European Environment Agency

EUROPEAN NEIGHBOURHOOD POLICY INSTRUMENT

SHARED ENVIRONMENTAL INFORMATION SYSTEM

Egypt Country Report

Egyptian Environmental Affairs Agency (EEAA)

CEDARE
Centre for Environment & Development for the Arab Region and Europe

central Agency for Public Mobilization and Statistics

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List of Acronyms

ALIS	Advanced Library Information System
APAT	Agency for Environmental Protection and Technical Services, Italy
BOD	Biochemical Oxygen Demand
CAPMAS	Central Agency for Public Mobilization and Statistics
CITES	Convention on International Trade in Endangered Species
CMS	Conservation of Migratory Species
CO	Carbon Monoxide
COD	Chemical Oxygen Depletion
DANIDA	Danish International Development Assistance
DO	Dissolved Oxygen
DPSIR	Driving– Force–State– Impact–Response
EEA	European Environmental Agency
EEAA	Egyptian Environmental Affair Agency
EEIS	Egyptian Environmental Information System
EHSIMS	Egyptian Hazardous Substance Information Management System
EIA	Environmental Impact Assessment
EIMP	Environmental Information Monitoring Programme
EEP	Egyptian Environmental Portal
ENPI	European Neighbourhood Policy Instrument
EPAP	Egyptian Pollution Abatement Project
EPIS	Environmental Projects Information Systems

EREMIS	Egyptian Regional Environmental Management Information System
FMIS	Financial Management Information System
GHG	Green House Gas
ISO	International Organization for Standardization
ICZM	Integrated Costal Zones Management
IGSR	Institute of Graduate Studies and Research
IPIS	Industrial Pollution Information System
LMOs	Living Modified Organisms
MCSD	Mediterranean Commission on Sustainable Development
MEAIS	Multilateral Environmental Agreements Information System
MHUUD	Ministry of Housing, Utilities and Urban Development
MOHP	Ministry of Health and Population
MSEA	Ministry of State for Environmental Affairs
MWRI	Ministry of Water Resources and Irrigation
NMHC	Non-Methane Hydrocarbons Compounds
NO_2	Nitrogen Dioxide
NIZIS	New Industrial Zones Information System
OECD	Organization for Economic Cooperation and Development
O_3	Ozone
PM_{10}	Particular Matters of Diameter less than 10 micros
POPs	Persistent Organic Pollutants
Pb	Lead

RIS	Ramsar Information Sheet
SO_2	Sulphur Dioxide
SEIS	Shared Environmental Information System
TAS	Time Attendance System
URDAIS	Urban and Ruler Developed Areas Information System
UNEP	United Nations Environmental Programme
VOCs	Volatile Organic Compounds
WQI	Water Quality Index
WHO	World Health Organization

Executive Summary

The ENPI–SEIS project aims to promote the SEIS (Shared Environmental Information System) principles in the ENP regions (South and East), through the development of national and regional environmental information systems in line with the EU approach.

SEIS should gradually lead to the identification and/or further development of environmental indicators and scorecards – suitable for the design and review of environmental policies, supporting the monitoring and compliance with various national, regional and international obligations and targets. It aims at improving the capacities in the field of monitoring, collection, storage, assessment, and reporting of environmental data in the relevant environmental authorities including the national statistical systems, in compliance with reporting obligations to international agreements and in coordination with relevant regional initiatives. One of SEIS objectives is to track the progress of regional environmental initiatives.

The ENPI–SEIS project will bring together environmental and statistical networks as key holders of environmental information and assist EU neighbours in environmental monitoring.

Relevant stakeholders (researchers, practitioners, and representatives of institutions) will be brought together to share their environmental data and information and other perspectives and experiences to stimulate discussion on improving the availability of reliable environmental information by strengthening environmental monitoring and information management needed for environmental policy-making at all levels and to ensure consistency, interoperability and harmonization to facilitate the sharing of information between stakeholders on key environmental and sustainable development issues related to the Mediterranean region.

During the SEIS consultation meeting held in Brussels in November 2010, four thematic areas were selected by the representatives of South ENPI countries, namely; fresh water (quality and quantity) and marine environment, wastewater, solid waste management and industrial emissions.

A SEIS visit to Egypt took place on 2–4 May 2011. The aim of the visit was to bring the different stakeholders together and to identify available environmental data flow for implementation of shared environmental information systems.

The purpose of this report is to highlight and identify consistent realities that constitute country-specific gaps and needs in content, infrastructure and institutional cooperation, address challenges to long-term implications through addressing locally grounded knowledge and reviewing recommendations based on institutional experiences that could support policy-making and capacity building as well as forge linkages between Mediterranean countries. This is a critical factor in making progress in any environmental strategy and assures political support in strengthening the environment statistical system.

This report has been prepared to explore the options of introducing Environmental Neighbourhood Policy Instrument (ENPI)–Shared Environmental Information System (SEIS) project in Egypt.

The report was prepared in consultation with and inputs from international and local environment professionals and key stakeholders from ministries, institutions, research and statistic centres, and governmental authorities. Moreover, there were contributions during the country visits from researchers, directors, and representatives from international organizations.

The report consists of five sections:

The first section explores inter-institutional cooperation. Eight main agencies were identified to analyse their mandates, organizational structure and data inputs. ***The second section*** investigates the capacities and infrastructure of the existing institutions. Capacities for monitoring pollution of fresh water, groundwater, drainage water, coastal areas, air pollution and solid and hazardous wastes were identified.

The third section describes the existing environmental information systems in Egypt.

The fourth section analyses the effectiveness of the available systems. It lists the constraints and barriers and highlights implementation challenges and existing data sharing mechanisms.

The fifth section explores country needs; ways for enhancing Egypt's monitoring systems and lists the main points that should be considered while implementing the SEIS at the country level. Finally, the report provides recommendations for priority actions.

1. INTER–INSTITUTIONAL COOPERATION

1.1. DIFFERENT INSTITUTIONS AND THEIR RESPONSIBILITIES

1.1.1. THE MINISTRY OF STATE FOR ENVIRONMENTAL AFFAIRS (MSEA)

The MSEA is the government body responsible for environmental policy in Egypt. Its principle challenge is the management of scarce common resources. In June 1997, the responsibility of Egypt's first full time Minister of State for Environmental Affairs was assigned as stated in the Presidential Decree No. 275/1997. From thereon, the new ministry has focused, in close collaboration with national and international development partners, on defining environmental policies, setting priorities and implementing initiatives within a context of sustainable development.

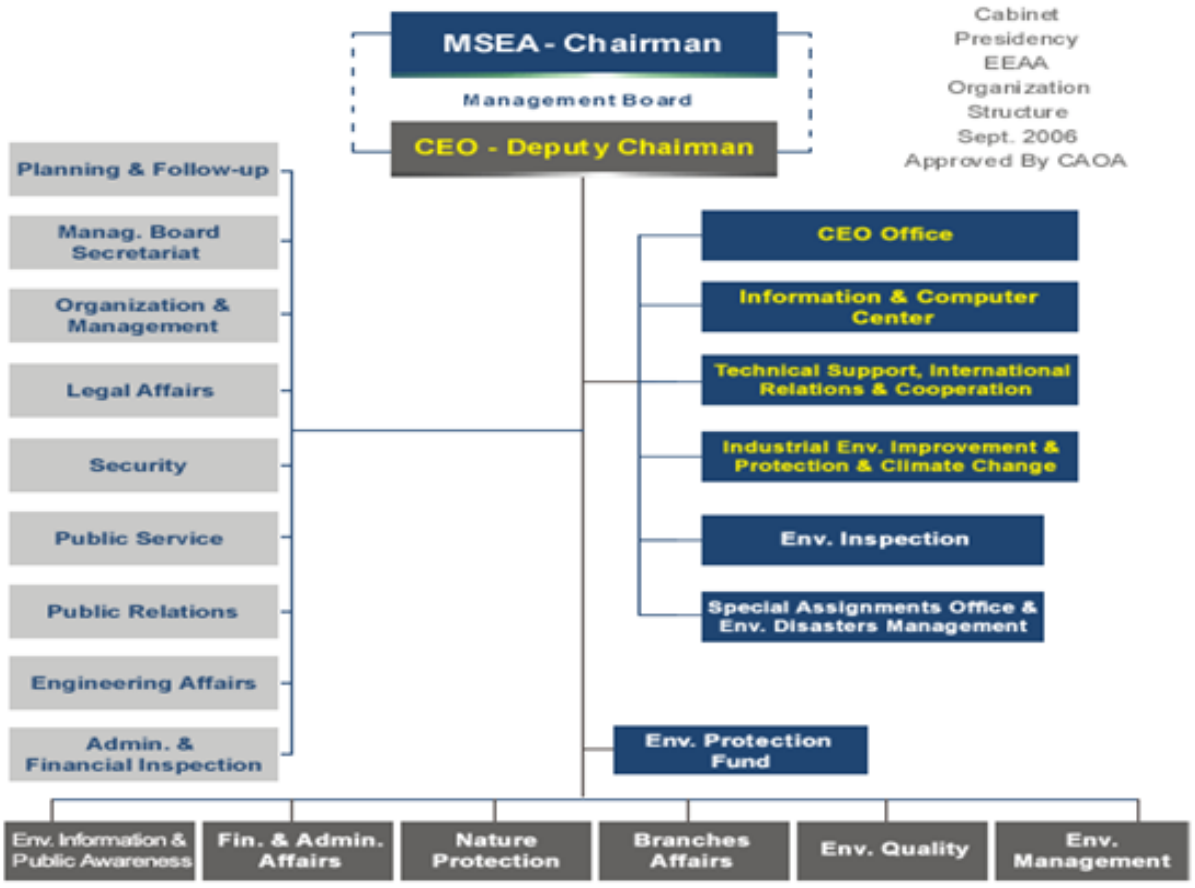


Figure (1) MSEA Organizational Structure

The Egyptian Environmental Affairs Agency (EEAA) is the main MSEA executive or administrative body responsible for environmental protection. It was established under Decree No. 631/1982 within the Prime Minister's Office and restructured later to include the Nature Conservation Sector. The main rules governing the EEAA's mandate, operation and function are derived from Law No. 4/1994, updated by Law No. 9/2009 and complemented by the executive regulations issued in the Prime Minister's Decree No. 338/1995.

The EEAA acts as the coordinating body for all government activities; formulating general policies, drafting legislation and issuing rules, regulations and standards; coordinating with other concerned authorities to prepare and implement plans and programmes for environmental protection; encouraging economic activities in the field of pollution prevention; and, enforcing laws and other environmental rules, including monitoring to ensure that existing establishments comply with environmental standards.

The mission of the agency is to:

- prepare the National Plan for Environmental Protection;
- prepare the Emergency Environmental Plan for Disasters;
- draft the laws concerning the environment;
- implement the experimental projects;
- prepare the Environmental Training and Planning Policy;
- draft the necessary norms and standards to ensure that the environment is not polluted;
- formulate the basis and procedures for the assessment of environmental impacts of projects;
- supervise the Environmental Protection and Development Fund.

Environmental policy:

The environmental policy of the Government of Egypt seeks to achieve environmental protection through the establishment of proper institutional, economic, legislative and technical frameworks at the local, regional, national and international levels. This is expressed through the six directives of the policy statement of the MSEA:

1. Strengthening partnerships at the national level.
2. Supporting bilateral and international partnerships in environmental fields.

3. Enforcing Law No.4/1994 for the protection of the environment, updated by Law No. 9/2009, and Law No. 102/1983 for Natural Protectorates and all other environmental legislation.
4. Supporting institutional strengthening and capacity building for the Egyptian Environmental Affairs Agency and Environmental Management Units (EMU's) of the governorates.
5. Supporting Integrated Environmental Management Systems.
6. Transfer and adaptation of environmentally friendly technologies.

The implementation of the environmental policies of the Government of Egypt, as expressed by the policy framework and directives of the MSEA, is carried out with four main principles underlying environmental management and protection initiatives:

- strengthening the integrative capacity of the central and local government;
- strengthening of public – private partnerships;
- partnerships with environmental non-governmental organizations;
- the integration of gender issues in environmental policies and programmes.

National Environment Action Plan (NEAP)

The National Environmental Action Plan (NEAP) represents Egypt's agenda for environmental actions for fifteen years (2002-2017). It complements and integrates with sectorial plans for economic growth and social development. NEAP is the basis for the development of local environmental initiatives, actions and activities. It is designed to be the framework that coordinates for future environmental activities in support of sustainable development of Egypt. NEAP includes eight main programmes each programme contains some sub programmes as follows:

1. National programme for improving air quality:
    - formulates strategy for controlling the air pollution sources;
    - protection from noise.
2. National programme for safe waste management:
    - safe management of municipal solid waste;
    - safe management of medical waste;
    - safe management of agricultural waste.
3. National programme for improving water quality:

- waste water reuse;
- protect the fresh water environment and bodies from pollution;
- protecting the marine environment;
- developing and managing the Egyptian lakes.

4. National programme for industrial pollution abatement:
    - industrial pollution control;
    - climate change.
5. National programme for protecting nature:
    - assessing, monitoring, and information of the biological diversity;
    - developing the protected areas;
    - support the protectorates and biological diversity.
6. National programme for environmental training and awareness:
    - environmental training;
    - environmental awareness.
7. National programme for decentralisation of environmental management:
    - developing the regional branches;
    - capacity building of the environmental offices in governorates;
    - prepare the environmental descriptions and action planes for the different governorates;
    - environmental management for the industrial cities.
8. National programme for environmental inspection
    - developing the performance of the environmental inspection on the national level.
9. Sustainable Development Programme:
    - support NGOs for bio-project in sustainable development, green buildings and green economy.

1.1.2. The Central Agency for Public Mobilization and Statistics (CAPMAS)

According to Presidential Decree No. 2915 of 1964, CAPMAS is considered the official source for providing all the State's agencies, authorities, universities, research centres and international organizations with data, statistics and reports that are essential inputs in planning, development, evaluation, policy formulation and decision-making.

CAPMAS has grown to have enormous manpower, outstanding technical experience and high-tech equipment. It is considered one of the most important agencies of the State in an era in which data and information dominate and represent the most crucial factors required for achieving development in all fields and activities in Egypt.

CAPMAS implements duties assigned to it in various areas; namely, conducting technical studies, field statistics and system designs. Moreover, it collects, processes, analyses, saves and disseminates all statistical data and censuses in a way that ensures the optimum utilization thereof while conforming to internationally-recognized publishing standards. It provides credible and scientifically-based data and statistics, adhering to the fundamental ethics and principles for official statistics.

1.1.2.1. INSTITUTIONAL COOPERATION BETWEEN CAPMAS AND MINISTRIES CONCERNED WITH THE ENVIRONMENT

According to Article VII of the Presidential Decree concerning the formation of the advisory committee, said committee convenes once a month to overcome obstacles facing the flow of statistical data. CAPMAS coordinates with various sectors in the field of the environment and follows up the status of the environment in the Arab Republic of Egypt as well as issues an annual report in this respect in cooperation with the EEAA.

