliminate burning of uncontrolled waste sites, will also reduce particulates. Finally, SpO D and the proposed SO 8 - *Tourism Resources Managed for Environmental Sustainability* is supported by policy reforms to improve and sustain the EEAA's capacity to manage and enforce protection measures in the Red Sea necessary to protect the condition of coral reefs.

5.3 Major Challenges and Crosscutting Themes of the Assistance Strategy

The policy reform program will focus on two major challenges: (1) overcoming the institutional inertia and barriers to the development and implementation of appropriate environmental policies; and (2) strengthening private sector incentives to use natural resources and the environment in a manner consistent with the principles of sustainable development and the *polluter pays principle*. In addition, there are a few crosscutting themes threaded throughout the program. These include an emphasis on public-private (and NGO) partnerships, systemic and comprehensive policy reforms as opposed to incremental or piecemeal changes, and strategic use of public awareness to reinforce policy reforms.

This section will provide an overview of the overall approach to policy reform recommended by the assessment team. For each area of policy reform, illustrative policy measures or milestones as well as supporting technical assistance are discussed.

5.3.1 Overcoming Institutional Inertia and Capacity Constraints

The most critical barriers to the success of the policy reform program are overcoming institutional inertia and capacity constraints among those units of government with responsibilities for setting environmental policy goals and implementing programs to ensure that polluters comply with requirements. Government institutions also play an important role in defining the conditions under which private sector firms may provide environmental goods and services. The policy reform agenda to strengthen government's enabling role in improving the environment includes the following reforms: (1) clarify roles and responsibilities for implementing and enforcing environmental regulations and guidelines; (2) expand staff and supporting resources; (3) develop data bases required to

manage the environment and natural and cultural resources; (4) adopt or expand the use of analytical tools; and (5) sustain financing for environmental and natural resource management.

Clarify Roles and Responsibilities for Implementation and Enforcement

During the assessment, many officials, donors, NGOs, and industry representatives emphasized the confusion over the respective roles of various ministries, the RBOs and the EMUs in the governorates in implementing and enforcing environmental regulations. It is critical that a clearer policy be developed to define relationships and lines of authority on enforcement. In view of the number of ministries which have authority over the various enterprises comprising the regulated community, this policy should be developed at the level of the Prime Minister to facilitate creation of enforcement capabilities and enable government units to identify resource needs, prepare enforcement strategies, and coordinate the development of an inventory of facilities and disseminate information to these facilities pertaining to their environmental requirements.

Responsibilities for implementation and enforcement of solid waste management regulations must be clarified. Roles and responsibilities for implementation and enforcement should be different for solid waste than for air and water standards because the municipality will typically have a much greater role in solid waste management. Depending on the extent of private sector involvement in MSW services, the municipality could be either the regulator or regulated entity. Also, much of the “enforcement” for MSW relates to certification of landfill design. If private companies provide MSW services under contract with the municipality, provisions for self-monitoring can be incorporated into contracts.

In tourism development on the Red Sea coast, closer coordination between the EIA process and the land development process is needed to ensure environmentally sound development practices are followed. Policy reform should focus on better integration of environmental considerations at the development phase to mitigate potential impacts identified during the EIA process and development of monitoring requirements during construction and later during operation.

Expand Staff and Supporting Resources

Given the size of Egypt and the large number of facilities subject to environmental regulations, there is a disproportionately small number of skilled staff involved in implementation and enforcement activities. High priority needs include recruitment and training of staff to implement the industrial compliance program; expansion of Ranger staff to patrol the protectorate areas of the Red Sea; and development of capabilities to enforce solid waste requirements.

Develop or Update Databases Required to Manage Environmental, Natural and Cultural Resources

Information and database management plays an important role in effective policy

formulation, implementation, and enforcement. For example, the EEAA is developing a database of ambient air and water quality data with assistance from Danida. Additionally, the EEAA needs to create inventories of industrial facilities subject to environmental requirements and a database on municipal solid waste facilities, information, and statistics. For industrial facilities, the facility inventory must be coordinated with a number of ministries, which may already have substantial information about industrial facilities (e.g., MPWWR, MHUUC). This inventory is required to implement a compliance program and to determine staffing needs.

Effective management of cultural and natural resources requires that an inventory of these resources be maintained. The SCA last updated the list of antiquities in 1952. The list needs to be updated to add recently discovered sites and delete sites that have been destroyed from the list. For each site on the list, an assessment of condition and restoration and management needs should be carried out. A similar assessment should be carried out for marine and terrestrial natural resources. For selected natural resources, the assessment should focus on current condition and stresses and provide an estimate of the carrying capacity of the resource on a sustainable basis.

Adopt or Expand Use of Analytical Tools

Egypt's use of analytical tools in environmental management is in its infancy. The primary tool that has been adopted is the use of EIAs, conducted at the facility or development level. The EIA process has a number of deficiencies that, if corrected, could improve the EEAA's ability to use the EIA process to afford wider environmental protection. EIA reforms should include flexibility to conduct EIAs for larger developments (e.g., resort developments) and expansion of the review process to allow for local government and public participation in the review process, and development of a certification program for EIA consultants.

As Law 4/1994 is increasingly enforced, both enterprises and municipalities will need to collect, maintain and submit to authorities accurate environmental data. Commercial laboratories will perform the bulk of these analyses. Development of a certification program for commercial analytical laboratories will ensure laboratories are generating environmental data within acceptable limits of accuracy. Accurate environmental data will provide another tool for evaluating industrial performance efficiency or may be used to drive enforcement actions.

There are a few other analytical tools that could play an important role in environmental management. For example, a number of countries in CEE are developing capabilities to estimate compliance costs. Use of these cost methodologies allows environmental agencies to establish realistic compliance schedules for specific industries. In Law 4/1994, uniform compliance dates have been proposed regardless of the size of the facility or the complexity and diversity of pollution sources. Economic tools such as benefit/cost analysis and willingness-to-pay surveys can provide valuable input into the policy formulation stage.

Secure Sustainable Financing for Energy, Environmental and Natural Resource Management

Closely related to the need to recruit and train staff to implement and enforce energy and environmental regulations is the need to identify appropriate sources of revenues to fund these activities on a sustainable basis. Generally, most staff requirements are financed out of agency or ministerial budgets. However, there is limited flexibility in the budgeting process to allow for substantial changes. Typically, agency budgets will increase or decrease minimally from year to year. However, for some types of agency programs, such as the Red Sea coast ranger program, there may be alternative sources of financing that could be mobilized more rapidly than through general revenues.

The USAID and other donors have helped initiate environmental management programs by financing staff and equipment costs for new offices in agencies such as the EEAA. These catalytic activities can demonstrate the value of regulatory programs but need to be sustained. Donor support needs to be phased out and responsibility for funding shifted to the agency.

5.3.2 Strengthening Private Sector Incentives

Expand Participation of the Private Sector in Managing Natural Resource and Providing Environmental Services

As pointed out in the Introduction, reforms are needed to improve the private sector's provision of goods and services and to strengthen incentives for polluters to protect the environment. There are many sectors such as power generation and MSW management that are either dominated by or are the exclusive domain of public sector enterprises or government. It is generally recognized that managers and workers in the public sector lack the incentives their counterparts in the private sector have to minimize production costs and provide goods and services of high quality. Public sector enterprises can compete with private sector firms only because of subsidies in input markets, preferential access to natural resources, exclusive contracts to provide goods and services to other public sector enterprises, or legal restrictions barring private firms. The environmental policy reform program for energy, and municipal solid waste, emphasizes reforms to allow private firms to participate in the provision of energy services and for greater contracting of MSW services from private firms. As noted in Chapter 2, one of the critical requirements for Egypt to reach and sustain higher rates of economic growth is to increase investment rates from their current level of 16 percent of GDP to more than 20 percent. Reforms to improve private sector access will benefit the environment and provide new investment opportunities. In addition, they allow governments to reduce public sector financing while simultaneously expanding their revenue base.

A number of policy reforms have been identified that would expand private sector participation in the energy sector: restructuring the energy industry to commercialize operations at all levels (i.e., production, transmission, and distribution), preparation of a renewable energy framework, providing incentives to help develop a domestic energy services industry, and development of policies and tariff rates for selling energy resulting from cogeneration.

In MSW management, the nepolicy reform would involve the development of administrative procedures to enable municipalities to procure private sector MSW services. Simultaneously, municipalities need to expand revenue potential enabling them to pay for

private sector MSW services.

Promote Efficient Use of Natural Resources

The adoption of energy efficient practices, or use of energy efficient appliances and equipment will usually yield both economic and environmental benefits. To the extent that energy savings associated with energy efficient equipment exceed their annualized costs, users of energy efficient equipment will reap economic benefits. In addition, depending on the type of fuel burned by the facility or at the power plant that provides the electricity, adoption of energy efficient approaches will also result in reduced air pollution.

Specific policy reforms to promote energy efficiency include development of a national certification and labeling program for water heaters, air conditioners, and other appliances; policies and related legislation to stimulate cogeneration; the development of voluntary or mandatory efficiency standards; a directive to encourage or require utilities to undertake demand side management; educational reforms to train engineers and equipment technicians about using and maintaining efficient equipment; and creation of an energy information data base.

In the development of resort and hotel complexes, there is potential to minimize the cost of water and energy consumption and solid waste and wastewater management through incorporating environmental design and engineering practices. Policy reforms would include modifications in building codes and construction codes of practices, introduction of covenants for environmentally sound practices in development plans, and incorporation of environmental design and engineering methods into engineering, architecture, and technical education curricula.

Promote Better Environmental Performance Among Polluters and Developers

To achieve significant improvements in environmental quality, government must send the correct messages to polluters. The commonly held view in OECD countries, embodied in the *Polluter Pays Principle*, is that polluters are responsible for controlling emissions and discharges to levels deemed acceptable to the public. While moral persuasion, and awareness and education campaigns, can yield modest improvements in the environmental performance of firms, the government's role in articulating and enforcing polluters' requirements is central to environmental quality. The policy reform program acknowledges the key role of the government in asserting the "polluter pays principle" and includes reforms to strengthen institutional capabilities designed to improve compliance with environmental regulations. However, the institutions that implement and enforce environmental requirements are currently one of the greatest potential barriers to the private sector adopting environmental controls, because the government is not creating the "demand" for environmental controls due to lack of enforcement. As such, polluters are unlikely to respond to environmental regulations or to require assistance for implementing compliance action plans. Thus, as the USAID develops the policy reform program, priorities early in the program should focus on governmental assistance to strengthen capabilities to implement, and enforce requirements, coupled with technical assistance to industries on achieving compliance in a cost effective manner. Such an

approach will be vital to the success of technical assistance to the private sector.

Examples of policy reforms: (1) stimulate changes in CNG use, review the CNG conversion strategy, the role of duties on CNG conversion equipment in deterring conversion, and the value of a public awareness campaign; (2) adoption and enforcement of remediation requirements for degraded shoreline conditions associated with landfilling and other modifications of the shoreline; (3) correction of incentives that encourage rapid development and preclude adequate time to assess environmental impacts and design for environmental sustainability; and (4) development of a compliance and enforcement program combined with private sector assistance in compliance planning and voluntary programs.

Facilitate Access to Financing for Energy Efficiency and Environmental Investments

Industry compliance with environmental requirements will be facilitated by reducing barriers in capital markets for securing financing for energy efficiency and environmental investments, improving access to financial analysis capabilities, and removing tariff and non-tariff barriers on the importation of energy efficient and environmental equipment and technology. Correcting capital market failures and distortions in incentives for industry are critical to execution of the policy reform program.

Policy initiatives could include support for compliance financing for industrial polluters. Specific needs include access to information on financing options, training in financial analysis and cost recovery, and creation of financing facilities to provide gap financing for SMEs and specific industrial sectors for which compliance costs are likely to be large.

Other policy reforms would include development of financing options for CNG conversion and the incipient energy performance contracting industry, creation of energy efficiency financing mechanisms, and development of private equity funds to support development of a domestic environmental controls manufacturing industry.

The National Environmental Protection Fund could play a catalytic role in financing environmental compliance investments. However, some policy reforms would need to be introduced to facilitate Fund involvement.

5.3.3 Crosscutting Themes

Three crosscutting themes are represented in the policy reform program. These include; (1) the use of public-private partnerships to overcome inertia, insure cost-effectiveness and high rates of compliance; (2) emphasis on systemic and comprehensive policy reforms; and (3) the value of complementing policy reforms with public awareness and education programs.

Foster Public-Private Partnerships

Partnerships between the public and private sectors can provide a mechanism for

identifying solutions to environmental problems that might not be possible if the government makes decisions in isolation. In addition, by bringing the private sector to the table, government may be able to secure a greater commitment from the private sector to implement measures that have been mutually agreed. One of the difficulties that governments face in developing regulatory programs is limited access to information about polluters. By involving the private sector, the burden of collecting information can be shifted from government. An example of public private cooperation is the regulatory negotiation process (“RegNeg”) which the US Environmental Protection Agency (USEPA) uses to reach agreement on difficult regulations. By bringing industry and environment groups to the negotiating table, the USEPA is often able to avoid costly litigation and identify more cost-effective regulations.

Several opportunities exist for public-private partnerships in facilitating environmental policy reforms in Egypt. One of the major reforms to improve industry's compliance with Laws 4/1994, 48/1982, and 93/1962 is the development of a compliance and enforcement program for the EEAA. It is recommended that the development of codes of violation and the enforcement program be carried out as a collaborative effort involving the EEAA, industry groups and NGOs. Industry would provide knowledge of emissions and discharges, production processes, and the amount of time and resources that may be required to comply with the EEAA regulations. Given the EEAA's limited resources to develop and implement standards, this cooperation could result in higher rates of compliance combined with reasonable compliance schedules. A similar collaborative effort between equipment and appliance manufacturers and the GOE is recommended to develop energyefficient appliance and equipment codes and standards.

A second opportunity for public-private cooperation is the development of an adaptive reuse policy by the SCA. Adaptive reuse provides a mechanism for mobilizing private sector resources to defray the costs of restoring cultural sites. Adaptive reuse projects will generate revenues for the cultural site over and above revenues collected from visitors. Adaptive reuse also provides a way to involve the surrounding community in the protection and management of cultural sites. This cooperation can potentially lead to a greater local commitment to the protection of the cultural sites from adverse community impacts, particularly if the cultural sites, through adaptive reuse and restoration, yield benefits to the local community.

The coral reefs in the Red Sea have already benefited from close cooperation on protection measures between the EEAA, the TDA, the Red Sea Governorate, businesses, and NGOs. This public-private partnership should be sustained and is a key element of the Policy Framework for the Red Sea coast. Workshops and conferences involving these partners provide fora for discussing and solving the problems facing the coral reefs. In addition, if USAID assists the EEAA and its partners in conducting a financial needs assessment for protecting and managing the Red Sea coast, cooperation could help identify self-enforcing mechanisms and other options for using EEAA staff as efficiently as possible. The public-private partnership in the Red Sea could serve as a model of cooperation for other tourist destinations where natural or cultural resources could be threatened by high visitation rates or impacts from development.

Another opportunity for closer cooperation is a public-private partnership between the TDA and developers. Through its role of managing land contracts with developers of resort properties on the Red Sea coast, the TDA could encourage greater environmentally

sound development. Two projects have been identified to stimulate better environmental planning: a technical assistance program to pair developers with an advisor who has experience in environmental design and engineering; and a project to explore ways that the TDA or the GOE could stimulate environmental planning among developers.

In the field of municipal solid waste, public-private partnerships could be forged to improve collection rates and to clean up uncontrolled waste sites. A program involving municipalities, NGOs, businesses and solid waste service providers could be established to try to solve some of the problems in the MSW collection system and to improve service in some neighborhoods. The EEAA could complement this effort by formalizing a contest between communities to improve collection rates and promoting successful approaches in public awareness information. In addition, there are opportunities for public-private partnerships to plan new land uses in areas that have become informal or uncontrolled dumpsites and to conduct clean-up campaigns. One example would be to develop the banks of canals as gardens or open areas, remove garbage that has been dumped into the canals, and make arrangements for alternative disposal in the neighborhood adjacent to the site.

Many developed countries have successfully implemented voluntary public-private partnership programs for reduction of industrial emissions. These "Challenge" programs, administered by the government and embraced by the industrial sector, encourage industry leaders to use their initiative to reduce their pollution discharges in a cost-effective manner. As enforcement systems become effective, the Challenge program can continue to provide a focal point for industries that choose to lead Egypt on environmental matters.

Most of these partnerships require only a commitment from the parties to cooperate and some technical assistance. However, to augment training and technical assistance activities that foster public-private partnerships involving the SCA and the TDA, two policy measures might be considered: (1) the SCA develops policy on adaptive reuse and implements a number of demonstrations; and (2) the TDA offers to extend the three-year development period in return for improved resort planning to protect the environment.

Encourage Systemic and Comprehensive Policy Reforms and Management

This theme recognizes the need to address policy reform at the level, which can lead to the greatest changes in performance. Often incremental changes may be easier to achieve but in the long-run yield more limited benefits and results, and in many cases, these incremental changes are more difficult to sustain without the fundamental, systemic policy reform. Preparation of environmental management systems at the municipal level and adoption of comprehensive regulations covering all aspects of solid waste management are examples of policy reforms that are systemic or comprehensive in scope.

Over the course of the assessment, many examples of inefficient natural resource utilization have been identified, often directly contributing to excessive levels of pollution or environmental degradation. In most cases, these problems stem from an incentive structure that either discourages or does not reward efficient use of natural resources or the environment. The GOE's decision to provide subsidies for water, land and other strategic inputs, and tax holidays for businesses and investors, is predicated on its desire

to stimulate economic development, encourage development of natural resources for tourism, and open up new land to agriculture. At present, the GOE lacks a process for evaluating national economic policies and programs in terms of the extent to which they promote development that is sustainable. Creation of a National Plan for Environmentally Sustainable Development would provide a first step in integrating the principles of sustainable development into national (and regional) planning. As part of this effort, the GOE would establish criteria for evaluating policies in terms of their adverse impacts on the environment and implications for resource use and conduct an analysis of the likely long-range implications of current policies. The plan would also establish a process for conducting inter-ministerial reviews of sector plans and policies and would be linked to the EIA process.

At the present time, a comprehensive set of national standards and enforceable regulations does not exist to guide management of municipal solid waste. Standards should cover all aspects of the process from the time the solid waste is collected until final disposal. These regulations should cover household, medical, industrial, and construction and demolition wastes. The development of a comprehensive system of regulations and management of solid waste would provide a solid foundation for municipal and regional solid waste management plans, and a better guide for the development of specific solid waste initiatives such as recycling centers, composting plants, or efforts to address troublesome uncontrolled dumping and burning of wastes.

There are a number of opportunities for improving Egypt's utilization and development of energy resources. Three key policy reforms are: (1) to develop renewable energy resources; (2) to improve utilization of waste heat by encouraging cogeneration; and (3) to encourage energy efficiency. Each of these policy reforms requires a wide array of simultaneous and coordinated changes in legislation, regulations, and institutional capabilities. For example, an independent regulatory authority, once it is functioning fully, would oversee implementation of these strategies. Thus, the assessment team has recommended that development (or strengthening) of strategies enumerating the full slate of policy changes required to meet the goals of improved energy utilization is the most effective and catalytic approach available.

Another policy reform involving development of a national strategy concerns the management of antiquities. The purpose of the strategy would be to assess the value of the antiquities in terms of their importance to the tourism sector, the potential impacts on tourism if antiquity sites continue to degrade, and the potential for increasing tourism if the antiquities were better managed. The strategy would cover issues such as prioritization of restoration and protection requirements, special management approaches for antiquity sites such as Luxor and Medieval Cairo, long-range staffing and financing plans, and policies concerning adaptive reuse. The development of this strategy would help assure better targeting of donor assistance as well as lead to improved management of antiquities.

Parallel to development of a national antiquities strategy, policy reforms should also focus on developing a national strategy for environmentally sustainable tourism. The strategy framework which has been developed for the Red Sea coast through the cooperation and collaboration of government agencies, business interests, NGOs and the USAID-funded EST project could serve as a model for a National Strategy. Key issues that would be covered in the strategy would include: an assessment of natural resources,

their quality and carrying capacity; improved capability to forecast tourism demand in Egypt; and development of protection and management programs.

The concept of Environmental Management Systems (EMS) is gaining support among industries in the US and Europe. An EMS approach allows companies to plan for compliance in an integrated way that often results in lower compliance costs. By extending the EMS concept to the municipal level, additional economies of scale may be exploited, particularly for developing capacity to manage industrial solid waste and wastewater. Egypt's industrial cities provide an appropriate scale for developing a municipal-wide EMS. Such an approach could lead to higher rates of compliance than could be expected if industry meets their compliance targets one standard at a time.

The development of the strategies and comprehensive regulatory programs discussed above can readily be linked to policy measures, which would facilitate the transfer of cash to institutional partners. Suggested policy measures include the following: the MOEA develops National Plan for Environmentally Sustainable Development; the EEAA adopts comprehensive municipal solid waste management regulations including landfill and transfer station standards; the OECP strengthens and then implements the national energy efficiency strategy; and the SCA develops a national strategy for protecting and managing antiquities and cultural sites.

Support Policy Reforms with Public Awareness and Education Programs

Establishing broad-based awareness among a diversity of public or stakeholder target audiences is critical to achieving substantive policy reform. As a starting point, public awareness should be viewed in the context of behavioral change, not simply as an informational mechanism intended to sensitize the general public to the importance of something called environmental reform. All public awareness campaigns or programs should have measurable objectives that can be reached by determining and increasing awareness levels that lead to, and result in, attitudinal and behavioral change.

