



ENVIRONMENTAL HEALTH PROJECT

ACTIVITY REPORT

No. 41

VOLUME II: APPENDICES

Design of a Monitoring and Evaluation Plan
for Egypt's Environment Sector and
USAID's Egyptian Environmental Policy Program

October 1997

Prepared for
ENVIRONMENTAL HEALTH DIVISION
OFFICE OF HEALTH AND NUTRITION

Center for Population, Health, and Nutrition
Bureau for Global Programs, Field Support and Res
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Data Sources and Availability

Data Sources (Air and Water)

Air Monitoring

- National Monitoring Network for Air Pollutants (Environmental Monitoring Center, Imbaba)**

Monitored Parameters: Sulphur Dioxide, Smoke & Total suspended particulates.

Monitoring Stations: Fifteen air quality monitoring stations have been established and data collection activities started in 1985. Monitoring stations are erected in locations: (a) not affected by sources of pollution, (b) not surrounded by building for better sampling, (c) not subjected to car exhaust, and (d) not close to surface water, agricultural areas or trees. The following table presents the number and locations of the air monitoring stations:

Air Monitoring Stations (Environmental Monitoring Center, Imbaba)

	Monitoring Site	SO ₂ & Smoke	TSP
	Cairo	12	4
	Giza	4	3
	Alexandria	4	4
	Qualiubya	3	2
	Beheira	5	4
	Gharbia	4	4
	Sharkia	3	2
	Suesz	2	2
	Ismailia	2	1
	Minia	4	4
	Assiut	4	2
	Dakahlia	3	1
	Port Said	2	1
	Kafr El Sheikh	1	0
	Damietta	2	0
	Total	55	34

Reports: Monthly report for high, average, low concentrations at each site and annual statistical report for all sites with highlight for samples which exceed the maximum permissible limits.

Limitations

- ♦ Funds are needed to continue and expand the operation of the network.
- ♦ Stations' maintenance, spare parts and trained personal are key sustainability issues, currently unstable because of limited funds.

Air Pollution Department (National Research Center)

This department was establishment in 1957 to monitor and evaluate air quality in urban and industrial areas, analyze air pollutants, provide guidelines on emission control and offer training and technical assistance in the air related fields.

Monitored Parameters: CO, NO_x, Ozone, H₂S, ammonia, falling dust, suspended dust, smoke and SO₂.

Monitoring Stations

Thirty stations have been established with a primarily focus on Greater Cairo along with stationary laboratory facility. The primary objective of these stations is to provide data for research activities and for technical assistance requested by a client/project.

Reports: No formal structure for documenting the collected data, however all data are linked to the purpose of their collection. Therefore, more than 200 research reports on topics related to air quality, dust, gases, and heavy metals.

Note: In 1996, the department was selected as the reference laboratory for "Air".

Occupational Health Department (High Institute of Public Health, Alex. University)

Monitored Parameters: CO, NO₂, SO₂, falling dust, suspended dust, smoke and Chloride.

Monitoring Stations

Monitored Parameter	# of Stations
Total Suspended Dust, Organic/Inorganic dust, Chloride/ Sulphates, Nitrates	10
Hydrocarbons	10
falling dust	2
Lead, NO ₂	9
Ammonia, Urea particles	1

Note: this in addition to portable equipment including high volume sampler, infrared spectrometer, NO₂ sampler, SO₂ sampler and Ammonia sampler.

Meteorological Monitoring Network (General Meteorology Organization)

Monitored Parameters (Air)

Turbidity, precipitation, total suspended dust, CO₂.

Monitoring Stations

4 Stations: Sidi Barrani, Siwa, Hurghada & Cairo (Kobri El Kobbah).

Reports: Data are prepared upon request; extracted from monitoring database.

Remote Sensing Center

Monitored Parameters

Turbidity, precipitation, total suspended dust, CO₂.

Monitoring Stations

4 Stations: Sidi Barrani, Siwa, Hurghada & Cairo (Kobri El Kobbah).

Reports: Data are prepared upon request; extracted from monitoring database.

El Tebbeen Institute for Metallurgical

Monitored Parameters

SO_x, NO_x, CO, falling dust, Stack analysis.

Monitoring Stations

Monitoring activities are contract based. Institute is equipped with portable monitoring stations including H.V. sampler, stack sampler, gas analyzers.

Reports: Data are prepared for monitored projects.

EIMP Air Quality Monitoring Program

The EIMP program will establish the Air Quality Monitoring stations to measure SO₂, NO_x, PM, HC, O₃, and CO. Equipment are imported and installation will start in Sep. 1997 to be in operation in 1998.

EIMP Air Quality Monitoring Stations

	Site Name	Area Type	Monitors						
			SO ₂	NO _x	PM	HC	O ₃	CO	Met
	Cairo								
	1 El Gemhoroya Street	StreetCanyon	.	.	.	.		.
	2 Ain Shams University	Urban/Res.	.	.					.
	3 Embaba police station	Road side		.		.		.	
	4 Cairo City center	Urban center	.	.	.		.	.
	5 Nasr City	Residential							
	6 Shoubra el Kheima	Industrial	.		.				
	7 Maadi (police station)	Residential	.	.					
	8 Tabbin	Industrial	.	.	.				.
	9 Giza, Cairo University	Residential	.	.		.	.		.
	10 Theeba language school	Background					.		
	11 Gizapyramid	Regional							
	Alexandria								
	12 Abu Keir College	Industrial	.	.					
	13 El-Max Petrogas	Industrial							
	14 IGSR Alex University	Urban/road side Residential	.	.	.	.	.	.	.
	15 El-Azafra-El Azhar Univ.	Residential Res./Industrial	.		.				
	16 Gheat El-inab school	Street canyon							
	17 Somoha dorm - Alex univ								
	18 Mostafa Kamel str.								
	19 Damanhur	Industrial/Res	.						
	20 kafr el Zayet	Industrial/Res	.						
	21 El Mahalla El Kubra	Industrial/Res	.		.				
	22 El Mansura	Industrial/Res	.	.					
	23 Damyat	Residential	.						.
	24 Tanta	Urban							
	25 Suez	Industrial/Res	.	.	.				
	26 Ismailia	Residential	.						
	27 10th Ramadan	Resid./ind							
	28 6th October	Industrial/Res							
	29 El Fayum	Resid./ind							
	30 El Minya	Res./Industrial	.						

	Site Name	Area Type	SO ₂	NO _x	PM	HC	O ₃	CO	Met
	31 Assiut	Industrial/Res	•	•					•
	32 Luxor	Residential	•	•			•		•
	33 Hurghada	Background					•		

Note: Blank sites contain samplers for some parameters.

Water Monitoring

Main data sources for Water Monitoring are:

- ♦ Ministry of Public Works and Water Resources, MPWWR, (Nile and canal network & irrigation drains).
- ♦ Ministry of Health (Potable Water).
- ♦ EIMP Coastal Water Program, EEAA (Coastal Water).

Ministry of Public Works and Water Resources

MPWWR is responsible for the management of freshwater (surface & groundwater) resources in Egypt. The *National Water Research Center* with its thirteen research institutes is considered the research engine of the MPWWR. It collects and monitors several parameters.

Nile Water: The Nile Research Institute (NRI) has been involved in water quality monitoring since 1976; jointly with the Ministry of Housing. Sampling site can be categorized as:

- ♦ 270 rivers sampling sites, every 10 Km on the river Nile and within 200 meters upstream and downstream of all waste discharge points; and
- ♦ 128 point sources sampling at waste discharge points along the river (72 agricultural drains and 56 industrial, municipal or mixed drains).

Most samples are analyzed for pH, temperature, conductivity, dissolved oxygen, carbon dioxide, ammonia, nitrite, BODs, COD, total dissolved solids, suspended matter, total alkalinity, total hardness, major anions and cations, oil and grease, phosphate and E.coli. In 1987, monitoring heavy metals and pesticides were added.

Overview of Water Quality Assessment Programs of the River Nile Conducted by NRI

Monitoring Campaigns	Drains and point Sources	Locations in the river
June 1976	35	86
Oct. 1977	35	142
Aug. 1978	71	151
March 1979	75	109
March 1984	74	176
July 1985	81	201
Sept. 1986	85	219
July 1991	43	36
April 1992	83	36
Dec. 1992	102	36
Aug. 1993	106	36
Dec. 1993	110	36
Dec. 1994	---	36
Oct. 1995	---	---

Currently Measured Parameters by NRI (since 1991)

Parameter	Method	Lower Limit of Detection
<i>Determined in situ</i>		
Dissolved oxygen	Membrane Electrode	0.1 mg/l
pH - value	Electrometric	
Temperature	Electrometric	
Conductivity	Laboratory and field	
Total Alkalinity	Potentiometric	20 mg/l
Turbidity	Nephelometric	0.02 NTU
Velocity	Current meter	
<i>Determined in the field</i>		
Total Coliforms	Mutiple Tube Fermentation	
Fecal Coliforms	Membrane filter	
Algae Density	Phytoplankton counting	
Chlorophyll-a	Spectrophotometric	
<i>Determined in the Laboratory</i>		
Ammonia-N	Ammonia Selective Electrode	0.01 mg/l
Nitrite	Calorimetric	0.01 mg/l
Nitrate	Nitrate electrode	0.14 mg/l
(ortho) Phosphate	Stannous Chloride	0.01 mg/lP
Total Phosphate	Persulfate Digestion	0.01 mg/lP
Biochem Oxygen Demand	5 day BOD test	0.01 mg/lO
Chemical Oxygen Demand	Closed Reflux Calorimetric	0.02 mg/lO
Total Suspended Solids	TSS dried at 103-150 C	1 mg/l
Oil & Grease/TDS	Partition - Gravimetric	0.9 mg/l
Total Dissolved Solids	TDS dried at 180C	1 mg/l
Chloride	Argentometric	0.15 mg/l CI
Sulfate	Turbidimetric	1 mg/l SO4
Calcium	EDTA titrimetric	1 mg/l Ca
Magnesium	EDTA titrimetric	1 mg/l Mg
Sodium	Flame Emission Photometric	3 mg/l Na
Potassium	Flame Emission Photometric	3 mg/l K
Phenols	Chloroform extraction	0.02 mg/l
Surfactants	Anionic surfactants, MBAS	0.01 mg/l

- ♦ No regular publication like a yearbook or annual report that document the collected and monitored parameters.
- ♦ The results of the monitoring activities can be found in research reports and papers.
- ♦ **Results of the ongoing monitoring activities are not being used for national policy making.**

□ Irrigation Drainage System Monitoring Network

The Drainage Research Institute (DRI) of the National Water Research Center has established monitoring network comprising of 93 locations in drains and 26 locations in adjacent irrigation canals as shown in table below.

Monitored parameters: Temperature, TDS, EC, pH, Ca, Mg, Na, K, CO₃, HCO₃, SO₄, Cl. In addition, DRI started in 1993 monitoring other parameters including NH₄, NO₃, NO₂ and PO₄.

Global Layout of the DRI Monitoring Network

Data Region	major drain system	discharging to	# of monitoring locations
Eastern	Bahr Baqar Drain System	Lake Manzala	13
	Bahr Hadus Drain System	Lake Manzala	14
	Serw Drain System	Lake Manzala	2
	Other drainage systems	Lake Manzala and Ismailia Canal	4
	Adjacent irrigation canals		10
Middle	Drain no. 1 system	Mediterranean Sea	6
	Gharbia Drain system	Mediterranean Sea	11
	Nashart Drain system	Lake Burullus	4
	Other drainage systems	Nile, Lake Burullus, Med. Sea	6
Western	Edko Drain system	Lake Edko	13
	Umoum Drain system	Lake Mariut	9
	Nubaria drainage system	Mediterranean Sea	8
	Other drainage systems	River Nile and Mediterranean Sea	3
	Adjacent irrigation canals		16
Total			119

In August 1995, DRI with the Technical support of Delft Hydraulics initiated a reconnaissance survey to measure the drainage water quality in more than 100 locations in the Delta and Fayoum. The current network implemented by DRI has 12 parameters will be extended to monitor 29 new parameters: turbidity, dissolved oxygen, total suspended solids and volatile solids, manganese, iron & boron; BOD, COD, and phenols; 6 nutrients; total coliforms; LUMIStox; 6 toxic heavy metals; 5 organochlorine pesticides.