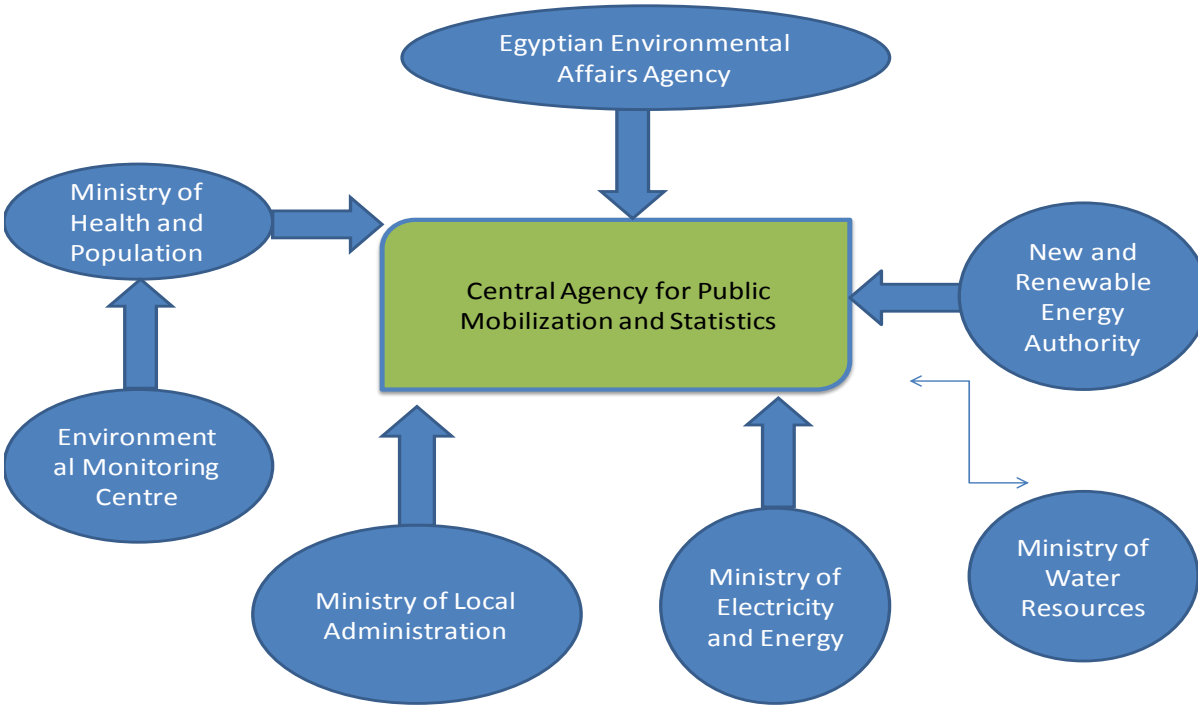


Figure (2) CAPMAS Inter-Institutional Cooperation

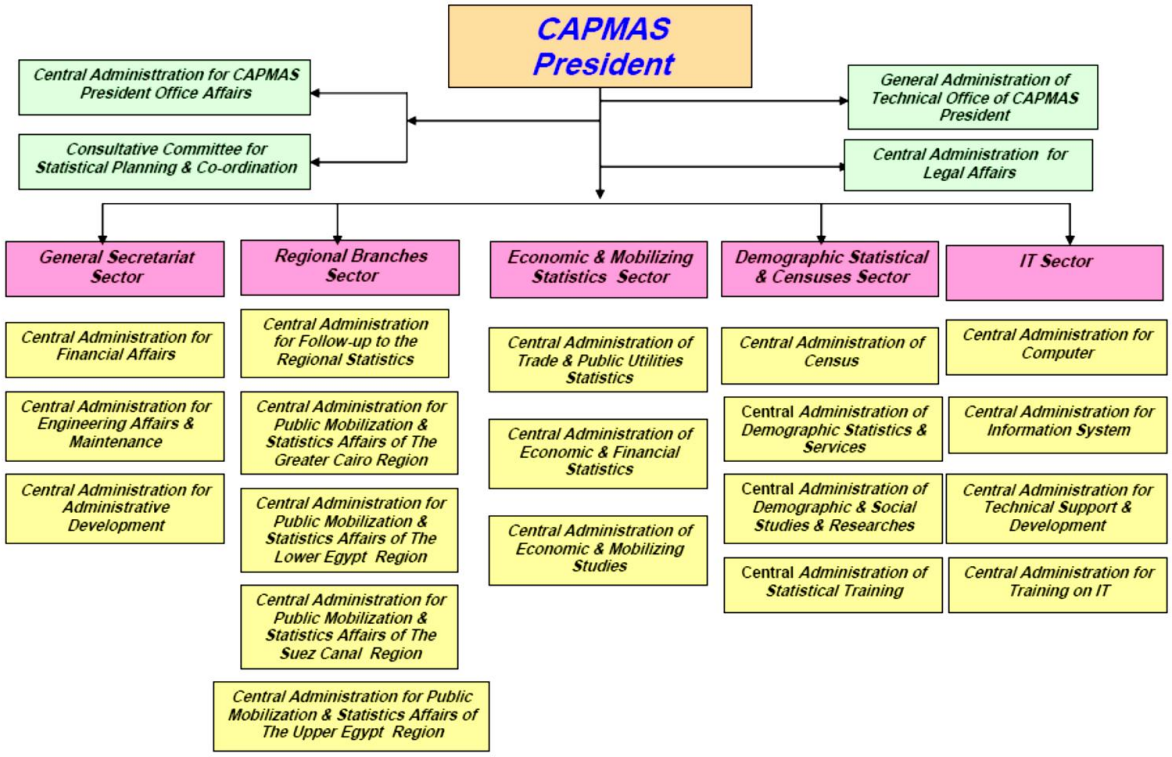


Figure (3) CAPMAS Organizational Structure

1.1.3. MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI)

The Ministry of Water Resources and Irrigation is one of the oldest ministries in Egypt.

In 1836, the Public Works Department was first established as a part of the Schools Bureau in Mohamed Ali Pasha's reign.

In 1857, "the Administration of Public Works", was established to comprise many departments, such as departments of Railway, Telegraph, Survey, Housing, Agriculture, Alexandria Harbour, Antiquities, Opera House, Zoo, Aquarium Garden, Sanitation and Irrigation.

In 1914, the Administration's name was altered from the Administration of Public Works to the Ministry of Public Works while maintaining the main functions of its departments, i.e. Survey, Alexandria Harbour, Antiquities, Opera House, Sanitation, Meteorological and Natural Phenomena, Helwan Observatory and Irrigation.

In 1964, Republican Decree No. 301/1964 restricted the ministry's activities to merely irrigation and drainage. Hence, it was called the Ministry of Irrigation.

In 1977, Republican Decree No. 587/1977 delegated additional responsibilities of land reclamation to the Ministry's former duties. Thus, the Ministry was called the Ministry of Irrigation and Land Reclamation.

In 1978, Republican Decree No. 365/1978 restored the Ministry's name to the Ministry of Irrigation and limited ministry activities to irrigation and drainage works.

In 1987, Republican Decree No. 449/1987 modified the Ministry's name to the Ministry of Public Works and Water Resources.

Finally in 1999, Republican Decree No. 409/1999 was issued to set the ministry's name to be the Ministry of Water Resources and Irrigation.

The Ministry's objectives can be summarised as follows:

- formulate the water policies necessary for securing coverage of all the water requirements in agriculture, industry, drinking, navigation and power sectors as well as other consuming requirements;
- maintain all the available water resources, rationalize use, maximize revenues and increase efficiency by using state-of-the-art technologies in managing the water of the Nile River, underground reservoirs, rainfall, torrents and drainage water that is usable according to specific standards;
- control distribution of irrigation water; establish, operate and maintain grand barrages and reservoirs and industrial works along the Nile River, along with its branches, rayahat, canals, and irrigation and drainage networks;
- improve and develop irrigation methods for the optimization of available water resources;
- maintain water quality and protect water from pollution;
- increase Egypt's share of Nile water through cooperation and coordination with Nile basin countries to establish joint projects to polarize and make use of lost water.

Figure (4) MWRI Organizational Structure

In 2003, the Ministry of Water Resources and Irrigation published the National Plan for Water Resources, in cooperation with the Ministries of Agriculture; Environmental Affairs; Trade and Industry; Housing, Utilities and Urban Development; Health; Finance; Local Development; Media; Economic Development; and Tourism. This plan aims at managing water in an integrated manner and preserving it from pollution according to available water resources and needs while taking economic, social, environmental and legal aspects into consideration. All relevant stakeholders take part in all stages of the plan's development and implementation. The main objective of the plan is to develop general and effective policies for all concerned ministries and agencies in Egypt to cooperate in order to achieve the principle of integrated management of water resources. This is done through the execution of a number of actions and plans contained in the policies of each ministry or agency participating in the plan and to insure non-duplication during implementation of policies that reflect the principle that the "benefits of others should be taken into consideration while making a decision". This would lead to sound and integrated management of water resources and reduce risk of separate decision-making.

A technical committee is formed by the Ministerial Committee, which serves as its technical secretariat and is responsible for the following:

- coordination between ministries and governorates participating in the plan's implementation;

- follows up the progress in the plan's implementation at various levels and reviews assessment and follow-up reports concerned with implementation of various projects of the plan;
- suggests strategic frameworks to update the National Plan for Water Resources and sets priorities for the higher ministerial committee to make decisions concerning urgent issues;
- suggests financial resources and time frames for the implementation and activation of data and information exchange;
- reviews governorate plans for water resources.

1.1.4. Ministry of Health and Population and the Environmental Monitoring Centre

The Ministry of Health and Population manages the health system in Egypt. This includes public hospitals and specialized treatment centres. It also handles ordinary and hazardous waste resulting from human use and treatment material in hospitals.

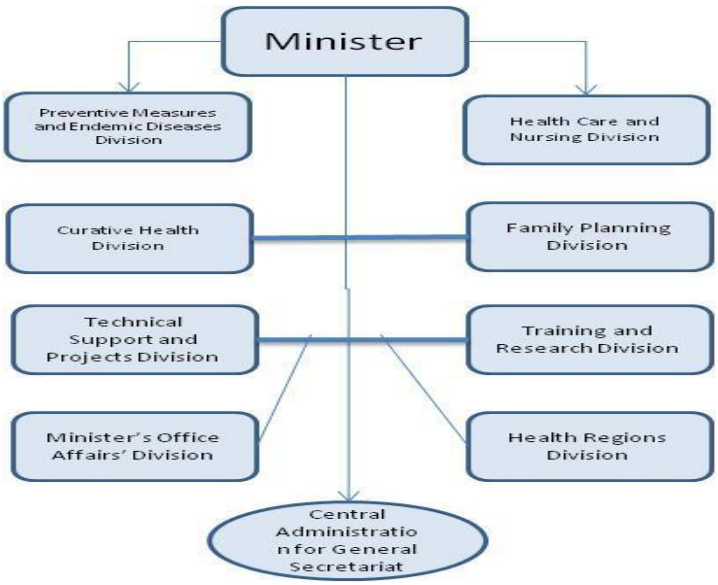


Figure (5) MOHP Organizational Structure

The Environmental Monitoring Centre affiliated to the ministry issues a report on air quality, monitors water quality through its network and measures the weight of hazardous waste generated by hospitals. It is also equipped with a number of vehicles with special specifications for transport of hazardous waste to burning places. The Ministry of Health and Population provides hospitals with necessary sterilization devices, chopping machines and incendiaries, according to available financial facilities and the plan set up by the Ministry.

1.1.4.1. National Nile Water Pollution Monitoring Network

The Ministry of Health Environmental Monitoring Network takes periodic samples of water from the Nile and its branches and some of the main canals for analysis in order to determine the quality of Nile water and its capacity for self-renewal.

Levels of water pollution are measured through 174 sites along the Nile and its two branches as well as the main canals such as Mahmudiya, Ismailia, and Ibrahimeya, in addition to a number of sites located along "Bahr Yusuf". Furthermore, the Ministry of State for Environmental Affairs' network includes 69 monitoring locations along the Nile where EEAA laboratories carry out various monitoring operations in different governorates.

The Ministry of Water Resources' network plays the same role through several monitoring stations in the country.

1.1.5. MINISTRY OF ELECTRICITY AND ENERGY

The first dedicated Ministry of Electricity and Energy in Egypt was established in 1964. Many decrees were issued by the State to regulate and specify its activities.

The last Decree was issued in 1974, and states that the goal of the Ministry is to provide electric energy to all consumers all over the country. In order to fulfil this obligation the ministry has to:

- settle the general plan for energy generation, transmission, and distribution using the latest scientific developments and high-tech equipment, supervise the execution of such plan, as well as follow-up the different activities concerning the electrical network;
- suggest the electric energy prices for all different voltage levels and different usages;
- supervise the study and execution of essential electrical projects;
- publish the statistics and data related to electric energy production and consumption;
- supply technical consultancies and services in electric fields to Arab countries as well as other countries.

The Ministry of Electricity and Energy attaches special importance to environmental affairs as the production of electricity and energy causes air pollution as a result of the burning of fuel. Moreover, Egypt is interested in producing electricity from environment-friendly sources.

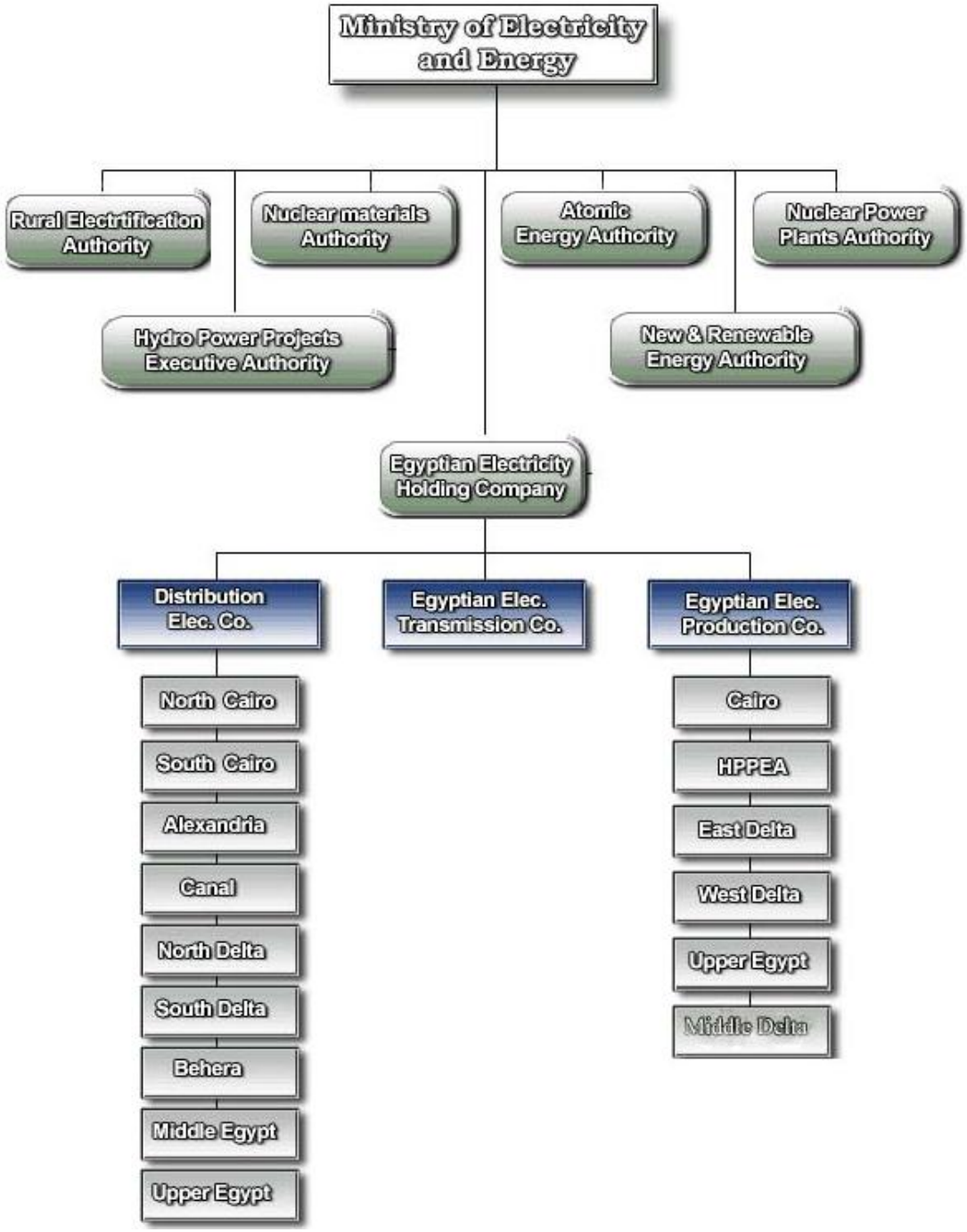


Figure (6) MOEP Organizational Structure

1.1.5.1. HOLDING COMPANY FOR ELECTRICITY

Electrical power stations emit fossil fuel combustion gases to the surrounding air causing environmental damage and gaseous pollutants such as sulphur dioxide SO2, nitrogen oxide (NOx) and ash, in addition to other pollutants such as pollution emissions to water, noise pollution, and industrial wastewater and solid waste. Thermal stations vary in the production of these gaseous pollutants in quantities determined by the type and characteristics of the fuel

burns and according to the technologies used in the production of electricity. So the provision of electricity and its use involves a set of effects; some positive and others negative.