In addition, public awareness campaigns, if they are to be effective, should be considered an integral part of policy reform, with programs designed and implemented from the outset in concert with the various sector efforts, whether they be the development of national standards and enforceable regulations for municipal solid waste management, convincing companies to plan for compliance through adoption of EMSs, or developing a national strategy for management of antiquities. Treating public awareness as merely a useful program component added in mid-stream or tacked on after the development of technical approaches is a recipe for failure of the overall program, as well-planned public awareness campaigns form constituencies, supporters, proponents that in themselves can provide the momentum for progress.

Public awareness programming will take many forms and be tailored for a diversity of audiences. In solid waste management, for example, reform could begin by selecting pilot urban neighborhoods for waste deposit in strategically positioned receptacles where the waste would be collected or taken to a newly established landfill by a private sector company. One or more active NGOs would participate in an awareness campaign that could include: community meetings; the availability of plastic garbage bags carrying the program logo; posters in stores and central locations; print brochures which, like the

posters, could be designed for a low-literate audience; and the selective use of mass media to highlight the effort for replication by other communities as the program is expanded, and to provide the area with the added benefit of community pride.

The mass media could use community efforts as an example for the nation, as a whole, with a series on the importance of responsible waste collection, storage, transportation and disposal.

Solid waste management provides an example of the potential for public awareness efforts to cut across sectors. For example, in Old or Medieval Cairo, the health and quality of life, benefits for the community could include the additional dimension of antiquities preservation. Historically significant buildings and monuments would be helped in retaining their structural integrity and be that much more attractive to the tourists who might otherwise be hesitant to visit an area marked by the more visible signs of squalor.

Additionally, governorate and national GOE officials, as well as the private sector companies responsible for the collection and the new landfill could be involved, standing side by side with community leadership of varying economic backgrounds. Credit for progress could be shared by all. To avoid the pitfalls of a bells-and-whistles media “splash” with no follow up, emphasis on sustainability could be implemented by the community's establishing a permanent area or neighborhood Citizens' Environmental Council with a rotating board of directors, a mission statement and clearly defined short- and long-term objectives that might well find the council addressing additional areas of environmental concern.

A well-publicized, effective solid waste management effort would likely have a spin-off effect in other locales, raising consciousness and concern, and motivating community action even in those areas without access to a landfill where leaders or NGOs could search for alternatives for the safe removal of unsightly health hazards from their streets.

Educating industries and companies on the validity of the EMS concept presents another example of the diversity of target audiences and the need for different approaches. In this sector, public awareness could include: seminars and workshops sponsored by city chambers of commerce or professional associations; on-site visits to companies that have adopted the EMS approach; direct mail campaigns; articles in leading print media, including the major daily publications and the business magazines; a business-oriented panel or talk show on regional television, among other possibilities.

In these and other areas, public awareness program planners will consider a wide range of possibilities and make recommendations as appropriate. For example, in energy efficiency the distribution company staff that goes door-to-door to collect electric bills could serve as educators, delivering verbal messages as well as brochures to the customers. In this example, the collectors would receive customer relations training, as would central office staff to enable them to work with their publics more effectively. This “hands on” approach could be supported by radio and television spots with tips on energy-saving techniques.

Appliance and equipment labels are another useful public awareness tool to educate consumers about the energy efficiency and other environmental aspects of different types

of appliances and equipment. In any countries, labels have been shown to be an effective part of campaigns to increase the overall efficiency of equipment available in the market.

The first crosscutting theme, “Foster Public/Private Partnerships” cited the benefits of public/private sector cooperation in the efforts to protect the coral reefs in the Red Sea. Again, this experience is another example of a public awareness approach that could help sustain the effort through workshops and seminars with a limited and well-defined target audience. To address a wider area of environmental concerns, the sustainable tourism effort could consider a user or Red Sea tourist education campaign to raise awareness and help the visitor, whether from overseas or Egypt, adopt environment-sensitive behavior practices that range from proper solid waste disposal to protection of the reefs.

As noted earlier, while the possibilities are numerous, specific recommendations for public awareness approaches will be presented in a separate, forthcoming document.

5.4 Assistance Tools for Implementing the Policy Reform Program

A variety of assistance tools can be utilized to support or catalyze the environmental policy reform agenda. **Technical assistance** can be divided into five types of activities: policy promotion and analysis; institutional strengthening; training; public awareness; and project preparation. Policy promotion and analysis often involves undertaking studies, assessing policy reform options, or assisting in the development of strategies or plans, development of legislation, regulations or procedures. Institutional strengthening usually will entail close cooperation, or side-by-side advising, by experts with staff in the recipient institutions. Institutional strengthening may also involve review of management approaches and procedures, budgeting, procurement, monitoring, etc. Training covers a broad array of mechanisms for transferring skills to companies, agency staffs, NGOs, and the public. Public awareness involves the dissemination of information to the public or targeted groups. Project preparation assistance may cover activities such as least cost compliance planning, identification of financing, preparation of technical feasibility studies and cost recovery plans for environmental investments.

The USAID has limited methods available for providing **financial assistance** to partners. Financial resources are disbursed in the form of grants, deposited into an interest bearing account. The USAID and its assistance partner negotiate the amount and conditions, under which part or the entire grant is disbursed, but typically, substantially more resources are made available through cash transfers than through technical assistance. In Egypt, the USAID has previously tied grant disbursements in various sector reform programs to a series of policy reform measures taken by the recipient country. This approach will be followed as part of the USAID's environmental sector reform program. Once the USAID makes a disbursement, the grant proceeds must be used to service Egyptian debt to the US, or to purchase goods and services from US vendors. Proceeds from commodity sales are deposited in a specific local currency account in the Central Bank of Egypt. Although this account is under the control of the Ministry of Finance, the USAID intends for account balances to be made available to counterpart ministries and agencies to support environmental programs. Thus, the USAID can provide financial assistance to counterparts in response to measurable progress in introducing environmental policy reforms.

The policy reforms that have been described earlier in the chapter, and are further elaborated in Chapters 6 to 10. They involve a mixture of technical assistance components in combination with proposed policy measures tied to cash transfer, in most cases. As the assessment team has developed strategies to promote the policy reforms, several criteria have been considered in the packaging of assistance activities. These criteria are presented and briefly discussed below.

- ***Potential for sustaining institutional capacities which are provided initially through technical or financial assistance.*** As the USAID develops its assistance strategy and the use of technical and financial assistance to help build capabilities, it should also develop a “graduation” plan, indicating how the GOE will sustain these activities initiated by the USAID. Graduation plans may be formalized as policy measures or simply include a list of conditions that the counterpart must meet before new assistance activities are initiated. Priority for assistance in capacity building should be given to those opportunities, which afford the greatest likelihood that, the assistance efforts will be continued by the counterpart.

- ***Catalytic effects of demonstrations.*** Demonstrations should be evaluated in two ways: (1) they should address a measurable environmental problem and result in environmental, health, or economic benefits; and (2) they should play a catalytic role, leading to similar efforts or encouraging counterparts to make policy reforms that will encourage enterprises or governments to replicate the demonstration. Demonstrations need to be conducted at the appropriate scale and cost; if they are perceived to be too costly, the potential for replication will be more limited.

- ***Leveraging of GOE and donor resources.*** One goal of the assessment has been to identify other activities initiated by the GOE or other donors. The USAID assistance should be coordinated with other donors to capitalize on ongoing activities or previous experience. For example, the USAID may focus its support activities on providing background policy analysis while other donors assist in training or institutional strengthening required to implement the reform.

- ***Mixed portfolio of assistance activities spanning short and medium time frames.*** Given the five-year time frame for the USAID's environmental policy reform assistance program, a mixture of short and medium term initiatives should be considered. While some policy reforms may be promoted in the short term, others will require an initial assistance effort to demonstrate the need for the policy reform or to provide appropriate background analysis or develop options.

- ***Timing, acknowledgment of preconditions, sequencing of and linkages between individual program elements.*** The use of technical assistance and cash transfers must be planned strategically to identify critical barriers that impede progress, set intermediate targets that should be met before follow-up activities are initiated, and to ensure proper coordination.

- ***Use of evaluative tools (attitude and willingness-to-pay surveys) to refine and direct future activities.*** As the USAID considers expanding assistance into new environmental sectors, some preliminary analysis can be undertaken to assess needs

or potential for success.

References

- El Banbi, H., Minister of Petroleum, *"Growing Energy Needs of Emerging Economies: Challenges and Ambitions. Arab Republic of Egypt"*.
- Environmentally Sustainable Tourism Project, June 1997. *"Policy Framework for Developing an Environmentally Sustainable Tourism Strategy for the Egyptian Red Sea Coast"*.
- Markandya, A., September 1996. "Sustainable Development and Economic Transition in Russia: What Issues? What Agenda?" Presentation at conference entitled *"The Environment in the 21st Century: Environment, Long-term Governance and Democracy"*, Abbaye de Fontevraud, France.

Chapter 6

Institutional and Legal Reforms to Complement Sectoral Programs

A number of institutional and legal reforms are critical to the success of the environmental policy reform program in Egypt. Despite the progress made in enacting Law 4/1994 and in establishing the EEAA and more recently the new MOEA, the GOE has yet to fully establish its credibility in environmental management either with the Egyptian public or with the international community. The true test in environmental management comes not with enacting Law 4/1994 and its Executive Regulations but with implementing and enforcing them. After all, the failure of Laws 48/1982 and 93/1962 to prevent or control widespread water pollution is vivid evidence of the particular challenge that implementation and enforcement pose to effective environmental management in the Egyptian context.

To address these issues and to complement the policy reforms of the particular sectoral programs described above, the USAID's environmental policy reform program should concentrate on three broad institutional and legal reforms:

Strengthen Environmental Management at the National Level. That is, address the root resource, capacity, and inter-institutional constraints that have prevented effective environmental management in the past.

Decentralize Core Environmental Management Functions to the Local Level. That is, delegate implementation and enforcement of environmental programs to the level of government closest to the problems.

Strengthen the Legal/Regulatory Framework for Environmental Management. That is, remedy the remaining weaknesses and jurisdictional conflicts in the existing legal/regulatory framework.

Each of these broad policy reforms consists of several, more narrowly focused policy components. The components each have an appropriate policy measure, which will allow the USAID to monitor progress in achieving the broad policy reform. For each component as well, the USAID has a mix of recommended assistance tools, including cash transfer and various forms of technical and financial assistance, to promote the policy reform and support necessary action by the GOE. These assistance tools and the criteria considered in recommending them were discussed in Chapter 5. The institutional and legal policy reforms, the policy measures, and the recommended assistance tools are summarized in Table 15 and discussed in more detail in the following sections. The types of technical assistance recommended are described in more detail in the project profiles contained in Annex C.

6.1 Strengthen Environmental Management at the National Level

The first policy reform requires the GOE to consolidate environmental management at the national level. To date, the government has not mustered the financial resources, technical personnel, or the political backing to provide credible environmental management. This reform is designed to demonstrate the government's commitment to the environment at the highest levels in terms of national development planning, budgetary resources and technical capacity, and political clout for overcoming ministerial coordination problems at the national level. It comprises four components: (1) ensuring incorporation of environmental considerations into national development planning; (2) strengthening capacity in existing environmental institutions; (3) institutionalizing mechanisms for inter-ministerial coordination; and (4) disseminating environmental information to the public.

6.1.1 Ensure Incorporation of Environmental Considerations into National Development Planning

As noted in Chapter 3, despite high-level policy statements and political rhetoric, there is little evidence that the GOE is incorporating environmental considerations into its national development planning. The wholesale development of the Red Sea coast and the New Delta Project are but two indications that either the political will, or the technical capacity, or both, for environmental analysis is lacking in national planning institutions. One way to remedy this situation is to prepare a plan for sustainable development that incorporates economic, social, and environmental considerations into Egypt's national development strategy. Not only should this plan assist in charting Egypt's development in the 21st century but also ideally it should institutionalize a process for national development planning that would ensure the routine consideration of environmental concerns.

To summarize, the policy measure for this component would be the preparation and adoption by the GOE of a National Plan for Environmentally Sustainable Development. The tools that the USAID would use to promote this policy reform would consist of both technical assistance to support the MOEA and other national institutions in preparation of the National Plan for Environmentally Sustainable Development and a cash transfer once the policy measure is met.

Preparation of the national plan would require technical expertise in specific areas where it is needed, such as environmental and developmental economics, poverty and social sector analysis, or long-range planning. This assistance would be needed to prepare background studies, perform policy analyses, and provide other support needed for elaboration of the plan. The specific areas of support would be determined by the MOEA and the EEAA. This technical assistance would be designed to leave sustainable planning capacity in the relevant national institutions as well as leverage donor resources in these institutions and in future development projects.

6.1.2 Strengthen Capacity in Existing Environmental Institutions

Although the national budget was not available for review by the EESA team, a

reasonable assumption, based on the anecdotal information available, is that budget allocations for environmental management taken as a whole are extremely low. This is true even for a country at Egypt's stage of development. Furthermore, the disparity in budget and personnel allocations, among institutions with environmental management responsibilities, is remarkable. For example, the new MOEA's budget and personnel allocation in no way compares with those of the MPWWR, the MOHP, or the MALR, and yet the MOEA's environmental responsibilities under Law 4/1994 are in many ways more far-reaching than the environmental functions of the other ministries. The EEAA, with approximately 200 personnel on staff or under short-term contract, has yet to reach the number of personnel, between one thousand and fourteen hundred, originally allocated to it. By mid-August 1997, the EEAA learned that it had been authorized to hire another 100 staff members. In order to establish its credibility on environmental management with the Egyptian public and the international community, the GOE will have to increase its national budget allocations for environmental management and take steps to rationalize budget and personnel allocations for environmental management across all institutions of government.

To summarize, the policy measure for this component would be a two percent annual increase above inflation in the budget allocation for environmental management (based on the budgets of the MOEA and selected ministries) in the national budget of the GOE.

To promote this policy reform the USAID would use tools consisting of an annual cash transfer once the policy measure has been met, coupled with technical assistance to build capacity in selected national institutions in the first and second years of the program.

The cash transfer to the MOEA would take place once the annual budget, including the two percent increase above inflation, has been approved by the GOE. The cash transfer may go directly into the Environmental Protection Fund to support the MOEA's activities.

Since the EEAA is already receiving as much capacity-building assistance as it can reasonably absorb, from Danida for the EEAA itself and from the Japanese International Cooperation Agency (JICA) for the RBOs, the USAID's technical assistance would be used to build capacity in selected national institutions other than the EEAA (Annex C, LEGAL 2). The MOEA and the EEAA would identify those national institutions with environmental management functions essential to supporting the overall mission of the MOEA and EEAA and provide them with technical assistance to strengthen their capacity to perform these functions effectively, and consistently, with the policies and programs of the MOEA and the EEAA. Potential candidates might include the MOHP in environmental health, the MPWWR in water pollution control, the MHUUC in waste management, the MALR in resources management, the MIMW in industrial pollution, the MOI in enforcement, the Ministry of Tourism in environmentally sustainable tourism development and the MOP in energy and energy efficiency. The technical assistance would be in the form of strategic planning, program development, training, and other capacity building provided by a team of international and local consultants. This technical assistance would be designed to strengthen sustainable environmental management capacity in the relevant national institutions as well as leverage donor resources in these institutions.

6.1.3 Adopt Effective Mechanisms for Inter-ministerial Coordination

As noted above, under the current institutional framework for environmental management, a number of national institutions besides the EEAA perform important environmental management functions. Close coordination between the EEAA and these institutions is critical if the EEAA is to ensure that these institutions carry out policies and programs in support of, or at least consistent with, those developed by the EEAA. However, despite the critical nature of this coordination, there are few, if any, formal mechanisms (e.g., inter-ministerial agreements, work groups, or committees) other than the EEAA Board of Directors for ensuring this coordination. To remedy this situation, the EEAA should take steps to enter into agreements, establish bodies, or identify other appropriate mechanisms to secure inter-institutional collaboration and coordination.

To summarize, the policy measure for this component would be the establishment by the MOEA of appropriate mechanisms (e.g., agreements, work groups, inter-committees) for ensuring its cooperation with a specified number of its partners in environmental management.

To promote this policy reform the USAID would provide both technical assistance to support the establishment of mechanisms for coordination and a cash transfer once the policy measure has been met.

The technical assistance would be in the form of short-term consultant support for preparation of the mechanisms for coordination (Annex C, LEGAL 3) provided in the first and second years of the program. It would be used to identify the EEAA's principal partners in environmental management, those institutions with significant environmental management responsibilities, and to propose appropriate mechanisms, such as inter-agency agreements, inter-ministerial work groups, committees, etc., to ensure close coordination with the EEAA's policies and programs. The technical assistance would include analyzing the objectives and bases for such cooperation, drafting agreements, and developing the terms of reference for work groups, committees or other mechanisms of coordination. The technical assistance would be designed to leverage existing donor support within the EEAA and the other institutions.

The cash transfer to the MOEA would take place once it has established appropriate mechanisms for coordination with a specified number of its partners in environmental management. Ideally, the cash transfer would be used to support the MOEA's role in implementing the mechanisms for coordination.

6.1.4 Develop the Environmental Protection Fund as a Mechanism for Sustainable Financing of Environmental Management

As noted in Chapter 3, Law 4/1994 established the Environmental Protection Fund within the EEAA as a mechanism for financing environmental activities and programs.

The sources of revenue for the Fund, including budget allocations, grants from foreign donors, and fines and compensation for environmental damage, as well as the activities for which the Fund's revenues can be allocated, including pilot projects, monitoring networks, and pollution control activities, are specified in the Law (Articles 14-16) and Executive Regulations (Articles 7-8). For various reasons, the Fund has yet to serve as an effective mechanism for financing environmental activities. Therefore, the EEAA should take the necessary steps to develop the Environmental Protection Fund as a self-sustaining mechanism for financing environmental management activities. This should include developing appropriate economic instruments for providing sustainable sources of revenue for the Fund (in addition to the EEAA's share of the 25 percent dues imposed on travel tickets issued in Egypt), identifying priorities among environmental activities and projects to be financed from the Fund, and establishing appropriate regulations and procedures for managing the Fund.

The policy measure for this component would be the completion of the activities necessary to establish the Environmental Protection Fund as an effective mechanism for sustainable financing of environmental management programs and activities.

To promote this policy reform the USAID would provide both technical assistance to establish the institutional requirements of the Fund and a cash transfer to endow the Fund once the policy measure has been.

The technical assistance would be in the form of short-term consultant support for strengthening the financial, technical, and managerial underpinnings of the Fund. For example, consultant support would be used in designing and developing appropriate economic instruments for providing sustainable sources of revenue for the Fund (e.g., pollution charges, product charges on selected commodities, or surcharges on environmental or tourist services as well as in setting priorities among environmental activities and eligibility criteria for projects to be financed from the Fund (e.g., grant and/or "soft" financing for private sector investments in pollution control equipment, funding for NGO activities in environmental management, or environmental education and awareness programs. In addition, the consultant support would be used to review the existing regulations and procedures for managing the Fund and recommend (in close coordination with the ongoing work of Danida's Organizational Support Programme) improvements in those regulations and procedures necessary to convert the Fund into an effective, self-sustaining financing mechanism.

6.1.5 Disseminate Environmental Information to the Public

Credible information is hard to come by in Egypt in general, and credible information on environmental issues, such as air and water quality data, industrial pollution information, etc., is especially difficult to obtain. In many cases, the environmental information is simply not being collected on a routine basis and is, therefore, not available. In other cases, however, environmental data are being generated, e.g., by ongoing air and water quality monitoring activities and other ministerial information sources, but are not being made available to the public on a regular basis. Law 4/1994 addresses this issue in part by requiring the EEAA to collect information on the environment and to prepare an annual "State of the Environment" Report for the purpose of disseminating environmental information to the public. The EEAA has

prepared its first such report, however, it has not yet released the report to the public.

In order for the new MOEA and the EEAA to establish credibility with the Egyptian public and the international community, they will have to overcome this institutional resistance to making information available to the public and undertake new initiatives to generate reliable environmental information and disseminate that information to the public in a manner that is useful.

The policy measure for this component would be the release of the “State of the Environment” Report and the dissemination of other types of environmental information to the public.

To promote this policy reform the USAID would provide both technical assistance to support the collection and dissemination of environmental information to the public and a cash transfer once the policy measure has been met.

The technical assistance would be in the form of short-term consultant support for the identification, collection, preparation and dissemination of environmental information that would be of use to the public. It would be used to identify the types of information (e.g., air and water quality data, waste problems, consumer information on household chemicals) to be disseminated; ensure collection and preparation of such information in a form useful to the general public; and establish the mechanisms for routine dissemination of the information as widely as possible.

The cash transfer to the MOEA would take place once it has released the first “State of the Environment” Report and established means for the routine collection and dissemination of environmental information.

6.2 Decentralize Core Environmental Management Functions to the Local Level

The second broad policy reform is for the GOE to decentralize core environmental management functions to the local level. Egypt has a strong tradition, established over the millennia of its history, of very centralized government and policy administration. This remains generally true today, even though the GOE is taking steps to delegate more and more decision-making authority away from central government. It is certainly the case in environmental management, where, with the exception of the rangers in the natural protectorates, the EEAA presently manages its environmental policies and programs from Cairo and has established its only RBO in Cairo. Furthermore, even though there are now EMUs in all of the governorates, their roles and functions in implementing and enforcing the EEAA's policies and programs remain largely undefined. For the GOE to have a credible environmental management program it will have to establish decision-making authority at subnational levels of government.