□ EIMP Coastal Water Monitoring System

A proposed water sampling program has been initiated by the EIMP, funded by Danida with a focus on the following items:

- ◆ Identified major industrial pollution sources along the Egyptian coastal waters;
- ◆ Pollution from sewage discharges from the major coastal cities;
- ◆ Pollution from sewage discharges at the major tourist resort areas; and
- ◆ Outlets from the river Nile and the major lakes.

Measured parameters

The parameters to be measured are grouped in three :

- ◆ Basic parameters (vertical profiles for salinity and temperature total suspended matter (SPM), visual observations (oil, tar on beaches, any visual disturbance of e.g. corals, etc.)
- ◆ Bacteriological parameters (total coliform, Faecal coliform and Faecal streptococci):
- ◆ Eutrophication parameters (water transparency "Secchi depth" nitrate/nitrite, ammonia, total N and P, phosphate silicate and chlorophyll)

The frequency of sampling is bio-monthly.

Major Marine Pollution Sources

The Potential sources of impact on the marine environment can be localized at:

- ◆ The Mediterranean Sea is mainly affected by discharge of industrial and domestic wastewater as well as drainage from agricultural areas.
- ◆ The Gulf of Suez is mainly affected by outlets from the oil industry and the shipping.
- ◆ The Red Sea and the Gulf of Aqaba is mainly affected by the tourist industry (sewage, landfilling, damage due to boating and diving).

Ministry of Electricity Data

□ Ministry Authorities

1. New renewable energy development and utilization authority;
2. Nuclear Material authority;
3. Nuclear plants authority for electric generation
4. Atomic power authority ;
5. Hydro generation project execution authority;
6. Rural electrification authority; and
7. Egyptian electricity authority.

□ Data Availability

Power station statistics are collected and published annually. Statistics include :

- ♦ Gross generation (KWH)
- ♦ Net generation
- ♦ Rate of fuel consumptions Gr/kwh generation .
- ♦ Peak Load, and load factor % (average load / Peak load %).
- ♦ Capacity factor % (average load / installed capacity %) .
- ♦ Efficiency %.

The above statistical parameters are monitored for the following power stations in Egypt .

<i>Shoubrah (st)</i>	<i>Demietta (comb)</i>	<i>Abu Kir (st)</i>	<i>El Shabab (gas)</i>
<i>Cairo West (st)</i>	<i>Talkha (comb)</i>	<i>El Suif (st)</i>	<i>Port Said (gas)</i>
<i>Cairo West (ext)</i>	<i>Talkha (st)</i>	<i>El Suif (gas)</i>	<i>Ismailia (gas0)</i>
<i>Cairo South (comb1)</i>	<i>Talkha (210)</i>	<i>Karmouz (gas)</i>	<i>Wailidia (st)</i>
<i>Cairo South (comb2)</i>	<i>Kafr El Dawar (st)</i>	<i>El Max (ges)</i>	<i>Assiut (st)</i>
<i>Helwan (gas)</i>	<i>Mahmoudia (gas)</i>	<i>Petro Chemical</i>	<i>High Dam</i>
<i>Wadi Hoff (gas0)</i>	<i>Mahmoudia (comb)</i>	<i>Carbon Black</i>	<i>Aswan Dam (1)</i>
<i>El Tebbin (s)</i>	<i>Damanhour (300)</i>	<i>Attaka (st)</i>	<i>Aswan Dam (2)</i>
<i>El Tebbin (gas)</i>	<i>Damanhour (st)</i>	<i>Abu Soltan (st)</i>	<i>Esna</i>
<i>Heliopolis (gas)</i>	<i>Damanhour (comb)</i>	<i>Suez (st)</i>	

Unified Power system (UPS)

Data on the installed capacity and the generated energy categorized by its type (Hydro, combo, Gas or Steam) are collected and annually documented in the annual report of electric statistics published by the ministry of electricity and Energy. Annual UPS data are available for all power stations in Egypt . The national energy control center (NECC) monitors the power system's real time operation, optimize energy supply and plan the operation of power system in future . On a national scale the following parameters are annually monitored and documented :-

- ♦ Fuel consumption (Coal, Mazout, Natural gas, naphtha and Sollar).
- ♦ Ratio of Natural gas equivalent Mazout consumed.
- ♦ Central Chemical Laboratories.

The laboratory conducts research and studies related to :-

- ♦ Designing treatment chemicals to improve power stations operations.
- ♦ Proposing technological solutions to increase the efficiency of regional power stations.
- ♦ Reviewing chemical technical specifications for new power stations.
- ♦ Monitoring the chemical data analysis in chemical laboratories of the electrical power stations.
- ♦ Preparing technical periodical publications.
- ♦ Implementing training plans.

Electric Energy Statistics

- ♦ Energy generated by type (annual)
- ♦ Monthly statistics of thermal, hydro, and total energy.
- ♦ Load duration curve of the UPS.

Thermal Generation Statistics

- ♦ Annual thermal energy generated (Steam, Gas, combined or purchased).
- ♦ Distributed thermal energy is measured and documented by zone (Cairo, Alexandria west Delta...).
- ♦ Distributed thermal energy is determined by the type of fuel (Mazout, Solar, natural).

Hydro Electric generation Statistics

- ♦ The hydro energy generated form the three stations . Aswan Dam, High Dam and Esna.
- ♦ The Hydro - Electric indicators are identified per station as ;
- ♦ Discharge Rate c.m./kwh.
- ♦ Average head (m).
- ♦ Efficiency %.
- ♦ Max. load.
- ♦ Maximum daily generated energy.
- ♦ Minimum daily generated energy.

Ministry of Petroleum Data

Annual Report

Ministry of petroleum publishes annually its report which Laotians parameters and an overview for the petroleum sector at large. Among the determined documented parameters are :

- ◆ Crude oil productions classified by region and by company;
- ◆ Natural gas productions for each gas field; and
- ◆ Consumption of each sector form the natural gas.
- ◆ Exports (Ton & LE) of Guide oil, petroleum and petro chemicals products.
- ◆ Petroleum Products Imports (Ton & LE)
- ◆ Financial and economies statements.

Consumption of natural Gas per sector (Million m³)

Sector	Consumption	%
Electricity	8.315.2	64.82
Fertilizers	1.781.2	13.89
Industry	709.4	5.53
Housing and Heaters	637.7	4.97
Petroleum	858.1	6.69
Investment	526.6	4.11
Domestic	198.3	1.55
<i>Total</i>	12.828.2	

Consumption of Petroleum Products

Product	1996 Consumption (1000 metric tons)
Potagaze	1,559
Gazoline	2,013
Kirosine	1,266
Solar	6,033
Diesel	18
Mazout	7,555
Trpine	422
Asphalt	667
Oil and lub	300
Others	320

Organization for Energy Conservation and planning (OECP)

The following brief description of OECP data is annually published:

Indicators and Reports :

1.1 National Indicators :

- ◆ Intensity energy consumption with respect to national economy.
- ◆ Intensity of electrical consumption with respect to national economy.
- ◆ Per capita primary energy and electricity.
- ◆ Total annual production of primary energy.
- ◆ Total annual consumption of primary energy.
- ◆ Foreign trade of the petroleum sector.
- ◆ Ratio of petroleum exports to total exports.

1.2 Petroleum Sector Indicators :

- ◆ Crude Oil production.
- ◆ Natural Gas production.
- ◆ Petroleum and gas reserves.
- ◆ Research and exploration activities.
- ◆ Wages in petroleum sector.
- ◆ Investments in petroleum sector.

1.3 Electricity Sector indicators :

- ◆ Electricity Production.
- ◆ Maximum and minimum network loads.
- ◆ Heat rate.
- ◆ Transmission and distribution losses.
- ◆ Renewable energy.
- ◆ Investments in Electricity sector .

1.4 Energy Sector Reports :

- ◆ Energy consumption analysis per sector.
- ◆ Primary energy production reports.
- ◆ Electricity distribution and sales reports.
- ◆ Prices reports.

2. Energy Balance on the National Level

3. Detailed Data :

3.1 Natural Resources :

- ♦ Exploration .
- ♦ Seismic Search.
- ♦ Agreements.
- ♦ Reserves.
- ♦ New and renewable energy .

3.2 Sectors of primary energy production:

- ♦ Production Zones .
- ♦ Production Companies.
- ♦ Production Fields.

3.3 Converting Sectors:

- ♦ Thermal Stations .
- ♦ Hydro Stations.
- ♦ Fuel for thermal stations.
- ♦ Operational Losses.
- ♦ Refineries.

3.4 Consumption Sectors :

- ♦ Consumption per sector.
- ♦ Petroleum Sector consumption.
- ♦ Distribution companies data.
- ♦ Tariffs Statistics.
- ♦ Loads Sales.
- ♦ Transmission and distribution of electricity.
- ♦ Oil Transmission

3.5 Foreign Trade :

- ♦ Petroleum Sector Exports.
- ♦ Petroleum Sector Imports.
- ♦ Coal Imports.

Tourism Sector

SO8 Tourism Resources Managed for Environmental Sustainability

Item	Measured	By	Accuracy	Comments
Coral Reef Condition	YES	GEF/EST	GOOD	GEF prepared baseline data & EEAA-TDA will continue the data collection
Environmental Fund Revenues	Partially	EEAA	GOOD	Only fines and not those generated by tourism
Coastal Water Quality Index	YES	DANIDA	GOOD	Monitoring starts January 1998
IR 8.1	Red Sea Ecosystems and Biodiversity Protected			
% of Red Sea Coastal waters zoned for uses	YES	TDA	GOOD	.....
# of boat mooring buoys installed	YES	Hebca	GOOD	
# of Sq miles of shoreline patrolled	YES	EEAA	GOOD	This is small number & long term
IR 8.2	Red Sea Tourism Infrastructure/facilities Designed and Managed for Environmental Compatibility			
# of regional marina created with appropriate infrastructure	YES	TDA	GOOD	This is a long term item
% of hotels in region with secondary wastewater treatment	YES	TDA	GOOD	This is a long term item
% of new coastal development sites with approved EIA	YES	TDA	GOOD	All development sites submit an EIA to be reviewed
% of inspected for compliance with EIA	YES	TDA	GOOD	.....
# of Urban areas implementing Solid Waste	YES	Gov.	GOOD	
IR 8.3	Cultural Resources Managed for Sustainable Re-Use			

	# of cultural sites with Environmental. risk plan adopted	YES	SCA		
	# of cultural sites with public-private	YES	SCA		
LLIR 8.01	Capacity of GOE to manage tourism for environmental sustainability				
	# of trained rangers stationed in Red Sea	Future item to be measured by: TDA/EEAA/EEPP			
	# of EEAA/TDA inspectors - EIA review	Future item to be measured by: TDA/EEAA/EEPP			
	# of boats and patrol vehicles for rangers	Future item to be measured by: TDA/EEAA/EEPP			
LLIR 8.02	Effective NGOs and Public/Private Partnerships created or strengthened: Future item to be measured by: TDA/EEAA/EEPP				
LLIR 8.03	Policies and institutions reformed to promote improved environmental management : Future item to be measured by: TDA/EEAA/EEPP				
LLIR 8.04	Public Awareness of environmental issues increased: Future item to be measured by: TDA/EEAA/EEPP				

Health Data

Environmental Monitoring & Occupational health Center (EMOHC)

Ministry of Health & Population

EMOHC is a part of the preventive medicine sector of Ministry of Health an Population. It is responsible for environmental monitoring (Water, air and soil) which are done by the "national network for water pollution monitoring " & the "national network for air pollution monitoring"

EMOHC is composed of the following Departments :

Departments of Water pollution monitoring

It is responsible for environmental monitoring of quality & pollutants of surface water (River Nile & main canals) and supervision for governorates Laboratories. All Laboratories are well equipped with updating instruments.

Quality is now measured monthly (mainly physical, chemical & bacteriological) in approx. **130 points**. In additional **15 points** in Greater Cairo measure every 6 months the quality, toxicity (heavy metals, pesticides & other organic pollutants) in main sources of pollutants.