As a result of the close correlation between electricity generation and the impact on the environment and in light of the growing demand for electricity to meet the requirements of economic and social development there are many more environmental considerations in the electric power sector worth examining, which include:

- emissions of pollutants that affect air quality;
- sources of water pollution resulting from industrial wastewater and sanitation and the use of cooling water;
- noise pollution;
- electromagnetic effects of electricity transmission lines and network electrical equipment;
- ecological impacts;
- economic and social impacts;
- solid and hazardous waste management.

Legislation and environmental regulations and standards secure environmental measures and control pollution from power plants for environmental management and define levels of air pollutants and compounds which can be emitted into the ecosystem without causing damage to the environment or human health.

The criteria for establishing and operating power plants follow environmental guidelines which are:

- air pollution emissions and ambient air quality;
- liquid flows to the aquatic/marine environment;
- noise levels;
- solid and hazardous waste management;
- construction and operational management (prohibit the establishment on beaches up to a distance of two hundred metres and right of way for land surrounding on both sides on electricity transmission);
- limits on the amount or concentration of pollutants.

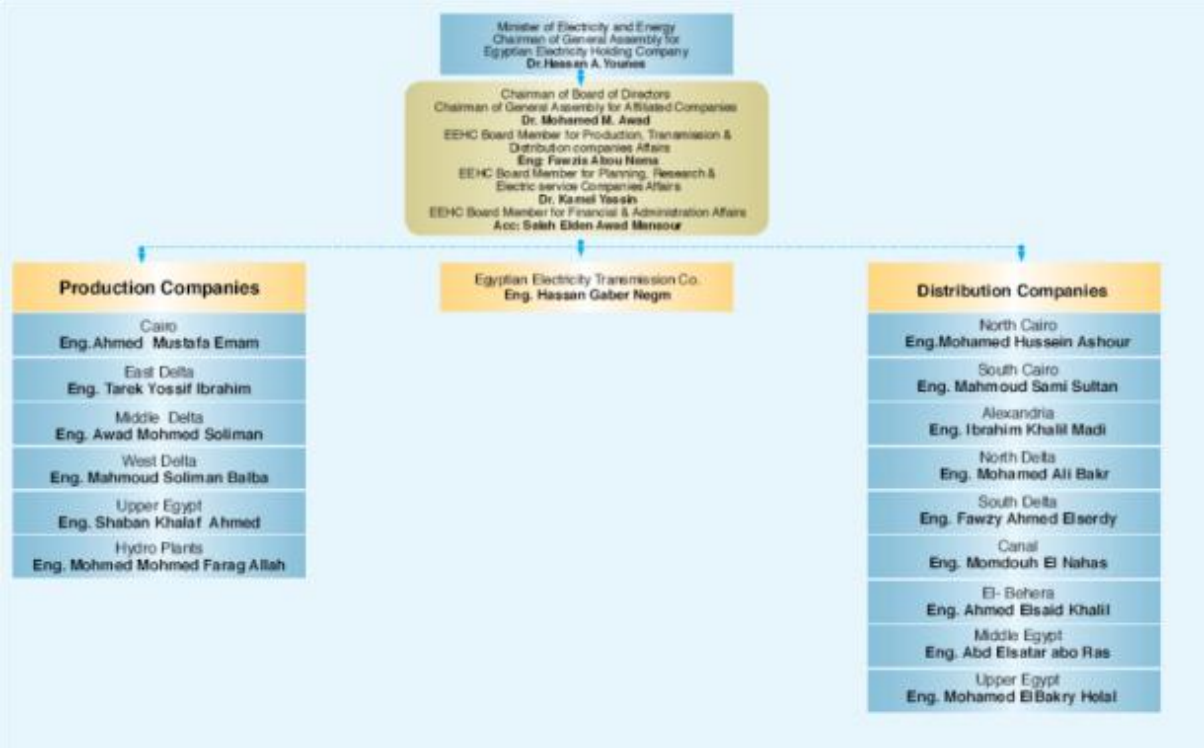


Figure (7) Holding Company for Electricity

1.1.5.2. NEW AND RENEWABLE ENERGY AUTHORITY (NREA)

The Centre targets to support NREA in achieving its objectives through establishing integrated information systems and data bases to assist executive management in taking the right decisions in a timely manner through availing the right information at the right time to be as accurate and elaborate as needed. Thus, the Centre contributes in presenting a comprehensive vision that supports decision-making.

A parallel and complementary objective is to continuously computerize an ever-increasing amount of NREA activities in versions fields (NREA, 2011). Information Centre objectives are to:

- develop integrated information systems in all NREA activities;
- avail relevant information to all management levels in NREA;
- continue cooperation with other information centres to exchange expertise among them;
- plan and implement development schemes for information systems, software and hardware including performing necessary and timely upgrades.

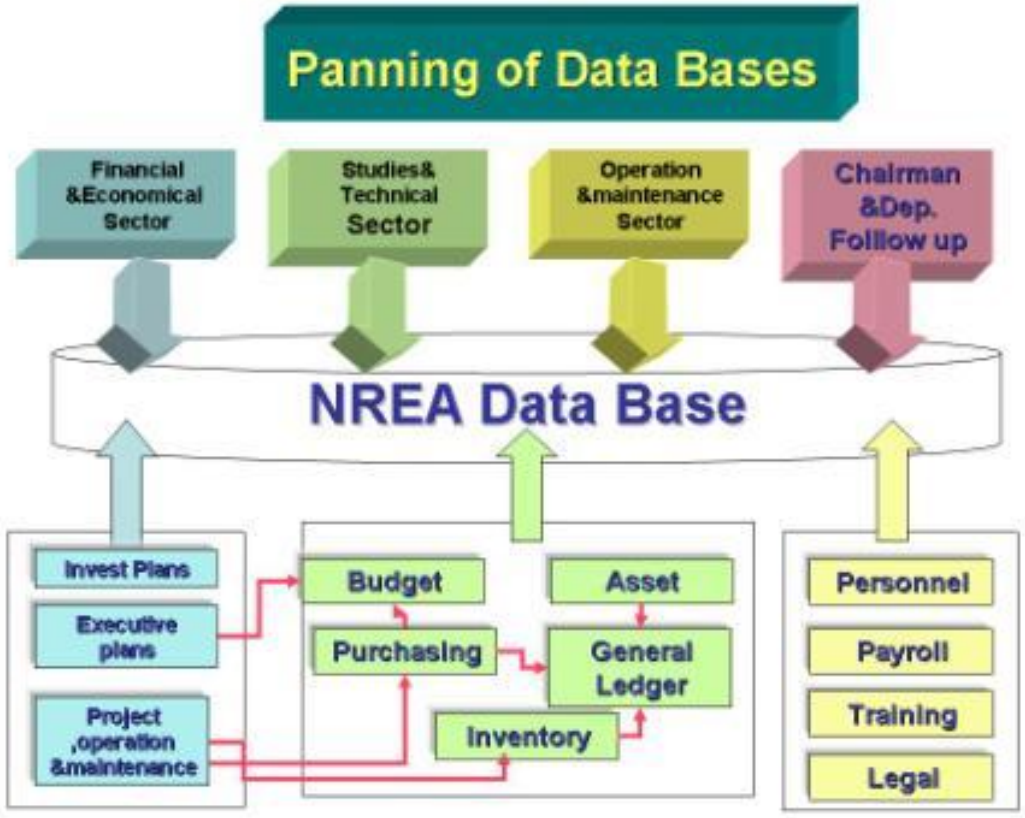


Figure (8) Planning of Databases

1.1.6. MINISTRY OF LOCAL DEVELOPMENT

Ministry of Local Development is central to all Egyptian governorates. It collects data on the governorates and publishes them as a sign of decentralization of the rule in Egypt where the authorities of the governor are equal to those of the President of the Republic and the Minister of Local Development is the general supervisor of the governors. The data compiled by the Ministry are sent to the Central Agency for Public Mobilization and Statistics (CAPMAS).

1.1.7. THE MINISTRY OF HOUSING, UTILITIES AND THE URBAN DEVELOPMENT

The Ministry of Housing, Utilities and the Urban Development is one of the country sectors concerned with the complete development in Arab Republic of Egypt, that includes urban, social development and the economic one. The complete development starts habitually the study of the urban space in Arab Republic of Egypt and wiping of the available capabilities to it, and accordingly putting the complete and structural plans to takes place for the development. That is being translated into detailed plans from networks to the infrastructure. The republican decision number of 164 issued in 1996 with the organization of Ministry of Housing and Utilities and the Urban Development where defining the ministry specialisation

as follows: “to draw the policy of housing and the facilities and the urban development, and a study, the preparation of plans and the programs of the urban development, and the coordination between it and between the programs of production and services within the framework of the national plan to the country, and the supervision of the projects of city planning and villages and the housing by different its kinds and its levels.2

The Ministry of Housing prepared an integrated operational plan for the National Strategy for Villages Sanitation in coordination with concerned ministries and agencies based on the following criteria:

- use of new non-traditional technologies;
- construct surface networks suitable for the Egyptian villages conditions to reduce investment cost;
- provide required land and electrical power to run these projects.

1.2. COMMITTEES IN THE FIELD OF ENVIRONMENT

1.2.1. WATER

#	name of the committee	tasks	parties
1.	Committee for Supplying Services and Sanitation to Villages (in the Ministry of Housing)	• to prioritise lists of the villages, which are negatively affecting the water bodies and need to be covered by sanitation services.	• Ministry of State for Environmental Affairs • Ministry of Water Resources and Irrigation • Ministry of Health • Ministry of Housing • local government
2.	Supreme Committee for Water (in the Ministry of Health)	• to examine all health matters related to drinking water, ice, domestic use of water, swimming pools and bathing beaches; • to develop the standards, health specifications, and requirements for drinking water: a. its resources, b. methods of treatment, c. preservation and transfer to consumers d. develop specifications and health requirements for home buildings; • to approve the water for swimming pool use, the means of its treatment and its influence on health before	• Ministry of State for Environmental Affairs • Ministry of Water Resources and Irrigation • Ministry of Health. (Central Laboratories – Central Department for Environmental Health). • Ministry of Housing • Ministry of Defence • National Centre for Research

		authorising their implementation; • to approve drainage human residues, industrial projects, to protect and prevent pollution of waterways and groundwater, before authorising the establishment of new residential or industrial use.	
3.	Committee of the Technical Secretariat of the Supreme Council for the Protection of the River Nile. (in The Ministry of Water Resources and Irrigation)	• to coordinate the work between ministries and governorates at stake; • to take all necessary measures to protect the Nile River and waterways from pollution; • to follow up on water quality status of the Nile River and any changes occur to take corrective action in a timely manner; • to follow up progress in the implementation of national plan for the water resources at different levels and review reports for assessment and follow up the implementation of various projects; • to propose a strategic framework to update the plan and set priorities for Higher Ministerial Committee for making decisions about urgent issues	• Ministry of State for Environmental Affairs • Ministry of Water Resources and Irrigation • Ministry of Health • Ministry of Agriculture • Ministry of Industry • Ministry of Finance • Ministry of Tourism and Organisation for transportation in river • Governorates (El-Behira, El-Faiom, Kenna)

1.2.2. INTEGRATED COASTAL ZONE MANAGEMENT

#	name of the committee	tasks	parties
1.	National High Steering Committee for Integrated Coastal Zone Management (in the Ministry of State for the Environmental Affaires).	• to coordination and integrate between ministries and specialised authorities an effective coastal zone management through implementation of guidelines for each activity as well as Environmental Impact Assessment studies; • at coastal zones level: a series of guidelines for activities and projects in the coastal zones have been published to promote rational development and sustainable utilisation of coastal resources, minimise pollution, and to protect and	• Ministry of State for Environmental Affairs • maritime transportation sector • Agriculture Research Centre – Ministry of Agriculture. • Urban Planning Agency • The Egyptian General Petroleum Corporation • Egyptian Navy Force • National Institute of Marine Science & Fisheries • Tourism Development Agency • Shoreline Research Institute - Ministry Of Irrigation And Water Resources • Shoreline Protection Agency - Ministry Of Irrigation And Water Resources

		conserve natural habitat and eco-systems; • to ensure that the land-use plans are included in the coastal areas development programs; • to adopt the best practices to compromise between development and sustainable use of coastal resources; • to sharing this vision during preparation of the national strategy for ICZM in Egypt; • to assure Egypt's fulfilment of its duties and responsibilities as its partnership in regional and international conventions. • to follow up on global environmental issues such as climate changes and study their shed on sea level.	• Remote Sensing Agency • National Authority of Fisheries Development Agency • National Centre for Planning and Land Use State • Authority of National Security

1.2.3. AIR

#	name of the committee	tasks	parties
1.	Scrapping of Old Taxis Committee	• to ensure technical follow-up for scrapping and recycling of old taxis that substituted through a replacement project of old taxis in the Ministry of Finance. scrapping and recycling process means : • shredding the taxis; • separation the components; • reuse of some components (glass - rubber); • transfer of components that cannot be used after an appropriate classification of the raw material which they are made of. At present, there is a company to scrap the old taxis.	• Ministry of State for Environmental Affairs • Ministry of Finance • Ministry of Interior • Scrapping companies
2.	Study the best way to scrap and recycle old taxis Committee	• to study the best way for scrapping and recycling old taxis and put the foundations that must be available in the factory; • the target is the establishment of a large factory specialising in scrapping and recycling of old all types of cars in Egypt.	• Ministry of State for Environmental Affairs • Ministry of Finance • Ministry of Trade and Industry • Ministry of Transportation