This policy reform is designed to demonstrate the government's commitment to delegating implementation and enforcement responsibilities to the level of government closest to the problems. It comprises four components: (1) establishing and operationalizing the RBOs, (2) reinforcing the EMUs in the governorates, (3) reinforcing

the EDs in the new industrial cities, and (4) fostering public participation and NGO involvement in local environmental management.

6.2.1 Establish and Operationalize the RBOs

The need to delegate some of the EEAA's environmental management functions to the subnational level by authorizing the EEAA to establish branch offices in the governorates by ministerial decree was anticipated by Law 4/1994 (Article 2). The EEAA has decided to use this authority to establish eight RBOs throughout the country. To date, the EEAA has established only one branch office, the Greater Cairo RBO. Its plans, however, include the phased establishment of the remaining RBOs over the next few years. Clearly, the EEAA needs to get on with this task and operationalize its RBOs in Alexandria, the Delta, the Red Sea coast, and Upper Egypt.

In authorizing the establishment of branch offices, however, Law 4/1994 failed to specify the environmental management responsibilities that these offices should undertake. With the creation of EMUs in the governorates, this has created some confusion over roles and responsibilities and inter-agency coordination in environmental management at the local level of government. To remedy this situation, the EEAA needs to issue a ministerial decree defining the roles and responsibilities of the RBOs in implementing and enforcing the policies and programs of the EEAA and specifying their responsibilities in coordinating with the EMUs and other local institutions involved in environmental management.

To summarize, the policy measures for this component would be the promulgation by the MOEA of a ministerial decree defining the roles and responsibilities of the RBOs, and the establishment and operation of the remaining RBOs throughout the country.

The tool that the USAID would use to promote this policy reform would be cash transfers once the policy measures have been met. The cash transfers to the MOEA would take place once it has promulgated the ministerial decree on the RBOs, and again once it has established and operationalized the RBOs. The cash transfer could be used to support the operations of the new RBOs. No technical assistance would be used by the USAID to support this policy reform as the EEAA is already receiving assistance from Danida and from JICA, for defining the roles of the RBOs and for building capacity and providing equipment to the RBOs, respectively.

6.2.2 Reinforce the Environmental Management Units in the Governorates

Law 4/1994 also failed to specify the responsibilities of the EMUs in the governorates, which are in fact established under separate legal authority, and how the EEAA would coordinate with these institutions at the local level in implementing and enforcing its policies and programs. This represents a serious failure in the legal and institutional framework for environmental management at the local level of government, which should be redressed by Prime Ministerial decree or, if necessary, by amendment

to Law 43/ 1979 on Local Governance. These would complement the ministerial decree, mentioned above, for the RBOs by sorting out the functions of local government in environmental management.

Once the responsibilities at the local level have been sorted out, the GOE should move to delegate implementation and enforcement functions to the local level of government. In order to be able to decentralize environmental management to the local level, however, capacity building would have to take place in the EMUs in the governorates. Currently, these local institutions have extremely limited capacity with little or no environmental planning or program experience, professional staff untrained in environmental management, a lack of necessary office and technical equipment, and limited financial resources. Clearly, the government will have to invest in building the technical capacity in these EMUs if they are to carry out their environmental management functions effectively.

The policy measure for this component will be the promulgation of a Prime Ministerial Decree specifying the roles and responsibilities of the EMUs in local environmental management.

The tools that USAID would use to promote this policy reform would consist of a cash transfer once the policy measure has been met, technical assistance for basic capacity building in selected EMUs, and financial assistance for the purchase of equipment.

The cash transfer to the GOE would take place once the Prime Minister has promulgated the decree specifying the roles and responsibilities of the EMUs in local environmental management. The cash transfer could be used to support the EMUs in implementing and enforcing EEAA policies and programs at the local level.

The technical assistance would undertake basic capacity building for environmental management in a select number of EMUs (Annex C, LEGAL 4) over the five years of the program. Criteria would be established for selecting the local institutions, which would participate in the program. The technical assistance would include capacity building in strategic planning, program development and evaluation, monitoring and enforcement; workshops, training, and internships, as appropriate.

Financial assistance would also be provided for the purchase of basic office and technical equipment necessary to support effective environmental management.

6.2.3 Reinforce the Environmental Divisions in Industrial Cities

The establishment of the new industrial cities, such as the 10th of Ramadan and the 6th of October, has created an additional wrinkle in the existing institutional framework for environmental manage. These cities are under the jurisdiction of the MHUUC, not of the governorate in which they are located, and thus do not fall under the jurisdiction of the EMUs in the governorates. The MHUUC has established local EDs to carry out environmental management functions in the new cities. However, it has not specified the

responsibilities of the EDs or how they would coordinate with the EEAA in implementing and enforcing its policies and programs. To remedy this situation, the MHUUC will need to promulgate a ministerial decree to that effect, much like the decree for the EMUs described above.

Again, once the responsibilities at the local level have been defined, the GOE will have to undertake capacity building in these EDs. As with the EMUs, the EDs have extremely limited capacity for environmental planning or program management, lack necessary office and technical equipment, and have limited financial resources.

The policy measure for this component will be the promulgation of a ministerial decree specifying the roles and responsibilities of the EDs in the new industrial cities.

The tools that the USAID would use to promote this policy reform would consist of a cash transfer once the policy measure has been met, technical assistance for basic capacity building in selected EDs, and financial assistance for the purchase of equipment.

The cash transfer to the GOE would take place once the MHUUC has promulgated the decree specifying the roles and responsibilities of the EDs in environmental management in the new industrial cities. The cash transfer could be used to support the EDs in implementing and enforcing EEAA policies and programs at the new cities.

The technical assistance would undertake basic capacity building for environmental management in the EDs (Annex C, LEGAL 4) over the five years of the program. Criteria would be established for selecting the local institutions, which would participate in the program. The technical assistance would include capacity building in strategic planning, program development and evaluation; monitoring and enforcement; workshops; training, and internships, as appropriate.

Financial assistance would also be provided for the purchase of basic office and technical equipment necessary to support effective environmental management.

6.2.4 Foster Public Participation and NGO Involvement in Local Environmental Management

The decentralization of environmental management functions to the local level will not be complete until both local NGOs and the general public play a greater role in implementing environmental policies and programs. With the exception of the citizens' action provisions of Article 103, Law 4/1994 does not specify the means by which public participation and NGO involvement in environmental management are to be fostered. In the absence of such guidance, it is incumbent upon the EEAA to define the mechanisms by which greater participation in environmental management can be encouraged. One obvious area for increasing public involvement, as mentioned in Chapter 4, is in the EIA preparation and review process, where the role of the public and the NGO community remains undefined. There will no doubt be other areas, from the dissemination of information to policy formulation, monitoring and enforcement, where the EEAA will realize the value of enlisting public and NGO collaboration in environmental management.

The policy measure for this component will be the identification of specific mechanisms for fostering NGO involvement and public participation in local environmental management.

The tools that the USAID would use to promote this policy reform would consist of technical assistance for defining the mechanisms for increased NGO involvement and public participation and financial assistance to selected NGOs to support such involvement.

The technical assistance would involve short-term consultant support for assisting the EEAA in identifying and defining the means by which greater NGO involvement and public participation can be encouraged. This effort may involve amending the Executive Regulations in part or issuing a new ministerial decree to carry out this purpose.

Financial assistance would also be provided to selected NGOs and community-based organizations for supporting their involvement in local environmental management activities. Criteria would be established for selecting the local organizations and the types of activities, which would be supported by the program.

6.3 Strengthen the Legal and Regulatory Framework for Environmental Management

The third broad policy reform is to enable the GOE to strengthen and complete the legal and regulatory framework for environmental management. Law 4/1994 represents a real advance in the legal framework for environmental management in Egypt, however, the regulatory and administrative framework for Law 4/1994 is not yet complete and must be finished before full and effective implementation and enforcement of the law can take place. Furthermore, there remain significant conflicts and weaknesses in the existing legislative framework that need to be addressed before the GOE can establish a credible environmental management program. Finally, the lack of experience with environmental issues in the legal infrastructure of Egypt may impede the effective use of the legal framework in implementing and enforcing the law.

This reform program is designed to demonstrate the GOE's commitment to improving the legal framework and infrastructure supporting national policy in environmental management. It comprises four components: (1) completing the regulatory and administrative framework for Law 4/1994; (2) integrating implementation and enforcement of the environmental laws; (3) building capacity in the legal infrastructure; and (4) assessing the need for revisions of and additions to environmental legislation.

6.3.1 Complete the Regulatory and Administrative Framework for Law 4/1994

As discussed in Chapter 3, not all of the regulatory and administrative requirements for full implementation and enforcement of Law 4/1994 have been completed. The EEAA itself can accomplish a number of these, including establishment of the EIA Permanent Review Committee and specification of conditions for a permit for construction within the coastal zone. Others, however, will require action by other national

institutions. For example, a number of ministries will have to identify hazardous substances and wastes before the requirements for proper management can be implemented, and the MOI will have to designate the governorates in which the vehicle emission standards can be applied. The identification of locations for vehicular emissions testing is a key initial action of USAID's Cairo Air Improvement Project. These regulatory and administrative impediments will delay effective implementation and enforcement of significant provisions of Law 4/1994. Therefore, the EEAA will need to coordinate the completion of the law's regulatory and administrative framework.

The policy measure for this component would be the completion by the MOEA and, other national institutions, of the regulatory and administrative actions necessary for effective implementation and enforcement of Law 4/1994.

To promote this policy reform the USAID would provide technical assistance to support completion of the regulatory and administrative framework in the first year of the program, and a cash transfer once the policy measure had been met.

The technical assistance would provide the MOEA and the EEAA with short-term consultants with legal/technical expertise (Annex C, LEGAL 5). The assistance would be designed to identify the remaining regulatory and administrative impediments to full implementation and enforcement of Law 4/1994 and to take the appropriate regulatory and administrative actions (e.g., draft regulations, prepare decrees, etc.) to overcome these impediments. The assistance may also be expanded in scope to provide for reviewing the existing Executive Regulations to Law 4/1994 and making recommendations for strengthening these regulation.

The cash transfer to the GOE would take place once the EEAA and the other national institutions have taken the actions necessary for implementation and enforcement of Law 4/1994. The cash transfer could be used to support implementation of the regulatory and administrative actions taken.

6.3.2 Integrate Implementation and Enforcement of Environmental Laws

The jurisdictional conflicts created by the existing environmental laws remain a serious barrier to effective implementation and enforcement. Under the current scheme, an industrial facility faces an array of different regulators on environmental issues. These include the EEAA for enforcement of Law 4/1994, the MPWWR and the MHUUC for enforcement of the various water laws, the Ministry of Manpower and Immigration for control of workplace environmental conditions, and the MOHP for air and water monitoring. This array of potential environmental authorities, each with its narrow focus, will continue to pose problems for effective environmental program management. To remedy this situation, the GOE will need to take steps to integrate implementation and enforcement of the various environmental laws. This may require consolidation of some permitting and inspection authorities or delegation of some authorities to a more appropriate institution for execution. The appropriate measures will have to be determined by the various national institutions with environmental responsibilities and specified in a Prime Ministerial Decree integrating environmental management.

The policy measure for this component would be the promulgation by the Prime

Minister of a decree integrating implementation and enforcement of the environmental laws by the MOEA and other national institutions.

The tools that the USAID would use to promote this policy reform would consist of technical assistance to support analysis and integration of environmental programs and a cash transfer once the policy measure had been met.

The technical assistance would provide the MOEA and the EEAA with short-term consultants with legal/technical expertise during the first and second years of the program. The assistance would be designed to identify the appropriate measures for integrating implementation and enforcement of the environmental laws and to prepare a decree effecting such measures for promulgation by the Prime Minister.

The cash transfer to the GOE would take place once the Prime Minister had promulgated a decree integrating implementation and enforcement of the environmental laws. The cash transfer could be used to support the integrated implementation and enforcement program.

6.3.3 Build Capacity in the Legal Infrastructure

Environmental law is a new field to the legal community in Egypt and, consequently, the legal system is ill prepared to handle environmental issues. Although they are critical to the legal process, most district attorneys and judges, for example, have little or no knowledge of Law 4/1994 and its requirements. Therefore, they are likely to give low priority to cases involving environmental violations or crimes. This is compounded by the fact that the legal system in Egypt is already hopelessly backlogged and slow in handling its caseload. Thus, the lack of a knowledge base for, and experience with, environmental legal concepts and technical issues presents a real barrier to effective implementation and enforcement of Law 4/1994.

In the absence of a policy reform measure, the USAID would assist the legal establishment to prepare for effective implementation and enforcement of environmental legal issues. The tool that the USAID would use to create a knowledge base for environmental legal issues would be technical assistance, particularly in the form of workshops and training programs, to support capacity building in the legal community during the second and third years of the program.

The technical assistance would build capacity in the legal community in general and in the legal system in particular (i.e., district attorneys, judges, etc.) for handling environmental legal issues and cases (Annex C, LEGAL 6). Workshops, training, and seminars would be run to increase environmental expertise within the legal community.

6.3.4 Assess the Need for Revisions and Additions to Environmental Legislation

Although Law 4/1994 represents a significant advance in establishing Egypt's legal framework for environmental management, that framework is far from complete. Because many of the laws are not available in English, the Environmental Sector Assessment team was not able to review the legal framework in depth. It is clear, however, that work remains to be done in completing and refining the legal framework, and in the coming

years the GOE should assess the need for revisions and additions to the whole range of existing environmental legislation. A top priority is in the area of planning. Whether in national economic development planning or in local land-use planning, the GOE does not appear to incorporate environmental considerations into its decision-making. To remedy this situation, the government may need to consider additional planning legislation, such as in the area of coastal zone management or revisions to the EIA provisions of Law 4/1994.

There would be no policy measure for this component. However, the USAID would provide technical assistance in the latter years of the program to support review and analysis of legal framework. This assistance would comprise short-term consultants with expertise in environmental legislation, who would examine the body of Egyptian environmental law and make recommendations for revising and adding to the legislation.

Table 15: Institutional and Legal Policy Reforms, Measures and Assistance Tools

Policy Reform	Policy Measure	Assistance Tools
6.1.1 Ensure incorporation of environmental considerations into national development planning	GOE adopts National Plan for Environmentally Sustainable Development	Technical assistance for preparation of the plan Cash transfer once policy measure is met
6.1.2 Strengthen capacity in existing environmental institutions	GOE increases budget for environmental management by 2% annually	Cash transfer when policy measure is met Technical assistance for capacity building
6.1.3 Adopt effective mechanisms for inter-ministerial coordination	MOEA establishes mechanisms for coordination with partners in environmental management	Technical assistance for mechanisms of cooperation Cash transfer when policy measure is met
6.1.4 Develop the National Environmental Protection Fund		
6.1.5 Disseminate environmental information to the public	Publish the “State of the Environment” Report and disseminate other environmental information to the public	Technical assistance for collecting and disseminating environmental information Cash transfer once the policy measure is met
6.2.1 Establish and operationalize Regional Branch Offices (RBOs)	MOEA issues decree specifying functions of RBOs; MOEA establishes and operationalizes the remaining RBOs	Cash transfer once each policy measure has been met
6.2.2 Reinforce Environmental Management Units (EMUs) in governorates	President issues decree specifying functions of EMUs	Cash transfer when policy measure is met Technical assistance for capacity building in the EMUs Financial assistance for equipment
6.2.3 Reinforce environmental divisions in industrial cities	MHUUC issues decree specifying functions of Environmental Divisions	Cash transfer when policy measure is met Technical assistance for capacity building in the EDs Financial assistance for equipment
6.2.4 Foster public participation and NGO involvement	MOEA identifies mechanisms for increasing public participation and NGO involvement	Technical assistance for identifying mechanisms for increasing public participation and NGO involvement
6.3.1 Complete the regulatory/administrative framework for Law 4/1994	MOEA and other institutions take regulatory/administrative actions	Technical assistance to support regulatory actions Cash transfer when policy measure met
6.3.2 Integrate implementation and enforcement of the environmental laws	President issues decree integrating implementation and enforcement of environmental laws	Cash transfer when policy measure met Technical assistance to integrate programs
6.3.3 Build capacity in the legal infrastructure	None	Technical assistance, particularly workshops and training, to build capacity

6.3.4 Assess need for revisions/additions to environmental legislation

None

Technical assistance to support assessment of environmental legislation

Chapter 7

Policy Reform Program for Industrial Pollution

Industrial development is one of the cornerstones of Egypt's strategy for economic development. As stated in a 1996 report describing the Egyptian manufacturing industry,

"Industrial development is one of the main foundations upon which Egypt's economic development may be built. A developed industrial base leads to greater prosperity for the country through its effects on productivity, GDP, per capita income, the country's balance of trade situation and the resulting improvement in the quality of life of its people. It also increases the chances of successful penetration into global markets and a share in international trade."*(1)*

For Egypt's planned expansion of its industrial base to be sustainable, industries must manage their discharges and emissions for compliance with existing environmental laws. Considering water emissions alone, the EEAA reports that 41 public enterprises located in Cairo, Alexandria and the Delta region have been identified which discharge untreated wastewater. Thirty-three municipal wastewater treatment plants (WWTP) in the region require upgrading and 16 plants are not even operational. Also, SMEs such as electroplating and leather tanning facilities, are often responsible for disproportionately large contributions to overall pollution loads.

The technology necessary to control air, water, and solid waste discharges is available and in service around the world. Egypt's existing environmental laws and regulations are, for the most part, sufficient to significantly reduce industrial emissions, provided that they are followed. By avoiding compliance with applicable legislation and not investing in the necessary pollution control equipment, industry is enjoying a short-term economic benefit. The cost of non-compliance is being transferred to others that are no longer able to use the polluted resource (or at substantial cost), causing, for example, loss of income for fishermen, extra costs for water supply, and health problems for resource users. As long as industry fails to comply, pollution will continue to increase, especially considering the continuing expansion of Egyptian industry. Such practices are not sustainable and must be curtailed.

In addition to regulations, a number of international and national drivers may provide further incentives to industry over the next few years. Among these are the International Standards Organization (ISO) standards, particularly ISO 9000 (quality assurance) and ISO 14000 (environmental management). The USAID Strategic Objectives support adoption of ISO standards (ISO 9000 is referenced in support of the USAID SO 1 (2)). ISO standards are rapidly becoming recognized as the minimum standards that will have to be met by companies wishing to export to developed countries and it is likely that they will ultimately be adopted worldwide. Voluntary compliance programs which reward compliance in advance of deadlines and schedules can be effective as a catalyst to regulatory programs, provided appropriate incentives could be offered. In addition, public disclosure requirements enable the public and NGOs to increase their awareness of sources of emissions and discharges in their community and may lead to voluntary compliance as part of firms' public relations activities.

One critical question with respect to achieving industrial compliance with the requirements of Law 4/1994 is timing. Under current law, industrial facilities will have to come into compliance with the requirements contained in Law 4/1994 and its Executive Regulations in March 1998, unless they have requested a two-year extension of this deadline and have submitted a Compliance Action Plan demonstrating reasonable progress in coming into compliance. As the March deadline approaches, it is increasingly apparent that neither the EEAA nor Egyptian industry is prepared for the deadline. On the one hand, the EEAA has neither the capacity nor the resources to monitor industrial compliance and take appropriate actions for enforcement of the law. On the other hand, Egyptian industry is barely aware of, and much less prepared to comply with, the regulatory requirements. The EEAA is facing a situation of widespread non-compliance in industry while being unable to effectively enforce the law. The agency has three options: (1) continue with the March deadline and do the best that it can to enforce industry compliance; (2) postpone the deadline for one year and use the additional time to raise industry awareness of the regulatory requirements and to strengthen compliance monitoring and enforcement capabilities at the national, regional, and local levels; or (3) use a targeted approach to compliance based on the size of facilities, types and amounts of pollution, and response to the waiver option.

To help support the GOE's efforts to reduce pollution from industrial sources, the team proposes an assistance strategy based upon overcoming the constraints mentioned above to improve the environment, while maintaining a climate for economic growth. The EEAA's environmental goal, environment managed for long-term sustainability, has been adopted by the USAID as its sub-goal for Egypt,

"Mitigating threats to natural resources such as air and water is critical to achieving sustainable development and an improved quality of life." (2)

The USAID approach to long-term sustainability in Egypt is based upon the following Strategic Objectives:

- SO 6: Increased access to and sustainability of water and wastewater service. USAID documents indicate that active reformation of water and wastewater utility operations is underway in Egypt, transferring management responsibilities to the local level of government. By 2001, USAID estimates that an additional eight million Egyptians will benefit from improved water and sewerage systems.
- SO 7: Reduced generation of air pollution and other selected contaminants; IR 7.2: Reduced Industrial Pollution; IR 7.3: Improved Solid Waste Management. Cairo is among the worst cities in the world for airborne particulate matter and it exceeds international standards for other serious pollutants. This excessive pollution has important implications. Adoption of mitigation techniques and technologies is planned to lead to a measurable reduction in the generation of air pollution by the end of 2001, including measures aimed at minimizing industrial emissions and particulates from burning of solid wastes.