Department of Air & Radiation pollution monitoring :

It is responsible for 16 Laboratories in different governorates (55) stations", they all responsible for environmental daily monitoring air pollutants (SO₂, Smoke, TSP).

Department of toxicology :

It consists of ;

- a. Food pollutants Monitoring and Food additive studies Lab.
- b. Pesticides Lab.
- c. Biological Lab.

Occupational Health and Medicine Department :

It is responsible for monitoring of work environment to identify different parameters which affect the workers and the environment.

EOHC also conducts various studies & Environmental Impact Assessment (EIA) including:

- ◆ Monitoring of water pollutants (potable, sea, lakes, ground, industrial & waste water).
- ◆ Analyzing Heavy metals, Pesticides, Detergents, and Oil.
- ◆ Monitoring of quality of Sediment an its composition.
- ◆ Monitoring of Food Pollutants.
- ◆ Monitoring of quality of air & air pollutants.

Solid Waste

No Solid Waste monitoring measurements are available, however only estimates. The following table shows the estimates of 1996 reported by the EEAA.

	Governorate		Population 1000 (July 1990)	Production Kg/pers/day	Total Daily ton/day
	Cairo	U	7,059	1.3	9,000
		R	-	-	-
	Giza	U	3,043	0.8	2,434.4
		R	2,254	0.35	788.9
	Qalubia	U	1,535	0.8	1,228
		R	1,957	0.35	685
	Alexandria	U	2,558	0.8	2,846.4
		R	-	-	-
	Behira	U	954	0.8	763
		R	3,125	0.35	1,094
	Matrouh	U	97	0.4	39
		R	93	0.2	18.6
	Damierta	U	229	0.8	182
		R	679	0.35	238
	Dakhlia	U	1,116	1.2	1,451
		R	3,143	0.35	1,100
	Kafr El Shekh	U	508	0.9	457
		R	1,722	0.35	603
	Gharbia	U	1,144	1.05	1,201
		R	2,350	0.35	823
	Munofia	U	544	1	544
		R	2,201	0.35	770
	Port Saced	U	563	0.65	366
		R	-	-	-
	Suez	U	501	0.65	326
		R	-	-	-

	Governorate		Population 1000 (July 1990)	Production Kg/pers/day	Total Daily ton/day
	Ismalia	U	320	0.6	192
		R			
	Sharkia	U	897	0.8	718
		R	3,361	0.35	1,176
	North Sinia	U	138	0.4	55
		R	86	0.2	17.2
	South Sinia	U	14.2	0.4	6
		R	21.8	0.2	43.6
	Beni Suef	U	453	0.6	272
		R	1,351	0.25	338
	Fayom	U	464	0.6	278
		R	1,537	0.25	384
	Menia	U	677	0.6	406
		R	2,583	0.25	646
	Assiut	U	770	0.6	462
		R	1,993	0.25	498
	New valley	U	62	0.4	25
		R	77	0.2	15.4
	Shoag	U	656	0.6	394
		R	2,332	0.25	583
	Qena	U	505	0.6	303
		R	2,177	0.25	544
	Luxor	U	159	0.6	95.4
		R	-	-	-
	Aswan	U	401	0.6	241
		R	612	0.25	153
	Red Sea	U	101	0.4	40.4
		R	17	0.3	3.4

Appendix II-B

Variable Data Sheets

VARIABLE DATA SHEETS

This appendix contains data sheets for each variable necessary for calculating the proposed R4 and Sectoral indicators. It can be updated to include any new variables necessary for calculating policy impact indicators. The variables are listed alphabetically. Each variable sheet contains the following information (where available):

Variable: Definition of the variable including the parameter measured, unit of measurement, and where necessary, the geographic location that it represents (e.g., fecal coliform, colonies per 100 ml, for Nile River downstream from Cairo).

Data Source: Organization from which the data are retrieved, with name of contact person (and/or title of position) if available.

Operator Collection Method: How the M&E Unit collects the variable including, where necessary, the name of the document or database in which the variable is located and the required procedures for obtaining the variable (MoU, formal request from USAID, etc.)

Primary Data Collection Method: Methodology used by the data source for collection of the raw data and generation of the variable (technology, procedure, etc.).

Variable Frequency: How often the M&E Unit collects the variable and generates indicators.

Data Frequency: How often the data source collects the raw data from which it generates the variable.

Data Quality: Quantitative (if available) or narrative description of the quality of the variable.

Comments/Assumptions: Assumptions and limitations of the variable.

Variable: AH_l = m² of hard coral species at location l (l = coral sampling location in the Red Sea)

Data Source(s): ROTC, Protectorate Division of EEAA

Operator

Collection Method: Contact source.

Primary Data

Collection Method: Underwater, fixed-transect or quadrant survey at four areas (Hurgada, Surfaga, Quseir, and Mar Salan) of five general categories (hard, soft and damaged coral; rubble; and sand). The number of survey sites may increase in the future.

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Based on visual estimates by the divers conducting survey.

Comments/

Assumptions: Only valid for survey areas. This activity was initiated and funded by USAID. It will require continued funding by USAID to produce the necessary Variable.

Variable: AR_{ARI} = Actual number of monthly reports on ARI made by MOHP facilities

Data Source(s): National Acute Respiratory Infections Control Program Health Information System (NARI-HIS) - The Case Registration System, Annual Report, MOHP.
Mother/Healthy Child Project. Funded by USAID, No. 242-263.

Operator

Collection Method: Report can be obtained from MOHP/ARI Program (Dr. Eman Abd El Gawad, ARI Program Officer) or from USAID/Egypt (Dr. Nahed Matta, Office of Health, Telephone: 357-2479).

Primary Data

Collection Methods: Data is collected from public health care facilities through the case registration system.

Variable Frequency: Annual

Data Frequency: Raw data are provided to the ARI central office on a monthly basis.

Data Quality:

Comments/

Assumptions: This variable, along with ER_{ARI} , is necessary to account for the fact that not all of all the MOHP health facilities tasked with the completion of ARI tracking reports respond every month (in 1996, only 66 percent of the required monthly reports were submitted).
Data is collected by governorate. It could be entered in the monitoring and evaluation system in this format if desired.

Variable: AR_{dia} = Actual number of monthly reports on diarrhea made by MOHP facilities

Data Source(s): National Diarrheal Control Program, MOHP

Operator

Collection Method: Obtain report (in Arabic) from MOHP or from USAID/Egypt: Dr. Nahed Matta, Office of Health, Telephone: 357-2479. To obtain the report from MOHP, a Memorandum of Understanding might be required.

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency: Raw data collected by MOHP is published every year.

Data Quality:

Comments/

Assumptions:

Variable: ARI₅ = Annual number of combined ARI cases (“very severe diseases”, severe pneumonia, otitis media, pharyngitis, and cough, colds, and bronchitis) reported in children under five years of age

Data Source(s): National Acute Respiratory Infections Control Program Health Information System (NARI-HIS) - The Case Registration System, Annual Report, MOHP.

Operator

Collection Method: MOHP/ARI Program (Dr. Eman Abd El Gawad, ARI Program Officer) USAID/Egypt (Dr. Nahed Matta, Office of Health, Telephone: 357-2479).

Primary Data

Collection Methods: Children under 5 years of age with ARI who are taken to MOHP outpatient health facilities are listed in a daily registration form, provided to each clinic in Arabic and bound into an official logbook with instructions on completion. A monthly summary form is completed by the clinic's medical director and a copy is sent to the District Health Officer (DHO).

Variable Frequency: Annual

Data Frequency: Raw data are provided to ARI central office by DHOs on a monthly basis.

Data Quality: Tremendous efforts have been made in formal training courses and informal on-the-job advice to promote the system and gain acceptance. Field supervisory (implementation) teams regularly tour districts and visit various health facilities to emphasize the importance of accurate case registration and correct obvious shortcomings. Quarterly and biannual workshops are organized for ARI coordinators and District Health Officers. However, a brief comparison of MOHP ARI-related data to that presented in the EDHS publication (published every 4 years) revealed significant discrepancies. It is suggested that the NARI-HIS data be calibrated every four years to the EDHS data, given the EDHS data is considered the more "official" source.

The case registration system from which these data are derived represent only cases of ARI treated in the public health system. The system does not capture cases treated by private health care providers or cases that are self treated. Thus, the data probably severely under report actual ARI cases.

Reporting through the case registration system is not complete (only 66 percent of the facilities reported in 1996), so adjustments are necessary to account for under-reporting (see variables AR_{ARI} and ER_{ARI}).

Comments/

Assumptions:

Data is collected by governorate. It could be entered in the monitoring and evaluation system in this format if desired.

Variable: ARIA₅ = Annual number of combined ARI cases (“very severe diseases”, severe pneumonia, otitis media, pharyngitis, and cough, colds, and bronchitis) requiring antibiotic prescriptions in children under 5 years

Data Source(s): National Acute Respiratory Infections Control Program Health Information System (NARI-HIS) - The Case Registration System, Annual Report, MOHP.

Operator

Collection Method: MOHP/ARI Program (Dr. Eman Abd El Gawad, ARI Program Officer) USAID/Egypt (Dr. Nahed Matta, Office of Health, Telephone: 357-2479).

Primary Data

Collection Methods: Children under 5 years of age with ARI who are taken to MOHP outpatient health facilities are listed in a daily registration form, provided to each clinic in Arabic and bound into an official logbook with instructions on completion. A monthly summary form is completed by the clinic's medical director and a copy is sent to the District Health Officer (DHO).

Variable Frequency: Annual

Data Frequency: Raw data are provided to ARI central office by DHOs on a monthly basis.

Data Quality: Tremendous efforts have been made in formal training courses and informal on-the-job advice to promote the system and gain acceptance. Field supervisory (implementation) teams regularly tour districts and visit various health facilities to emphasize the importance of accurate case registration and correct obvious shortcomings. Quarterly and biannual workshops are organized for ARI coordinators and District Health Officers. However, a brief comparison of MOHP ARI-related data to that presented in the EDHS publication (published every 4 years) revealed significant discrepancies. It is suggested that the NARI-HIS data be calibrated every four years to the EDHS data, given the EDHS data is considered the more "official" source.

The case registration system from which these data are derived represent only cases of ARI treated in the public health system. The system does not capture cases treated by private health care providers or cases that are self treated. Thus, the data probably severely under report actual ARI cases.

Reporting through the case registration system is not complete (only 66 percent of the facilities reported in 1996), so adjustments are necessary to account for under-reporting (see variables AR_{ARI} and ER_{ARI}).

Comments/

Assumptions:

Data is collected by governorate. It could be entered in the monitoring and evaluation system in this format if desired.

Variable: $AS_l = m^2$ of soft coral species at location l (l = coral sampling location in the Red Sea)

Data Source(s): ROTC, Protectorate Division of EEAA

Operator

Collection Method: Contact source.

Primary Data

Collection Method: Underwater, fixed-transect or quadrant survey at four areas (Hurgada, Surfaga, Quseir, and Mar Salan) of five general categories (hard, soft and damaged coral; rubble; and sand). The number of survey sites may increase in the future.

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Based on visual estimates by the divers conducting survey.

Comments/

Assumptions: Only valid for survey areas. This activity was initiated and funded by USAID. It will require continued funding by USAID to produce the necessary Variable.

Variable: AT_l = m² of total survey area at location l (l = coral sampling location in the Red Sea)

Data Source(s): ROTC, Protectorate Division of EEAA

Operator

Collection Method: Contact source.

Primary Data

Collection Method: Underwater, fixed-transect or quadrant survey at four areas (Hurgada, Surfaga, Quseir, and Mar Salan) of five general categories (hard, soft and damaged coral; rubble; and sand). The number of survey sites may increase in the future.

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Based on visual estimates by the divers conducting survey.

Comments/

Assumptions: Only valid for survey areas. This activity was initiated and funded by USAID. It will require continued funding by USAID to produce the necessary Variable.