3.	Capital Taxi project Committee	• to set the technical specification of the tender for taxis that work in this project; • to follow-up the private companies that participate in the project; • to solve any problems that the taxis owners face; • to facilitate any administrative problems with agencies (parking – licenses).	• Ministry of State for Environmental Affairs • Cairo governorate (West region)
4.	Special Standards for Measuring Devices of Environmental Pollutants Committee	• to prepare Egyptian specifications for various environmental measuring devices.	• Ministry of Petroleum • Ministry of State for Environmental Affairs • Occupational Health and Safety Centre • Institute of Environmental Studies and Research • General Authority for Standards and Quality
5.	Committee for the preparation of Egyptian code for the principles of design and terms of implementation of the acoustics work and the noise control for the buildings	• to identify the definitions, the terminology and the symbols of audio for the building and its components; • to cover methods of the measurement and the calibration of these characteristics in addition to the means of insulation in walls and ceilings for sound and vibrations control; • to put the standards of environmental sound and recommendations of the noise background, standards and limits of the levels and the safe periods of exposure to the noise.	• Ministry of State for Environmental Affairs • National Centre for Research on housing and construction • Faculty of Engineering (Cairo University • Faculty of Engineering (Ain Shams University). • Academy of Arts

1.2.4. WASTE

#	name of the committee	tasks	parties
1.	Industrial Hazardous Substances committee in the Ministry of Industry	• to present suggestions to update the official industrial hazardous substances list	• Ministry of Industry and Foreign Trade • Egyptian Environmental Affairs Agency
2.	Industrial wastes in free zones in the general authority of Investment and free zones	• to discuss the availability to address sound management system for the industrial wastes generated in the industrial free zones	• Egyptian General Authority for Investment and Free Zones • Egyptian Environmental Affairs Agency
3.	Chemicals Committee in the	• to prepare Egyptian standards for safe using of	• Ministry of Industry and Foreign Trade

	Egyptian general authority of Quality and standards	various chemicals according to Egyptian specifications	• Egyptian Environmental Affairs Agency
4.	National Committee for Environment and Trade	• to cultivate of the trade policy with environmental regulations according to WTO and MEN's reg.	• Ministry of Industry and Foreign Trade • Egyptian Environmental Affairs Agency
5.	Green ICT information and communication technology task force	• to cultivate environmental standards to ICT sector	• Ministry of Communication • Egyptian Environmental Affairs Agency
6.	Basel convention regional Centre for Arab states	• to implement and fellow obligation of the Basel convention	• Ministry of Industry and Foreign Trade • Egyptian Environmental Affairs Agency • Ministry of Agriculture • Ministry of Electricity • Egyptian General Authority for Investment and Free Zones
7.	Arab technical team for implementation of the MEA's related to chemical and hazardous wastes		• Egyptian Environmental Affairs Agency • Ministry of Foreign Affairs

1.2.5. CLIMATE CHANGE & PROTECTING OZONE LAYER

#	The committee	Tasks	parties
1.	the National Committee on Climate Change	• to develop mitigation and adaptation strategies to address phenomenon of climate change	• Ministry of Foreign Affairs • Ministry of Water Resources and Irrigation • Ministry of Agriculture and Land Reclamation • Ministry of Electricity and Energy • Ministry of Petroleum • Ministry of Trade and Industry • Ministry of Economic Development • Ministry of Defence • experts for national and relevant agencies
2.	The National Committee for the Clean Development Mechanism	• to implement projects helping to reduce greenhouse gases emission.	• Ministry of Foreign Affairs • Ministry of Electricity • Ministry of Trade • Ministry of Industry • Ministry of Agriculture • Ministry of Investment • Ministry of Transport • Ministry of Petroleum • Ministry of International Cooperation • in addition to NGOs
3.	World Energy	• to promote the sustainable	• ministries at stake

	Council - Egyptian National Committee	supply and use of energy	
4.	Grievances committee	• to study complaints of importers with the customs Department and the General organization for Export & Import Control	• General organization for Export & Import Control
5.	Steering committee of the Third National Communication to the United Nation Framework Convention on Climate Change (UNFCCC).	• to prepare a report encompass information on emissions and removals of greenhouse gases and activities undertaken to implement the convention.	• national experts from relevant ministries
6.	Green Information & Communication Committee		• communication & information technology
7.	Sustainable Development Committee	• to prepare national strategy of sustainable development.	• concerned ministries
8.	Sustainable Transport Committee		• concerned ministries
9.	Nationally Appropriate Mitigation Actions Working Group	• to coordinate among relevant stakeholders national priorities for mitigation actions.	• Ministry of Agriculture and Land Reclamation • Ministry of Electricity & Energy • Ministry of Petroleum • Ministry of Trade & Industry • Ministry of Transport
10.	Green Building codes committee - Egyptian Green Building Council	• to provide a mechanism to encourage building investors being satisfy both energy efficiency and environmental conservation	• Housing & Building National Research Centre • government ministers from Cabinet level agencies • officers from respected NGOs • prominent businessmen • seasonal labour leaders • major contractors
11.	Project committee	• to apply sustainable & green building concepts.	• Ministry of Planning & International Cooperation • Ministry of Finance • UN organizations, European Union, Donors.
12.	National Ozone Committee	• to implement the Egyptian Program for Ozone layer protection.	• Ministry of Agriculture • Ministry of Finance • Ministry of Trade & Industry • Ministry of Solidarity & Social Justice

2. CONTENT

2.1. ENVIRONMENTAL LAWS AND LEGISLATIONS AND THE AUTHORITIES RESPONSIBLE FOR THEIR EXECUTION

- Law 93/1962 regulates the discharge of wastewater into public sewer networks. Ministry of Housing and Public Utilities, The Local Authorities
- Law 38/1967 general cleaning and sanitation (Local governments)
- Law 38/1967 regulates the collection and disposal of solid wastes. Ministry of Local Development and its departments, Department of Civil Defence
- Law 48/ 1982 prevents Nile River pollution by the discharge of wastewater loaded by organic matter. The law fixes the limit to 10mg/l, and also sets standards for industrial installations.
- MD 134/1968 implements Law 38/1967, and provides the specifications for dumping sites. Ministry of Local Development.
- PD 1948/1965 establishes a permanent committee for protecting the sea from oil pollution. Located in the Ministry of Defence.
- PD 45/1983 Signs the Protocol for the protection of the Mediterranean from land based pollution sources. EEAA Port Authorities.
- Law 124/1983 is related to the protection of water resources. It also regulates fishing, conservation of marine animals, and fish farming plans in the near future in terms of development of legislation and legal instruments.
- Preparing the rules and regulations that organize the ideal use of natural resources inside natural protectorates in addition to setting a comprehensive organization for how to estimate the value of utilization right for all projects determined to be established (tourism–service–entertainment–industry–mines).
- Preparing and studying draft law related to getting biological resources and relevant heritage knowledge as well as the resulting benefits.
- Preparing a legal study on the system of setting and implementing control methods regarding the Nile River, to be presented to the supreme council for Nile River protection, elaborating the role of the Ministry of State for Environmental Affairs towards the Nile River and waterways protection.
- Amending Law No. 4/1994 and reviewing it in State's council.

- Finalizing the preparation of the executive regulation of environment Law No. 9/2009.
- Finalizing the regulatory organization established with the purpose of estimating environmental compensation value for damages, arising from various industrial establishments affecting the air.
- Presidential Decree No. 2915/1964 established the Central Agency for Public Mobilization and Statistics (CAPMAS)
- CAPMAS was established in accordance with Laws No. 210/ 1951, 189/1958, and 35/1960 concerning statistics and censuses.
- According to Article I of the Presidential Decree, the title "Central Agency for Public Mobilization and Statistics (CAPMAS)", replaces the title "Public Mobilization and Statistics Agency", and the agency acts as an independent authority adjunct to the Presidency of the Republic.
- CAPMAS exercises the jurisdictions of the technical staff set out in Law No. 35/1960 and Presidential Decree No. 2915.
- CAPMAS ' President may conduct the statistics and censuses required by the state and may specify their dates, define their methods and disseminate their results, as well as identify the authorities and agencies that conduct such statistics and censuses in a way that ensures full coordination between the operations and statistical agencies, and leads to raising the standard of accuracy and efficiency of such operations.
- According to Article VII of the decree, an Advisory Committee for Planning and Statistical Coordination is created in CAPMAS. Such a committee, headed by the CAPMAS President, is made up of technicians of high statistical calibre drawn from various sectors of the state and appointed by the head of CAPMAS.

2.2. Reporting Obligations under National laws

2.2.1. State of environment report and indicators

Egypt has produced the State of Environment Report on an annual basis. The methodology of the state of the environment report depends on four principles:

Principle I:

Transparency: In this context, the real image of environmental status in the Arab Republic of Egypt has been displayed using updated data made available by The Egyptian Environmental

Affairs Agency (EEAA), in cooperation with other ministries, organizations and think–tanks. It is believed that the transparency principle will allow people to know the nature and magnitude of impacts on the environment as well as government efforts to mitigate them.

Principle II:

Participation: The report emphasizes the importance of public participation, and relies on its development and revision on the participation of experts, researchers and environmental stakeholders who are representing various executive sectors such as line ministries, research centres, universities and environmental awareness experts, representatives of the private sector, and non-governmental organizations and associations.

Principle III:

Adoption of internationally recognized standards in developing State of the Environment Reports, as well as utilizing a scientific approach in writing this report in all its aspects (sources, harmful impacts, environmental indicators, the efforts to reduce negative impacts and future vision and plans)

Principle IV:

Commitment to Egypt's international agreements: Egypt continues to meet its international commitments including international environmental agreements that affect the global environment in conjunction with national efforts regarding national environmental issues.

The State of Environment Reports are published on the web site in English and Arabic http://www.eeaa.gov.eg/English/info/report_search.asp

2.2.2. ENVIRONMENTAL INDICATORS

Egypt has also produced the Environmental Indicators Index according to the Driving Force – State – Impact –Response (DPSIR) framework, with UNEP–ROWA integrated environmental methodology and includes a comprehensive analysis of all environmental information and data collected.

Within the framework of the Mediterranean Commission on Sustainable Development (MCSD) activities on sustainable development indicators the EEAA started a national initiative in collaboration in 2000 with plan blue in order to identify the indicators which were potentially applicable to the Egyptian context and the Egyptian government entities

potentially responsible for the calculation and monitoring of such indicators. A survey was done on the indicators which were being calculated and monitored by various ministries and projects. The results showed that a significant number of indicators of the blue plan were already calculated and monitored periodically.

Table 1 Methodology sheet

Indicator	**The name of the indicator**
Definition	
Exact definition	This section should include the descriptive definition of the indicator, as well as the detailed equation(s) used for its calculations, with the clarifications of the different variables/parameters used.
Unit of measurement	
Justification for use	This section should include the function and the aim of choosing the indicator.
Data Compilation	
Data sources	There is the need to specify whether: • the indicator is obtained directly from another source; • the indicator is calculated/estimated using data compiled/collected from another source; • the indicator is calculated using data collected by the unit/department;
Frequency of data compilation	
Indicator Values	
Targeted	Law permissible limits/international limits Note: If there is a deadline targeted, it shall be mentioned
Actual	
Comments	Comments on results compared with the targeted limits and previous years.

2.2.3. CAPMAS REPORTING

2.2.3.1. FRAMEWORK ADOPTED REGARDING ISSUANCE OF ENVIRONMENTAL STATISTICS REPORTS

The first Statistics Report was issued in 2007 followed by the 2008 and 2009 volumes. These reports will continue to be issued on an annual basis. The 2010 Annual Report is currently underway, containing detailed up-to-date data and time series.

The objective of these reports is to present the true picture of all environmental statistics in the Arab Republic of Egypt by using available data and manifesting the state's efforts to alleviate the impact of environmental degradation resulting from various activities as well as overuse of energy sources.

CAPMAS analyses data and information on various elements of the environment, namely; air quality, water, ordinary and hazardous waste, land use, climate changes, as well as new and renewable energy.

CAPMAS organizes a regular consultative meeting between the coordinators of the ministries concerned with environment and CAPMAS' delegate to overcome the obstacles facing the timely and periodical flow of data by relevant ministries, to enable CAPMAS to issue its periodical bulletins on due dates and up-date them with available information when necessary.

One of the problems facing data flow is the inefficient data exchange system. Data exchange still takes the form of statements, documents or compact discs. Attempts are still underway to link CAPMAS to other ministries through a limited network, the internet or through a database that is shared by all parties. However, financial support is still needed to create this network.

CAPMAS publishes all old and new bulletins, in addition to time series by various researchers and decision-makers on its website on the internet, in accordance with international publishing standards.

2.2.3.2 CAPMAS' ROLE IN THE PRODUCTION OF OTHER BULLETINS ON THE ENVIRONMENT

CAPMAS issues various annual brochures on the environment. The General Administration for Services issues two important publications: "Trade Statistics and Public Facilities Bulletin" , which deals with drinking water and sanitation, and "the Health Bulletin", which specializes in health aspects of the Arab Republic of Egypt. Moreover, the General Administration for Agricultural Statistics releases bulletins on agriculture including area of cultivated land, agricultural production and livestock, in addition to agricultural output of the three loops. Furthermore, the General Administration for Industrial Statistics issues a brochure on industrial production and the number of establishments which generate different kinds of solid, liquid and gaseous wastes.

In addition to the above, the General Administration of Environment Statistics divides its bulletin into six parts, namely; air, water, waste, weather, land uses and biological diversity (biodiversity).

2.2.3.3. CAPMAS PUBLICATIONS

A list of CAPMAS statistical data is provided in Annex I

I - Directories& Classifications
II - Censuses
III – General Statistics
IV - Periodical Statistics :
1-Industrial Statistics
2-Transportation &Communication Statistics
3-Trade Statistics
4-Services Statistics
5-Population & Labor Statistics
6-Financial,Economic & Prices Statistics
7-Agricultural, Livestock & Fish Statistics
8- Population Magazine
9-Draft core indicators for measuring the information society.

2.2.4. REPORTING UNDER GLOBAL MEAS

Egypt has ratified or signed on many multilateral environmental conversions such as:

- Vienna Convention and Montreal Protocol: Each party shall provide data on its annual production and consumption of substances responsible for depleting the ozone layer
- Montreal Protocol: The convention portal supplies tools for data communication.
- Instructions or guidelines, a UNEP–DTIE handbook on data communication, as well as data communication forms. The data is stored by the Secretariat (data access centre) and is classified according to the range of chemicals indicated into each protocol annex.
- Ramsar convention: Every three years, the parties submit their national reports to the COP, in a format adopted by the parties. The parties shall report to the Secretariat any

change or ecological hazard threatening their national classified wetlands. Each country shall update its Information Sheet on Ramsar Wetlands (RIS).

- Convention on Migratory Species: The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale. Since the Convention's entry into force, its membership has grown steadily to include 116 (as of July 1, 2011) parties from Africa, Central and South America, Asia, Europe and Oceania.
- The Convention on Biological Diversity: The Convention was opened for signature on June 5, 1992, at the United Nations Conference on Environment and Development (the Rio "Earth Summit"). The Convention on Biological Diversity was inspired by the world community's growing commitment to sustainable development. It represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. As of 1994 the EEAA became the national institution concerned with issues of conservation of biodiversity and national obligation under the convention on Biodiversity
- The Cartagena Protocol on Biosafety: The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international treaty governing the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the Convention on Biological Diversity and entered into force on 11 September 2003.
- On 29 January 2000, the Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.
- The Basel Convention on the Control of Hazardous Wastes and their transfer across borders.