The proposed strategy reflects the challenges in implementing an environmental compliance program for industry in Egypt and attaining rates of compliance typically achieved in OECD countries. It recognizes that the USAID's assistance programs must

complement, not duplicate, efforts of the GOE and other donors. Consistent with the principles of sustainable development, the strategy strives to encourage cost-effective attainment of environmental goals. Assistance delivery mechanisms for implementing the strategy have been evaluated in terms of their potential to contribute to and sustain institutional capabilities and maximize replication and diffusion opportunities. Given the limited resources available to the USAID, the strategy also seeks to leverage Egyptian and other donor resources to address those solutions providing the greatest health and environmental benefits.

The strategy comprises three broad policy reforms for addressing industrial pollution:

Strengthen implementation and enforcement capabilities (Section 7.1).

Promote industry compliance through voluntary and mandatory approaches (Section 7.2)

Expand and improve public awareness to support institutional strengthening and industry initiatives (Section 7.3).

Two general types of assistance delivery mechanisms or tools are expected to be employed as part of the strategy. These include: (1) technical assistance, which includes policy promotion analysis, institutional strengthening, training, public awareness, and project preparation; and (2) financial assistance that may be applied to institutional strengthening or to the capitalization of financfacilities to assist industry in funding compliance investments. This strategy will provide a sound basis for environmental management and a framework for individual projects that support environmental protection. It should be noted that other donors are assisting EEAA in crafting an industrial compliance strategy. Danida's Organizational Support Programme has assisted EEAA in the elaboration of a "Strategy for Industry's Environmental Compliance and Enforcement" and CIDA EEIS Project has a component focused on creation of industrial pollution database. Thus, while the assistance strategy described below has been developed to illustrate a comprehensive approach, USAID's EEPP would have to decide the appropriate stage at which to provide assistance (and this determination would have a bearing on the appropriate policy reforms). The three specific policy reforms, supporting projects and policy measures are discussed below and summarized in Table 16. Individual projects are discussed in greater detail in Annex C.

7.1 Strengthen Implementation and Enforcement Capabilities

Policy reform to strengthen current capacities of governmental agencies (central and regional) to effectively carry out their assigned responsibilities for compliance and enforcement is vital if industrial pollution is to be reduced and substantial improvement in environmental quality achieved. Through technical assistance, primarily institutional strengthening, training and public awareness, successful implementation of this component will establish a firm institutional basis for a compliance monitoring and enforcement system. A compliance monitoring and enforcement system has a high likelihood of operating effectively in Egypt because of strong donor support for environmental investments. At least 13 other donors are active in Egypt, providing assistance in assessing control options and providing "soft" financing to support technology transfer demonstration. Such funding mechanisms are not necessarily available to industry in other

countries, including those competing with Egyptian industry in international markets, giving Egypt a possible competitive advantage in some markets.

The fundamental building block of an effective compliance program is the facility inventory that includes all emission sources and dischargers, identifies their locations, the types and volumes of pollutants released, and frequency of release. The facility inventory provides information that will enable officials to plan compliance activities, determine resource needs, and set priorities for compliance based on the relative magnitudes of environmental and health threats.

The initial focus of the compliance program would be on industrial wastewater and air pollution rather than solid and hazardous waste (these are covered in Chapter 8). Some attention to the potential release of petroleum products and chemicals from underground storage tanks (UST) is also recommended, based on interest expressed by the EEAA and the likelihood that many tanks are leaking in areas with high water tables. Finally, the compliance program should focus not only on bringing individual sources into compliance but also on solving complex pollution problems such as deteriorated quality of large lakes due to variety of sources. In effect, progress in solving these complex problems will require both an effective enforcement strategy and cooperation from a number of government ministries and jurisdictions.

Attainment of the following policy measures would contribute to creation of an effective compliance monitoring and enforcement program:

- The EEAA delivers an electronic facility inventory detailing emission locations, characteristics, and applicable regulations to all agencies that have enforcement responsibilities.
- The EEAA develops a table of possible violations for each regulation under Law 4/1994 and existing environmental legislation.
- The EEAA develops a violation response guide outlining penalties (e.g., fines, fees, and imprisonment).
- The EEAA develops an inspector certification program and establishes a core of trained industrial and solid waste management inspectors at the national, regional, and local level.
- The EEAA develops a certification program for analytical laboratories.
- The EEAA inventories USTs (e.g., identifies facilities with USTs; specifies size, number, tank material, age).
- The EEAA develops UST regulations.

The major project to support this policy reform component would include technical assistance to the EEAA to develop and implement a Compliance Management System (CMS). This project would include three phases. First, the EEAA would need to create a computerized facility inventory. The challenge in developing this database will be

determining cost-effective methods for retrieving existing data from other ministries and developing source data for facilities, which are not currently covered by other agencies through permitting and licensing. In addition, the EEAA would need to develop a plan for maintaining the facility inventory and sharing information with other ministries and government bodies. The second phase would involve development of a table of violations and a violation response guide. The table of violations is an important tool in communicating facility responsibilities and for taking enforcement actions against violators. It is recommended that this table of violations be developed as a collaborative process the EEAA and other government bodies, industry and industry groups, and NGOs as appropriate. The EEAA might organize working groups with involvement from relevant industry sectors. Industry has a vested interest in the outcome of this process and the setting of standards and violations, and would provide useful information on costs and realistic compliance time frames. The EEPP could facilitate the working group process and help industry estimate potential compliance costs. The violation response guide would provide the foundation for the EEAA's enforcement strategy as well as a vehicle for communicating the monitoring and enforcement process to facilities. The third phase would involve assistance to the EEAA and other enforcement authorities in developing enforcement capabilities.

It is anticipated that a combination of technical and financial assistance will be required to develop and implement the CMS. Financial assistance could be helpful in creating the facility inventory and dealing with staff limitations. Support for staffing of the enforcement program should be limited to the start-up phase. Ultimately, the EEAA and other enforcement authorities must sustain financing for the compliance program. The GOE may want to consider the use of nominal compliance fees or pollution charges to generate revenue to sustain the compliance program. Industry's willingness to pay such fees could be enhanced if the compliance program provides industry with advice and source of information that enables facilities to identify and adopt cost-effective compliance strategies. Also, if a portion of pollution charges was used to capitalize "soft" financing for industrial projects provided through the National Environmental Protection Fund, stronger support for pollution charges could be expected.

To support the CMS, additional assistance would be provided to develop and implement a nation-wide laboratory certification process. As Law 4/1994 is increasingly enforced, enterprises will need to collect, maintain, and file accurate analytical data at their facilities. To date, quality assurance and quality control procedures vary widely at existing commercial laboratories and there is no certification procedure to guarantee that the data generated are within accepted limits of accuracy. The EEAA will work with appropriate authorities, such as the Egyptian Organization for Standards (EOS), to establish a certification board.

EEAA has also expressed interest in developing an enforcement program that would include technical standards for USTs, outlining leak detection and remediation requirements and a replacement schedule for older USTs. A could be implemented that commenced with educational workshops for the EEAA describing the USEPA's UST program, and exploring which components would be applicable to Egyptian conditions, including the overall regulatory framework. An effective UST program would require that the EEAA develop an inventory of USTs throughout Egypt, specifying location, owner, tank material and age. The inventory would give regulators a sense of the severity of the problem they may be facing, and a regulatory focus. Supporting demonstrations projects

could include leak testing and remediation at selected sites, and replacement with corrosion-protected tanks and facility leak detection systems.

Environmental officials throughout Egypt have long recognized that the demise of Egypt's freshwater lakes (e.g., Lake Manzala, Lake Qarun, and Lake Maryut) seriously affects Egypt's access to domestic freshwater fish supplies, negatively impacts local populations who depend on the lakes for their livelihood and, overall, reduces the environmental quality of the Egyptian landscape. While many studies have been conducted to identify the problems of Lake Manzala, no specific action to improve its water quality or eliminate filling along its shorelines have been taken. A project to address the problems of Lake Manzala would involve clarification of relative contribution of industrial, municipal, and agricultural sources, development of a control strategy and determination of those industrial sources which are likely to be addressed through the CMS or investments in municipal wastewater treatment infrastructure, and facilitation of a process with representatives from jurisdictions that contribute to the lake's demise.

7.2 Promote Industry Compliance

Compliance and enforcement mechanisms will need to be implemented over a number of years, given the starting point for many industries is an absence of controls on air emissions and wastewater discharges. The EESA team has proposed a one-year delay in Law 4/1994 implementation in addition to the potential two-year waiver that is currently available to facilities. This will result in some additional lags in the implementation of mandatory requirements. In the meantime, progress can be made in reducing pollution by capitalizing on and expanding initiatives already undertaken by industry, in many cases assisted by donor support.

This policy reform has two distinct components: (1) support for development of industrial pollution reduction and compliance; and (2) support for financing of industrial environmental investments. It would build upon recent success stories from Egyptian industry in reducing pollution and encourage other industries to take action in advance of regulatory requirements. It supports the polluter pays principle, makes use of changing public and industry attitudes towards the environment, and demonstrates improvements made by industry, while encouraging replication and diffusion through promotion of success stories. During the first few years, this policy reform will be linked to the compliance and enforcement program as a preliminary step that would encourage voluntary compliance. As the compliance and enforcement program expands, this component can, on a self-sustaining basis, serve to encourage industry to move beyond compliance. The EESA team believes the one-year delay is essential pre-condition to progress in strengthening the industrial compliance and enforcement program, but acknowledges the desire to maintain the current schedule because of the "impression" that a delay leaves with the public as well as the regulated community. Nevertheless, inability to review compliance plans and carry out enforcement actions because of lack of resources can diminish the deterrent effect of sanctions and reduce the program's credibility.

7.2.1 Support Development of Industrial Pollution Reduction and Compliance Programs

The EESA team recommends support for industry compliance programs on two fronts: (1) development of industry capabilities to analyze, finance, and implement controls to bring industry into compliance; and (2) creation of incentives for voluntary compliance ahead of the current compliance deadlines. Both of these efforts will build on donor programs. Progress in developing the CMS, discussed previously in Section 7.1 should increase demand for donor assistance and allow donors to consolidate and better focus resources and programs in the sector. Also, while the assistance described here concentrates on the industrial sector, environmental authorities have an important role to play in disseminating information and responding to questions about compliance requirements.

The following policy measures have been identified for this policy reform component:

- The EEAA establishes environmental units at selected industrial cities and selected municipal development areas
- The GOE establishes a formal reward system to recognize champions in industry, government, donors, financial institutions, and/or NGOs that are willing to engage in a voluntary program.
- The GOE provides initiatives for establishing trade groups for the top eight to ten industrial sectors.

Projects supporting this component should focus on providing assistance to industry regarding pollution reduction and environmental compliance. Industries continue to maintain that little information is available for them to make informed decisions regarding environmental compliance, some of which could be provided through industrial technical assistance centers, offering training courses, literature, on-site assistance, business connections and management assistance. The USAID-funded projects, ECEP and EP3, have achieved considerable success with environmental improvement projects in a number of individual plants or operations. Assistance has included energy efficiency audits (ECEP) and assessment and implementation of pollution prevention investments (EP3). More than 80 plants have participated in assessments. In addition to having reduced their impact on the environment, these plants serve as case studies and models for similar industries. Three Egyptian agencies have participated in these programs, the FEI, the Tabbin Institute for Metallurgical Studies (TIMS), and the Development Research and Technological Planning Center (DRTPC), and have contributed to information dissemination services and training activities.

One of the key challenges of the EEPP assistance program will be to identify ways to broaden the coverage of existing ECEP and EP3 programs to reach a much larger number of facilities and industries. The potential costs of a larger assistance program underline the importance of utilizing and expanding local capacity among industry groups, NGOs, and technical assistance centers. Thus, the project would evaluate the effectiveness of the existing technical assistance centers and make recommendations for their closure, consolidation, or expansion. The project would also review the accomplishments of other GOE and donor initiatives including the National Pollution Prevention Programme and the Department for International Development-supported

SEAM project. Sustainable action plans will be prepared for selected centers.

An important theme in the assistance program will be to encourage the implementation of cost-effective control strategies. For the most part, this will involve educating facilities about the importance of considering annualized costs of control (which consider equipment depreciation and O&M cost) rather than focusing narrowly on the capital costs of the initial investment. Although Egyptian environmental policy does not currently accommodate the use of economic instruments such as emission trading and bubbles, the EESA team recommends that the EEAA support development of projects that can demonstrate the potential benefits of addressing pollution reduction at the industry as opposed to the facility level.

For example, a demonstration project in at least one industrial sector (or city) could be used to gather information on the cost implications of treating wastewater discharges at the industrial facility, connecting to a municipal wastewater treatment facility (after appropriate pre-treatment to remove heavy metals), or developing an industrial wastewater treatment facility that would serve several facilities. Cost models would be developed for use in the decision-making process by facilities to identify optimal least cost solutions. Given the potential that industrial dischargers might overwhelm existing municipal wastewater capacity, additional analysis of municipal capacity, current pricing practices for servicing industrial facilities and consideration of the costs for expanding municipal services would be desirable. This project would initially be undertaken as a demonstration, with follow-up assistance provided to replicate the study in Egypt's industrial cities.

Another supporting project would involve developing and implementing a pilot citywide EMS. An effective EMS can help individual companies approach environmental issues systematically and integrate environmental improvements into their normal operations and business strategy. Involving city residents can further expand this centralized approach to environmental management. Success of an effective citywide EMS can attract clean-technology industry and manufacturers of pollution control equipment to the city, resulting in an increased revenue base for the city. A city-wide EMS could be implemented in a number of communities throughout Egypt, including new industrial cities that are familiar with the EMS concept as a result of existing donor projects (e.g., 10th of Ramadan, 6th of October); and in new municipal development areas and new industrial development areas. It could be readily replicated in similar communities throughout Egypt, resulting in a nation-wide industrial pollution prevention initiative, as well as significant reduction in industrial and municipal emissions to the environment.

Encouraging industry to voluntarily undertake pollution reduction measures can also be accomplished by establishing a "challenge" and registry program for industry and energy facilities. This project can be implemented in Egypt at low administrative cost, with the potential to make significant reductions in pollution from the industrial sector. As enforcement systems become effective, the voluntary program can continue to provide a focal point for industries that choose to lead Egypt on environmental matters.

The first phase of a voluntary challenge and registry (VCR) program would involve establishment of the program and the identification of champions. The second phase of the VCR program would involve development of the registry of participating facilities and establishment of environmental and energy efficiency performance targets. The third phase would delineate program rules and monitoring protocols needed to assess

facility performance at regular intervals. The final phase would involve a communications program to recognize champions and their success stories.

Establishing industry-supported, sector specific organizations that will act as a focal point for sector-specific technical information can be critical for continued development of the Egypt's industrial sectors. To date, the majority of Egyptian industry has, not organized into trade groups, however, Egyptian industry could be served well by active trade groups, since the majority of Egyptian industry is concentrated in only 11 major industrial sectors in Egypt (e.g., cement, metallurgical, textile, food, automotive; as well as significant small and medium enterprises). The first phase of the project would be a needs assessment to identify two or three sectors that are interested and would benefit most by establishing trade groups. After sectors are identified, US and European trade groups in those sectors would be contacted to determine if they might be interested in developing a sister organization in Egypt. Sector groups would be modeled after sister organizations, and eventually boards of directors would be established. Trade groups would be initially supported by project funding, but would convert to member financing as soon as possible. Project work would be conducted with organizations that already work extensively with Egyptian industry (e.g., FEI, the Association of Enterprises for Environmental Conservation [AEEC]).

7.2.2 Support the Financing of Industrial Environmental Investments

In meetings, participation panels, and the industrial pollution roundtable, the EESA team has elicited information from industry about the potential need for financial assistance to undertake compliance investments. While industry representatives have voiced concern about the ability of some facilities to obtain financing, further analysis of financing needs by facility size and industrial sector is needed, once more accurate information about the expected compliance costs is available.

However, there is a likelihood that many facilities will need “soft” financing. Public enterprises, still the largest and most polluting enterprises, have made little investment in environmental improvements, because capital from both public and sector generated funds is primarily available for investments that would maximize profits. While private enterprises are generally newer, and therefore less polluting, they still require investment to achieve compliance with Law 4/1994. Commercial banks, offering conventional loans at approximately 15 percent interest, consider environmental investments risky, and are therefore reluctant to lend funds even if data is available showing an acceptable return on investment. Thus, another element of the industrial pollution strategy would examine and document existing sources of “soft” financing and assist counterparts in expanding the availability of financing that is affordable. Such financing assistance to industry has been invaluable in economies in transition, resulting in substantial environmental improvements despite weak enforcement capabilities.

In addition to affordable financing, the GOE could help catalyze compliance investments by providing tax benefits that reduce the costs of importing control equipment and stimulating the development of a domestic environmental control and service industry providing goods and services at lower costs.

The following policy measures have been identified for this policy reform

component:

- The EEAA develops and implements an application and selection process for co-financing environmental projects proposed by industries, municipalities, and NGOs.
- The GOE reduces tariffs and customs to 10 percent.
- The GOE offers tax incentives to private enterprises offering environmental consulting services and/or manufacturers and vendors of pollution reduction equipment.

The focus of future assistance to support financing of compliance investments would include three interrelated components. First, an analysis of potential financing needs among industrial facilities would be undertaken. There is a need to assess the level of investments that would be required to comply with environmental regulations, determine what proportion of these costs facilities would be able to cover from own resources, and the size of the financing “gap” to be closed. The EEAA has initiated a process to evaluate financing that may be available for industries, and Phase 1 of this project would complement the EEAA’s efforts, evaluating both public and private sector access to capital for environmental investments. The team would evaluate the suitability of various sources for different types of investments, considering such factors as collateral requirements, repayment period, and the minimum and maximum amount financed.

Second, assistance would be provided to develop and strengthen options for supporting mechanisms that provide financing for environmental investments. The National Environmental Protection Fund, established by Law 4/1994, is empowered to provide assistance for priority projects that contribute to environmental improvements. A reliable revenue base is being sought by the EEAA for the Fund. In addition, there is a need to strengthen the Fund so that it can play a role in co-financing compliance investments. Development of a competitive application process, assessment and adoption of alternative disbursement mechanisms, and development of negotiation and monitoring capabilities would improve the transparency and accountability of the Fund. If the Fund were to meet donor criteria, it could provide a mechanism for disbursing donor contributions.

Most donor supported funds, which are being channeled through commercial banks, are not intended to be revolving and have a limited life, e.g., the World Bank’s Pollution Abatement Fund of \$54,500,000 over 3 years; and the KfW’s of \$38,500,000 until all funds are distributed. Additional options for finance would be explored, as well as modifications to existing programs that would increase their appeal and accessibility to industry. Most of the financial programs would be geared towards private enterprise, though suitable programs for public enterprises would also be evaluated. Financial support for industrial environmental investments could be provided by offering loan guarantees for individual investors seeking commercial bank loans, or by offering incentives to banks to offer favorable terms, such as extended grace periods or reduced interest rates.

Technical assistance for the National Environmental Protection Fund portion of Component two is likely to be extensive. Both the managing entity and industries that are

interested in accessing the fund would be provided with training regarding fund operation and management, project preparation and selection. Other likely components would include public awareness and promotion at start-up, technology transfer and institutional development and capacity building for the managing entity and industries.

The third task would be to develop a directory of financing mechanisms available to industry, including terms and conditions, and contact information for each source. With this information, a facility can fully evaluate all available financing options and develop a strategy for making manageable environmental investments to meet its compliance goals. The directory should also help to raise general awareness of the need for finance and encourage other financial institutions to develop programs. Plans for periodic updates of the directory would be made. Public awareness would be a significant element of this task, as the directory would be widely publicized and distributed to industry through various channels, including industry groups and vendors of environmental technology.

Industries who have USTs will also need access to funding if new UST regulations are established. The EEAA may want to consider creating a special account in the National Environmental Protection Fund that could provide co-financing for tank replacement and/or clean-up of UST leaks. The special account might be available to those tank owners who agree to upgrade their tanks voluntarily ahead of compliance dates. The EEAA should also consider a variety of financing mechanisms that could capitalize such a fund. In the US, the most common revenue sources for UST programs are gasoline surcharges and tank fees, which vary according to size, contents, and construction material.

If the GOE demonstrates a strong commitment to supporting compliance investments by adopting policy measures described above, USAID may want to consider use of cash transfers to augment National Environmental Protection Fund revenues, earmarked for industrial compliance investments or UST investments. Although the adoption of policy measures to encourage domestic manufacturing of environmental control equipment through tax incentives may be adequate, the EEPP may want to consider assisting in the development of a venture capital fund for start-up industries, possibly with co-financing provided through the National Environmental Protection Fund.

7.3 Expand and Improve Public Awareness to Support Institutional Strengthening and Industry Initiatives

Public awareness and education initiatives are essential complementary activities to the compliance programs discussed above. Public awareness is needed to support the following:

- government strategies and policies affecting the environment;
- promotion of enforcement and compliance measures;
- industry success stories;
- information on funding availability;
- identification of champions in government, industry, and NGOs playing leading roles in reducing pollution; and
- recognition of leaders for taking action to reduce pollution.

This component responds to concerns from industry and NGOs that there is a significant lack of awareness among regulated entities and the public about Egyptian environmental laws and regulations. It is compatible with the growing public sensitivity to environmental degradation and ensures that actions by government, industry, donors, and NGOs receive appropriate recognition as models for future replication and diffusion of sound environmental practices.

Supporting projects would consist of public awareness activities targeted toward industry to facilitate its understanding of responsibilities regarding pollution reduction, environmental compliance and to introduce available assistance mechanisms (particularly financial assistance) for achieving its environmental management goals. For example, one of the first public awareness activities that the EEAA, other regulatory agencies, and NGOs would conduct using technical assistance from the program would be a series of seminars and an advertising campaign explaining Law 4/1994, other existing environmental laws, and associated compliance requirements (e.g., compliance action plans, emissions reporting requirements, and sampling and analysis). This activity is critical to industry's overall environmental awareness, considering that the USAID-funded survey discussed earlier found that up to 57 percent of Egyptian industries are still unaware of Law 4/1994.