Variable: $BODI_{k,t}$ = Biological Oxygen Demand at site k at time t (where k = all inland {Nile and Drains} sampling sites in EEIS and t = all sampling events)

Data Source(s): Nile Research Institute (NRI) and Drain Research Institute (DRI). May be collected by Egyptian Environmental Information System (EEIS).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of Nile and drains

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: EEIS will not become operational until 1998.

Variable: C_{ARI} = Average cost of outpatient treatment for ARI in L.E.

Data Source(s): Data for Decision Making (DDM) Alternative estimates may be available from USAID/Egypt: Sameh El Saharte, Office of Health, Telephone: 357-3342.

Operator
Collection Method: Contact source

Primary Data
Collection Methods: DDM has estimated the average cost of outpatient treatment at L.E. 5.95 (1996 price level) per visit (DDM, Cost Analysis of Health Care).

Variable Frequency: This is treated as a constant. It should be updated whenever more recent and reliable estimates are made available.

Data Frequency:

Data Quality:

Comments/
Assumptions: The average cost of outpatient treatment was estimated in 1996.

Variable: C_{dia} = Average cost per case of outpatient treatment for diarrhea in L.E.

Data Source(s): Data for Decision Making (DDM)

Operator

Collection Method: Contact source

Primary Data

Collection Methods: DDM has estimated the average cost of outpatient treatment for uncomplicated diarrhea was estimated at L.E. 9.46 per case in 1996 by DDM, assuming an average of 1.5 visits per case (DDM, Cost Analysis of Health Care).

Variable Frequency: This is treated as a constant. It should be updated whenever more recent and reliable estimates are made available.

Data Frequency:

Data Quality:

Comments/
Assumptions:

Variable: C_{ORS} = Current year cost of ORS packet in L.E.

Data Source(s): MOHP

Operator
Collection Method: Contact source

Primary Data
Collection Methods:

Variable Frequency: Annual

Data Frequency: Raw data collected by MOHP is published every year.

Data Quality:

Comments/
Assumptions:

Variable: CNGB_{CTA} = Number of buses in the fleet of Cairo Transit Authority (CTA) using CNG

Data Source(s): CAIP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain number of buses running on CNG from CAIP

Primary Data

Collection Method: Management information by CAIP

Variable Frequency: Annual

Data Frequency: Running total

Data Quality: Good.

Comments/

Assumptions: See performance standards 3 and 4 under C.2d, CAIP

Variable: CNGB_{GCBC} = Number of buses in the fleet of Greater Cairo Bus Company (GCBC) using CNG

Data Source(s): CAIP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain number of buses running on CNG from CAIP

Primary Data

Collection Method: Management information by CAIP

Variable Frequency: Annual

Data Frequency: Running total

Data Quality: Good.

Comments/

Assumptions: See performance standards 3 and 4 under C.2d, CAIP

Variable: $CO_{e,t}$ = Carbon monoxide emissions from point source e at time t , mg/m³
(where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to USAID via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

Comments/

Assumptions: Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: DDS = Total number of designated dive sites in the Red Sea.

Data Source(s): EEAA

Operator

Collection Method: Contact source

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: DIA_5 = Number of diarrheal episodes per year for children under 5 years of age reported by public health facilities

Data Source(s): National Diarrheal Control Program, MOHP

Operator

Collection Method: Obtain report (in Arabic) from MOHP or from USAID/Egypt: Dr. Nahed Matta, Office of Health, Telephone: 357-2479. To obtain the report from MOHP, a Memorandum of Understanding might be required.

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency: Data recorded as one or more diarrheal episodes reported in any given 2-week period (including diarrhea in the past 24 hours). Raw data collected by MOHP is published every year.

Data Quality: The case registration system from which these data are derived represent only cases of diarrhea treated in the public health system. The system does not capture cases treated by private health care providers or cases that are self treated. Thus, the data probably severely under report actual diarrhea cases.
Reporting through the case registration system is most likely not complete, so adjustments are necessary to account for under-reporting (see variables AR_{dia} and ER_{dia}).

Comments/

Assumptions:

Variable: EF_i = Carbon dioxide emission factor for fuel i . Tons of CO₂ equivalent emitted to air by combustion of one unit of fuel i (i = natural gas, mazut, gasoline, diesel, coal, kerosene, and benzine)

Data Source(s): Ministry of Petroleum

Operator

Collection Method: Contact source

Primary Data

Collection Methods: Ministry of Petroleum production records

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: The EF_i constants assume complete combustion. Incomplete combustion is a particular problem in Egypt. This indicator thus underestimates emissions of CO₂ in Egypt, but it does track trend.

Variable: EIA = Number of new tourism developments with approved EIAs

Data Source(s): TDA

Operator

Collection Method: Contact source

Primary Data

Collection Methods: License approval procedures

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: ER_{ARI} = Expected number of monthly reports on ARI made by MOHP facilities

Data Source(s): National Acute Respiratory Infections Control Program Health Information System (NARI-HIS) - The Case Registration System, Annual Report, MOHP.
Mother/Healthy Child Project. Funded by USAID, No. 242-263.

Operator

Collection Method: Report can be obtained from MOHP/ARI Program (Dr. Eman Abd El Gawad, ARI Program Officer) or from USAID/Egypt (Dr. Nahed Matta, Office of Health, Telephone: 357-2479).

Primary Data

Collection Methods: Data is collected from public health care facilities through the case registration system.

Variable Frequency: Annual

Data Frequency: Raw data are provided to the ARI central office on a monthly basis.

Data Quality: complete. Thus, the data probably severely under report actual ARI cases.

Comments/

Assumptions: This variable, along with AR_{ARI} , is necessary to account for the fact that not all of all the MOHP health facilities tasked with the completion of ARI tracking reports respond every month (in 1996, only 66 percent of the required monthly reports were submitted).
Data is collected by governorate. It could be entered in the monitoring and evaluation system in this format if desired.

Variable: ER_{dia} = Expected number of monthly reports diarrhea made by MOHP facilities

Data Source(s): National Diarrheal Control Program, MOHP

Operator

Collection Method: Obtain report (in Arabic) from MOHP or from USAID/Egypt: Dr. Nahed Matta, Office of Health, Telephone: 357-2479. To obtain the report from MOHP, a Memorandum of Understanding might be required.

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency: Raw data collected by MOHP is published every year.

Data Quality:

Comments/

Assumptions:

Variable: ETDA = Number of employees in TDA's Environmental Review and Sustainable Development offices

Data Source(s): TDA

Operator
Collection Method: Contact source

Primary Data
Collection Method: Budgeting process

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/
Assumptions:

Variable: FC = Total power sector fuel consumption rate (Fuel consumption (TOE) divided by KWH produced.)

Data Source(s): Arab Republic of Egypt, Ministry of Electricity and Energy, Egyptian Electricity Authority, Annual Report of Electric Statistics.

Operator

Collection Method: Obtain value from USAID, R4, SO1.
Obtain annual report from USAID.
Alternatively, obtain report from MOEE or EEA.

Primary Data

Collection Methods: Derived from power plant records kept by EEA.

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Good to excellent

Comments/

Assumptions: This indicator contained in SO 1. The indicator is for publicly produced electricity only, it does not include electricity generated by industries.

Variable: GDP_c = Current year GDP (L.E.)

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/

Assumptions:

Variable: $GDPD_{ARI}$ = GDP deflator for the year in which ARI outpatient costs are estimated (currently 1996)

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator
Collection Method: Contact source

Primary Data
Collection Methods:

Variable Frequency: Whenever the variable C_{ARI} is updated.

Data Frequency: Annual

Data Quality:

Comments/
Assumptions: This variable is used to adjust the cost of outpatient treatment for ARI to account for inflation. The most recent costs estimates were in 1996. The GDP deflator is used to convert costs over time into a base year. If health care costs rise faster than other costs, however, the indicator will underestimate actual outpatient costs.

Variable: GDPD_b = GDP deflator, year of base value

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Quarterly

Data Quality:

Comments/

Assumptions:

Variable: GDPD_c = GDP deflator, current year

Data Source(s): Issued quarterly by the Central Bank with a three month reporting delay.
Available from USAID/Cairo, Economics Division

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Quarterly

Data Quality:

Comments/

Assumptions:

Variable: GDPD_{dia} = GDP deflator for the year in which diarrhea outpatient costs are estimated (currently 1996)

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator
Collection Method: Contact source

Primary Data
Collection Methods:

Variable Frequency: Whenever the variable C_{dia} is updated.

Data Frequency: Annual

Data Quality:

Comments/
Assumptions: This variable is used to adjust the cost of outpatient treatment for diarrhea to account for inflation. The most recent costs estimates were in 1996. The GDP deflator is used to convert costs over time into a base year. If health care costs rise faster than other costs, however, the indicator will underestimate actual outpatient costs.

Variable: $GDPD_{sew}$ = GDP deflator for year when willingness to pay for household sewer connection was estimated (currently 1995)

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Whenever the variable WTP_{sew} is updated.

Data Frequency: Annual

Data Quality:

Comments/

Assumptions: This variable is used to adjust the willingness to pay for sewer connections in Cairo. The most recent costs estimates were in 1995. The GDP deflator is used to convert costs over time into a base year.

Variable: $GDPD_{wat}$ = GDP deflator for year when willingness to pay for in-home water connection was estimated (currently 1995)

Data Source(s): Central Bank, but also available from USAID/Cairo, Economics Division

Operator
Collection Method: Contact source

Primary Data
Collection Methods:

Variable Frequency: Whenever the variable WTP_{wat} is updated.

Data Frequency: Annual

Data Quality:

Comments/
Assumptions: This variable is used to adjust the willingness to pay for in-house water connections in Cairo. The most recent costs estimates were in 1995. The GDP deflator is used to convert costs over time into a base year.

Variable: ICP = Number of industries with compliance plans submitted

Data Source(s): EEAA

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Running total

Data Quality:

Comments/

Assumptions:

Variable: INSP = Number of new tourism development sites reinspected for compliance with approved EIAs

Data Source(s): TDA

Operator
Collection Method: Contact source

Primary Data
Collection Methods: License approval procedures

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions:

Variable: IT = Total industries in Egypt

Data Source(s): EEAA

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Running total

Data Quality:

Comments/

Assumptions:

Variable: L_{4T} = Number of industries in compliance with Law 4

Data Source(s): EEAA

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Running total

Data Quality:

Comments/

Assumptions:

Variable: LF_{Egy} = Number of standard-meeting landfills in all of Egypt

Data Source(s): EEAA
Governorates

Operator
Collection Method: Contact Source

Primary Data
Collection Methods: Licensing process

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions: There are currently no standard-meeting landfills in Egypt. EEAA will need to promulgate standards before this indicator can be measured.

Variable: MM = Number of mooring maintenance activities.

Data Source(s): HEPCA/EEAA (HEPCA is current data source but this could change if program management changes.)

Operator
Collection Method: Contact source

Primary Data
Collection Method: Monthly activity reports

Variable Frequency: Annual

Data Frequency: Monthly

Data Quality: Good

Comments/
Assumptions: Targets for this indicator will have to be developed , probably based on an average number of maintenance activities per installed mooring point, drawing upon HEPCA's experience.

Variable: $MORT_{ARI}$ = annual infant and child mortality rate due to ARI

Data Source(s): National Acute Respiratory Infections Control Program Health Information System (NARI-HIS) - The Case Registration System, Annual Report, MOHP.
Mother/Healthy Child Project. Funded by USAID, No. 242-263.

Operator

Collection Method: Obtain report

Primary Data

Collection Methods: CAPMAS collects data on annual mortality rates by age group and cause through the registration system.

Variable Frequency: Annual

Data Frequency: Reported monthly, published annually

Data Quality: Several studies indicate that the registration system under-reports mortality in infants.

Comments/
Assumptions:

Variable: MORT_{dia} = annual infant and child mortality rate due to diarrhea

Data Source(s): CAPMAS

Operator

Collection Method: Obtain CAPMAS data on “Infant and Child Mortality Rates in Egypt”

Primary Data

Collection Methods: CAPMAS collects data on annual mortality rates by age group and cause through the registration system.

Variable Frequency: Annual

Data Frequency: Reported monthly, published annually

Data Quality: Several studies indicate that the registration system under-reports mortality in infants.