Table 2 Multilateral environmental convention to which Egypt is a party

name of the convention	ratification date/ adhesion /entry into force	reporting obligation	next report due in
The Ramsar Convention on the preservation of wetlands	1988	information Sheet on Ramsar Wetlands	2012
The Convention on Biological Diversity	• signed 1992 • party since 1994	three National reports on implementation of the Convention have been submitted to the secretariat (1998, 2004, 2005)	2014
Cartagena protocol on Biosafety	party since 2004		30/9/2011
The Vienna Convention and to protect the ozone layer	1985(s)/1988(R)	National programme report	30/4/2014
Montreal Protocol: ozone depleting substances	1992	Country programme report	30/6/2012
The United Nations Framework Convention on Climate Change	Party Non Annex I : • ratified - 1994 • entry into force - 1995 - rapports - national web	National communication	August 2014 or extended for one year
The Kyoto Protocol on climate change	ratified 2005 (R), entry into force 2005	National communication	August 2014 or extended for one year
Rotterdam convention	Not a party		
Stockholm convention Persistent organic pollutants	• signed 2002 • ratified 2003	Reports have been submitted until 4th COP 2009	2013
Bonn Convention	entry into force 1983	National report (in questionnaire based format)	November 2011
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	• entry into force 1978 • adhesion 1978	Reports 2002, 2003, 2004	Every two years
The Basel Convention on the Control of Hazardous Wastes and their transfer across the border	adhesion 1993	Reports have been submitted up to 2009	
The United Nations Convention to Combat Desertification	• signed1994 • ratified 1995 • entry into force 1996	3 National report have been submitted in 1999, 2002 and 2004	

2.2.5. NATIONAL ENVIRONMENT ACTION PLAN (NEAP)

The Egyptian Environmental Affairs Agency's National Environment Action Plan (NEAP) 2002–2017 identified specific actions to undertake: 1) the establishment and building of basic information infrastructure, and 2) capacity building training.

In establishing the basic infrastructure, an internal data transmission network was installed, as well as eleven networks in the governorates linked to the main network. Mechanisms for securing and protecting information were built for the internet and intranet. Advanced methodology for building information systems, applications, and databases was conducted, as well as building a website for the Egyptian Environmental Affairs Agency, which consisted of an environmental information portal, e-government services and GIS. This bilingual website describes the activities of the EEAA and Ministry of State for Environment and provides environmental information and reports to the public, specialists, investors and researchers free of charge. The website also seeks to strengthen public service, support and receive feedback (complaints) by educating the community and children on environmental issues. The total visitors per day is 4720.

Furthermore, the EEAA has formed a system to monitor seasonal rice straw collection and transfer, as well as established a national system for integrated management of hazardous substances in Egypt in cooperation with ministries, such that it also monitors vessels transiting the Suez Canal carrying hazardous wastes – whether this waste will be recycled or disposed of.

The EEAA has also decentralized the agency's environmental management system to be able to access, integrate and analyse data in eight branches in governorates. This information system needed equipment to sustain the current network which was provided by MEDSTAT I and II.

The EEAA requests support in the refurbishment or replacement of internal networks equipment, servers (obsolete–served more than 10 years), hardware, software (from Oracle to web-based applications) and provision of technical support for their maintenance. Additionally, the EEAA would like capacity building training and skills development for their staff in the latest technological developments, networking, maintenance and other technical fields.

2.2.6. ARAB REGION ENVIRONMENTAL INFORMATION NETWORK (AREIN)

The Arab Declaration on Environment and Development and future prospects was issued in September 1991 in preparation for the Arab United Nations Conference on Environment and Development on the importance of developing an Arab network for environmental information. There have been several attempts at cooperation between the Technical Secretariat of the Council of Arab Ministers, the United Nations Environment Programme and CEDARE to establish a network of environmental information that links all environmental agencies in Arab countries. This attempt was unsuccessful due to differences in terms of availability of information and databases, as well as the scattering of information between different national authorities in various Arab countries, and the absence of a genuine desire among Arab organizations for regional cooperation to establish this network as well as lack of sufficient resources available to create the network.

At the beginning of the third millennium, and in preparation for the World Summit on Sustainable Development, the Council of Arab Ministers planned the implementation of initiatives that centred on enhancing national and regional capacities in the field of environmental information, such as the initiative of the Abu Dhabi Global Environmental Data (2002). They selected priority indicators, for different sectors, and strengthened capacities in the field of environmental information – both existing and new – to encourage, promote and work on the coordination and integration as well as learn from the various experiences. These efforts resulted in the adoption of a list of indicators on environment and sustainable development that was extended to include all Arab countries. Other meetings have been held to discuss ways of activating the establishment of the Arab Network for Environmental Information, and develop a framework for implementation in the Arab region, and learn about the experiences of the available networks in each country and regional levels in order to benefit from best practices and identify constraints taking into account the priorities of each country. Agreements were also reached on the structure of the network, areas of work, main activities, implementation mechanisms, funding sources, as well as operational needs and future steps to implement the package of environmental and sustainable development indicators in the Arab region.

Most importantly, however, is that Arab states will report annually on progress made in the application package for Arab-based environmental and sustainable development indicators and show progress made to date in the establishment of national environmental information

network. In addition, they will provide the Secretariat of the League of Arab States (Department of Statistics and Databases) with the necessary information and data so that it can be published in an annual statistical environment and sustainable development report.

The AREIN requests all countries to report on their environmental indicators periodically and to volunteer in the implementation of the selected Arab indicators.

2.2.7. Africa Environmental Information Network (AEIN)

UNEP has prepared a framework proposal for the establishment of an Africa Environmental Information Network (AEIN), a capacity building programme that aims to harness and enhance access to information and knowledge to support the management of Africa's environmental resources as assets for sustainable development. The overarching goal is to strengthen the capacity of African countries to use good quality information on environmental assets to make informed investment choices at national and sub-national levels, and manage these assets on a sustainable basis. A key objective of the initiative is to build capacity for establishing the essential data foundation needed to support country-level sustainable development initiatives, focusing on the environmental aspects.

Within the AEIN framework, Egypt has to report on its environmental information, particularly environmental indicators in accordance with the timeline of the development of Africa Environment Outlook report.

2.3. Description of Environmental Data Availability and Data Flow

Environmental data are shared among many institutions in Egypt. CAPMAS receives data from the Ministry of health, Ministry of Water resources, Ministry of Local development and the EEAA as shown in Figure 6.

The EEAA collects data for developing environmental indicators and state of the environment reports from Governorates and Ministries of health, Water Resources, Housing and Local Development. Figure 7 shows an example of the data flow for the EEAA. Table 4 provides lists of environmental data, time series and data sets. Table 5 illustrates environmental data indicator label, indicator definition, frequency of production, geographical coverage and data and time series source.

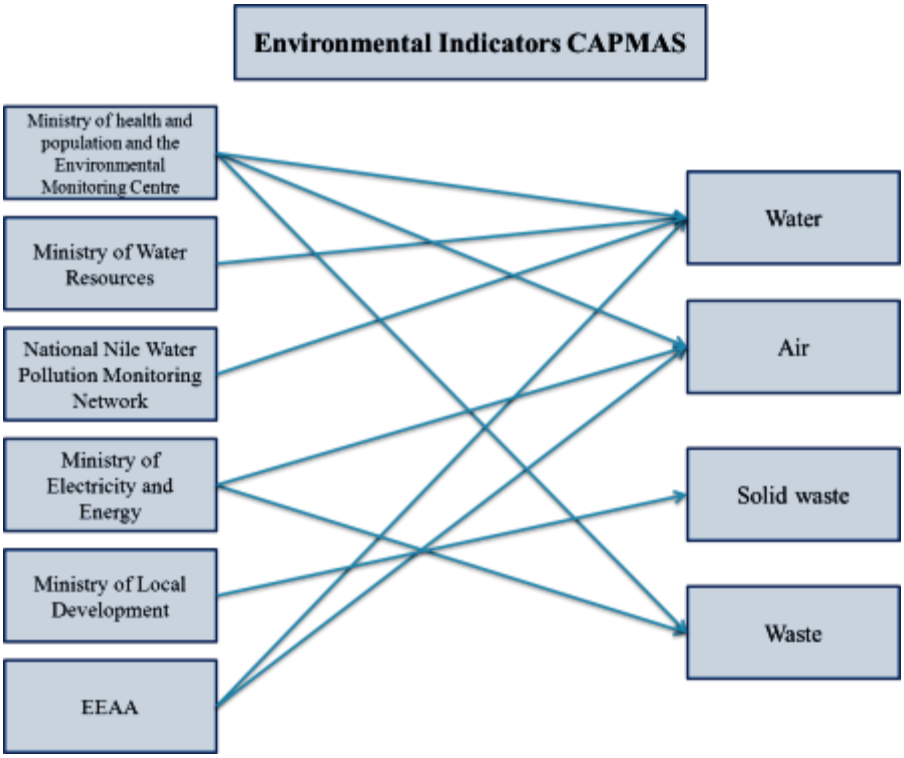


Figure (9) Data Flow for CAPMAS

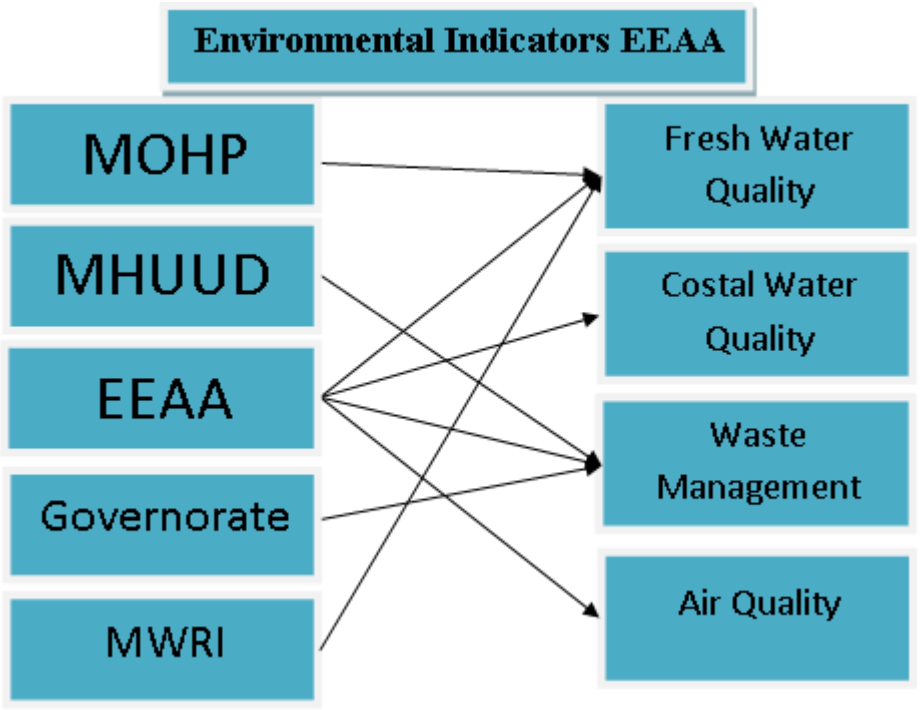


Figure (10) Data flow for the EEAA

Table 4 EEAA Environmental Data

Web site	Data time series	Parameters measured	Data set
www.eeaa.gov.eg	1999-2010	• PM10, SO2, NO2, Pb, O3, CO	Air quality
www.eeaa.gov.eg	2004-2010	• Total suspended particulate's emissions from cement companies stacks. • Rice straw burning emissions. • Percent of vehicles compliance with road emission inspection in greater Cairo. • Percent of public transportation authority buses compliance.	Industrial & Road emissions
www.eeaa.gov.eg	1990-2010	• Total amount of carbon dioxide concentrations (CO2). • The total amount of CO2 per capita. • The total amount of GHG emissions.	Climate change
www.eeaa.gov.eg	2000-2010	• Annual consumption rate of the ozone depleting substances. • Ozone measurements in Egypt.	Ozone layer protection
www.eeaa.gov.eg	2007-2010	• Noise equivalent levels in greater Cairo.	Noise
www.eeaa.gov.eg	1990-2010	• COD, BOD, DO. • Nutrient concentrations.	Fresh water quality (River Nile)
www.eeaa.gov.eg	2010	• COD, BOD, DO. • Nutrient concentrations.	Fresh water quality (North lakes)
www.eeaa.gov.eg	1998-2010	• Bacterial count for fecal coli forms, E.coli and Fecal streptococci. • Nutrient concentrations of ammonia, nitrate, phosphate	Costal water quality
www.eeaa.gov.eg	2006-2009	• Species of distanced or threatened to distance marine organisms. • Areas of Mangrove forests • Percentage of coastal marine protected areas to total area of protectorates in Egypt • Areas of coral reefs in marine environment.	ICZM
www.eeaa.gov.eg	1983-2010	• The total area and number of protected areas in Egypt.	total area and number of protected areas
www.eeaa.gov.eg	1995-2010	• Total planted forest area using treated waste water	Afforestation area
www.eeaa.gov.eg	2007-2010	• Electricity generated from wind farms. • Percent of electricity from renewable sources. • Total amount of sectorial electricity consumption.	Energy
www.eeaa.gov.eg	2004-2010	• The total quantity of solid waste generated annually. • The total amount of municipal waste generated annually. • The total amount of municipal waste collection annually.	Solid waste

		• The proportion of municipal waste that is collected on the amount of municipal waste generated. • Municipal waste components. • The number of sites for waste landfills.	
www.eeaa.gov.eg	2006-2010	• The quantities of hazardous substances used in industrial sector. • The quantities of hazardous substances used in the agricultural sector. • The amount of hazardous chemicals incoming to the country through customs releases. • The number of accidents resulting from hazardous substances. • Quantities of obsolete pesticides. • Quantities of hazardous waste generated from the health sector. • Quantities of hazardous waste passing through Suez Canal. • Quantities of exported hazard waste. • Fluorescent bulb waste. • Number of hazard waste landfills.	Hazard waste and substances
www.eeaa.gov.eg	2004-2010	• Number of projects candidate for EIA. • Number of big projects (group C) candidate for EIA.	Environmental impact assessment
www.eeaa.gov.eg	2007-2010	• Type classification of environmental pollution accidents. • Geographical classification of environmental pollution accidents.	Environmental disasters
www.eeaa.gov.eg	1994-2010	• Life expectancy at birth. • Average infant mortality. • Average mortality rate. • Average mortality rate of children less than five years.	Environmental health

2.4. Description of Environmental Indicator Availability

In collaboration with APAT the EEAA has published the APAT methodology used to gather data from different institutions for the elaboration of the APAT environmental data yearbook. Based on the Italian experience a questionnaire has been sent to all the institutions in order to gather data. The questionnaire gives information about the data gathering methodology (monitoring sites, data sources, etc.) data owners, and data availability.

During project cooperation with the APAT, capacity building needs were identified in the field of indicators production and data. APAT organized some training on different subjects,

such as key concept and terminologies, information pyramid (PSR and DPSIR) indicator classifications, decoupling (OECD Methodology and APAT application), how to prepare indicators data (activities, tools and sources) and how to use them to present environmental information. For each indicator a fact sheet was produced illustrating the following information: description of the indicator, measuring unit, data source, periodicity of the updating, information quality, relevance, accuracy, comparability over time, comparability cross space, purpose, target fixed by the law, assessment of the state and trend and comments on tables and figures.