Throughout the USAID's five-year assistance program, counterparts would initiate a public awareness campaign of industrial successes to recognize industry champions and to help replicate project results in similar environments. Throughout the program, training would be provided to counterparts conducting the public awareness campaigns (e.g., the EEAA, other regulators, and NGOs) regarding delivery of public awareness campaigns, with follow-up research to assess and strengthen the impact.

References:

TERRA Corporation, June 1996. *"An Environmental Profile of Egyptian Manufacturing Industries. A Report on Environmental Conditions Today"*.

USAID, 1996. *"Strategic Plan for Egypt"*.

Table 16: Industrial Pollution Policy Reforms, Measures and Assistance Tools

Policy Reform	Policy Measure	Assistance Tools
7.1 Strengthen implementation and enforcement capabilities	EEAA delivers electronic facility inventory and procedures for access and updating inventory	Financial assistance to set up electronic facility inventory; technical assistance to prepare procedure, convene training sessions on use of inventory
	EEAA develops a table of violations for Law 4/1994 and other environmental legislation; EEAA develops a violation response guide outlining penalties for violations	Technical assistance to EEAA and industries to convene work groups to develop violation codes; technical assistance to EEAA to prepare enforcement strategy and certification program; training of enforcement staff in implementing violations response guide
	EEAA develops an inspector certification program and establishes a corps of inspectors	Training and certification of enforcement staff
	EEAA develops certification program for analytical laboratories	Technical assistance to assist EEAA in developing certification capabilities
	EEAA inventories USTs; develops UST regulations	Technical assistance to EEAA to familiarize staff with UST programs in U.S. and Europe; develop UST regulations; implement demonstration projects
7.2.1 Promote industrial pollution reduction and compliance activities	EEAA establishes environmental units at selected industrial cities	Technical assistance to support establishment of environmental units
	GOE establishes a formal reward system to recognize champions in industry, etc., in voluntary programs	Technical assistance to support development of reward system
7.2.2 Support the financing of industrial environmental investments	GOE reduces tariffs and customs on pollution control equipment to 10%; GOE offers tax incentives to private enterprises offering environmental services or equipment	Technical assistance in amending tariff legislation/regulations, assessing other tax incentives
	EEAA develops process for co-financing environmental projects proposed by industries, cities, and NGOs	Technical assistance for developing the application and selection process
7.3 Expand and improve public awareness to support institutional strengthening and industry initiatives	None	Technical assistance to develop and implement public awareness campaigns

Chapter 8

Policy Reform Program for Municipal Solid Waste

Chapter 2 characterized the municipal solid waste sector in some detail. Across Egypt there exists a wide array of MSW services provided by the public and private sectors. Essentially every arrangement seen elsewhere in the developing world, from purely public to the private models of contract, franchise, concession, and open competition, is observed somewhere in Egypt. Further, the range of collection and disposal systems in use in Egypt is quite large. It covers the gamut from curbside collection in some urban areas, to pickup only from local collection centers, to no service at all. Where MSW services are provided, frequency of collection also is variable.

To an outsider it appears that MSW service is far from optimal within many cities in Egypt. Littering is a widespread problem, in part because solid waste collection services are unavailable in many neighborhoods. Many households dispose of solid waste in aesthetically undesirable ways. Throughout urban areas, waste piles are set on fire to reduce their volume, resulting in serious air pollution problems (solid waste burning is responsible for about one-third of the particulate matter in Cairo's air). Additionally, in some areas that are adequately served by MSW services, scavengers go through curbside containers looking for recyclable items and scatter waste that the paid collectors will not remove.

It is tempting to say that the problems seen in MSW collection and disposal would be solved if Egypt adopted laws and regulations similar to those in place in Western Europe or the US. However, the demand by Egyptian households for and their attitudes about solid waste services may be quite different to what is observed in Western Europe or the United States. This could imply the need to support different levels and types of service and result in different responses to prices and other incentives. Furthermore, the costs of providing MSW services may be quite different from other countries as well.

To develop an effective assistance program that promotes solid waste policy for Egypt, the USAID needs better information on the costs and benefits of alternative MSW service arrangements and how households and other actors in the system respond to various types of incentives. Only with that information is it realistic to begin to craft a cost-effective assistance program that will yield maximum net benefits to Egypt.

While the assessment team has proposed an assistance program for MSW that identifies needed policy reforms and supporting projects, it believes that the USAID should develop additional information on the demand for MSW services and the costs of providing these services before initiating this program. Thus, it is recommended that the MSW policy support program be undertaken in two phases. The initial phase of assistance activities would concentrate on closing the information gap and helping the USAID prioritize MSW assistance activities in the second phase. First phase activities would include three studies: (1) measuring willingness to pay for different types of MSW service; (2) analysis of the costs of alternative types of MSW services; and (3) financing mechanisms and incentives.

The second phase would involve a comprehensive program of MSW management reforms and technical assistance. Specific policy components would include development

of MSW management regulations, strengthening of implementation and enforcement capabilities, continued work on financing (from the first phase), and expanding the role of the private sector in providing MSW services. In addition, the assessment team has identified projects that would promote more effective MSW management but do not entail policy reforms. These projects are briefly discussed at the end of the chapter under the heading of public awareness and participation.

Although the MSW strategy has been divided into two phases, there is scope for some overlap in the timing of some assistance activities. For example, there may be specific projects, which are part of the more comprehensive program that can be accelerated. USAID might implement public awareness activities or selected projects, which have significant near term benefits in terms of reduction of solid waste disposed in uncontrolled sites. Also, if the EEAA is prepared to proceed in developing national standards for MSW management before the beginning of the second phase, the USAID could proceed using short-term consultants rather than a long term advisor (which might be appropriate in the second phase of MSW assistance).

Section 8.1 outlines the first phase of the MSW strategy. It is anticipated that the three studies that comprise the first phase could be conducted within six to twelve months of EEPP start-up. Potentially, the willingness-to-pay study could be delayed because the questionnaire must be approved by the Central Authority for Population Mobilization and Statistics (CAPMAS) before it can be distributed. *Section 8.2* describes MSW policy reforms and supporting technical assistance. Conceivably, the second phase could be initiated within twelve to eighteen months of the EEPP start-up, in time to incorporate MSW policy measures in the second tranche of cash transfers. Table 17 provides a summary of proposed policy reforms, policy measures and assistance tools recommended for implementation under the EEPP.

8.1 Analysis of the Demand for and Costs of Providing MSW Services

The following projects are designed to address the information needs that must be met in order to design a sustainable MSW program that addresses the problems of littering, burning, and mobilizes adequate resources to recover the costs of these services.

8.1.1 Measuring Willingness to Pay for MSW Service

The amounts that Egyptians are willing to pay for different levels of municipal solid waste service is an essential input to the formulation and design of policies for managing municipal solid waste. Households are viewed as having a willingness to pay to have clean and relatively odor free neighborhoods. They may also pay to avoid risk of disease. At best one might infer a minimum willingness to pay for *some* areas based on charges currently imposed and willingly paid. However, large portions of metropolitan areas within Egypt are without municipal solid waste service and in other areas, service is at very low levels. The amount that households, which do not currently receive services, are prepared to pay for different types of services is not known.

Willingness to pay for MSW service likely extends beyond simply having one's solid waste collected. Neighborhood aesthetics are likely to matter to many; they would pay something to see to it that their neighbors' solid waste is collected. Furthermore, households are likely to be willing to pay something to reduce the risk of disease being spread throughout their community.

As part of the background analysis for establishing a sustainable MSW policy, the USAID should sponsor a survey to provide estimates of the amounts that households are willing to pay for alternative levels of municipal solid waste service. A model for such a survey is the work of Hoehn and Krieger concerning the willingness to pay of residents of Cairo for municipal water and wastewater service (1).

A willingness to pay survey would involve both a survey of knowledge, attitudes, and practices (KAP) and questions to elicit willingness to pay (WTP) for alternative types and levels of services. The KAP component of the survey would help develop a better characterization of the current situation and would provide useful input into subsequent public awareness campaigns. The WTP results, combined with analysis of the costs of MSW services and analysis of financing (discussed below), and would help USAID better gauge the potential benefits and success of the policy reform program.

8.1.2 The Cost of Alternative Levels of Service

The USAID should consider sponsoring a study of the costs (per household, per ton collected, and by other parameters) for the solid waste collection and disposarrangements currently in use in Egypt. One could view the wide variety of public and private services currently in use in different neighborhoods as a series of experiments. Several key questions could be addressed:

- Is the private sector more efficient than the public sector?
- What are the most efficient means of organizing a particular level of private sector service: contracting; franchise; concession; or open competition?
- What does it cost to increase the frequency of collection?
- How does recycling affect the economics of MSW services in different neighborhoods?

This study should be closely coordinated with the WTP study. Preliminary information on the costs of services can be valuable in assigning realistic cost ranges to WTP questions for different types of services. The study should also examine the potential impacts of new MSW regulations on the costs of services. Regulations on landfills are likely to increase the costs of MSW services because of greater costs of managing landfills (which affect tipping fees) and higher transportation costs (because of the likelihood that landfills will be sited at greater distances from collection points).

8.1.3 Financing Mechanisms and Incentives

After addressing the information needs described above, the principal economic issue is financing. Should the MSW program be supported by user fees or general tax receipts? This is a complex question that cannot be answered easily. Having users pay

for public services generally is viewed as appropriate economic policy. Through that process, users face the correct economic signals about disposal costs. However, there may be overriding concerns about community aesthetics and public health. If only a minority of households elects not to participate in a pay-for-service MSW program, the neighborhood can become an eyesore and a public health problem. Enforcing rules and regulations against littering could prove difficult, especially if casual attitudes toward waste disposal are commonly observed.

For the purposes of the EESA, the assessment team conducted a preliminary analysis of solid waste management costs and revenues in Egypt. The objectives of this analysis were to estimate costs of MSW services in Egypt, assuming environmentally-acceptable standards are applied, and determine the amount of revenue that is potentially available to fund MSW services. The study also tried to estimate the approximate value of recoverable materials in the Egyptian MSW waste stream. The preliminary conclusions of the analysis suggest that current revenues potentially available to finance MSW services could cover about half of the costs of a comprehensive MSW system. The team also estimated the value of recoverable materials to be about \$200 million per year on a gross basis (not accounting for costs of labor to recover these materials).

The first step in the financing study would be to update the preliminary analysis conducted for the EESA. Results from the costs of services study would be used to refine the previous cost estimates and to examine how costs vary by community size, location of landfill, etc. Additional discussions with MSW officials would help clarify the revenue side. The second step of the study would be to examine ways to reallocate existing revenues to finance MSW and identify and assess new sources of financing. In addition, the study would examine the potential for increasing revenues from existing mechanisms. For example, as rent controls are relaxed, revenues from the rent-based cleansing tax can be expected to increase.

Financing options might be addressed on an experimental basis. Communities might experiment with systems that charge users in some neighborhoods and try using property tax receipts or other general revenue sources to pay for MSW service in other neighborhoods. The fees could be a flat charge per household or based on the volume of use (e.g., fees per bag or per can). A number of issues could be investigated: How do user fees affect the volume of waste collected? Are there problems in collecting the user fees? How do different fee levels affect the percentage of households that participate? How does the participation rate affect the quantity of litter observed in a neighborhood?

While a great deal of attention has been given to the issue of how to finance MSW in industrialized nations, the developing world is likely to be quite different (attitudes, culture, ability to pay, the economics of recycling, etc.). Consequently, a study of these issues in the developing country context is essential.

8.2 MSW Policy Reforms and Assistance Program

The overall goal of the assistance program would be to develop an effective, comprehensive, sustainable, nationwide MSW management system. This goal is consistent with the USAID's promotion of sustainable development and is reflected in the

USAID's strategic objective for reduced generation of air pollution and other selected contaminants (which identifies improved solid waste management as an important intermediate result).

This strategy embodies the challenges in initiating an implementation and compliance program in Egypt, and achieving rates of compliance typically achieved in similar countries. In this regard the USAID's assistance programs must complement efforts of the GOE and other donors, and should be designed to do so. With limited assistance resources, the proposed MSW program emphasizes assistance to address those problems posing the greatest health and environmental benefits. Consistent with the principles of sustainable development, the strategy strives to encourage cost-effective attainment of environmental goals. Assistance delivery mechanisms for implementing the strategy are being evaluated in terms of their potential to contribute to and sustain institutional capabilities and maximize replication and diffusion opportunities.

Four types of assistance delivery mechanisms are expected to be employed as part of this strategy. These include technical assistance, training, financial assistance, and public awareness programs. It is intended that this strategy will provide a sound basis for environmental management and a framework for individual projects that support a sustainable environment. As noted in the introduction, the specific policy components are: MSW management regulations; enforcement; financing; and expansion of private sector participation in MSW service delivery. In addition, activities to improve public awareness and participation are discussed at the end of the section.

8.2.1 MSW Management Regulations

A comprehensive set of national standards and enforceable regulations does not exist in Egypt. Comprehensive, effective, workable MSW management must start with a clear statement of national standards supported by regulations and enforcement mechanisms and practices. Everyone must know the rules. Standards would be established for:

collection, transportation (transfer operations) and landfill disposal;
composting and recycling;
medical waste and household hazardous waste;
construction and demolition debris;
design, construction and operation of waste management facilities;
monitoring, inspection and reporting requirements; and
program(s) for delegation of implementation and enforcement to regional governments.

National standards and regulation would be developed by the EEAA. The regulatory structure would provide for delegation of implementation and most enforcement activities to regional authorities or local governments. Assistance would be integrated and coordinated with current GOE regulatory development efforts to the extent they exist and would aim to enhance the capabilities of existing GOE institutional structures and support development and management of programs and projects in progress, based on an evaluation of their potential for supporting reform program objectives.

As part of this effort, the roles and responsibilities of various parties within the

MSW sector need to be reviewed and recommendations developed for creating a more effective structure of policy development, implementation, enforcement, and coordination. One option for strengthening national coordination of MSW would be the establishment of a central directorate for solid waste management. This directorate could be responsible for development of a national plan, review of regional strategies, developing management models, and collecting and disseminating information and statistics.

Two policy measures might be considered by the USAID in formulating cash transfer performance standards and the GOE's progress in adopting comprehensive national solid waste standards. First, for the second tranche, a policy measure would involve the drafting of Law 4/1994 Implementation Regulations for solid waste management by the EEAA. Second, these regulations would require the promulgation of a decree by the Prime Minister after a thorough review of the regulations by other ministries. This policy measure could be included in the second or third tranche depending on the expected lags between drafting and promulgation.

The EPPP would provide technical assistance to the EEAA to familiarize them with MSW management standards in the US, Europe, or the Far East. Initial activities might include preparation of an options paper describing similarities and differences in regulatory approaches and case studies and organization of a seminar with presentations by MSW officials in selected countries. Assistance would also be provided in finalizing these regulations, estimating the potential costs of the regulations, and developing training programs and public awareness materials.

In conjunction with the development of MSW management regulations, follow-up assistance might focus on side-by-side assistance to help selected communities design and construct landfills and transfer stations. The availability of landfill capacity, currently lacking in Egypt, is one of the major prerequisites for an effective and comprehensive national system. For both types of assistance, the construction of new facilities would be followed up by the development of case studies that could be used to facilitate replication through training and public awareness activities.

8.2.2 Strengthen Implementation and Enforcement Capabilities

A policy to strengthen the current capacity of governmental agencies (central and regional) is essential so that these agencies will have the capability to manage MSW more effectively. This policy is vital if any substantial, sustainable improvement is to be made to Egypt's environment. The following specific activities might be undertaken in support of these policy reforms.

Develop a National Database

There is a need to develop and maintain a national database of MSW management information and statistics. It provides a basis upon which to quantify the problem, allocate resources, measure progress, and identify weaknesses. It provides discipline and accountability, and a basis for enforcement. The database can also provide useful input in estimating the potential costs of regulation and determining the staff resources needed to certify MSW management facilities, conduct inspections and take enforcement actions.

Develop Enforcement Procedures and Technical Guidance for Enforcement Agencies

The current enforcement strategy for MSW is not well defined or properly structured. Clear lines of authority for implementation and enforcement need to be established. Given the minimal level of staffing for enforcement activities, generally, and MSW specifically, the EEAA will have to prepare a strategy that emphasizes self-reporting by municipalities (or private MSW service providers) and prioritizes enforcement. For example, the initial phase of enforcement activities should concentrate on landfill design and management practices. Issues to be addressed in the strategy would include intergovernmental cooperation, clarification of roles and responsibilities of the EEAA, other ministries, RBOs, and EMUs, and use of sanctions and enforcement orders.

Training

A number of training activities would be undertaken with assistance from the USAID or other donors. These include training of enforcement officials in enforcement techniques, the use of analytical results in enforcement, increasing their knowledge of equipment and technologies used in MSW systems and the operation and management of MSW systems.

8.2.3 Financing, Funding and Cost Recovery

As previously discussed, a significant impediment to improving MSW management is simply the lack of money earmarked for MSW services. At the present time, insufficient funds are generated in the economic system to pay for effective MSW management. Without adequate funding it will not be possible to develop the extensive capabilities needed for proper MSW management, nor to maintain necessary capabilities on a sustainable basis. Inadequate funding and uncertainties in the levels from year to year could have implications for securing financing and subsequently servicing the debt for capital investments. Ultimately, insecure sources of funding will increase the costs of capital and may limit access to modern technology.

To increase revenue generation, two approaches would be undertaken. One would be to increase the effectiveness of the current funding mechanisms, such as increasing collection and disposal fees, and making revenue transfer mechanisms more effective. Another would be to identify additional sources of revenue, such as transfers from general revenue accounts. It should be noted that MSW financing options are well-established throughout the world and the process of setting user rates to recover capital and operating costs are straightforward exercises. The key issues concern affordability across economic strata, commitment of officials to full cost recovery, and the effectiveness of revenue collection authorities.

As discussed in Section 8.1.3, some preliminary analysis would be undertaken in the first phase, including some assistance to specific communities to identify and implement alternative financing schemes on an experimental basis. In the second phase, technical assistance would be provided to the GOE ministries and local governments to

identify new revenue sources, evaluate alternatives, and develop appropriate strategies for improving collection. We anticipate that the strategy or strategies that maximize net benefits (benefits minus costs) in one neighborhood may be quite different from those in another neighborhood. Such factors as income level, population density, and width of streets are likely to affect variables such as the place and frequency of collection, and determine whether collection costs are partly or fully funded through user charges or subsidized by government. We may find that arrangements in some neighborhoods are close to optimal, but that major changes are called for elsewhere to improve the enforcement of existing laws on littering and burning of trash in the streets. As a policy measure, the EEAA could prepare an analysis of the obstacles to the recovery of MSW management costs and draft necessary legal or regulatory reforms required to overcome these obstacles.

8.2.4 Private Sector MSW Services

Private MSW management firms should play a major role in the development and ongoing operation of proper MSW management systems in Egypt. Private firms usually provide resources and capabilities, particularly in terms of efficiency, technology application, and cost control, that are usually superior to those that can be provided by the public sector (and especially local governments). Government provision of these services may be less expensive, but only because the quality of service is lower. Some private firms in Egypt currently provide MSW management services under contract to public agencies, however, several factors limit their ability to provide services on a more widespread basis.

One factor is the lack of adequate funds earmarked for MSW services that would enable private firms to recover both annualized capital costs and the costs of operations and maintenance. Other factors that impede private firm participation are largely administrative. These include deficiencies in definition of scope of work, application of proprietary capabilities, procurement procedures, the form of contracts, coordination among different political bodies, and other procedural factors.

An objective of the USAID assistance would be to provide support for increasing government's ability to contract with private firms for MSW services and to expand the capabilities and resources of the private MSW management sector, including joint venture and consortium initiatives. Specifically, assistance would be provided to support the development of improved procurement and contracting procedures. This would involve a review of Law 9/1983 concerning public procurement, tenders and auctions and an assessment of changes required to its implementing regulations.

A second component of assistance would be an assessment of the likely financial barriers that private firms would face in initial capitalization efforts. The capital costs required to provide MSW services are substantial. Private firms may have problems raising capital for these purchases from banks and other financial intermediaries unless the length of service contracts with municipalities are substantially long. Also, tariffs on imported equipment will increase costs, and non-tariff barriers could result in significant delays in delivery of equipment (which will result in additional costs for the firm). A combination of tax credits or holidays (for a limited period, perhaps five years) and lower tariffs on imported equipment (and spare parts) may be necessary to attract private firms

to the MSW sector. Policy measures to promote private sector involvement in the provision of MSW services would focus on regulatory changes to streamline or modify procurement practices and improve tax and tariff incentives to provide for adequate capitalization of MSW services.

The assessment team has also identified two additional projects that will enhance the private sector's ability to provide cost-effective MSW services. The first project would involve an analysis of equipment needs for different types of collection problems (e.g., narrow or unpaved streets, different types of collection bins) and development of equipment specifications that are consistent with low-cost labor utilization. Some degree of standardization would be beneficial to allow a service industry providing spare parts and repairs to develop in Egypt. The second project would entail assistance to MSW service providers in developing equipment maintenance programs. One of the major problems identified in the EESA's Solid Waste Participation Panel was the frequent disruptions in waste collection resulting from vehicle breakdown. Technical assistance would focus on preparation of guidelines for maintenance programs plus side-by-side training for a select number of MSW companies and local government units providing MSW services.