Comments/

Assumptions:

Variable: MP = Number of designated diving sites with mooring points installed

Data Source(s): HEPCA/EEAA (HEPCA is current data source but this could change if program management changes.)

Operator

Collection Method: Contact source

Primary Data

Collection Method: Monthly activity reports

Variable Frequency: Annual

Data Frequency: Monthly

Data Quality: Good

Comments/

Assumptions:

Variable: NM = Number of members (corporate and individual) of HEPCA

Data Source(s): HEPCA

Operator

Collection Method: Contact source

Primary Data

Collection Method: Membership records

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: $\text{NOX}_{e,t}$ = Nitrogen oxides emissions from point source e at time t , $\mu\text{g}/\text{m}^3$
(where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to EMIS via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

**Comments/
Assumptions:** Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: NPP = Number of cultural sites in a public/private partnership for adaptive reuse

Data Source(s): SCA

Operator
Collection Method: Contact source

Primary Data
Collection Method:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions: Progress in this area will depend upon adoption of an adaptive reuse policy by SCA.

Variable: NSP = Number of cultural sites with adaptive reuse plans

Data Source(s): SCA

Operator

Collection Method: Contact source

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: Progress in this area will depend upon development of procedures for adaptive reuse planning by SCA.

Variable: NV = Number of vehicles in Cairo tested under VET

Data Source(s): CAIP

Operator

Collection Method: Obtain data set from VET of CAIP

Primary Data

Collection Method: VET program required to track performance on standard emission test administered to vehicles; data collected on a running total basis.

Variable Frequency: Annual

Data Frequency: Compiled by VET annually

Data Quality: Good; program will assume that the subset of vehicles sampled represents the population of vehicles in Cairo

Comments/

Assumptions: Under IR C.1b in CAIP, VET required to accomplish 80 percentage pass rate

Variable: $O3_{e,t}$ = Ozone emissions from point source e at time t , $\mu\text{g}/\text{m}^3$ (where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to USAID via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

Comments/

Assumptions: Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: $O_3_{k,t}$ = Ambient ozone concentrations at site k at time t (k = all O_3 monitoring stations in EIMP and t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator
Collection Method: Obtain data set from EIMP

Primary Data
Collection Method: Ambient monitoring

Variable Frequency: Annual

Data Frequency: Ozone is conventionally measured on 10-second frequency on hourly average; measured in mass per volume.

Data Quality: Good.

Comments/
Assumptions:

Variable: ORS = Number of ORS packets sold in Egypt annually

Data Source(s): MOHP

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency: Raw data collected by MOHP is published every year.

Data Quality:

Comments/

Assumptions:

Variable: $Pb_{e,t}$ = Lead emissions from point source e at time t , $\mu\text{g}/\text{m}^3$ (where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to USAID via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

Comments/

Assumptions: Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: $Pb_{n,t}$ = ambient lead concentrations at site n at time t , $\mu\text{g}/\text{m}^3$ (n = all lead monitoring stations in EIMP and CAIP and t = all sampling events)

Data Source(s): EIMP monitors ambient conditions throughout Egypt. CAIP monitors ambient conditions in Cairo.

Operator
Collection Method: Obtain data sets from EIMP and CAIP

Primary Data
Collection Method: Ambient monitoring.

Variable Frequency: Annual

Data Frequency: Sample collected in same process as PM on 3-day cycle. Sample analyzed for various components of PM, taking the lead fraction out of the PM. Measured in mass per volume.

Data Quality: Good.

Comments/
Assumptions: CAIP will reevaluate monitoring after initial period to determine whether there would be a statistically significant loss if it uses a six day cycle instead;

Variable: $PM10_{e,t}$ = Particulate emissions larger than 10 microns from point source e at time t , $\mu\text{g}/\text{m}^3$ (where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to USAID via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

Comments/

Assumptions: Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: $PM_{10,m,t}$ = ambient PM10 concentrations at site m at time t , $\mu\text{g}/\text{m}^3$ (m = all PM10 monitoring stations in EIMP and CAIP and t = all sampling events)

Data Source(s): EIMP monitors ambient conditions throughout Egypt. CAIP monitors ambient conditions in Cairo.

Operator

Collection Method: Obtain data sets from EIMP and CAIP

Primary Data

Collection Method: Ambient monitoring.

Variable Frequency: Annual

Data Frequency: PM10 measurement frequency is every third day, measured in mass per volume.

Data Quality: Good.

**Comments/
Assumptions:** CAIP will reevaluate monitoring after initial period to determine whether there would be a statistically significant loss if it uses a six day cycle instead.

Variable: POL_{7,1} = policy measures implemented and verified for IR 7.1

Data Source(s): M&E Unit verification documentation.

Operator
Collection Method: Check verification documentation

Primary Data
Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POL_{7.2} = policy measures implemented and verified for IR 7.2

Data Source(s): M&E Unit verification documentation.

Operator
Collection Method: Check verification documentation

Primary Data
Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POL_{7.3} = policy measures implemented and verified for IR 7.3

Data Source(s): M&E Unit verification documentation.

Operator
Collection Method: Check verification documentation

Primary Data
Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POL_{8.1} = policy measures implemented and verified for IR 8.1

Data Source(s): M&E Unit verification documentation.

Operator

Collection Method: Check verification documentation

Primary Data

Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POL_{8.2} = policy measures implemented and verified IR 8.2

Data Source(s): M&E Unit verification documentation.

Operator
Collection Method: Check verification documentation

Primary Data
Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POL_{8.3} = policy measures implemented and verified for IR 8.3

Data Source(s): M&E Unit verification documentation.

Operator

Collection Method: Check verification documentation

Primary Data

Collection Method: Verification procedures

Variable Frequency: Annual

Data Frequency: At least once per tranche (18 months)

Data Quality: Good

Comments/
Assumptions: General targets for this indicator should come from EEPP design, with specific targets established at tranche intervals (18 months).

Variable: POP₅ = Population estimate of children under five years of age

Data Source(s): Central Agency for Public Mobilization and Statistics (CAPMAS)

Operator
Collection Method: Contact source

Primary Data
Collection Methods: CAPMAS statistics are calculated by an analysis of vital registration data, and are considered the official data source with regard to population estimates, among other data types.

Variable Frequency: Annual

Data Frequency: Raw data collected by CAPMAS is published on an annual basis (interim Egypt-wide reports), with more comprehensive data published every four (4) years

Data Quality: CAPMAS data is considered a reliable source of Egypt-wide population demographics.

Comments/
Assumptions: Data is collected by governorate. It could be entered in the monitoring and evaluation system in this format if desired.

Variable: POP_w = Percent of population served by direct connections to water supply and wastewater systems

Data Source(s): USAID/Egypt: Office of Urban Administration and Development

Operator

Collection Method: Contact Office of Urban Administration and Development

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: This indicator is used for evaluation of SO 6. It reflects the percent of population served in areas receiving USAID support.

Variable: PR = Number of rangers hired and trained to patrol the Red Sea coastal waters.

Data Source(s): Protectorate Division, EEAA

Operator
Collection Method: Contact source

Primary Data
Collection Method: Budget process

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Good

Comments/
Assumptions:

Variable: PV = Number of vehicles in Cairo passing inspection under Vehicle Emissions Testing, Tune-up and Certification Program (VET)

Data Source(s): CAIP

Operator
Collection Method: Obtain data set from VET of CAIP

Primary Data
Collection Method: VET program required to track performance on standard emission test administered to vehicles; data collected on a running total basis.

Variable Frequency: Annual

Data Frequency: Compiled by VET annually

Data Quality: Good; program will assume that the subset of vehicles sampled represents the population of vehicles in Cairo

**Comments/
Assumptions:** Under IR C.1b in CAIP, VET required to accomplish 80 percentage pass rate

Variable: Q_i = Quantity of fuel i used in current year (i = natural gas, mazut, gasoline, diesel, coal, kerosene, and benzine) (units depend on fuel type)

Data Source(s): Ministry of Petroleum Annual Report

Operator
Collection Method: Obtain report

Primary Data
Collection Methods: Ministry of Petroleum production records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/
Assumptions:

Variable: Q_j = Quantity of fuel/energy j used/produced by year (j = hydro power, solar, and wind energy)

Data Source(s): Natural Gas - Ministry of Petroleum Annual Report

Solar and hydro-electric energy produced - Arab Republic of Egypt, Ministry of Electricity and Energy, Egyptian Electricity Authority (EEA), Annual Report of Electric Statistics.

Operator

Collection Method: Obtain reports

Primary Data

Collection Methods: Ministry of Petroleum production records
Egyptian Electricity Authority operating records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/
Assumptions: Currently only hydroelectric power is an important component of Q_j , however, wind and solar power could become more important in the future.

Variable: Q_{NG} = Quantity of natural gas used in current year

Data Source(s): Ministry of Petroleum Annual Report

Operator

Collection Method: Obtain report

Primary Data

Collection Methods: Ministry of Petroleum production records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/

Assumptions:

Variable: RAR = Annual revenue to SCA from adaptive reuse (L.E.)

Data Source(s): SCA

Operator

Collection Method: Contact Source

Primary Data

Collection Method:

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Good

Comments/

Assumptions:

Variable: RM = Number of regional marinas

Data Source(s): TDA

Operator

Collection Method: Contact Source

Primary Data

Collection Method: Licensing process

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Good

Comments/
Assumptions:

Variable: SC_i = Sulfur content of fuel i in Egypt (i = natural gas, mazut, gasoline, diesel, coal, kerosene, and benzine)

Data Source(s): Ministry of Petroleum

Operator
Collection Method: Contact source

Primary Data
Collection Methods: Ministry of Petroleum production records

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions: The SC_i factors for sulfur are based on annual average sulfur contents of fuels used in Egypt.

Variable: SEW = Number of households connected to sewers in Cairo

Data Source(s): USAID/Egypt: Office of Urban Administration and Development

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: $SO_{2,e,t}$ = Sulfur dioxide emissions from point source e at time t , $\mu\text{g}/\text{m}^3$
(where t = all sampling events)

Data Source(s): EIMP, Environmental Quality Section, EEAA

Operator

Collection Method: Obtain monitoring reports data set from EIMP. These may eventually be available on the Egyptian Environmental Information System and available to USAID via modem, if USAID participates in the system.

Primary Data

Collection Method: Sampling at 50 industrial facilities and public utilities, including some small- and medium-sized industries. Stack monitors (gas analyzers), filters and/or wet-chemical sampling. Flue gas temperature, flow velocity and volume will also be measured and converted to standard temperature and pressure conditions

Variable Frequency: Annual

Data Frequency: Tailored to each facility, as specified in individual monitoring plans

Data Quality: Good

Comments/

Assumptions: Although an attempt is being made to have the facilities be representative, the total number of facilities is limited. Information will not be available until 1998.

Variable: TB_{CTA} = total number operational buses in the fleet of CTA

Data Source(s): CTA

Operator

Collection Method: Obtain total number of operational buses in fleet from CTA

Primary Data

Collection Method: Management information by CTA

Variable Frequency: Annual

Data Frequency: Running total

Data Quality: Good.

Comments/

Assumptions: See performance standards 3 and 4 under C.2d, CAIP

Variable: TB_{GCBC} = total number operational buses in the fleet of GCBC

Data Source(s): GCBC

Operator

Collection Method: Obtain total number of operational buses in fleet from GCBC

Primary Data

Collection Method: Management information by GCBC

Variable Frequency: Annual

Data Frequency: Running total

Data Quality: Good.

Comments/
Assumptions: See performance standards 3 and 4 under C.2d, CAIP

Variable: $TCC_{k,t}$ = Total coliform at site k at time t in colonies/100ml (k = all Mediterranean Sea, Gulf of Suez, and Gulf of Aqaba sampling sites in EIMP and t = all sampling events)

Data Source(s): EIMP, Environmental Quality Sector, EEAA

Operator

Collection Method: Contact source. This data eventually may be available via the Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: EIMP will have 78 coastal water monitoring stations. TC will be collected at 61 of the stations.

Variable Frequency: Annual

Data Frequency: Approximately bi-monthly

Data Quality: Good. The program will have a quality control system, with established sampling protocol and a reference laboratory which will periodically test duplicate blank samples.