Table 4 Environmental Indicators

Domain	Indicator label	Indicator Definition	Frequency of production	Geographical coverage	Data and Time Series	Source
Fresh water quality	COD concentration in the Nile River, its branches and main canals	Oxygen concentration required for oxidizing organic matter chemically in water.	Measured monthly and compiled annually	All over Egypt	1999-2010	• MWRI • MOHP • EEAA
	Cumulative number of industrial facilities in compliance with industrial effluent discharge standards	The Cumulative number of industrial facilities which stopped the industrial discharge on the Nile River and facilities which discharge direct or indirect discharge in the Nile River.	Annually	All governorates located in the Nile River area and including facilities with direct or indirect discharge in the Nile River	2006-2010	• EEAA
Coastal water quality	Total nitrogen concentration in the Mediterranean coastal waters	Is the sum of nitrate (NO3), nitrite (No2), organic nitrogen and ammonia (all expressed as N)	Measured four times a year and compiled.(update every year)	Mediterranean region	1998-2010	• EEAA
	Total phosphorus concentration in the Mediterranean coastal waters	Measure of both inorganic and organic forms of phosphorus	Measured four times a year and compiled.(update every year	Mediterranean region	1998-2010	• EEAA
Solid waste management	Total municipal waste generated	The amount of municipal waste generated per year, according to population numbers and the annual increase in the quantities expected.	Is estimated on annual basis	All over Egypt	2004-2010	• EEAA • GOVs
	Number of landfills	Are the sites that were selected according to geographic information systems GIS, which have been placed on digital maps and site of the 55 county-level	variable	All over Egypt	2004-2010	• EEAA • MHUUD • MSLD
Air quality	PM10 concentration	Suspended particulates considered as an indication of air quality that represent the emission intensity	daily and annual basis	All over Egypt	1999-2010	• EEAA

		from different sources either from natural or non-natural sources, such as those associated with the different industries or that emitted from traffic. Also it reflects any improvements that prove the efficiency of the policies that have been implemented by the Ministry of State for Environmental Affairs to mitigate air pollution; in addition, how can the Ministry of Environment coordinate with the other Ministries and concerning authorities to mitigate pollution sources that affect directly air quality, human health; and to improve the economic conditions in general.				
	SO2 concentration	Sulphur dioxide gas is mainly generated as a by-product of the oxidation of sulphur remnants in liquid petroleum products during burning processes that is emitted from fixed sources such as electrical power plants, different industries or from mobile sources that use diesel as fuel.	daily and annually	All over Egypt	1999-2010	• EEAA
	NO2 concentration	Nitrogen dioxide is formed as a by-product of all fuel burning processes that happen at high temperature. There are no maximum annual average limits for its concentration in the Executive Regulations of the Environmental Law 4/1994. However, the World Health Organization (WHO) has recognized a limit of (40 g/m3/year) which is being used in the interim as part of the modified Executive Regulations for Environment Law 9/2009 that would be included as a suggested annual average for nitrogen dioxide in the ambient air.	daily and annual basis	All over Egypt	1999-2010	• EEAA
Air quality	ozone	The ozone gas is considered a secondary pollutant at lower altitudes of the atmosphere that results from the interaction of volatile organic compounds with nitrogen oxides in the presence of sunlight. Accordingly, ozone concentration near ground level is higher in the summer compared to the winter, because of increase in the sunlight hours. Ozone is considered very dangerous to human health. Also, at high concentrations it contributes to smog	Hourly, 1 hour and 8 hours	All over Egypt	1999-2010	• EEAA

		formation. Accordingly, the Executive Regulations of the Environment law limits were set at 200 microgram/m3/hour and 120 microgram/m3/8hours.				
Air quality	Carbon monoxide	Carbon monoxide gas is emitted from vehicle exhaust pipes and burning of coal or wood in different activities. Also, it's considered one of the most dangerous and toxic pollutants to humans and animals because it reacts with haemoglobin, forming carboxyl haemoglobin that prevents oxygen from combining with haemoglobin, causing asphyxiation.	Hourly, 1 hour and 8 hours	All over Egypt	1999-2010	• EEAA
	Lead	Lead pollutants impact human health in different ways, either through inhalation or, ingestion of lead or its derivatives. The most damaging is the inhalation of its particulates in the air or as attached to dust particles. This leads to the accumulation of toxic levels of lead in the blood through the respiratory system that affects embryos, causes mental retardation and lead induced anaemia especially in children.	daily and annual basis	Greater Cairo	1999-2010	• EEAA

3. INFRASTRUCTURE

3.1. EEAA HARDWARE AND SOFTWARE

The EEAA maintains an inventory of all their hardware and software (e.g., servers, workstations, peripherals, operating systems, word processing software and database management software). The inventory should include the dates that items were acquired, version numbers, warranties, and on-going maintenance contracts.

The EEAA maintains information on the use of hardware and software, as well as reported bugs and/or problems. Tools should be implemented to manage this information.

Using the information produced by the previous activities, the EEAA should develop a systematic way to upgrade its hardware and software. General policies on minimum requirements for different types of use should be established so that users most in need of upgrades are the first to receive them. It also allows elements to be transferred from one user to another, where possible, and allows technologies causing problems (bugs, repairs) to be identified.

The EEAA should establish technical orientations for different types of technologies (OS, DBMS, development tools). Agency personnel involved in the selection of technologies (applications and tools) should be encouraged to follow these orientations so that the sustainability of these technologies is ensured by appropriate expertise (e.g., standardization of DBMS-Oracle). These orientations should be updated regularly, i.e., every two years.

The roles and responsibilities of the ICC Department should be defined and publicized so that frustrations about its involvement or non-involvement in technology-oriented activities are reduced (e.g., who has the final decision on acquisition, who decides who obtains new computers, how much technical support is available, and in what period of time).

IT personnel should be properly trained (annual programmes) so that they can efficiently manage the technologies and monitor new ones.

3.2. MONITORING CAPACITIES

3.2.1. MONITORING FRESH WATER

Water monitoring, national networks in Egypt: the main sources of pollution to surface water are industrial and municipal wastewater and agricultural drainage water. The Egyptian government has introduced legislations to protect the quality of fresh water. Environmental Law No. 4/1994 has been issued to protect the environment in Egypt in general, while Law No. 48/1982 deals with pollution of all water sources in Egypt and has set standards for the liquid waste discharge to fresh water. The enforcement and the implementation of the law pertaining to water quality are under the responsibility of the Ministry of Water Resources and Irrigation (MWRI), the Ministry of Health and Population (MOHP) and the Ministry of State for Environmental Affairs (MSEA). The national authority for drinking and municipal water (The Ministry of Housing, Utilities and Urban Development-MHUUD) oversees the installation of sewage collection networks and municipal wastewater treatment and finally the holding companies oversee the operation of municipal wastewater treatment. The national networks were established to monitor the quality of surface water through the measurement of physical, chemical and biological parameters. The monitoring networks include:

- a network of the Ministry of Water Resources and Irrigation, which consists of 232 monitoring sites including Lake Nasser, the Nile River with its two branches, EL-Riyahat, main canals, agricultural drainages in Upper and Middle Egypt, Fayoum and Delta, in addition to 203 monitoring points for groundwater in different reservoirs distributed in Egypt. Periodic Monitoring programmes are conducted by the National Centre for Water Research affiliated to the Ministry of Water Resources and Irrigation through its specialized institutes;
- a network of the Ministry of Health, which consists of 174 sites for periodical monitoring of water quality along the Nile, its two branches, and some of its major canals with special interest in drinking water intakes. This programme is implemented by the Environmental Monitoring and Occupational Studies Centre;
- a network of the Egyptian Environmental Affairs Agency, which consists of 69 monitoring sites along the Nile River to monitor the impact of wastewater, especially industrial wastewater, and to monitor hot spots at drainages. This programme is implemented by the EEAA's Central Lab and Regional Branches Laboratories.

Through these networks, the quality of fresh water in Egypt can be monitored. Currently, there is a mechanism to exchange monitoring data among the different institutions.

Table 5 Water pollution monitoring stations along the waterways in 2010

Governorate	Monitoring sites								
	No. of stations	Nile River	Rashid Branch	Damietta Branch	Ismailia Lake	Mahmoudeya Lake	Bahr Youssef	Ibrahimia Lake	High Dam Lake
Cairo	18	12	1	1	4	-	-	-	-
Alex	7	-	-	-	-	7	-	-	-
Port Said	8	-	-	-	8	-	-	-	-
Damietta	8	-	-	8	-	-	-	-	-
Dakahlia	8	-	-	8	-	-	-	-	-
Gharbia	24	19	3	2	-	-	-	-	-
Beni Suef	11	7	-	-	-	-	2	2	-
Fayoum	20	-	-	-	-	-	20	-	-
Minya	13	8	-	-	-	-	-	5	-
Assiut	20	15	-	-	-	-	-	5	-
Sohag	17	17	-	-	-	-	-	-	-
Aswan	20	19	-	-	-	-	-	-	1
Total	**174**	**97**	**4**	**19**	**12**	**7**	**22**	**12**	**1**

Source: Ministry of Health – Environmental Monitoring Centre (the Annual Report of the National Nile Water Pollution Monitoring Network – 2010)

Table 6 Monitoring sites for surface water and deep groundwater wells

Province	Number of monitoring sites	Annual monitoring number
Lake Nasser	4	2
The Nile River	29	2
The Nile Branches	7	12
Fresh lakes in the Delta	48	12
Upper Egypt's banks	29	2
Banks in Delta and Fayoum	115	12
Ground aquifers in Delta	51	1
Ground aquifers in the valley	55	1
Greater Cairo	12	1
Western Desert	43	1
Eastern Desert and Sinai	42	1

Source: Ministry of Water Resources and Irrigation

3.2.2. MONITORING OF GROUNDWATER

There are 203 locations to monitor groundwater quality, and the stations are managed by the Ministry of Water Resources and Irrigation. A Water Quality Index (WQI) has been developed to describe the Nile River quality based on nine parameters.

3.2.3 DRAINAGE WATER MANAGEMENT IN EGYPT

Drainage water is monitored by the Ministry of Water Resources and Irrigation. The functions of the drainage system in Egypt and its management are to prevent water logging, prevent soil salinity, increase crop productivity, and mitigate seawater intrusion. It is also utilized as a conveying system for other wastes. The scarcity of water is increasing along with an increase in population, especially as Egypt reaches the year 2025. Therefore, water reuse has to be addressed and developed into a policy since Egypt does not have sufficient rainfall. There is a six BCM/year gap between fresh water resources and the country's requirements. Some propositions are being explored in the reuse of drainage water, such as gravity reuse which requires several governmental authorities to cooperate together. Reuse is taking place only in the Delta region and natural reuse occurs in major drainages. The data produced are drainage rate (mm/day), drainage water salinity, oxygen in drainage, drainage flow to sea and Nile (quantities). Total water going to the sea is 2-3 billion/year.

There is a good water quality monitoring network and technical support programmes that have been funded and established by several donors. The current network monitors the quantity and quality of water all over the Nile River (70 stations monitored yearly), Delta (166 stations monitored bi-annually), its branches and agricultural drains (70 sites) as well as Lake Nasser/Nubia due to developments on the banks of the Nile. All types of wastes are being monitored, including agricultural, domestic, and industrial and sediment activities (HM analysis taken twice a year). A total of 33 parameters are monitored and presented but not in a pollution index. In 1993, some mixing pump stations were stopped since existing pollution affected drainage reuse.

There is a need to revise pollution with regard to irrigation systems and have a central database since each sector has its own database. There was a plan with the Canadians to have such central database; however, it did not go through.

3.2.4 MONITORING OF COASTAL WATERS

In cooperation with the Danish International Development Assistance (DANIDA) the EEAA has developed an Environmental Information Monitoring Programme (EIMP) in order to collect data and information for the quality of both air and coastal water. The programme intends to compile baseline knowledge about water quality to define hotspots and to apply possible measures to improve water quality. There are 45 monitoring stations along the Mediterranean coast and the stations are located according to land based activities near shore. Some stations are used as reference and are located far from the land based sources of pollution.

The Institute of Graduate Studies and Research (IGSR) signed a yearly contract with the EEAA to carry out the monitoring of water quality of the Mediterranean Sea on a seasonal basis. However, the National Institute for Oceanography and Fisheries signed a yearly contract with the EEAA to carry out the monitoring of water quality of the Red Sea, Gulf of Suez and Gulf of Aqaba on a seasonal basis. They carry out sampling, analyzing, and data reporting. The water parameters measured are:

- Physical parameters: profiles of salinity, alkalinity, conductivity, oxygen concentration, temperature and visual.
- Bacteriological parameters are measured in the areas with high tourism activities (samples are taken in bathing zones): total coliforms, faecal streptococci and E. coli characterizing the bathing water quality. The bacteriological sampling techniques are carried out according to ISO 5667/1 and ISO 5667/2.
- Eutrophication parameters where possible eutrophication: water transparency, nitrate /nitrite, phosphate, ammonia, silicate, suspended particular matter and chlorophyll-a.

3.2.4.1. MEDITERRANEAN AND LAKE MONITORING PROGRAMMES

Water quality monitoring in the Mediterranean Sea

The Mediterranean Sea Monitoring Programme monitors water quality along the Egyptian coast on a regular basis to determine water quality, evaluate indicators of pollution and identify sources of pollution along the Egyptian coast of Mediterranean Sea (1150 Km). This is conducted in cooperation with the Institute of Graduate Studies and Research (IGSR) at the University of Alexandria.

The programme started in 1998, with fixed stations and monitoring being conducted on a regular basis for the measurement of natural and chemical and microbiological indicators as follows:

- Physical measurements (temperature, PH, dissolved oxygen, electrical conductivity, salinity, transparency).
- Chemical measurements (nitrate, nitrite, ammonia, total nitrogen, phosphate, total phosphorus, chlorophyll a, silicate).
- Bacteriological Measurements (coli form bacteria, bacteria Streptococcus career, Alaichirxiakolay bacteria).

There are 30 fixed monitoring stations along the Mediterranean coast from Salloum in the west to Rafah eastward covering all activities of affected areas: residential, ports, industrial companies, and touristic villages.

Monitoring the organic and non-organic pollutants, heavy metals, hydrocarbons and pesticides in sediments and biota in the Mediterranean Sea:

The EEAA cooperated with international and regional organizations, MEDPOL and United Nations Programme for the Environment to monitor the persistent organic pollutants and heavy metals, hydrocarbons and pesticides in the bottom sediments and biota in the sea-beds in ten stations in the Mediterranean since 2009. Samples are collected periodically once per year.

Monitoring the water quality and sediments of the northern lakes

The EEAA started a programme in 2009 to monitor water quality and sediments of the northern lakes (54 points) to detect changes in water quality as a result of sea activities and to take corrective action in a timely manner (the quantity of wastewater flowing into the northern lakes is around 16.79 billion cubic metres annually as of 2009). The monitoring programme also assessed the current state of the environment and geological conditions for each of the northern lakes. The programme allowed for the creation of a database control system for the North Lakes and an integrated management process for the development of the lakes, as well as a map of each lake that shows the changing environmental conditions that affect each lake. Water samples and sediments are collected periodically four times a year (March, May, July, and September) to perform various tests.