8.2.5 Public Awareness and Participation

Many of the activities described above will include public awareness components. The Phase 1 studies would yield findings that can be utilized in public awareness campaigns and educational programs. In addition, if new regulations are developed and implemented, some assistance could be provided to the EEAA to disseminate information on new requirements. It would be useful to develop an educational program targeted at children. Such a program could provide information about the environmental and social dimensions of uncontrolled dumping and littering and involve projects to make children more aware of their personal habits and practices.

In addition, the assessment team developed two projects to foster community involvement in addressing solid waste disposal problems. The first project would focus on the restoration of public areas, rivers and canals that have been utilized for uncontrolled dumping of solid waste. Communities would be encouraged, perhaps through grants from the National Environmental Protection Fund or through other financial incentives, to develop new uses for these dump sites, remove existing waste and identify permanent disposal options. For example, an informal dumpsite might be cleaned up and used for a community park or a canal bank could be developed as a cornice or planted open space. The second project would be a competition to encourage communities to find low cost ways to increase collection rates and reduce litter. Winners would receive recognition from the GOE or the EEAA. Both projects would result in environmental improvements and provide good case studies for public awareness campaigns.

References:

USAID, 1995. *"Cairo Water and Wastewater Economic Benefits Analysis"*. Hoehn and Krieger.

Table 17: Municipal Solid Waste Policy Reforms, Measures and Assistance Tools

Policy Reform	Policy Measure	Assistance Tools
8.1.1 Improve awareness of MSW problems and increase level of interest in solving MSW problems	None	Study to gauge knowledge, attitudes, and practices, estimate WTP; Follow-up technical assistance to develop public awareness materials
8.2.1 Development of comprehensive solid waste regulations	EEAA drafts Law 4/1994 Implementing Regulations for solid waste; Prime Minister issues decree to promulgate regulations	Technical assistance to EEAA to compare MSW regulations in other countries; and prepare draft regulations; Technical assistance to MSW systems to design and construct landfills and transfer stations
8.2.2 Strengthen implementation and enforcement capabilities	EEAA develops and maintains national data base of MSW operations; EEAA develops enforcement strategy for MSW	Technical assistance to EEAA to develop national data base; technical assistance to EEAA to prepare enforcement strategy; Training of enforcement staff
8.2.3 Improve the potential to recover costs by removing policy, legal, and regulatory barriers (also, 8.1.2 and 8.1.3)	EEAA prepares analysis of obstacles to cost recovery and drafts legal or regulatory reforms	Technical assistance to identify new revenue sources; Analysis of costs of services, gaps between revenues and costs and how to close the gap
8.2.4 Encourage private sector participation in MSW through improved access and economic incentives	EEAA drafts and GOE accepts changes in public procurement law; GOE provides tax and tariff relief to start-up MSW companies	Technical assistance to EEAA to assess structure of barriers and incentives for private sector provision of MSW services; technical assistance to develop equipment specifications, maintenance programs for MSW
8.2.5 Improve public awareness of solid waste problems	None	Assist EEAA and local communities to develop public awareness, education programs; technical and financial assistance for environmental restoration; technical assistance to EEAA to organize competition to improve community MSW collection efficiency

Chapter 9

Policy Reform Program for Energy and Energy Efficiency

Many of the policy options discussed in this section respond directly to constraints identified in Chapter 4. The policy reform programs for energy and energy efficiency are discussed separately in this chapter although there are several overlapping areas in the reform measures. *Section 9.1 Energy* and *Section 9.2 Energy Efficiency* present overviews of existing policy constraints, as well as proposed policy reforms, supporting policy measures, and the approach determining the type of assistance offered. Table 18 provides a summary of proposed policy reforms, policy measures and assistance tools recommended for implementation under the EEPP.

9.1 Energy

Establishment of an independent regulatory authority and restructuring of Egypt's energy sector to increase private sector participation and competition are critical to the viability of energy efficiency policy and other environmental initiatives proposed in the energy sector. Both the regulatory authority and the restructuring initiatives described below fall under the purview of the Division of Power and Telecommunications, USAID/Cairo and are not recommended for inclusion in the EEPP. They are discussed here because of their crucial role in establishing the necessary environment for implementation and sustainability of the other proposed energy and energy efficiency projects.

Policy initiatives and projects proposed for inclusion in the EEPP include a review of the existing CNG conversion strategy, establishment of a policy and legal framework for renewable energy, and creation of a cogeneration promotion policy. These energy sector initiatives reduce environmental impacts and promote sustainable energy production and delivery.

9.1.1 Establish Independent Regulatory Authority for Energy Sector

Currently, the GOE sets all energy prices in the absence of a transparent tariff review process. Political expediency plays a large role in the tariff-setting process, rather than sound technical and financial analyses. As a result, there is substantial price subsidization and cross-subsidization of energy prices in Egypt, and some energy sector entities are in poor financial condition. This limits their ability to implement efficient equipment and operating practices, and leads to inappropriate consumption levels of scarce resources.

Without proper pricing signals, energy efficiency programs are not sustainable in the long-term, or even the medium-term. Equitable pricing provides market signals to consumers that prompt appropriate levels of consumption and more efficient utilization of energy resources, thereby reducing environmental impacts of energy use on air, land and water resources. Pricing is best controlled through competition and an open

marketplace. In the absence of competition, an independent regulatory authority can best replicate the effects of competition and ensure equitable pricing.

The GOE should transfer responsibility for tariff-setting to an independent regulatory authority, and allow it to pass judgments free of political interference. An effective independent regulatory authority is required to insure equitable pricing, to protect consumer and supplier interests, and to insure the reliability of energy supply. A regulatory authority should be established for all energy sectors, including oil, gas, and electricity. A Presidential Decree to create the regulatory body for the electricity sector has been approved by the Council of Ministers, but requires final approval by the President and the Cabinet. A number of projects, proposed for consideration by the Office of Power and Telecommunications, USAID/Cairo, are briefly described in Box 8.

Box 8

Projects to Support Development of an Independent Regulatory Authority

Establish a Fully Functional, Independent Regulatory Authority for Energy Sector is a one year technical assistance project designed to provide institutional design support to the Independent Regulatory Authority. Specific objectives are to establish the Regulatory Authority's mandate, develop its detailed terms of reference, identify staffing requirements and delineate rules and regulations for the Authority's operation.

Institutional Development of Independent Regulatory Authority for Energy Sector is a two-year technical assistance project to build capacity within the regulatory authority to efficiently and effectively perform its functions. Technical assistance will be provided in highly specialized technical skills, pricing, planning, utility finance, protection of customer interests, energy efficiency, etc., which are critical to the proficiency, efficiency and credibility of the regulators.

Education of Regulated Entities Regarding Role of Energy Sector Regulatory Authority, a six month technical assistance project, is an important element of a successful regulatory program. Organizations in the petroleum, gas, and electricity sectors will be targeted by a training and awareness campaign which includes: the rationale for establishing such an authority, what role this authority will have within the energy sector, and what direct impact this authority will have on their operations, particularly with regard to pricing.

Public Awareness Campaign Regarding Role of Energy Sector Regulatory Authority would be funded through the GreenCOM Project, with collaboration from long-term advisors on the Institutional Development of Independent Regulatory Authority for Energy Sector Project. Egyptian consumers require education regarding the rationale for establishing such an authority, what role the authority will perform, and what direct impact the authority will have on their lives. It is critical that the role of the regulator be understood by the public, in order for the authority to be protected from political pressure, to attain credibility with the public, and to operate effectively. There is also a need for energy suppliers to understand their rights in the regulatory regime.

9.1.2 Restructure Energy Sector

While various sectors of the Egyptian economy have experienced privatization of public sector assets, the electricity sector remains dominated by the public sector. Although steps have been taken to increase private sector involvement in the energy sector, there remains little incentive within the industry to improve the efficiency of

operations. More efficient operation and management of the energy sector on the basis of commercial principles will result in reduced air emissions, as well as reduced discharges into land and water.

Although public sector operation of the EEA, the Electricity Distribution Companies (EDC) and the EGPC and its subsidiaries has been characterized as inefficient, no one has yet identified exactly what should replace government ownership. The GOE should restructure and unbundle the various operating entities in the energy sector to promote commercialization and increased competition, leading to greater efficiency in the production and delivery of energy. The implementation of an independent regulatory authority could promote efficient operating practices, and approve tariffs, which recover costs and place entities on firm financial ground. The regulatory authority should set policies to encourage implementation of demand side management (DSM) programs, encourage private sector investment, and facilitate increased competition in the energy sector. Suggested projects to complement restructuring of the energy sector for consideration by the Office of Power and Telecommunications, USAID/Egypt are listed in Box 9.

9.1.3 Revise MOP CNG Conversion Strategy

The MOP's CNG conversion strategy should be revised with the intent of facilitating increased conversions of vehicles to natural gas. CNG is a more environmentally friendly fuel than diesel and gasoline; thus substitution of CNG for these fuels results in reduced air pollution and improved environmental quality. The current CNG strategy is hampered by subsidization of competing fuels and the cost of conversion equipment.

Policy Measures

Establishing a regulatory authority and restructuring the energy industry as discussed above will help to address the shortcomings in the MOP's CNG policy, however, it may take some time before these initiatives are underway and implemented. In the meantime, the MOP's policy should be reviewed in an effort to speed-up CNG conversions, thereby improving environmental quality and the GOE's foreign exchange and balance of payments.

The strategy study should assess means for reducing subsidies on diesel fuel while recognizing the impact on inflation and the overall quality of life for the nation's poor. It should also assess various means for reducing or eliminating the duty on conversion kits to the overall benefit of the environment and Egypt's foreign exchange.

Box 9

Projects to Support Development of Energy Sector Restructuring

Evaluation of Options for Restructuring the Energy Industry is a nine month technical assistance project that will include a review of worldwide restructuring experience vis a vis the unique characteristics of the Egyptian energy sector, so that the most appropriate structure for Egypt's energy industry is selected. Without a thorough review of alternative means for restructuring the sector, valuable time, monetary and technical resources, and political will may be lost as “experiments” in restructuring individual entities are conducted in the absence of a coherent, deliberate restructuring plan.

Development of Commercial Operating Agreements between Entities in Restructured Energy Sector is a six month technical assistance project which will provide assistance to draft, negotiate and implement the legal agreements required among operating entities in the restructured electricity sector. Owing to the public sector monopoly in the energy sector to date, little has been done to formally document the roles and responsibilities of individual participants in those sectors. Further, those roles will change as the sector is restructured. An important component of this project will be both formal and on-the-job training of counterparts in the development, negotiation and implementation of commercial operating agreements.

Capacity Building of the EDCs and the EEA is a three-year technical assistance project designed to enhance the ability of both the EEA and the EDCs to operate as commercial entities in the restructured electricity sector. This project will build on an ongoing USAID effort with the EEA, which focuses on institutional development and commercialization, taking that effort deeper into the organization. A demonstration zone and demonstration distribution company will be selected as the focus of technical assistance, in addition to the transmission company. Upon completion of technical assistance/training provision, demonstration facilities will be paired with a second facility.

Capacity Building of the EGPC and its Subsidiaries is a three-year technical assistance project designed to enhance the ability of the EGPC and its subsidiaries to operate as commercial entities in the restructured oil and gas sector. Demonstration entities such as an individual refinery, distribution facility, etc. will be selected as the focus of technical assistance. Upon completion of technical assistance/training provision, demonstration facilities will be paired with a second facility.

Public Awareness Campaign on the Benefits of Introducing Commercial Operation and Private Sector Participation is a project to be funded through the GreenCOM Project. It will address the general public's lack of knowledge about commercial operation and private sector participation in the energy sector. As Egypt introduces a greater level of competition and private sector participation into its energy sector, Egyptian consumers' concerns about loss of public sector control over the energy sector must be addressed.

Approach

Review of MOP CNG Conversion Strategy is a six month technical assistance project which will analyze the MOP's CNG conversion strategy, identifying conflicting initiatives and constraints to the existing CNG conversion strategy, clarifying the objectives of the conflicting initiatives, and developing recommendations for policy reform to ensure clear, consistent signals to the public. Potential follow-on projects might include cash transfers to government in lieu of import duty reductions, and financing for CNG conversion kits. This project will have to coordinate with initiatives being undertaken in the USAID-funded Cairo Air Improvement Project.

Public Awareness Campaign on Benefits of CNG Conversion is a project to

be funded through the GreenCOM Project, with collaboration from long-term advisors on the CNG Conversion Project and Cairo Air Improvement Project. The awareness campaign will address the economic and environmental benefits of CNG conversions, and will be required once the policy analysis and reform component has been completed.

9.1.4 Introduce a Policy and Legislative Framework for Renewable Energy

The Egyptian government receives considerable support from international donor agencies to tap into Egypt's extensive renewable energy resources, including assistance from Germany, Denmark, the Netherlands and the European Union. These assistance projects have focused almost exclusively on resource assessments, technology development and demonstration and pilot projects.

Policy Measures

Egypt needs a comprehensive and results-oriented policy and legislative framework for renewable energy to guide and encourage development of its renewable energy resources, and to ensure that all the benefits that renewable energy offers to the economy are considered when energy supply options are evaluated. The renewable energy framework should provide clear direction to the EEA on the acquisition of renewable energy resources and financial incentives for renewable energy projects and firms. In addition, the government should consider establishing a policy and supporting programs for certification of renewable energy equipment and service providers. Efforts in this area should be coordinated with the United Nations Development Program/Global Environment Facility (UNDP/GEF) project on *Energy Efficiency Improvements and Greenhouse Gas Reduction (3)*.

Approach

Development of a Renewable Energy Policy and Legislative Framework is a two-year technical assistance project to support the development of a comprehensive and results-oriented policy and legislative framework for renewable energy. The project will include a review of renewable energy policies in countries worldwide, with a focus on their relevance for Egypt. Recommendations for Egypt's Renewable Energy Policy will be developed with an emphasis on the country's long-term energy supply and environmental needs.

The Renewable Energy Equipment Certification and Labeling Program is a technical assistance project which will address the lack of government oversight of renewable energy equipment. Lack of consumer confidence in renewable technologies that are economically attractive, like domestic solar water heaters, means that these technologies are not being adopted as rapidly as possible. Government certification of equipment technical performance, combined with a labeling program to let consumers know that equipment has met the government's technical specifications, will increase consumer confidence and speed adoption of economically-attractive technologies.

9.1.5 Develop a Cogeneration Policy

The market for cogeneration will not improve until the current policies are changed to allow private sector cogeneration developers to enter the market. The barriers to expanded cogeneration include: the EEA's disallowance of synchronization with the grid and wheeling of power between customers; the illegality of purchasing power from any supplier other than the EEA and the EDCs; an unattractive tariff for backup electricity supply from the grid; and high import duties on cogeneration equipment.

The UNDP estimates that cogenerated power would not only reduce the need for construction of new generation capacity, but would also result in 1.6 million metric TOE energy savings and a 4.4 mmt reduction of CO₂ by 2010 (3). Adequate financing is available for these projects if a supportive policy environment is created.

Policy Measures

The GOE should develop a policy to provide for and promote cogeneration. The energy regulatory authority should be responsible for implementation, but the policy should be adopted at the highest level to overcome the current policy barriers (several facilities have received permission to cogenerate by obtaining a Presidential Decree). Any efforts in this area considered by the USAID should be coordinated with the UNDP/GEF project on *Energy Efficiency Improvements and Greenhouse Gas Reduction (3)*, which focuses on removing barriers to cogeneration.

Approach

Development of a Cogeneration Policy is a one-year, technical assistance project to create a policy environment that supports the development of cogeneration projects by addressing existing barriers to cogeneration development. Cogeneration will reduce environmental impacts from electricity generation, and provide economic benefits such as reduced energy costs, reduced need for new generation construction, increased potential for petroleum and electricity exports, and improved power quality from dispersed generation.

9.2 Energy Efficiency

As yet, Egypt has not adopted a national energy efficiency policy. Many of the current institutional and market barriers to implementing energy efficiency can be addressed through policy reforms supported by programs to increase consumer awareness and help develop the market. Changes at all levels of the marketplace are required to support increased energy efficiency. No country in the world has achieved a sustained increase in energy efficiency without policy reform to encourage that improvement.

The GOE should develop and introduce a broad-ranging energy-efficiency policy and legislative framework that creates a market environment to promote energy efficiency. The current constraints Egypt faces are similar to those that have been addressed by

governments worldwide. In *Energy Efficiency Policy - Lessons Learned Worldwide* by International Resources Group, the major types of energy efficiency policies and programs utilized worldwide are examined, and specific country examples and experiences from both developing and OECD nations are provided.

A number of prior studies have addressed explicitly the potential economic benefits to the Egyptian economy of adopting a comprehensive energy efficiency program. The total energy savings associated with the energy efficiency benefits outlined below are estimated to be as high as 5,244 GWh per year within ten years. This is equivalent to about 11 percent of the 1995/96 electricity sales in Egypt. These benefits include (2):

- Lower electricity bills to Egyptian households and businesses. These lower bills can improve their real income, quality of life, and productivity.
- Reduced capital expenditures for building power plants, transmission lines, and distribution systems.
- Reduced oil and gas use for generating electricity.
- Better use of foreign exchange, associated with the above two items.
- Less pollution of air, water, and land associated with reduced generation of electricity.
- New job opportunities, because of expanded economic activities associated with the increased demand for efficient end-use equipment, buildings, and industrial facilities.

One component of the ECEP project alone, the Gas Analyzer project, shows energy cost savings of \$12,104,800 *per year* to project participants, from activities that began in March 1996 (1). The ECEP project has by no means captured all, or even most, of the efficiency gains available in Egyptian industry. The potential savings and benefits to the economy overall are much greater.

Policy Measure

The Egyptian government can take strong steps to begin to capture energy savings by implementing a broad energy efficiency policy and legislative framework. The policy measure that would guide the USAID's support for energy efficiency would entail the development of a comprehensive and results-oriented energy efficiency policy and legislative framework. This framework would build on the OECP's existing national strategy, and address: appliance testing, standards and labeling; building energy efficiency educational capacity; private sector delivery of energy services; and development of an energy efficiency financing facility.

Egypt already has created an institution, the OECP that can coordinate government efforts to develop a comprehensive energy efficiency policy and legislative framework. The OECP's role as the leading institution addressing the government's response to its commitments under the United Nations Framework Convention on Climate Change, is a further reason for designating it as the lead agency to address energy efficiency policy. Among the organizations with which the OECP should coordinate policy development are the EEA, the MOEE, the MOP, the Ministry of Finance, the Ministry of International Cooperation and Planning, the Ministry of Education, and the EDCs. Other organizations may be identified during the policy dialogue.

It is the EESA team's understanding that the GOE has committed US \$3 million

per year, for each of the next five years, to address four areas of energy efficiency: appliance standards, training and education, promotion, and technical support for consumer energy efficiency activities, such as energy audits. However, the EESA team has been unable to determine the source of these funds, and is concerned that they may fluctuate from year to year. In any case, the amount budgeted for these activities is not adequate to address all of these initiatives; in particular, the appliance standards and training and education activities will not be covered adequately if they are assigned proportional shares of \$750,000 per year. Developing appliance standards requires research to understand the current efficiency levels of appliances available in the marketplace, as well as research on equipment currently manufactured in Egypt. Testing facilities need to be developed to ensure that appliances meet the specified efficiency levels. Enforcement mechanisms need to be put in place to ensure that manufacturers do not claim efficiency levels higher than the appliance operating efficiency level. Appliance standards can make a significant difference in the efficiency of equipment available in the marketplace, but the standards often need to be phased in, and enforced once they go into effect. OECP's budget is insufficient for developing testing laboratories and performing all the research required to develop realistic and effective appliance standards.

Approach

Development of a national energy efficiency policy is the highest priority for the USAID assistance in the field of energy efficiency. To be effective this policy should address the need for the GOE's commitment to continued rationalization of energy prices and tariff and customs reform, enumerate other measures to stimulate domestic production of energy efficient equipment, and include development of energy efficiency standards for appliances and other equipment and energy efficient building codes. To complement these policy reforms, investments in testing facilities, development of a labeling program, and capacity building in educational and public awareness programs will be needed. Finally, the policy should promote investments in energy efficiency through programs to involve the private sector in delivering these services, assist in the creation of a financing facility for energy efficiency, and encourage DSM options.

The EESA team has proposed a policy reform program for increasing energy efficiency within the Egyptian economy that includes three groups of projects. As noted above, the highest priority activities relate to the development of the comprehensive policy on energy efficiency. Assistance activities directly related to the development of this policy are presented among the first group of projects (***Policy Group***). The second group of projects is designed to build capacity to implement energy efficiency measures and support the policy with appropriate awareness and education programs (***Capacity and Awareness Group***). The third group of projects (***Implementation and Financing Group***) includes assistance to the GOE in creating private sector and energy supplier capabilities to undertake or stimulate energy efficiency investments.

Some of the projects included in the second and third groups could be initiated even while the energy efficiency policy is under development. Educational reform will require considerable time to implement. Support for development of appliance and equipment testing labs, and appropriate training, also could precede adoption of the policy. As noted above, provisions to facilitate market entry by both private energy services

providers and energy suppliers interested in strengthening their customer relationships and diversifying their business should be included in the energy efficiency policy. Each of the projects listed under the Implementation and Financing Group includes preliminary or first phase activities that could be initiated early in the EPPP.