Comments/

Assumptions: EIMP is scheduled to produce sampling results by 1998.

Variable: $TCG_{m,t}$ = Total coliform at site m at time t in colonies/100ml (m = all groundwater sampling sites in EEIS and t = all sampling events)

Data Source(s): Groundwater Research Institute (GRI).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of groundwater sources

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: EEIS will not become operational until 1998.

Variable: $TCI_{k,t}$ = Total coliform at site k at time t in colonies/100ml (k = all inland {Nile and Drains} sampling sites in EEIS and t = all sampling events)

Data Source(s): Nile Research Institute (NRI) and Drain Research Institute (DRI). May be collected by Egyptian Environmental Information System (EEIS).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of Nile and drains

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: EEIS will not become operational until 1998.

Variable: TD = Total number of new tourism developments approved for construction.

Data Source(s): TDA

Operator

Collection Method: Contact source

Primary Data

Collection Methods: License approval procedures

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: TDS_m = Total dissolved solids at site m (m = all groundwater sampling sites in EEIS)

Data Source(s): Groundwater Research Institute (GRI).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of groundwater sources

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: EEIS will not become operational until 1998.

Variable: TE = Thermal efficiency

Data Source(s): USAID, R4, SO1
Arab Republic of Egypt, Ministry of Electricity and Energy, Egyptian
Electricity Authority, Annual Report of Electric Statistics.

Operator

Collection Method: Obtain annual report from USAID. Alternatively, obtain report directly
from MOEE or EEA.

Primary Data

Collection Methods: Derived from power plant records kept by EEA.

Variable Frequency: Annual

Data Frequency: Annual

Data Quality: Good to excellent

Comments/
Assumptions: This indicator contained in SO 1.

Variable: TEEF = Amount of revenue generated by EEF from tourism which is retained for the operation and maintenance of the Red Sea Marine Park (L.E.)

Data Source(s): EEAA

Operator
Collection Method: Contact source

Primary Data
Collection Method:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions: EEAA may not be tracking tourism as a source of income to EEF.

Variable: TG = total gasoline production in Egypt, in liters

Data Source(s): Organization for Energy Conservation and Planning (OECP)

Operator

Collection Method: Obtain copy of report published by OECP for annual gasoline consumption

Primary Data

Collection Method: Official GOE data collection.

Variable Frequency: Annual

Data Frequency:

Data Quality: Published by OECP

Comments/
Assumptions: Remaining leaded gasoline likely to be phased out early in the 5-year life of the process.

Variable: TLES = total annual lead emissions from smelters (tons)

Data Source(s): CAIP

Operator
Collection Method: Obtain data set from CAIP

Primary Data
Collection Method: Based on aggregate source emissions monitoring by CAIP before (baseline) and after

Variable Frequency: Annual

Data Frequency: Sampling run on 3-day schedule (24 hours every 3rd day); to be compiled on quarterly basis with 30-45 day lag time between collection and analysis;

Data Quality: Good for major sources, but fair for small smelters because of challenging conditions; in many cases there are no stacks to measure from

Comments/
Assumptions: CAIP will have sampling results, but it (or EMIS, using additional data from CAIP) will need to do further computational work to calculate annual reductions in tons. Emissions testing required under IR C.4b of CAIP; however, only large smelters planned at present to have controls installed.

Variable: $TNC_{k,t}$ = Total nitrogen at site k at time t (k = all Mediterranean Sea, Gulf of Suez, and Gulf of Aqaba sampling sites in EIMP and t = all sampling events)

Data Source(s): EIMP, Environmental Quality Sector, EEAA

Operator

Collection Method: Contact source. This data eventually may be available via the Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: EIMP will have 78 coastal water monitoring stations. TN will be collected at 75 of the stations.

Variable Frequency: Annual

Data Frequency: Approximately bi-monthly

Data Quality: Good. The program will have a quality control system, with established sampling protocol and a reference laboratory which will periodically test duplicate blank samples.

Comments/

Assumptions: EIMP is scheduled to produce sampling results by 1998.

Variable: $TNG_{m,t}$ = Total nitrogen at site m at time t (m = all groundwater sampling sites in EEIS and t = all sampling events)

Data Source(s): Groundwater Research Institute (GRI).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of groundwater sources

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: EEIS will not become operational until 1998.

Variable: $TNI_{k,t}$ = Total nitrogen at site k at time t (k = all inland {Nile and Drains} sampling sites in EEIS and t = all sampling events)

Data Source(s): Nile Research Institute (NRI) and Drain Research Institute (DRI). May be collected by Egyptian Environmental Information System (EEIS).

Operator

Collection Method: Contact source. May be collected by Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: Monitoring of Nile and drains

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/
Assumptions: EEIS will not become operational until 1998.

Variable: TOE_i = Tons of oil equivalent of one unit of fuel *i* (*i* = natural gas, mazut, gasoline, diesel, coal, kerosene, and benzine)

Data Source(s): OECP Annual Report

Operator

Collection Method: Obtain reports

Primary Data

Collection Methods: Ministry of Petroleum production records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/

Assumptions: The tons of oil equivalent for various fuels used in Egypt are:

Conversion Factors by Fuel to TOE

Fuel (tons)	TOE	Conversion Factor (T _i)
Crude Oil (tons)	.995	.995 (TOE/tonne)
Mazut	.975	.975 (TOE/tonne)
Kerosene	1.086	1.086 (TOE/tonne)
Gasoline (Benzine)	1.103	1.103 (TOE/tonne)
Solar (Similar to Diesel)	1.066	1.066 (TOE/tonne)
Petrol Coal	.67	.67 (TOE/tonne)

Source: OECP Annual Report, 1996.

Variable: TOE_j = Tons of oil equivalent of one unit of fuel/power source *j* (*j* = hydro power, solar, and wind energy)

Data Source(s): OECF Annual Report

Operator

Collection Method: Obtain reports

Primary Data

Collection Methods: Ministry of Petroleum production records
Egyptian Electricity Authority operating records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/

Assumptions:

Variable: TOE_{NG} = Tons of oil equivalent of one unit of natural gas

Data Source(s): OECF Annual Report

Operator

Collection Method: Obtain reports

Primary Data

Collection Methods: Ministry of Petroleum production records
Egyptian Electricity Authority operating records

Variable Frequency: Annual

Data Frequency: Annual

Data Quality:

Comments/

Assumptions: The tons of oil equivalent for various fuels used in Egypt are:

Conversion Factors by Fuel to TOE

Fuel (tons)	TOE	Conversion Factor (T _j)
Natural Gas (ton=1,242 m ³)	1.111	894.526 (TOE/million m ³) ^a
Portagas (Bottled gas)	1.125	1.125 (TOE/tonne)

^a Natural gas consumption is reported in million cubic meters. There are 1,242 cubic meters per metric tonne and 1.111 TOE per metric tonne. Thus, there are 894.526 TOE per million cubic meters of natural gas.

Source: OECF Annual Report, 1996.

Variable: TSSC_{k,t} = Total suspended solids at site *k* at time *t* (*k* = all Mediterranean Sea, Gulf of Suez, and Gulf of Aqaba sampling sites in EIMP and *t* = all sampling events)

Data Source(s): EIMP, Environmental Quality Sector, EEAA

Operator

Collection Method: Contact source. This data eventually may be available via the Egyptian Environmental Information System (EEIS), in which case, if USAID is a node, EMIS will be able to download the data through EEIS via a computer.

Primary Data

Collection Method: EIMP will have 78 coastal water monitoring stations. TSS will be collected at 75 of stations.

Variable Frequency: Annual

Data Frequency: Approximately bi-monthly

Data Quality: Good. The program will have a quality control system, with established sampling protocol and a reference laboratory which will periodically test duplicate blank samples.

Comments/

Assumptions: EIMP is scheduled to produce sampling results by 1998.

Variable: TUL = Total unleaded gasoline production in Egypt, in liters

Data Source(s): Organization for Energy Conservation and Planning (OECF)

Operator

Collection Method: Obtain copy of report published by OECF for annual gasoline consumption

Primary Data

Collection Method: Official GOE data collection.

Variable Frequency: Annual

Data Frequency:

Data Quality: Published by OECF

Comments/

Assumptions: Remaining leaded gasoline likely to be phased out early in the 5-year life of the process.

Variable: VI = Total value of imports of pollution prevention technologies (L.E.)

Data Source(s): Commodity Import Program may have data on imports from U.S. Imports from the U.S. are largely pollution prevention technologies, energy efficiency technologies come largely from Europe. Commercial Division of Embassy may be another source.

Operator

Collection Method: Contact source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions: These technologies are separated out in import categories. Imports of these technologies from the US will be captured and reported by the Commodity Import Program. The US is the major supplier of environmental technologies. Energy efficiency technologies come more from Europe. Demand for these technologies are likely to outstrip economic growth for the next 5-10 years.

Variable: WAT = Number of households connected to water in Cairo

Data Source(s): USAID/Egypt: Office of Urban Administration and Development

Operator

Collection Method: Contact Source

Primary Data

Collection Methods:

Variable Frequency: Annual

Data Frequency:

Data Quality:

Comments/

Assumptions:

Variable: WTP_{sew} = Willingness to pay for household sewer connection in Cairo (L.E.)

Data Source(s): Cairo Water and Wastewater Economic Benefits Assessment Report. The monthly value of a sewer connection to a household is L.E. 21.70. The annual value is thus L.E. 260. This value is in 1995 prices.

Operator

Collection Method: This value is a constant taken from previous research

Primary Data

Collection Methods: Large scale contingent valuation survey of Cairo households funded by USAID and conducted in 1995.

Variable Frequency: This is treated as a constant. It should be updated whenever more recent and reliable estimates are made available.

Data Frequency:

Data Quality:

Comments/
Assumptions:

Variable: WTP_{wat} = Willingness to pay for access to in-home piped water in Cairo (L.E.)

Data Source(s): Cairo Water and Wastewater Economic Benefits Assessment Report. The monthly value of a sewer connection to a household is L.E. 24.7. The annual value is thus L.E. 296. This value is in 1995 prices.

Operator

Collection Method: This value is a constant taken from previous research

Primary Data

Collection Methods: Large scale contingent valuation survey of Cairo households funded by USAID and conducted in 1995.

Variable Frequency: This is treated as a constant. It should be updated whenever more recent and reliable estimates are made available.

Data Frequency:

Data Quality:

Comments/
Assumptions:

Appendix II-C

Customer Survey

Research Memorandum:

**Customer Survey for the Design of the USAID/Cairo Environment
Monitoring and Evaluation System**

Prepared by

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Prepared for

**USAID
Environmental Health Project**

July 23, 1997

Introduction

A key tenet of the proposed USAID/Cairo Environment Program Monitoring and Evaluation (EM/E) system is that it should produce information people want and intend to use. For every piece of information - e.g., data, reports, memorandums - entered in the system, there should be a specific potential *customer* for that information who has identified an *intended use* of the information.

The purpose of this memorandum is to report on a recent investigation of the information needs of a variety of potential customers for the system. The various offices contacted were nominated by USAID/Egypt Environment Program management and staff as the key information customers for the system. The primary audience for this memorandum is the EM/E design team, USAID/Cairo Environment Division and the EHP task manager.

Methodology

In preparation for the interviews, each of the prospective interviewees was provided information on the intended EM/E system - what it is intended to do and how it is being developed. This information is summarized in Appendix A.

The interviews were conducted in person and by phone, each for about 40 minutes. The questions discussed are listed in Appendix B. The interviews were conducted individually by Tom Cook, Lane Krahl and Magdy Saleh (consultant to the design team in Cairo). The people interviewed are identified in Figure 2 and Appendix C.

Results

The results from the customer survey are presented in Figure 2 and in Appendix C. The reader should review this material along with the following discussion.

These results can be discussed both in terms of the customer survey process and the information needs of the customers. The main *process* result is that the people surveyed were unaccustomed to being asked about the information they needed to make decisions about environment policies and programs. Most had never been asked about their information needs and therefore had some initial difficulty in articulating them. They tended to respond to our questions in terms of how they would like the EM/E system to operate rather than in terms of specific indicators they wanted the system to track and report on. They nonetheless thought it was a good idea to conduct the customer survey as part of the process of developing the EM/E system.