The following measurements are conducted:

Hydrochemical characteristics (temperature, dissolved oxygen, salinity, electrical conductivity, PH, transparency, turbidity, total content of suspended solids, carbide hydrogen, biological oxygen demand (BOD), chemical oxygen demand (COD), and chlorophyll a).

- nutrients (ammonia, nitrate, phosphate, active-total nitrogen and total phosphate);
- heavy metals (mercury, arsenic, cadmium, copper, zinc, lead, nickel, iron, manganese and chrome);
- pesticides;
- petroleum hydrocarbons;
- evidence of bacteria (total coliform, faecal coliform and faecal streptococci);
- phytoplankton, zooplankton, and bottom fauna and flora.

The monitoring results of 2010 show the need to improve water quality. Results indicate comparisons between the percentages of total nitrogen in the past four years to improve water quality. Also identified are areas of concentration of industrial pollutants and fluid drainage, which have a significant impact on water quality. Maps have been prepared to identify such sources of pollution and periodic inspections are conducted at those facilities, as well as development of mechanisms for environmental rehabilitation programmes according to the environmental impact assessments. Also conducted are grant giving, soft loans and technical support for various industrial facilities to adopt environmentally sound behaviour and adjust their positions according to established criteria in relevant environmental laws.

The department produces an annual report and regular visit reports which are posted on the website. Information is posted on the website about coastal water quality. There is also a database on the Mediterranean Sea and the Red Sea.

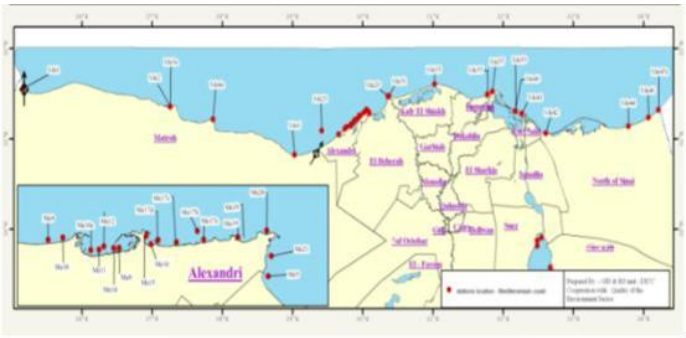


Figure (11) monitoring sites on the Mediterranean coast

3.2.4.2. RED SEA AND GULF OF SUEZ AND AQABA

Water quality monitoring

The Red Sea and the Gulfs of Suez and Aqaba Monitoring Programme monitor water quality along the Egyptian coast on a regular basis to determine water quality, evaluate indicators of pollution and identify sources of pollution along the Egyptian coast of the Red Sea (1200 Km) and Gulfs of Suez and Aqaba (650 Km). This is conducted in cooperation with the National Institute of Oceanography and Fisheries (NIOF).

The programme started in 1998, with fixed stations, and monitoring being conducted on a regular basis for the measurement of natural and chemical and microbiological indicators as follows:

- Physical measurements (temperature, PH, dissolved oxygen, electrical conductivity, salinity, transparency).
- Chemical measurements (nitrate, nitrite, ammonia, total nitrogen, phosphate, total phosphorus, chlorophyll a, silicate).
- Bacteriological measurements (coliform bacteria - bacteria Streptococcus career - Alaichirxiakolay bacteria).

There are 22 fixed monitoring stations along the Red Sea and Gulfs of Suez and Aqaba coast from Suez in the North to Bir Shalatin in the south covering all activities of affected areas: residential, ports, industrial companies, and tourist villages.

Monitoring the organic and non-organic pollutants and heavy metals, hydrocarbons and pesticides in sediments and biota

The EEAA cooperated with PERSGA to monitor persistent organic pollutants and heavy metals, hydrocarbons and pesticides in each of the bottom sediments and biota in sea beds in 17 stations in the Red Sea and Gulfs of Suez and Aqaba coast since 2009. Samples are collected periodically once per year.

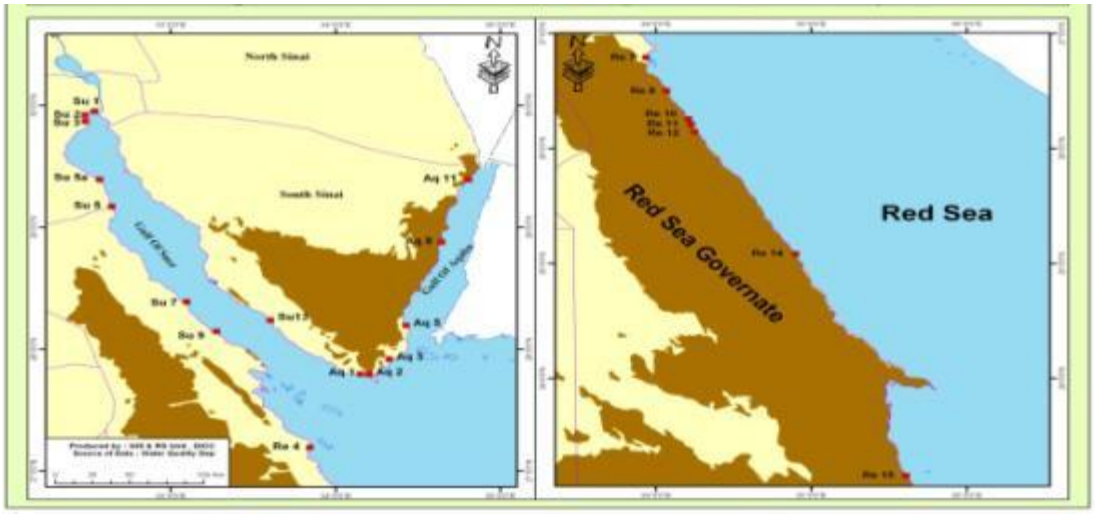


Figure (12) sites of water quality monitoring stations in the Red Sea, Gulf of Suez and Aqaba

3.2.4.3. Cooperation between CAPMAS and other Ministries regarding Coastal Data for Red Sea and Mediterranean Sea Coastal Monitoring

a) Data on monitoring coastal shores quality is available within the EEAA network.

- Thirty fixed monitoring stations were selected along the Mediterranean Coast covering all activities affecting residential areas, ports, industrial companies, tourist villages, in addition to some referential stations (see 3.2.4.1a).
- Ten fixed monitoring stations were selected along the Mediterranean Coast to monitor persistent organic pollutants, heavy metals, hydrocarbons and pesticides in seabed sediments and biota (see 3.2.4.1 b).
- Twenty-two monitoring stations have been selected along the Red Sea Coast and the Gulf of Aqaba and Suez (see 3.2.4.2 a).
- Seventeen fixed monitoring stations were selected along the Red Sea Coast and the Gulf of Aqaba and Suez to monitor persistent organic pollutants, heavy metals, hydrocarbons and pesticides in seabed sediments and biota (see 3.2.4.2 b).
- The total number of monitoring stations in the northern lakes amount to 54. They are distributed as follows to include all parts of the Lakes and represent all different aspects (see 3.2.4.1 c).

Table 7 Number of monitoring stations

Lake	Number of monitoring stations
Al-Bardaweel	12
Edfo	9

Al-Manzala	11
Al-Borolos	12
Maryout	10

b) Monitoring oil pollution by using radar images

Pollution from factories and petrochemical refineries built along the Gulf of Suez shore has been monitored by using processed radar images as shown in the figure below. This pollution could cause serious environmental problems which may affect the ecological balance in the Gulf and the surrounding land as well. The situation could be exacerbated as this risk is mobile and floating, being controlled by wind direction, ebb and tide factors and the intensity of waves. Moreover, the pollutants of a certain area could move to another after a period of time, either directly or indirectly through contaminated fish.

image 1:

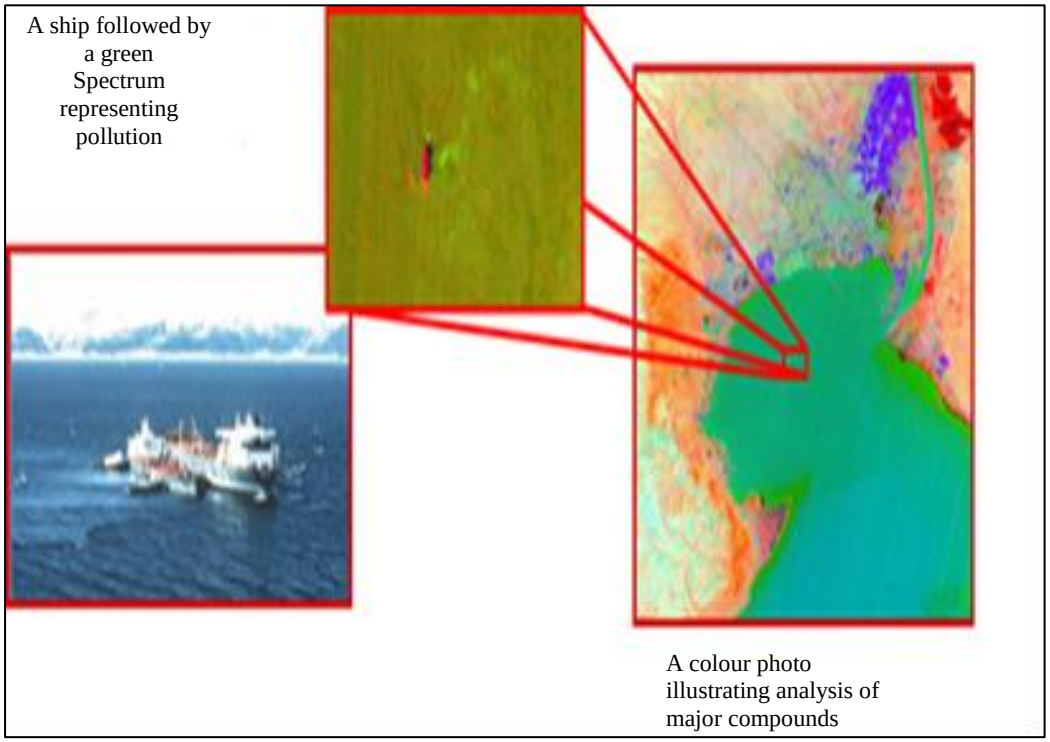


Image 2:

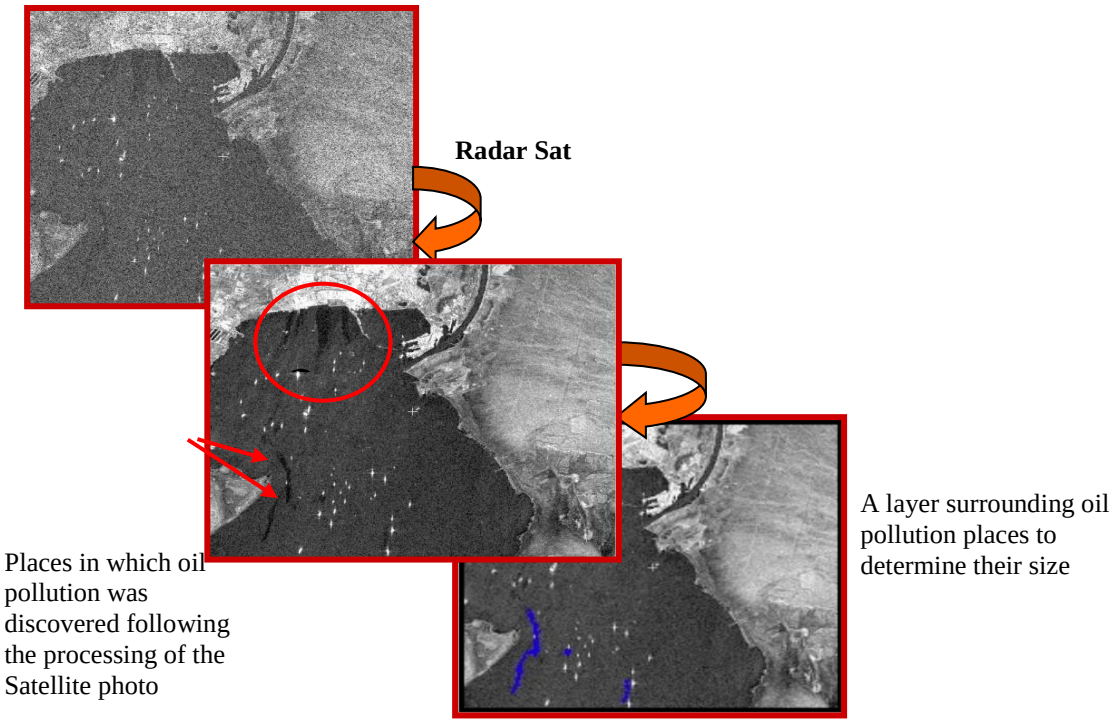


Figure (13) Monitoring oil pollution by using radar images 1 and 2

Monitoring coastal water by using remote sensing is considered one of the best techniques for periodical pollution monitoring in the Suez Canal. It is proposed to apply the same method on coastal beaches to undertake immediate measures to address pollution if financial capabilities are available.

3.2.5. Monitoring of Air Pollution

3.2.5.1. Air Pollution Monitoring Network (MOHP)

Since 2006, the MOHP has utilized an air pollution monitoring network, distributed in various governorates, to measure the different air pollutants such as sulphur dioxide, smoke, total suspended particulates, inhaled particulates, and lead.

Table 8 Air pollution monitoring network of the MOHP

Governorate	Environmental Monitoring Sites				
	Sulphur dioxide	Smoke	Total suspended particulates	Inhaled particulates	Lead
Cairo	14	14	8	3	11
Alex	4	4	4	1	5

Port Said	3	3	2	-	2
Suez	2	2	2	-	2
Damietta	2	2	2	-	2
Dakahlia	2	2	1	-	1
Sharkia	3	3	2	-	2
Qalyoubia	1	1	-	-	-
Kafr-El Sheikh	1	1	-	-	-
Gharbia	3	3	4	1	4
Beheira	3	3	2	-	3
Ismailia	2	2	-	-	-
Fayoum	1	1	2	2	4
Beni Suef	1	1	1	-	1
Minya	5	5	5	1	6
Assiut	3	3	2	1	3
Sohag	1	1	1	1	2
Aswan	1	1	1	-	2
Total	**52**	**52**	**39**	**10**	**50**

Source: Ministry of Health – Environmental Monitoring Centre

3.2.5.2. NATIONAL NETWORK FOR MONITORING AMBIENT AIR POLLUTANTS (EEAA)

The MSEA has established an integrated National Network for monitoring air pollutants composed of 87 stations for monitoring and controlling main air pollutants periodically and continuously since 1998. Additionally, the network monitors other pollutants such as volatile organic compounds (VOCs) and non-methane hydrocarbons compounds (NMHC). Furthermore, the Ministry compiles data from meteorological stations, such as wind speed, direction, temperature, and relative humidity.

The monitoring air quality network includes 87 stations, distributed to 42 instantaneous monitoring stations and 45 sampling stations that include 20 stations to collect lead samples in Greater Cairo.