9.2.1 Policy Group

Developing a Comprehensive and Results-Oriented Energy Efficiency Policy and Legislative Framework

The effort will, over two years, help the OECP refine its draft policy in collaboration with other relevant government agencies, with input from the private sector and consumer organizations. As part of the policy development process, current policy barriers to increased energy efficiency (e.g. high customs duties and tariffs on energy efficient equipment) will be addressed.

Assistance in support of the development of the policy and legislative framework should help the OECP address the following four issues: (1) which government entity will have primary responsibility for implementing the policy; (2) roles and responsibilities of other government organizations that must play a role in policy implementation; (3) the scope of private sector responsibilities; and (4) how these entities will communicate and collaborate on an ongoing basis to ensure effective policy implementation. (Experience in other countries has shown that without an institutionalized communication process, in which all relevant parties participate, designated agencies may find it difficult to implement stated government policies.) Assistance may also be provided to develop a plan for implementing the policy, identifying specific steps that need to be taken to implement the different pieces of the policy, and proposed timing for each, and provisions for certification, monitoring, and enforcement programs.

Development of Energy Efficiency Standards

Whether voluntary or mandatory, development of energy efficiency standards is one of the most effective measures used worldwide to improve new product energy efficiency. While market forces in Egypt increase the economic attractiveness of energy efficient equipment, most local equipment and appliance manufacturers have not yet adjusted their product lines to produce energy efficient equipment. (Without programs to increase their awareness, customers may not know to demand efficient equipment, and the market responds to demand. The proposed Energy Efficiency Public Awareness and Outreach Project addresses the awareness barrier.) This project would, over five years, assess the efficiency level of appliances and equipment currently available in the Egyptian market, identify target end-uses, and assemble a representative group of stakeholders for each to develop a plan and implementation schedule for revising existing efficiency standards to reflect current technology characteristics and industrial capabilities, including the possibility of further revisions to be phased in later. This project also should incorporate the experiences gained in USAID-funded efforts in South and Southeast Asia, and should coordinate with the UNDP/GEF project.

Energy Efficient Building Codes

Energy efficient building codes counteract the lack of incentive or direction in the commercial building market that results in the construction of inefficient buildings. Once an energy inefficient building is constructed it is very expensive, if not impossible, to make changes that improve its energy efficiency. Developing a building code is a complicated undertaking that demands considerable resources for implementation. However, Egypt's current boom in hotel and commercial and multifamily construction suggests that, until building codes can be modified (and the modification enforced), the government should design an incentive to encourage energy-efficient construction in the interim period. The project will support development of such an incentive in the short-term, and of an energy-efficient building code in the longer term, if the government chooses to pursue it.

9.2.2 Capacity and Awareness Group

Appliance and Equipment Testing Facilities Development

As a prerequisite for effective appliance and equipment standards and labeling programs, Egypt needs the capability to test the equipment manufactured domestically, as well as imported equipment. This project would determine existing testing capabilities within Egypt and identify sites for additional testing facilities. Testing equipment would be installed, and appropriate training provided. The project would last approximately four years.

Appliance and Equipment Labeling Program

This project would support, over two years, development of a labeling format to be tested in a pilot project in an urban area. Well-designed appliance energy labels pull the market toward higher efficiency by providing consumers with the information they need to choose efficient models with lower life-cycle costs, including operating costs as well as purchase price. The program should incorporate the experiences of USAID-funded efforts in South and Southeast Asia, and should coordinate with the UNDP/GEF project.

Energy Efficiency Public Awareness and Outreach Project

A public awareness campaign will raise consumer and private sector awareness about energy efficiency overall, and about the government's initiatives. Since the decision to purchase or install a more efficient appliance or piece of equipment usually is made at the individual consumer level (e.g. the end-use level), public awareness and outreach is needed to reach all levels of the marketplace, including equipment distributors and retailers, and help move the market toward use of more energy efficient equipment. (Government decision makers, as well as the general public, may not have a strong understanding of energy efficiency's strong links to many broader energy and environmental sector issues, and need to be educated about how the pieces fit together.) Messages will be designed to target different end-use markets, e.g. industrial, commercial, residential, for maximum effectiveness, and will highlight the connection between energy

efficiency and a cleaner environment. The project also will support development of public information materials about actions each group can take. This program should be coordinated with other environmental sector public awareness campaigns.

Building Energy Efficiency Educational Capacity

This proposed project would, over a five-year period, work to incorporate energy efficiency into engineering, architecture and technical school curricula, thus increasing the base of professionals who follow energy-efficient design, engineering, maintenance and operating practices. Training and certification programs offered to date have significantly increased the number of individuals familiar with and trained to operate energy efficient equipment. As yet, there still are not enough individuals to meet the potential demand created by a greater move toward a more energy-efficient economy, nor are there any current efforts to incorporate energy efficiency into the curricula at engineering, architecture and technical schools, which is needed to ensure sustainability. The project will provide support to technical schools and universities with curriculum development, energy efficiency materials in Arabic, support to develop appropriate reference libraries, and laboratories for the engineering courses. The program also will develop an ongoing certification program for energy efficiency professionals, in which consumers have confidence, similar to those offered by the Association of Energy Engineers in the US and elsewhere.

9.2.3 Implementation and Financing Group

Promoting Private Sector Delivery of Energy Efficiency Services Project

Support for private sector delivery of energy efficiency services will help achieve energy savings and environmental improvement. Despite strong market fundamentals, few private energy efficiency projects have been developed (outside of the ECEP's work) because industrial and commercial customers still lack the necessary knowledge and expertise to implement such projects on their own. Private sector energy efficiency service providers, such as energy service companies (ESCOs), equipment vendors, consulting engineering firms, etc., can help this situation by providing turnkey energy efficiency services to industrial and commercial customers. At the present time, there are no firms in Egypt that provide these services, although interested firms have been identified through the ECEP project seminars. Additionally, energy efficiency services could be linked with pollution prevention services to support industrial firms' compliance with Law 4/1994. Development of the energy efficiency services industry would be supported and accelerated by government activities that support the creation and training of private sector firms that can provide turnkey energy efficiency services and the development of a standard energy savings monitoring and verification (M&V) protocol for Egypt.

This project would provide a multi-phase support program for new energy efficiency service providers. Such support would include, in the first phase, assistance with business development efforts, and the facilitation of joint ventures with foreign firms for potential energy efficiency service providers with sufficient technical or management capability. The second phase would include training and start-up financing for firms with acceptable business plans, while the third phase would include technical assistance with

project development and implementation for firms that have signed letters of intent with potential customers. Technical assistance throughout the project could be provided by the Egyptian organizations that have worked with the ECEP project (TIMS and DRTPC), as well as by US firms. The project also would provide support to TIMS and DRTPC to develop a standardized Egyptian monitoring and verification protocol for energy efficiency services provided through the private sector. Such a protocol would reduce the transaction costs involved in ESCO projects. The project should coordinate efforts with the UNDP/GEF project's ESCO component.

Development of an Energy Efficiency Financing Facility

Egypt's banking sector is not fully mature, but continues to develop rapidly after reforms instituted in 1991. Ample corporate financing is available for industrial and commercial investment projects at interest rates of around 14 percent. Only limited project financing is available, while leasing and vendor financing are undeveloped. The latter three are most appropriate for financing energy efficiency projects. In the short term, mechanisms that facilitate the use of existing corporate financing for energy efficiency projects will be important to the development of an energy efficiency services industry. Over the longer term, the development of project, lease and vendor financing mechanisms will be important for its continued operation.

Energy efficiency projects incur relatively high project development costs because they are smaller than typical industrial and commercial investment projects. These up-front costs increase the risks associated with energy efficiency projects and prevent some projects from being developed. Over the short term, mechanisms that mitigate some of the risks associated with high project development costs will support development of an energy efficiency services industry. This project would support design of an energy efficiency financing facility to partially finance project development costs (such as audits, feasibility studies and working capital) and to leverage existing corporate financing for energy efficiency projects by providing partial or full guarantees of loans from banks, interest rate buy-downs and loan term extensions. The facility's design will incorporate any policies or positions of USAID/Egypt regarding the provision of financial support to public sector companies.

DSM Program Development

DSM refers to actions taken by energy suppliers (e.g. electric and gas utilities) to help their customers use energy more efficiently. This project would focus on energy suppliers and encourage the EEA and the EDCs, with the primary focus being on the latter, to incorporate DSM programs into their planning and business, and to build and strengthen the capacity with these organizations to design, implement, and evaluate DSM programs appropriate for each organization. The project *may* also include technical assistance to the energy regulatory authority (if it has been created) for addressing DSM programs. (Egypt may not wish to include DSM programs within the portion of a utility's business that is subject to regulation. Obviously, no decision on this matter can be reached until there is a functioning regulatory authority.) This project should be coordinated with the UNDP/GEF project providing DSM assistance to the EEA.

References:

Energy Conservation and Environmental Protection Project, February 1997. "*Gas Analyzer Report.*"

Energy Conservation and Environmental Protection Project, January 1997. "*DSM Pilot Program Institutional Capability Assessment, Draft Report.*" Hagler Bailly.

United Nations Development Program/Global Environment Facility, May, 1997. "*Draft Project Document: Energy Efficiency Improvements and Greenhouse Gas Reduction.*" Arab Republic of Egypt.

Table 18: Energy/Energy Efficiency Policy Reforms, Measures and Assistance Tools

Policy Reform	Policy Measure	Assistance Tools
9.1.3 Revise MOP CNG conversion strategy	Review existing strategy and rationalize incentives to convert to CNG	Technical assistance to review CNG conversion strategy including an analysis of the feasibility of increasing diesel prices and decreasing taxes/duties on conversion kits. The review will identify alternative mechanisms to achieve social objectives of subsidization of diesel and public awareness campaign on benefits of CNG conversion.
9.1.4 Introduce policy and legislative framework for renewable energy	Develop renewable energy policy, including guidelines for evaluation of renewable energy vis-à-vis alternatives sources, financial incentives for renewable energy projects and firms. Preparation of guidelines for certification of renewable energy equipment and service providers	Technical assistance to review renewable energy policies worldwide and draft and implement policy; technical assistance to develop renewable energy equipment certification and labeling program
9.1.5 Develop cogeneration policy	Policy and legal reform to permit and promote cogeneration; assignment of cogeneration program implementation to regulatory authority	Technical assistance to assist in development and implementation of cogeneration policy
9.2 Introduce policy and legislative framework to promote energy efficiency	Develop comprehensive and results-oriented energy efficiency policy and legislative framework, to build on OECP's existing national strategy, and to address: appliance testing, standards and labeling; building energy efficiency educational capacity; private sector delivery of energy services; development of an energy efficiency financing facility.	<p>Technical assistance to: refine strategy; assess policy options; develop guidelines for energy efficiency equipment testing, standards, and labels</p> <p>Technical assistance to develop energy efficiency standards for appliances, energy efficient building codes</p> <p>Technical assistance to develop appliance and equipment testing facilities and labeling program; public awareness and outreach campaign and curriculum development for testing and certification</p>
		Technical assistance to: identify incentives for private sector entry into energy services delivery; design energy efficiency financing facility; develop options paper on DSM policies for EEA and EDCs; and work with them to implement adopted policies.

Chapter 10

Policy Reform Program for Environmentally Sustainable Tourism

The Policy Reform Program for EST will continue and build on the assistance program for the Red Sea initiated by the USAID in early 1996. The USAID's EST program has achieved a number of significant successes in supporting the protection of the Red Sea's coral reefs. Most important, from a policy perspective, has been the EST program's success in encouraging officials, industry and businesses, and NGOs to cooperate in the development of a "Policy Framework for Developing an Environmentally Sustainable Tourism Strategy for the Egyptian Red Sea Coast" (2). This document provides a comprehensive overview of the key policy reforms and supporting capacity building, training, and public awareness needs to manage the Red Sea coast's resources in an environmentally sound way. The EST Program has also supported the development of a management plan for the Red Sea Islands National Park, purchase and installation of mooring buoys, creation of EEAA's ranger program to patrol and police the new park, and other programs to expand public awareness, train workers and businesses, and empower NGOs.

The proposed program for EST recommended in this chapter would continue the Red Sea coast initiatives albeit with greater emphasis on improving incentives for tourism development and sustaining financing for protectorate management. The collaborative process that has led to the development of the Red Sea policy framework provides a foundation for developing a national EST strategy. While the Red Sea EST program has focused some attention on cultural heritage issues (refurbishment and establishment of St. Anthony's and St. Paul's Monasteries as part-time tourist attractions), the EESA team proposes that a higher level of assistance resources be devoted to antiquity and cultural site protection, restoration and management.

The policy reforms to promote a national EST program are divided into reforms to support development of a long-range strategy for the management of tourism resources and complementary short and medium term reforms. Given the important role of tourism on the Red Sea and the potential threats to the natural resources there, some of the proposed policy reforms are focused in that area. Specific initiatives and supporting projects are discussed under four areas of policy reform: (1) developing a long range strategy for environmentally sustainable development; (2) strengthening institutions to protect and manage natural resources and cultural sites; (3) improving incentives for environmentally sound development; and (4) sustaining financial support for management and protection of natural and cultural resources, including private sector financing and/or management. Each of these policy reforms will support the long-term goal of EST to promote the management of natural and cultural resources to maximize environmentally sustainable economic and social benefits. Table 19 provides a summary of proposed policy reforms, policy measures and assistance tools recommended for implementation under the EPPP.

10.1 Development of a National EST Strategy

At the present time, Egypt does not have a national strategy for promoting tourism and also ensuring that the resource base upon which tourism depends is protected from overuse, pollution, and other external factors. The EESA team recommends that the USAID provide assistance to the GOE to develop a sustainable program for tourism development and a strategy for sustainable management of antiquities. In effect, the strategy for antiquities management would be a component of the national EST strategy. However, given the importance of antiquities to tourism and the fact that a single authority, the SCA, has management responsibilities, a separate strategy is recommended.

Policy Measures

This program of sustainable tourism development should be integrated into and coordinated with the development of a National Plan for Sustainable Development (discussed in Chapter 6). The long range goal of the tourism sector should be to adopt policies and implement programs that ensure that tourism development and practices promote the greatest sustainable level of benefits from the use of natural and cultural resource. A major step would be the drafting of an EST strategy component for the National Plan for Sustainable Development, assuming the GOE pursues this recommendation in Chapter 6.

10.1.1 Sustainable Program for Tourism Development

A national EST strategy would have several components. Foremost, the strategy should be proactive and anticipatory, not reactive. It should recognize the value of land use and economic development controls in promoting environmental sustainability and not simply focus on corrective actions in response to poor land use planning. It should include development of a data base on the natural and cultural resources of the country, include an assessment of biological and social carrying capacity, clearly delineate linkages between other sectors and tourism, particularly critical economic and environmental impacts. The strategy should also include a policy statement, elaborate criteria for setting priorities within the sector, articulate any legislative and regulatory changes needed to meet the strategy's objectives, and identify resources required for management and protection of cultural and natural resources. While USAID could assist with the development of any or all of these components, initial efforts should focus on developing a better understanding of the resource base and building capacity to analyze economic impacts and market trends.

Understanding the Resource Base

Natural and cultural resources provide the basis for tourism and are affected by tourists, tourism development, and other economic activities. The first step in developing a national program of sustainable development for tourism involves an assessment of the resource base. This assessment should involve the identification of all natural and cultural resource sites, determination of their current quality or condition, remedial measures and their costs, and enumeration and quantification of current and potential threats to their quality.

At present, there have been efforts to assess natural resources in specific areas such as the Red Sea. The World Bank GEF project has developed a methodology for determining the development carrying capacity of natural resources in the Red Sea and has conducted an inventory of natural resources in southern parts of the Red Sea. There has not been a comprehensive effort to assess natural resources at the national level or to thoroughly assess issues such as carrying capacity.

The SCA has not updated its inventory of sites since 1952. It is difficult to effectively manage 10,000 antiquity sites if you do not know if they exist, their current condition, the costs and resources required to restore, preserve or protect them, and their current use and importance to tourism. While the updating of the entire inventory of sites is a major undertaking, it would be useful to initiate this update for some priority areas such as Medieval Cairo in conjunction with identification of potential sites for adaptive re-use (see Section 10.4.2).

An important issue that needs to be clarified is visitor satisfaction and the relative importance placed on intrinsic quality of the resource versus the quality of tourism services provided. For example, what effect, positive or negative, does congestion, site quality, the use of maps, site brochures, and guides have on the quality of the visitor's experience?

In summary, the most critical assistance needs include studies on carrying capacity of desert, coastal, and marine resources, visitor attitude surveys, and initiation of the SCA's update of the registry of antiquity sites.

Economic Impact and Market Analysis

The GOE needs to develop the capacity to assess the potential economic and environmental impacts of tourism development and to conduct market analyses of tourism growth that can help assess the need for and rate of expansion in tourist accommodation and supporting facilities. To build up these capabilities, it is proposed that USAID assist the TDA in preparing an economic impact analysis of the planned development of the southern coast of the Red Sea.

The GOE has decided to sell parcels of coastal land to developers of resort and hotel properties along the Red Sea coast southwards from Hurghada to the Sudan border. Land contracts stipulate that significant development must be initiated within three years of the contract signing to avoid cancellation. Therefore, developers quickly plan these resorts and begin construction, without adequate information on future demand and hotel carrying capacity in the Red Sea coast region.

The decision to open new areas of the Red Sea coast to development has direct impact on the economy of the area, local populations, and the land and marine environment. This new development also affects the existing tourism industry, often attracting tourists (and workers) away from older developments that do not provide the same amenities as the newer resorts. Timing of new development is critical. If development proceeds too quickly, the entire industry suffers. Lower occupancy rates extend payback periods for investors and make it difficult for hotels to hire staff to deal effectively with peak tourism periods. As other countries have learned, overdevelopment

can lead to the boom/bust cycle and tremendous waste of capital investment resources.

Assistance would be provided to the TDA to conduct an impact study for a region of the Red Sea coast that has not undergone substantial development (even if land has been allocated). The region that would be serviced by the proposed Marsa Alam airport or regions to the south of it, may be suitable. Given that the development “clock” has already started for many of these properties, it would be necessary for the TDA to provide extensions to developers (see Section 10.3.1). Therefore, the results of this study could be incorporated into future resort planning.

The study would involve a comprehensive analysis of tourism demand and hotel capacity, job creation, infrastructure demands, implications for inland, coastal and marine resource protection, and economic and social impacts on communities in the area, and existing tourism developments, their workers and communities. Such analysis might also look at case studies from other countries to examine the impact that new development has had on existing facilities in the time frame over which these facilities were developed. This case study could be a first step in analyzing development capacity within Egypt, enabling the TDA to assess market trends, capacity issues and catalyze development of a sustainable tourism development strategy for Egypt, covering all inland and coastal destinations.

10.1.2 Strategy for Sustainable Management of Antiquities and Cultural Resources

Many specialists believe Egypt is losing antiquity sites at an alarming rate and that actions to set priorities for saving sites and improving management cannot be postponed. During the Cultural Resources Management Participation Panel (a component of the EESA), participants highlighted a number of issues that need to be addressed if the SCA is to improve its efforts to preserve and protect over 10,000 antiquity and cultural heritage sites. Among the problems enumerated were:

- the lack of an up-to-date inventory of sites (mentioned earlier);
- an assessment of restoration and management requirements;
- the lack of trained staff for restoration and documentation programs;
- limited ability to address off-site stressors;
- lack of coordination with surrounding communities;
- centralization of management that limits local SCA initiative; and
- a lack of financing for costly restoration.

The USAID's potential role would be to facilitate and encourage the SCA to take action to develop a long-range strategy for protecting and managing Egypt's vast heritage of antiquities and cultural sites. One thrust of this initial effort would focus on documenting the current situation and the management and financing needs for protecting cultural heritage sites. This study would examine antiquities in terms of their value to the tourism sector and the potential impact on tourism if the antiquity sites continue to degrade and the potential for increasing tourism if the antiquities were better managed. This background research would be coordinated with a training program proposed by the USAID's Development Training II Project titled “Forward Planning for the Supreme Council of Antiquities” (1). This training program focuses on strengthening planning and

team-building skills, stimulating a dialogue on long-range planning, the scope for adaptive reuse, creative solutions to funding needs, and development of a customer service ethic in the SCA.

The relative success of proposed training for senior managers at the SCA could be used to gauge the prospects for follow-up assistance to the SCA. Follow-up activities would focus on meeting specific needs for assistance requested by the SCA. These could include preparation to update the antiquities inventory, development of prioritization criteria, designation of special Antiquity Protection Sites or Districts, development of long range financing strategy, and development of new sources of financing to support the antiquities program.

10.2 Improved Protection and Management of Natural and Cultural Resources

As noted in Chapter 4, there are numerous institutional barriers to effective protection and management of natural and cultural resources. Specific needs include increasing staff capacity to manage protected areas, clarification and coordination of enforcement efforts, develop of capacity to monitor damage to resources and take actions to compel responsible parties (when identified) to implement remedial measures, and to improve the management of cultural and antiquity sites.

Policy Measures

It is anticipated that the Red Sea would be the initial focal point for strengthening protection and management capabilities. Lessons learned from these efforts could then be applied at the national level and in other regions of the country. To ensure there is a clear mandate for protection of the Red Sea's resources, the GOE needs to expand protectorate status for coral reefs and take a more proactive anticipatory approach to other natural resources that could require protection in the future. An increase in protectorate areas would be a positive development provided this expansion is accompanied by develop and use of criteria to prioritize additions and there are adequate provisions for managing and financing the operations of new areas. Expansion of protectorate status needs to be complemented by strengthening of the institutions to protect and manage natural resources and cultural sites.