They appreciated that the process would help focus the system on the collection of data that would be used. Several noted that most of the indicators reported on were used mainly because they were available. This resulted in the collection of data that were unlikely to be used in systematic analysis of environment issues; collection of these data often represented a waste of resources. A more focused data collection strategy was seen as a way to apply limited resources more cost-effectively.

The *information needs* results can be reviewed in Figure 2 and Appendix C. As can be seen in these sources, some of the interviews remain to be completed, and will be completed on the team's trip to Cairo in August.

Several general findings, or themes, emerged from the discussions:

1. Help is needed in selecting the *vital few indicators* that will yield the most useful information at the least cost (i.e., data collection burden). The approach of using all of the indicators one can think of is viewed as wasteful at best and confusing at worst. The desire is for the use of readily understood indicators that are easily applied and interpreted in program decision making.

2. There is a clear recognition of the need to use extant data that are certified as to their credibility. There is unlikely to be an infusion of funding for new data collection so existing data sources will have to be evaluated for data quality and used in appropriate ways.

3. The system should be routinely fine-tuned to respond to changing information needs. It needs to be easily modified to keep it current and useful.

4. The system development should be coordinated with on-going data collection by other donors, such as the Annual State of the Environment Report (DANIDA), as well as with GOE data collection. This will help avoid wasteful data collection duplication.

5. The system should be computer-based to facilitate easy and timely access to data and promote systematic analysis of the data for program decision making.

6. The system should be explicitly linked to policy and programmatic cycles so that credible data/information it can be available to inform decision making.

7. Wherever possible, use people-level indicators to track the impacts of programs on presumed beneficiaries.

8. Need good measures of sustainability for all programs. This is a key issue - how durable are program results - that is inadequately addressed in extant indicators.

9. Provide context for measures/indicators. What does the measure mean? Why is

it useful ? In using the measure in analysis, what types of mediating (e.g., population, education level, economic conditions) variables need to be included ?

10. Need to select indicators and stay with them, rather than always “improving them.” Need *stable set of measures* that can be tracked over time to monitor and evaluate.

Appendices

A.

USAID/Cairo Environment Office *Customer-Focused* Environment Monitoring and Evaluation System

The Environment Office is developing an environment monitoring and evaluation system (EM/E) to support the effective management of its expanding program. The goal of the system is to provide timely and credible data and information on the implementation and impact of USAID environment projects and to report periodically on the status of Egypt's environment.

The system is based on the principle of *customer focus*. This means that any information collected and maintained by the system data base, such as monitoring and evaluation data, must have a specific customer who has expressed a need for the information and an intent to use it. In other words, customer information demands will determine the content of the system data base and, in turn, the system information output, based on the premise that monitoring and evaluation data and information people need and ask for will be data and information they use. The logic of this approach is depicted in Figure 1.

Figure 1
EM/E Customer Information Need _ EM/E Data Base _
EM/E Information Output _ EM/E Customer Information Use

The key to the success of the system is to focus on the *vital few indicators* that will meet customer information needs with minimum effort, rather than to fill the system data base with all possible indicators regardless of whether or not anyone has expressed a desire for the information or an intent to use it. In addition to being demand,-driven, the EM/E system data and information should be *available* in time to be useful, easily *accessible*, and methodologically *credible*.

Finally, the system should be *cost-effective* and *collaborative*. By being cost-effective it will use data and information that is the most useful to its customers for the least cost. Existing data, for example, should be used wherever possible. It will also collaborate with other stakeholders, such as other environment sector donors and the Government of Egypt, to avoid the duplication of effort and make available the best data and information useful for environment program and project management decision making.

B.

USAID Environment Monitoring and Evaluation System User Survey Interview Protocol

Interview Date _____

1. System Customer name and location
2. What are your (or your agencies) programs/responsibilities that relate directly to Egypt's environment ?
3. What are your priority EM/E issues ?
4. What decisions do you need to make ? What data do you use to make those decisions ?
5. Does your agency have a EM//E system ? Location and contact name. Written description of the system?
6. What EM/E data/information do you rely upon ? Primary EM/E data Source (s) ?
What *other* EM/E data/information could you use ?
How would you use it ?
8. What performance reporting (routine or episodic) does your agency do ?
Example of a performance report ?

C.

Selected Survey Results

1. User Name and Location.

Mike Colby
Senior Environmental Policy and Planning Advisor
Bureau for Asia and the Near East
USAID
Washington, DC 20523

2. What are your (or your agency=s) programs/responsibilities that relate directly to Egypt=s environment?

He is on the virtual teams for all of Environment Office activities (SOs). He, along with John Wilson, provides strategic planning assistance to all of the Missions within the Bureau. He focuses on monitoring and indicators, and participates in priority setting, program performance assessments, and rankings.

3. What are your priority Environmental Monitoring and Evaluation issues?

The SOs -- energy, water, air, and tourism.

4. What decisions do you need to make? What data and information do you use to make those decisions?

For other Bureau countries, his office makes recommendations on funding. Egypt is a special case, so State Department makes funding decisions. They just comment on the strategic plan.

5. Does your agency have an Environmental Monitoring and Evaluation system? Location and contact for the system. Written description of the system?

R4

6. What Environmental Monitoring and Evaluation data and information do you rely upon? What is the primary source or sources for that data and information?

SOs and R4.

7. What other Environmental Monitoring and Evaluation data and information could you use? How would you use it?

Need bio-physical indicators. Many of the indicators are for technologies developed or replications, which give very little information about impact.

Basically there are no impact indicators for Sustainable Tourism. The two indicators that they have -- number of cultural and natural plans (1) designed and (2) implemented -- tell you nothing about sustainability of the tourism. The entire objective needs real indicators.

SO7, air, needs work. There are too many indicators, and many are confusing or not useful. For example, reductions in six parameters show up at least twice in the indicators with different interpretations and measurements. Each of the six should be its own indicator, incorporating (or improving upon) the information spread across the various existing indicators. At the IR level the indicators are more vague, such as number of replications and measures adopted.

Need context for items like buses running on compressed gas. Need numbers and percentages. Comment box could provide context.

8. What performance reporting (routine or episodic) does your agency do? Example of a performance report?

R4

1. User Name and Location.

Kay Freeman
Officer in Charge, Egypt Desk
Asia Near East Bureau
Office of Middle Eastern Affairs (ANE/MEA)
USAID/Washington

2. What are your (or your agency=s) programs/responsibilities that relate directly to Egypt's environment?

She has general program liaison responsibility for all Egyptian programs. She gets involved in the environment in response to questions from USAID/Washington, Congress, the Executive Branch, and the public. She is also involved in facilitating communications between the Mission and the Vice President=s office because of the Gore/Mubarak Initiative, of which Subcommittee 3 is for the environment.

3. What are your priority Environmental Monitoring and Evaluation issues?

She responds to requests for information, which may deal with any environmental issues. Because of Subcommittee 3, there are constant questions from Vice President's office regarding lead abatement and corral reef protection in the Red Sea.

There are some other issues she knows she will receive requests for: desertification, development the new valley (which will require taking water from Lake Nassar and transporting it to the western desert). USAID is not involved in the new valley project, but she thinks she will get requests for information as it is implemented (if it is implemented) because of the potential for major environmental impacts.

When she gets a request, she forwards it to USAID/Egypt for a response.

4. What decisions do you need to make? What data and information do you use to make those decisions?

She does not make decisions about the environment in Egypt. Rather, she consumes and relays information to those who do.

She is involved in R4, and wants to be sure that the indicators can show achievement for investment.

5. Does your agency have an Environmental Monitoring and Evaluation system?
Location and contact for the system. Written description of the system?

R4

6. What Environmental Monitoring and Evaluation data and information do you rely upon? What is the primary source or sources for that data and information?

She relies upon R4 and whatever information the Mission can provide her in response to her requests.

7. What other Environmental Monitoring and Evaluation data and information could you use? How would you use it?

She needs very current information about lead abatement and coral reef protections in the Red Sea. Most of the information she receives goes into the political process (Congress, Vice President, etc.), so it needs to be up-to-date and accurate.

For something like the new valley project, she needs to know if it has been funded, by whom, the time table, if there is an environmental assessment, and how to access the information in the assessment.

Most of the information she gets from the USAID/Egypt Environment Office is quite good, but it could use better editing (style as well as typos). She also would like to get context for the data. She often gets numbers without context. For example, she will receive information that the GOE has converted 1,500 busses to compressed gas, but no information on the total number of busses in Cairo -- is that 1,500 out of 1,600 or 1,500 out of 15,000. She gets information on the number of anchor buoys installed in the Red Sea to protect coral reefs, but has no idea how many will eventually be needed.

8. What performance reporting" (routine or episodic) does your agency do?
Example of a performance report?

R4

1. User Name and Location.

Robert MacLeod
Environmental Advisor
Office of Environmental and Urban Programs
Environment Center
USAID

2. What are your (or your agency=s) programs/responsibilities that relate directly to Egypt=s environment?

He is on the virtual team for the sustainable tourism objective.

He also manages EP3 (Environmental Pollution Prevention Pays) in Egypt, which has

three activities: Mainstream, Tenth of Ramadan, and Alexandria.

4Mainstream was the first EP3 project in Egypt and will conclude in July, 1997.

It was a survey activity, identifying the industrial sectors most likely to benefit from EP3, in terms of potential amount of pollution reduction and willingness to adopt technologies.

4In Tenth of Ramadan, EP3 is working with industrial estates.

4In Alexandria, EP3 is working with the municipal authority which manages the wastewater treatment plant, to help it develop a program to reduce (via pollution prevention) the amount of industrial discharges into the system.

3. What are your priority Environmental Monitoring and Evaluation issues?

He is primarily involved in the EP3 program, so the rest of his answered deal only with EP3, not sustainable tourism.

EP3 has three goals: adoption of EP3 technologies, changes in policies to encourage EP3, and capacity building. He wants to know to what extent these goals are achieved in Egypt.

4. What decisions do you need to make? What data and information do you use to make those decisions?

We did not really talk about what decisions he makes, but he is involved in program management and design.

Currently, the only data and information they use to track program performance is the number of facilities implementing EP3 practices and technologies.

They are currently trying to develop better indicators -- indicators of impact rather than participation. During their last program review, A number of facilities implementing ...@ was criticized as being insufficient as an indicator.

The contractor is currently developing draft indicators, which will be reviewed in July, 1997. They are looking at measuring: volume of pollution reduced as measured by reduced air emission, solid waste, and effluent; energy saving; money saved by firms; and dollars invested in EP3 technologies.

They also want to track policy changes (removal of disincentives and creation of incentives) which encourage EP3 technologies.

For capacity building, they collect number of individuals attending workshops, but want to move to tracking impact of participation. For some participants, they may initiate a program of follow-up consultations in their factory, and then track adoption of technologies. May also do some sort of telephone or survey follow-up for other participants.

5. Does your agency have an Environmental Monitoring and Evaluation system? Location and contact for the system. Written description of the system?

Did not discuss, because he is USAID and they use R4.

6. What Environmental Monitoring and Evaluation data and information do you rely upon? What is the primary source or sources for that data and information?

Type of data and information discussed under question 4. Source: R4.

7. What other Environmental Monitoring and Evaluation data and information could you use? How would you use it?

Discussed under question 4.

8. What performance reporting (routine or episodic) does your agency do? Example of a performance report?

Did not discuss, because he is USAID and they use R4.

1. User Name and Location.

**John Wilson
Senior Environmental Officer
Bureau for Asia and the Near East
USAID
Washington, DC 20523**

2. What are your (or your agency's) programs/responsibilities that relate directly to Egypt's environment?

John leads strategic planning and analysis for environmental and natural resources in the bureau. He oversees the annual assessment of environment and natural resources programs in Egypt, including the water projects housed in the infrastructure office rather than the environmental office.

3. What are your priority Environmental Monitoring and Evaluation issues?

Because he has broad oversight for the Egypt environmental portfolio, his priorities are the environmental strategic objectives.