10.2.1 Improved Capacity to Manage Protected Areas

Through the USAID and other donors, significant levels of training, awareness, and education have been undertaken in the Red Sea area. The USAID has trained and financed an incipient EEAA ranger program with responsibilities for patrolling the new Red Sea National Marine Park. Public awareness campaigns and training workshops have targeted resort operators, developers, and businesses such as dive shops and dive boat operators about the potential impacts of tourism and recreation on the coral reefs. Developers have been introduced to potential new areas of tourism such as ecotourism and ecolodges, greater packaging of cultural heritage tours, birdwatching, and desert

adventures.

The EESA team recommends that the USAID continue the training program initiated under the Red Sea EST program, with the following changes. As discussed in Section 10.4.1, the GOE needs to assess the staffing and resource needs for protection and management activities. The development of the training and capacity building activities should be closely coordinated with this assessment. In addition, the USAID should be encouraging the GOE to take an increasing role in providing training and public awareness or delegating and/or financing local authorities or to provides these needed activities. Third, the USAID should review these previous training and institutional strengthening activities to identify opportunities for replication and diffusion to other regions or other types of natural and cultural resources.

10.2.2 Clarify and Coordinate Enforcement Roles

Protection of natural and cultural resources could potentially involve a number of authorities at the national, regional, and local levels. While Law 102/1983 identifies the EEAA as the lead agency in protecting and managing national parks and their resources, the potential role of local and regional authorities is unclear. Since local communities stand to benefit from the protection of tourism destinations, they have a vested interest in the level of protection provided. Also, the protection of natural resource areas from off-site impacts provided in Law 102/1983 is very general. In managing a national park, can the EEAA use its authority under Law 102/1983 to prohibit certain types of marine and coastal activities? Does the EIA process provide adequate protection of national parks from pollution associated with industrial and tourism development? What enforcement mechanisms are appropriate and cost-effective? To what extent can self-monitoring and reporting substitute for enforcement by the EEAA and other authorities?

In conjunction with efforts to improve GOE capacity to manage protected areas, the EEAA should assess the current and potential roles of other government authorities, businesses and developers, and even NGOs. Assistance could be provided to the EEAA to sort out enforcement responsibilities between protectorates and coastal resources, assess options for greater roles for local and regional authorities, and the potential for self-monitoring by businesses.

10.2.3 Remediation of Damaged Natural Resources

Many areas of the coastline have been damaged by improper development practices. Sedimentation and accelerated erosion of beaches often results, contributing to increased turbidity and damages to near shore coral reefs. Other natural resources such as lakes, which provide habitat for migratory waterfowl and fish, have also suffered damages as a result of nearby development, wastewater discharges, and drainage of agricultural lands.

Once these damages have occurred, there may be remedial actions that can be taken to restore the quality of the natural resource. Three types of capabilities need to be developed to ensure that remedial actions are taken. First, the GOE (most likely the

EEAA) needs to develop the capacity to assess damages and identify responsible parties. To compel these parties to finance and/or undertake remedial actions, the government needs to clarify the liability law or provision that applies to the type of damages incurred. Second, the GOE needs to develop the capacity or institute an advisory program to identify and assess potential remedial actions and develop a process for approving proposed remedial actions. Third, it will be necessary to provide oversight for these remedial actions.

For the most part, damages to the Red Sea coastline can be attributed to specific developments. For polluted lakes, the source of damages may be more general, making it more difficult to hold a single or few parties liable for clean-up. The GOE financing of remedial actions may be required for lakes. Nevertheless, there may be significant benefits associated with remedial actions. For example, improvements in water quality achieved through remedial actions could increase tourism and fisheries benefits if the improvements enhance the value of the lake to serve these functions.

Several of Egypt's lakes are important for migratory waterfowl and are designated as wetlands of international significance under the Ramsar Convention. Unfortunately, this protected status has not been sufficient to prevent severe deterioration in lake water quality throughout Egypt. A brief description of a project to improve lake water quality of Lake Qarun in Fayoum Governorate is provided below.

Construction of an Artificial Wetland to Improve Water Quality in Lake Qarun

Agricultural drainage is the main source of water to Lake Qarun and the Wadi Rayyan in Fayoum Governorate. Raw sewage, effluent from a sewage treatment plant and some municipal solid waste are dumped into the agricultural drainage waters that flow into the lake at three locations. These drainage waters contain high concentrations of nitrogen and phosphorus resulting from fertilizer use, residual pesticides, sewage and other pollutants associated with industrial activities. Levels of these substances can be reduced if the drainage water passes through an artificial wetland prior to being released into Lake Qarun. Removal of these pollutants would enhance water quality in the lake and slow down, or reverse, the eutrophication process caused by nitrogen and phosphorous.

This project aims to demonstrate the feasibility and the cost of reducing nitrogen, phosphorous and other pollutant levels in the water draining into Lake Qarun, with the construction of one or more artificial wetlands. While other lakes in Egypt are more seriously degraded than Lake Qarun, it may be easier to demonstrate the benefits of artificial wetlands because the pollution is mainly a result of agricultural activities. If existing land near the drains feeding into the lake cannot be appropriated, the artificial wetland could be constructed in the lake in the vicinity of the drainage inflow. The construction of the artificial wetland would lead to reduced nutrient levels in Lake Qarun and would be beneficial to wildlife in the lake, particularly migratory waterfowl. Such investment could delay costly lake restoration activities to address the build up of sediments, and anoxic conditions in the lake.

10.2.4 Decentralize Antiquity Site Management

As noted earlier, responsibility for management of antiquity sites is vested with the SCA. The EESA team has noted several problems in the management of sites that could be eliminated if local SCA managers had greater authority *and* the SCA invited local communities to play a greater role in determining how sites are managed and used. Many cultural sites are located in densely populated areas where the potential adverse impacts of community life on the site may be substantial. There is a sense that the sites do not make a positive contribution to the community and, except for areas around the major destinations, the sites yield limited economic benefits. All proceeds from entrance fees go to the GOE, with no distribution to the local community. Most problematic are those sites which have not been maintained well enough to attract large numbers of visitors. The existence of the antiquity site may prohibit certain types of uses near the site or discourage other development if the antiquity site falls into disrepair. As one commentator expressed it, “the communities hate the antiquities.”

The EESA team would recommend assistance be provided to the SCA to explore the potential for decentralizing antiquity site management, providing local SCA managers, local community officials, and NGOs with greater role to determine the manner in which the sites are managed. Local community involvement may be critical to addressing local land use conflicts and dealing with problems such as littering and vandalism at the site. Options such as NGO management and certification of tour guides, development of signs and guidebooks, etc. could improve visitor satisfaction while yielding benefits to the local community. The SCA might also want to explore the possibility of special site designations to ensure that external adverse impacts on the antiquities can be addressed.

10.3 Incentives for Environmentally Sound Tourism Development

The GOE needs to review the current structure of incentives for environmentally sound development and policies related to land development and planning and make appropriate policy reforms to ensure protection of the resource base. Three areas of assistance are described in this section: improvements to the structure of incentives for land developers, greater effort to link EIA impacts to development plans and contracts, and increased capacity for environmental design.

Policy Measures

One of the key constraints to environmentally-sound development planning is the requirement that developers make substantial progress within three years or risk the loss of their properties. The GOE should consider relaxing this requirement provided developers use this additional time to design and plan resort developments to minimize potential damage to the environment and ensure infrastructure costs are minimized. A few modifications of the EIA process by the EEAA would also make a positive contribution to development practices.

10.3.1 Improve Structure of Incentives for Land Development

To accelerate the development of the Red Sea coast, developers have been offered

a number of incentives including very low land prices, tax holidays and reduced tariffs on imported equipment. In return, they must plan and initiate construction within three years or risk cancellation of their land contracts with the TDA. A major concern with this development program is the extent to which developers will design and build resorts that do not consider protection of coastal and marine resources. Presently, the primary tool for ensuring environmentally sound development practices are followed is the EIA, which the developer submits to the EEAA before starting development. (Suggestions for strengthening the EIA process are discussed in the next section).

The key to ensuring that developers build in an environmentally sound way would appear to be the leverage the GOE has in providing subsidies to developers. These include the TDA's ability to include covenants in the land contract, which restrict and guide the activities of the developer and provide tax holidays and tariff reductions to developers receive as a GOE inducement to develop.

This project would involve preparation of a paper identifying options for linking environmental performance to the various subsidies that are currently available to developers of properties on the Red Sea coast and assessing their viability within the legal and political constraints that characterize land development practices in Egypt. It would be prepared in cooperation with the TDA and the EEAA and would consider the following options: (1) linking the EIA process to TDA land contracts in the form of environmental covenants; (2) the development of a self-monitoring program (with spot inspections by the EEAA), during the construction and operation phase, tied to certain subsidies and benefits the developer receives; (3) relaxation of the three-year provision for demonstrating significant progress if developers take additional time to develop in an environmentally responsible manner; and (4) linking environmental planning and design as well as follow-up monitoring to the availability of tax holidays (cross-compliance provision).

Following the preparation of this paper, a workshop would be convened by the TDA and the EEAA to discuss the study recommendations and to elicit input and suggestions from developers, local government officials, and NGOs. Assuming the TDA decides to implement the recommendations, assistance could be provided to develop and provide training for a self-monitoring program and to strengthen guidelines for environmentally sound design and management practices.

10.3.2 Improve Linkages between the EIA Process and Development

The EIA process has severe limitations as a tool for ensuring that environmentally sound practices are followed. First, the scope of review is limited to the EEAA, which may lack the technical skills to evaluate site impact or other remedies. A broader review process would allow greater input from other ministries, local governments, NGOs, and the academic community and enhance the accountability and transparency of the EIA process. Second, EIAs are conducted for specific developments. Since many of the environmental impacts result not from a single resort complex but from a number of resorts concentrated in an area, some EIAs should be conducted for regions rather than individual sites. Third, and most importantly, the EEAA lacks the resources to conduct inspections during and following construction to verify the developer has followed the EEAA recommendations and/or the plan described in the EIA.

Even in the absence of EIA reforms, some efforts have been undertaken to plan and identify impacts for several resort complexes. For example, a development plan for the Nabq Tourism Center has been prepared with assistance from the USAID-funded EST program. Also, a development company was created to plan and develop several properties near Marsa Alam.

Assistance would focus on a review of the EIA process in Egypt, with special attention focused on the use of EIAs in tourism development. The study would also make recommendations for linking EIAs to development, expanding the use of covenants, and development of monitoring protocols to certify that developments, once completed, have implemented mitigation measures proposed in the EIA to minimize environmental impacts.

10.3.3 Increase Capacity for Environmental Design

Currently, many developers lack the expertise or incentives to adopt environmentally sound designs and plan for cost-effective infrastructure, water and energy use. Mechanisms for compelling developers to adopt environmentally sound designs are weak and the three-year time frame discourages developers from time-consuming planning. In addition, environmental restrictions on design may be perceived by the developer to be costly, albeit of unknown magnitude.

Environmental design is a new area of study and practice in Egypt and developers have limited access to this type of expertise. An assistance program to help developers implement principles of environmental design and engineering, carried out on a demonstration basis, could serve as a catalyst for better planning, and encourage the TDA to incorporate environmental covenants in land contracts. Ideally, the TDA would consider extensions to the land contract performance period if developers agree to additional environmental provisions. Given recent decisions by the TDA to cancel 50 land contracts, such extensions might be attractive to developers, particularly if assistance was available from the USAID.

The project would include three components: environmental design and engineering assistance on selected development projects, preparation of a guidebook, and assistance in developing and improving university curricula to incorporate environmental practices in design and engineering.

The TDA would be responsible for screening developers and projects using criteria to be developed jointly by the TDA, the EEAA, and the USAID. The USAID would provide an advisor qualified to work with developers on environmentally sound designs and engineering specifications. This advisor would provide technical assistance, estimate costs and cost savings (if realized by the design), compared to more traditional designs, and prepare, and present, a report for each project. Subsequently, each project would be developed into a case study. The second component would involve development of information on environmental design, selected case studies, and guidelines for environmentally sound development. The advisor would assist the TDA in developing a guidebook and related information materials. The third component of the advisor's work would be to cooperate with university faculty in integrating environmental design practices into university curricula. The advisor might participate and/or help organize seminars featuring other specialists in the field of environmental design. As part of this activity,

an exchange with a US university, with a strong curriculum in environmental design, may be organized by USAID.

10.4 Sustainable Financing for Protection and Management of Natural and Cultural Resources

As noted in the introduction, sustainable financing is needed to provide for effective management and protection of natural and resources. The GOE has often been able to rely on donor contributions to finance some of the functions that in other countries would be the responsibility of the government. As long as Egypt can rely on donor contributions, there will be no incentive to identify and implement alternative sources of financing. The EESA team recommends that assistance be provided to help the GOE replace donor resources with sustainable revenues. Two assistance projects are described in this section: financing for Red Sea protection and management; and private sector financing for restoration and adaptive re-use.

Policy Measures

Policy reforms to expand financing opportunities for protection and management of natural resources and antiquities could include: the design of mechanisms (by the EEAA) to raise revenue from Red Sea tourists and subsequent adoption of such measures by the GOE; and development of a policy by the SCA to allow adaptive re-use and create incentives for private financing of restoration. Five demonstrations of the adaptive re-use concept involving private financing could be undertaken.

10.4.1 Financing for Natural Resource Protection and Management

The USAID's EST project has provided technical and financial assistance to support the efforts of the EEAA and the Hurghada Environmental Protection and Conservation Association (HEPCA) to protect the Red Sea coral reefs from damages primarily associated with dive boats and divers. To date, the USAID has financed the installation of 250 mooring buoys (with plans for an additional 150 buoys by the end of 1997), supported training activities for 200 dive boat captains on the use of the buoys, and supported the establishment of the EEAA's ranger program. To afford adequate protection to the Red Sea coral reefs, it will be necessary to extend protectorate status to coastal and island reefs. To effectively patrol and police these areas, will require expansion of the ranger program. Also, as new resorts open up in other diving areas, it may be necessary to expand the system of buoys. To date, the USAID has provided most of the financial assistance for these activities. While the USAID is committed to continue support for these activities, the EEAA, the governorates and the resorts need to explore other financing options that can be sustained when the USAID eventually shifts resources to other problems.

The first step in assisting in the development of sustained financing would be to conduct a financial needs assessment. To match financing mechanisms to requirements, it is necessary to estimate the level of financing required to sustain protection and

management activities. These costs include staff and resource costs for the ranger program and other protection activities. The EEAA must recruit staff with appropriate background, determine training requirements, and to determine capital, and ongoing operational and maintenance costs, for equipment such as ranger boats. In addition, the buoy program will require dive/boat teams to install and maintain buoys, funding for new and replacement buoys, and recurring training programs. The major factor affecting the magnitude of all these programs is the extent of the protectorate program. If protectorate status is extended to all of the islands, the cost of these programs would increase significantly over their current levels. On the other hand, to facilitate comprehensive protection the use of certain financing mechanisms such as fixed charges for divers, may be required.

A number of mechanisms could be used to meet revenue needs. These may include fees paid by each diver, licensing fees on boats, small surcharges on accommodation, "association fees" for dive centers and resorts, as well as government budgetary sources of revenue. Some of the existing GOE mechanisms have been previously evaluated under the EST project. The mechanism reviewed in that study, as well as alternative mechanisms, would be evaluated in terms of the following criteria: ease of adoption, potential legal or legislative barriers to overcome; collection efficiency; amount of revenue generated; potential impact on demand for the good or the service upon which the mechanism is based; and the relationship between party charged and the benefits derived from the use (or availability/quality) of the protected coral reefs.

Even if revenues can be collected from the mechanisms above, it may still be necessary to ensure that these revenues can be earmarked for protection activities. For example, uniform fees for visitors to Ras Mohammed National Park are deposited into the National Environmental Protection Fund. These revenues, however, can then be used for a variety of purposes. Similarly, hotel room surcharges go to the Ministry of Finance. Potential obstacles to earmarking funds for specific purposes would be identified and solutions for overcoming these obstacles developed in conjunction with the EEAA, hotel operators, investors, dive shops, and NGOs.

Assuming the revenue source selected will be paid by divers and/or visitors, the collection efficiency and support for the revenue mechanism can be enhanced through a public awareness program. This program would explain to the visitor the importance of the programs financed through their payments. This task would also involve development and dissemination of the public awareness material. Some options might include information posted at dive shops, brochures handed out to visitors and short descriptions of the protection program attached to hotel bills.

10.4.2 Private Sector Financing for Antiquity Site Restoration

Throughout Egypt, many antiquities and cultural resource sites require restoration, and subsequent protection, if they are to be saved from gradual decay or destruction to clear the way for new development. Although the SCA collects substantial revenues from visitors to the major tourism sites (Giza Pyramids, Luxor, and the Egyptian Museum), this revenue is not fully recirculated to support site restoration, protection and management needs. The SCA allocates a budget for restoration, but donors, including the USAID, provide some finance for restoration. Nevertheless, the financing needs are tremendous

and unfortunately, some sites will be destroyed before resources can be mobilized.

Cultural resource sites in Medieval Cairo are especially at risk because of developmental pressures, and inadequate site management. One option for financing and improving community support for and involvement in the protection of cultural sites is adaptive reuse. Through support from the private sector, selected cultural sites would be restored and developed for uses that are compatible with the protection of the cultural and historical values of the sites. The major constraint to adaptive reuse is the SCA's concern that adaptive reuses will be incompatible with protection or inadvertently result in damage to the site. Paradoxically, the SCA may receive more criticism if adaptive reuse projects fail to provide adequate sustained protection, than if the sites are neglected and destroyed. A demonstration project, which includes the development of appropriate criteria and guidelines for adaptive reuse, and a monitoring and management program, may be able to reduce opposition to an extensive adaptive reuse program. In addition, it needs to be recognized that only selected cultural sites will be attractive to the private sector for adaptive re-use; particularly those with high visitor interest and convenient access and infrastructure.

The SCA faces three key challenges in developing an adaptive reuse strategy: (1) identifying the best methods of promoting visits to cultural sites without other uses of the site detracting from visitor satisfaction; (2) identifying compatible adaptive reuses consistent with protection of the site; and (3) identifying appropriate sources of financing for site restoration and management and assessing the likely level of private sector interest. To prepare for demonstrations of adaptive reuse, the project team would work with the SCA to develop criteria for selecting sites, partners for adaptive reuse projects, and a monitoring and management plan. The criteria would be applied to select the sites for demonstration projects. Additional assistance would be provided to the SCA to prepare agreements and/or contracts with adaptive reuse partners and develop public awareness programs. Following the demonstration of the models, assistance would be provided to the SCA to help develop an adaptive reuse strategy. Components of this assistance would include preparation of an inventory of potential sites suitable for adaptive reuse, development of a priority list based on assessment of the urgency to initiate restoration and protection activities at sites on the inventory, refinement of criteria used to select demonstration sites, monitoring protocols, and site management plans.

References:

Development Training II Project, 1997. *"Forward Planning for the Supreme Council of Antiquities"*. Report for USAID.

Environmentally Sustainable Tourism Project, 1997. *"Policy Framework for Developing an Environmentally Sustainable Tourism Strategy for the Egyptian Red Sea Coast"*.

Table 19: Environmentally Sustainable Tourism Policy Reforms, Measures and Assistance Tools

Policy Reform	Policy Measure	Assistance Tools
10.1.1 Develop national EST strategy	GOE drafts EST strategy component for National Plan for Sustainable Development	Technical assistance for carrying capacity studies, workshops and training in sustainable development planning
10.1.2 Develop sustainable management strategy for antiquities	None	Technical assistance to plan assessment of sites, options paper on management needs; training for senior management;
10.2.1 Improved capacity to manage protected areas	GOE expands protectorate status to all islands and off-shore reefs	Technical assistance to train staff in protection and management activities
10.2.2 Clarify and coordinate enforcement roles	None (see 6.1.3)	Training and public awareness
10.2.3 Adopt measures for remediating damaged coastal areas	None	Technical assistance to develop guidelines, evaluate coastal damage, and pilot remediation project(s)
10.2.4 Decentralize antiquity site management	SCA develops proposal for special antiquity management areas	Technical assistance to identify antiquity sites requiring special protection and management; technical assistance to assist SCA in preparing draft decree to create special management areas, policies for local community participation in management
10.3.1 Improved incentives for development of tourism properties	GOE relaxes requirement for development of tourism properties within three years of award	Technical assistance to justify land development policy and moratorium
10.3.2 Improved linkages between EIA and land contracts/development	EEAA modifies EIA process to allow multi-project or regional EIAs; TDA develops environmental covenants and monitoring protocol	Technical assistance to EEAA on strengthening EIA process; technical assistance to TDA to review and strengthen land contracts, develop monitoring protocol
10.3.3 Increased capacity for environmental design	None	Technical assistance to assist developers design for environment; university curriculum development
10.4.1 Sustained financing for protection and management of coral reefs	EEAA designs mechanisms to raise revenue from Red Sea tourists; GOE subsequently implements mechanisms	Technical assistance to determine financial assistance needs, review and assess mechanisms; cash transfer for bridge financing during first year
10.4.2 Private sector financing for antiquities site restoration	SCA develops a formal policy and supporting regulations for adaptive reuse; SCA implements 5 adaptive reuse demonstrations	Technical assistance to identify demonstrations, develop policies and regulations, follow-up public awareness; cash transfer to support monitoring of demonstration projects