4. What decisions do you need to make? What data and information do you use to make those decisions?

He makes budget recommendations for environmental and natural resources programs throughout Asia and the Near East. He primarily uses the R4 to do so.

5. Does your agency have an Environmental Monitoring and Evaluation system? Location and contact for the system. Written description of the system?

R4

6. What Environmental Monitoring and Evaluation data and information do you rely upon? What is the primary source or sources for that data and information?

Environmental strategic objective indicators in R4.

7. What other Environmental Monitoring and Evaluation data and information could you use? How would you use it?

His office also provides technical support for the development of strategic plans for the environment. Mike Colby, from his office, is currently helping USAID/Egypt develop better environmental indicators -- more results oriented.

During the last R4 review they identified weaknesses in indicators:

- 4Some of the indicators did not monitor annual performance because they were stepwise indicators which may take several years to achieve.
- 4They wanted to see some natural resource condition indicators for sustainable tourism.
- 4They wanted to see indications of lead reduction replications, rather than just the number of demonstrations conducted.

USAID/Egypt is tracking other donor performance, but Washington does not need this information, and he does not think that donor performance will be included in R4.

He wants us to work with Mike Colby to get the indicators right, so that they do not have to make future modifications. The notion is to get the right indicators in place and track programs using them over several years, rather than continuously improving the indicators -- thus making time series comparisons impossible.

8. What performance reporting (routine or episodic) does your agency do? Example of a performance report?

R4

Figure 2

Egyptian Environmental Monitoring and Evaluation (EM/E) Information Customer Matrix

Potential Customer	Egyptian Environment Sector	EEP P	Information Customer	Results Package Level	Issues/ Information Needs	Person Interviewed
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U.S. Embassy

U.S. Embassy/Cairo	X			Interested in commercial opportunities in environment sector in Egypt. U.S. companies looking for either 1) business/investment opportunities in Egypt, or 2) to provide services to the Egypt environment sector. Information on Pollution problems in Egypt that may affect business ventures. Companies want to know what the GOE is doing to combat pollution. Current legislation dealing with the environment; GOE environment policy. Getting data/information. It is now a hit or miss situation getting good information on the GOE environment and environmental technology ; Interested parties have to rely on industry sources for data. Key issue: what are the GOE plans for environment regulations - mandatory and/or voluntary compliance, and how will it affect prospective investors ?	John Priamou
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USIS	X			<p>Three levels of information desired:</p> <p>USAID/USIS staff - information on current research activities; how is the research going, breakthroughs, etc. More technical, in house information.</p> <p>Information for environmental and Technical writers; stuff they can use in their stories</p> <p>1. General economic writers; less technical; popular press; easy to digest for he non-technical reader</p> <p>He liked the idea of 1-2 pp. project success stories, well packaged (press releases, finished products they can hand out to reporters). Also liked idea of working with USAID staff to develop stories of results.</p>	Robert. Ogburn
Embassy Library	X			<p>L. Fanous - Professionals and academics come to them for information about the environment. Very interested in comparative data between Egypt and other countries; also data on Egypt environment - general information and industry-specific. Developers come to them for information, prospective investments. Reports of other countries environment Situation helpful, especially in the region. Want data on environment. Quality indicators. Trouble getting good environment Data. They get lots of requests from media people wanting information. On the Egypt environment, and what is happening - policy and practice. Interest in Egypt's conservation of its natural resources.</p>	Louis Fanous

USAID/
Egypt

Environment Office	X	X	X	X	<p>Need data/information at several levels:</p> <p>Sector-wide, Egypt-wide data/information on the state of the environment</p> <p>EEPP-level information</p> <p>1. Results packages, SOs; R4 reporting</p> <p>Quick press releases and brief success stories</p> <p>2. Quick research/analysis to support the program</p>	George Deikun, Jim Goggin
Program Office (Strategic Analysis and Evaluation)	X			X	Office very new; still working on its agenda. No plans in place for use of EM/E data, but very interested in being involved in the system development process.	Thomas Roshi Jon O'Rourke
Press Office	X	X	X		<p>People-centered stories most effective. Human interest - how are people affected by USAID projects (e.g., health, incomes, air they breathe) ?</p> <p>Before-after stories - what was the impact on a problem ?; what was the change ?</p> <p>Baseline information to compare with what happened is essential.</p> <p>Need easily "digestible" figures/statistics for non-experts. Information needs to be packaged to get it read and used.</p>	Manal Alfrad, Bea Byers

USAID/
Washington

USAID/ Wash./ANE/En vironment Office	X			X	Mike Colby - see appendix C	Mike Colby, John Wilson
Global Office	X			X	Baun - Unable to contact Borrazzo - Declined interview, felt he did not monitor or evaluate activities in Egypt. Seabright - Unable to contact Robert McCleod - see appendix C	Ken Baum, John Borrazzo, Jeff Seabright, Robert McCleod
Bureau				X	See appendix C	John Wilson
Egypt Desk				X	See appendix C	Kay Freeman

GOE

Ministry of Planning					To be done	
Ministry of Tourism	X				No structured, systematic environment data collection system in place. Data collection is not customer oriented; utilization rate for collected data less than 30%. Data collected occasionally which precludes systematic analysis. Absence of data quality control to ensure reliability or validity of data. Data duplication a problem and wasteful; agencies reluctant to share data, all want their own system. Need data collection strategy for the EM/E system: simple, customer-focused and computer-based (i.e., interactive). Link to ongoing activities, such as the "State of the Environment" report, to promote utilization. Involve the private sector in the process, supported by government authorities.	Dr. Magdy Saleh
Organization For Energy Conservation and Planning (OECF)	X				The system should be computerized to facilitate access. It should also be global and integrated into the annual energy report. Key is the data collection scheme used. OECD uses "Clipper" as its database, storing data on a variety of indicators (crude oil production, per capita energy consumption, GDP in agricultural, industrial, electricity sectors, etc.	Dr. Ibrahim Abdel Gelil
Tourism Develop. Authority	X				Limited baseline data relevant to tourism. World Bank funded GEF project to prepare coastal zone management scheme will include mapping of the Red Sea. Sees need for computerization of TDA data to assist planning. Need GIS data to monitor tourism development. Need monitoring and evaluation data to ensure that development is within TDA and EEAA plans. Ideally, the proposed EM/E system would be integrated with the current and proposed TDA systems.	Adel Rady
Ministry of International Cooperation	X				To be done	Dr. Hassan Selim
Ministry of Foreign Affairs	X				To be done	Ahmed Gamaledin
Protectorates Department	X				Computerized monitoring system will be needed for optimal operations and information on donor activities.	Dr. Essam El Badry, Director Gen. Ahmd Shehata Deputy Director
Protectorates Development Programs					It important to include information on the constraints that may affect the creation of protected areas, such as limited resources and funding.	Dr. Michael Pearson National Parks of Egypt, Manager, Protectorate s

People's Assembly: Chief of Energy and Industrial Committee	X				Committee monitors activities of the Petroleum, Electricity and Energy sectors. Committee has no independent monitoring scheme in its sectors; relies on those being monitored to supply data. Monthly and bi-monthly reports would be useful. Summary of the monitoring and evaluation results provided the committee. System should be linked to the People's Assembly Information Center (to be checked by the Center's management). System should be simple to use and understand. It should use simple interactive computer format with different screens tailored to the time and skill limitations of busy decision makers.	Dr. Amin Mubarak
EEAA/Technical Cooperation Office for the Environment (TCOE)	X				In the areas he works in - land and water resources, hazardous waste, industry and air pollution, urban waste, hospital waste - the data are scattered and unreliable. He sees a need for a computerized interactive system to assist in strategic planning.	Dr. Tarek Genaneh

Others						
Municipal Authorities					To be done	
Governate Authorities					To be done	
ECEP	X				Need access to information that will help him do his job as ECEP/CoP. Useful for adjusting program focus in light of performance and/or changing circumstances. Finds data from other projects useful, but concerned about continuity of data collection after project ends. Need to explore strengthening NGO's to collect data/information over time to monitor key indicators on the environment. EEAA needs to define its role in this regard and be supported. Need to focus on a vital few indicators, rather than try to collect all possible indicators to answer all possible questions; focus and concentrate.	Richard Smith, CoP
CAIP					To be done	
Environment NGO Steering Committee.					To be done	
CIDA	X			X	Interested in data/information at the sector-wide level that enables CIDA to review its total portfolio in an integrated manner	Nicole Chartsand-Treich
DANIDA	X				Data/information on the social impacts of environment actions; beneficiary impacts, especially. GOE-the main DANIDA customer. See their role to provide data/information on need-be basis to GOE. Moving to sector-wide reviews of performance, needs data/information to address these issues. Prepare Annual Environment Report. (may be basis for collaboration With USAID, on this report)	Kirsten Rasmussen

Appendix II-D

EMIS Staffing

Proposed EMIS Personnel

√ *Unit Manager / Analyst*

DUTIES:

Supervise staff and manage all functions of the M&E Unit, including management of budget, yearly staff reviews, and allocation of resources.

Prepare statements of work (SOW), Terms of Reference (TOR), consulting agreements, subcontracts, and budgets for short-term TA.

Carry out analyses and case study investigations in response to periodic reporting requirements for the SOs and R-4, and in response to *ad hoc* queries from the Mission, Congress, and others.

Determine, with USAID staff, appropriate new indicators and benchmarks for new projects coming on line. Work with the Database Programmer to ensure that new indicators and benchmarks are appropriate from a data management standpoint.

Design QA/QC procedures and train clerk in their use.

Act as the primary liaison between the M&E Unit and the Mission.

EXPERIENCE:

Masters Degree in Ecology, Environmental Science, or related field.

At least ten years of experience of which at least five are in the area of Monitoring and Evaluation.

Experience in set goals, managing staff, and tracking a budget.

Arabic speaking skills a plus.

√ *Researcher / Journalist*

DUTIES:

Conduct research and assist Analyst with conduct of case study investigations

Write project profiles, press releases, media announcements, and success stories.

Respond to incoming *ad hoc* requests for information

EXPERIENCE:

Bachelors degree in Journalism, Communications, or related field.
At least five years of experience, particularly in print media.
Proven writing and editing skills.
Excellent speaking and writing skills in both English and Arabic.

√ *System Administrator / Database Applications Programmer*

DUTIES:

Work with vendor to install, configure, and maintain all system software and hardware, including the Local Area Network (LAN).

Develop and coordinate plan of regular maintenance of system, including anti-virus procedures, keeping software licenses up-to-date, and conducting regular backup and archives of programs and data.

Develop, as needed, new database applications, forms, tables, and reports. Ensure integration of all database applications with other applications: spreadsheets, word-processing, etc.

Assist Unit Manager in the establishment of QA/QC procedures for data.

Validate QA/QC of data by Data Entry Clerk.

EXPERIENCE:

Bachelor's degree in Computer Science or related technical field with specific training in relational database principles and design and formal programming techniques.

At least three years experience with database programming on IBM-compatible computers. Experience installing, configuring, and maintaining PC computers. Experience installing, configuring, and maintaining a Local Area Network (LAN).

Experience programming two or more common PC-based database programs such as Access, FoxPro, or Paradox. Experience with standard PC applications programs, especially Lotus-4 and WordPerfect. Experience with MapInfo.

√ *Part-Time Data Entry and QA/QC Clerk*

The Environmental Health Project (EHP) provides technical assistance to USAID missions and bureaus and other development organizations in nine areas: tropical diseases, water and sanitation, wastewater, solid waste, air pollution, hazardous waste, food hygiene, occupational health, and injury. It is part of the Office of Health and Nutrition's response to requests from USAID missions and bureaus for an integrated approach to addressing environment-related health problems. In addition to EHP, this effort includes an Environmental Health Requirements Contract and a PASA (Participating Agency Support Agreement) with the U.S. Centers for Disease Control and Prevention. A wide range of expertise is made available by EHP through a consortium of specialized organizations (see list below). In addition to reports on its technical assistance, EHP publishes guidelines, concept papers, lessons learned documents, and capsule reports on topics of vital interest to the environmental health sector. For information on the reports available, contact EHP headquarters.

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