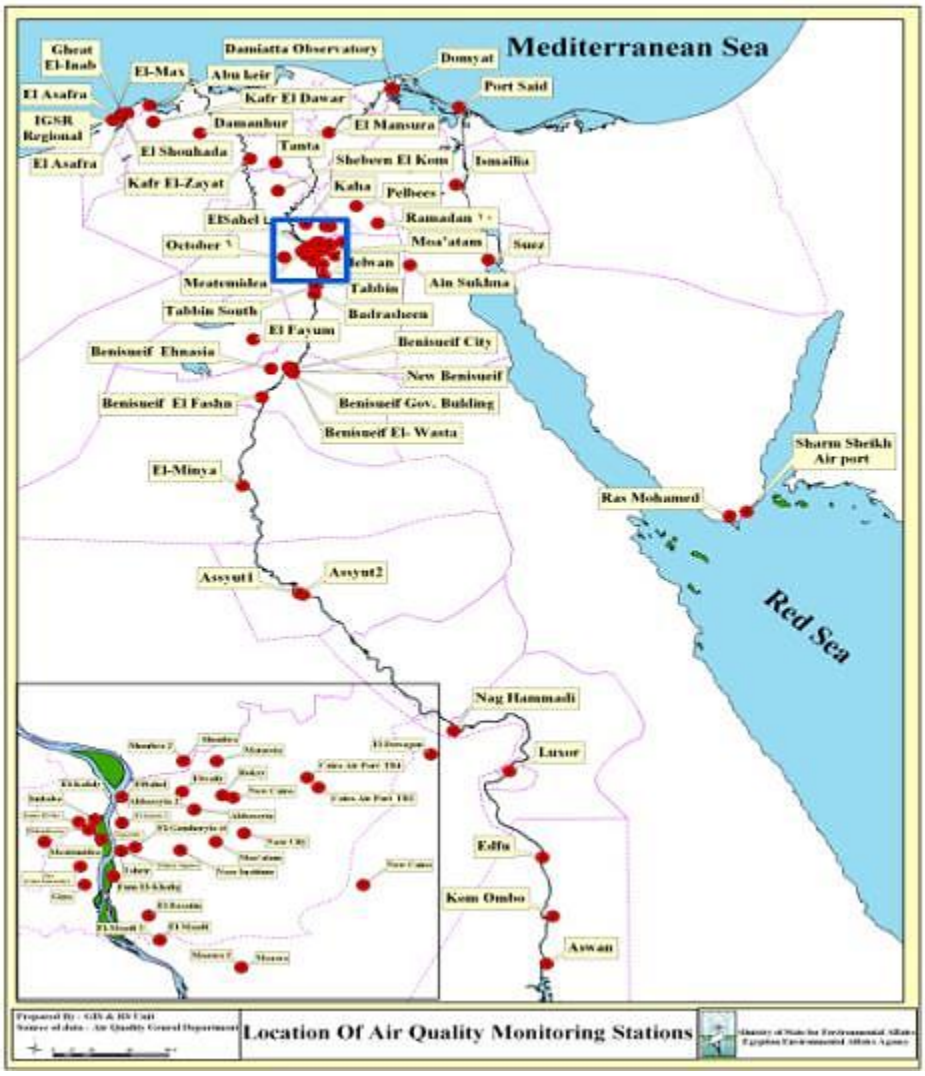


Figure (14) Location of air quality monitoring stations

3.2.5.3. CEMENT INDUSTRY EMISSIONS (EEAA)

Application and activation of Article 20 of the Executive Regulation of Environment Law No. 4/1994, stipulates that the EEAA shall supervise the establishment and operation of the Environmental Monitoring Network, so that a national network to monitor cement companies' emissions has been established. It provides continuous and effective monitoring of the environmental situation throughout the whole day and thus achieves control over cement companies' stacks and takes necessary legal procedures in case of violations.

Eighty-two monitoring sites were followed by the network through continuous self-monitoring of total suspended particulates' emissions from stacks of 17 cement companies in all parts of Egypt.

3.2.6. SOLID WASTE

The Ministry of State for Environmental Affairs is in charge of the development and implementation of waste policy in cooperation with the Ministry of Local Development and the various governorates.

In context of the environmental concepts expanding in waste management and the linking of economies to social and environmental aspects, the process of waste management in most countries of the world has become vital for health and safety. Therefore, the system of waste management has become an integrated and interdependent system. Each step of waste management depends on previous steps, which starts with separation from the source, collection, transport, recycling and recovery of substances that can then be used, with the final step of safe disposal of rejects in landfills. It is necessary at each stage to use adequate and appropriate methods and resources available.

Since July 2009, Greater Cairo has been considered a first priority, through the study of the current situation and problems with the development of executive plans, including the amendment of contracts and the development of collection, transport and increasing recycling rates, as well as selection of new complexes for sorting, recycling and final disposal of waste in adequate spaces and in locations far from residential areas.

Since July 2009, the MSEA, in coordination with all stakeholders have developed waste management systems through implementation of the following:

- choosing five new sites as collectors for sorting, recycling and final disposal of waste in the desert. The MSEA approved these sites and presidential decree No. 86 was issued in 2010 for the benefit of the governorates of the region;
- Preparing and implementing plans for the development of waste systems in Giza and Cairo governorates;
- determining the needs of handling the new stations and the development of existing plants;
- implementation of two transfer stations is in progress to sort waste for those interested, so as to ban random waste sorting;
- improving the work performance of contractors and garbage collectors through organization of the contractual relationship with companies and the transfer of current sorting activities to the new automatic sorting stations in Katamiya and El Salam;

- developing monitoring systems for the performance of companies and authorities working in the field through the establishment of monitoring units in each district, in addition to training technical teams and providing them with necessary equipment and tools;
- projects to generate energy from waste. Through global proposals two projects have been selected, and feasibility studies are currently being organized in preparation for the signing of agreements to start implementation;
- a national campaign to raise environmental awareness of negative behaviours and the dangers of handling waste. Announcement of currently implemented development plans, as well as encouraging citizens to participate in achieving the desired objectives of development efforts.

3.2.7. HAZARDOUS WASTE

In light of this vision, some guiding principles are used, taking into account the waste management hierarchy (prevention, minimization, reuse, recycling, recovery including energy recovery, and final disposal.).

In doing so, the MSEA encourages treatment options that deliver the best overall environmental outcome, taking into account life-cycle thinking.

The MSEA has implemented an inventory of hazardous electrical and electronic waste, such as that of fluorescent bulbs. A pilot model has been conducted for surveying fluorescent bulb waste that is generated annually by ministries, hospitals, hotels and universities. An inventory of factories producing plastic bags and paper has also been conducted to develop a strategy for reducing use of plastic bags and encourage use of alternatives such as paper, cardboard, cloth, thick and multi-use plastic bags.

An inventory has been conducted for governmental and private sector health-care facilities, in addition to quantities of hazardous medical waste generated annually.

As the acting national focal point under the Basel Convention the MSEA is responsible for controlling and monitoring trans-boundary movement of hazardous waste passing through Egyptian territory in coordination with the Suez Canal Authority. The hazardous waste department at the MSEA receives notifications of trans-boundary movement from the authorities of exporting countries to permit hazardous waste shipments from the Far East to Europe for recycling or final disposal under the Basel Convention.

3.2.7.1. HAZARDOUS WASTE MANAGEMENT IN EGYPT – CURRENT STATE OF PLAY AND OPPORTUNITIES FOR INFORMATION SHARING

Hazardous waste management is important for the protection of the environment, human health, promoting sustainable livelihoods and achieving Millennium Development Goals. Such management options deliver the best overall environmental outcomes and include controlling trans-boundary movements, prevention, minimization, reuse, recycling, and recovery including energy recovery and final disposal.

The current situation of waste quantity is increasing. There is over 20 million tons of municipal waste mixed with hazardous components. Within the regulatory structure, there are no infrastructural facilities, and obligations of the local authorities are geared towards household waste collection recovery and disposal. Discretion is practiced with regards to commercial and industrial waste.

There have been concerns regarding disposal of hazardous waste and it is recommended that policy tools need to be instigated to safeguard safe disposal. Such policy tools take into account extended producer responsibility; polluter pays principle; encouraging recognition of wastes as a resource; developing integrated wastes management; and utilizing life-cycle approach.

3.2.7.2. WASTE STATISTICS

Ordinary and hazardous waste generated by the Ministry of Health hospitals			
Waste generated by health institutions during 2010			
Number of beds	Total waste (kg/day)	Hazardous waste (kg/day)	
Number of beds in different sectors from 2000 to 2010			
Year	Governmental sector	Private Sector	Total
Hazardous waste, incendiaries and vehicles transporting hazardous waste during 2010			
Governorates	Number of Incendiaries	Number of vehicles transporting hazardous waste	Average weight of waste

3.2.7.3. National Efforts to Develop Municipal Solid Waste Management

The current situation of annual solid waste in Egypt is 75 million tons. There are many different entities operating in Egypt in solid waste, such as the government, traditional garbage collectors, foreign companies, local private companies, compost factories, treatment stations and sanitary land filling.

Solid waste management in Egypt faces many challenges that render the whole system unsustainable and incomplete due to shortages of equipment, insufficient funds, lack of environmental awareness and poor economic management. Egypt needs a total of 1.5 billion Euros to manage waste. With this in mind, a national solution became an immediate priority to the government of which a ministerial committee was formulated to prepare plans for the management of solid waste. A Presidential Decree was then issued for the allocation of land. The availability of local expertise was utilized in receiving and sorting, sorting line feeding, initial sorting, bag opening, collection, packing, compressing, recycling, compost production, and reject land filling. There are currently seven landfill areas with four being constructed. as well as five sorting and treatment sites. A pilot project with a Canadian company is being implemented in Helwan region to transfer waste into energy. If successful, the project will be replicated.

The National Programme for Integrated Management of Solid Waste addresses the following:

- Planning Phase: this phase would be conducting the necessary steps to accurately measure daily output, organize garbage collectors and sub-contractors, designate proper locations for waste handling, create mediatory transfer stations for waste sorting, and establish a system to transfer waste to energy. This phase is a preparatory step to establish monitoring units, utilize railways for transfer of waste, create legal and institutional reforms, allocate sufficient funds and raise awareness through media campaigns.
- Operational/Implementation Phase: solid waste management should be handled by private companies in which fees are paid per ton for collection, transportation, sorting, treatment, and final disposal. Currently, there are three private companies which have contracts for 15 years.
- Current Status: implementation is underway along with remediation of 15 million metres of waste in Cairo. A total of LE46 million were allocated for equipment and 151 projects were completed in villages across the country. The second phase plans to cover a total of 373 villages. The programme seeks technical, institutional, financial support and technology transfer.

The current cooperation is based on ad hoc request; there is no common environmental information system.

There are unclear processes of environmental information collection, production and dissemination, and the fact that monitoring organizations do not feed their results into a common information system.

3.3. EXISTING INFORMATION SYSTEMS

3.3.1. EGYPTIAN ENVIRONMENTAL INFORMATION SYSTEM (EEIS)

3.3.1.1. BACKGROUND AND LEGISLATION

Effective environmental management and protection relies on a sound decision-making process that incorporates the formulation and implementation of policies, legislation, programmes and projects, based on the timely storage, retrieval, processing and analysis of the appropriate environmental information. In this respect, environmental information systems have come to present a primary tool within the Ministry of State for Environmental Affairs (MSEA) and its executive institution, the Egyptian Environmental Affairs Agency (EEAA), for planning and decision-making processes, as well as the dissemination of environmental information. It is supported within the scope of the Egyptian Environmental Information System (EEIS), under the mandate of Environment Protection Law No. 4/1994, which encompasses the collection, processing, production and distribution of environmental information. The New Development Zones Information System (NDZIS) supports the activities of the MSEA and EEAA in carrying out environmental assessment of new development zones, as well as the Environmental Contingency Plan Information System (ECPIS). The Industrial Pollution Information System (IPIS) is another application used as a management tool by the Environmental Inspection Unit for tracking information concerned with industrial compliance to environmental requirements and regulations. Furthermore, the development of an Executive Environmental Information System which started in 2000–2001 was designed to support decision-makers at the executive level in the MSEA and EEAA by providing an overview of key environmental information. In this context, an initial focus has been placed on air quality in Greater Cairo, with support provided from the Cairo Air Improvement monitoring network.

The Ministry and the Agency's web site www.eeaa.gov.eg has been developed to:

- provide environmental information to the public, specialists, and researchers (free service);

- identify the Ministry's and Agency's activities;
- strengthen public service and support;
- educate the community (environmental awareness);
- receive community feedback.

The linkage between the MSEA and EEAA and other ministries, authorities, organizations and the general public is continuously strengthened through dissemination of environmental information. In this regard, the MSEA and EEAA web site (www.eeaa.gov.eg) is regularly updated with:

- new information on policies.
- activities and services of the MSEA and EEAA.
- a public complaints system has also been established for receiving environmental inquiries and complaints on the internet.

Within this context, a functional version of the Environmental Common Information System (ECIS) of the Egyptian Environmental Information System (EEIS) was operational in 2000–2001, an initiative launched in 1997 in partnership with the Canadian International Development Agency (CIDA), and the deployment of the ECIS to different users within the MSEA and EEAA. This system, currently hosting some maps and environmental data, is gradually being expanded with the aim of eventually housing processed EEAA and MSEA data, and allowing on-line access to this data. Within the context of extending the ECIS to the area of nature conservation, the Saint Catherine protectorate was provided with a linkage and plans are underway to further extend this to other Red Sea protectorates

3.3.1.2. THE MAIN USERS OF THE EEIS

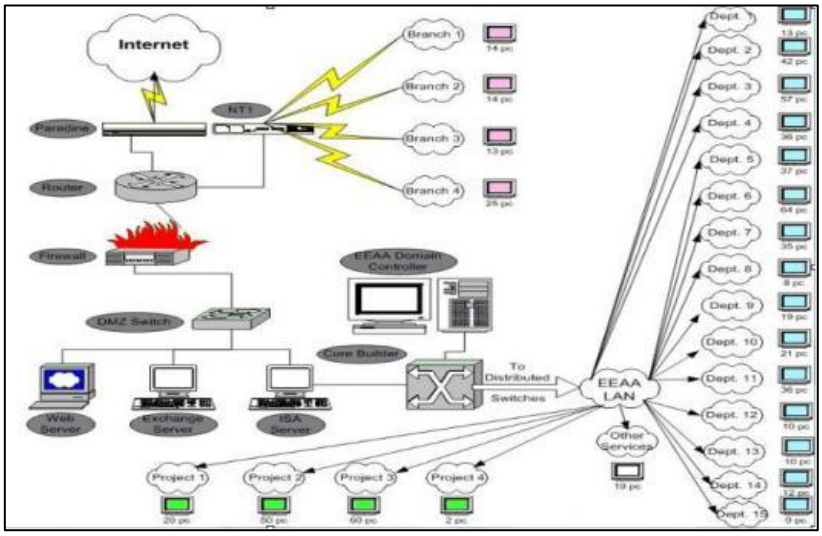
- Executive management level of the EEAA
- The central department of planning: International Cooperation and Disasters Management
- Environmental Inspection Unit
- The Nature Conservation Sector
- The Environmental Management Sector
- The Environmental Quality Sector
- The EEAA Regional Branch Offices

3.3.1.3 . OBJECTIVES

- to provide the EEAA with an operational and functional Environmental Information System (EIS) and to assist with the capacity building of EEAA staff;
- to enhance capacity to use environmental information for decision-making and policy formulation through the implementation of an EIS.

3.3.1.4. STRUCTURE

Figure 11 EgyptianEnvironmental Information System Structure



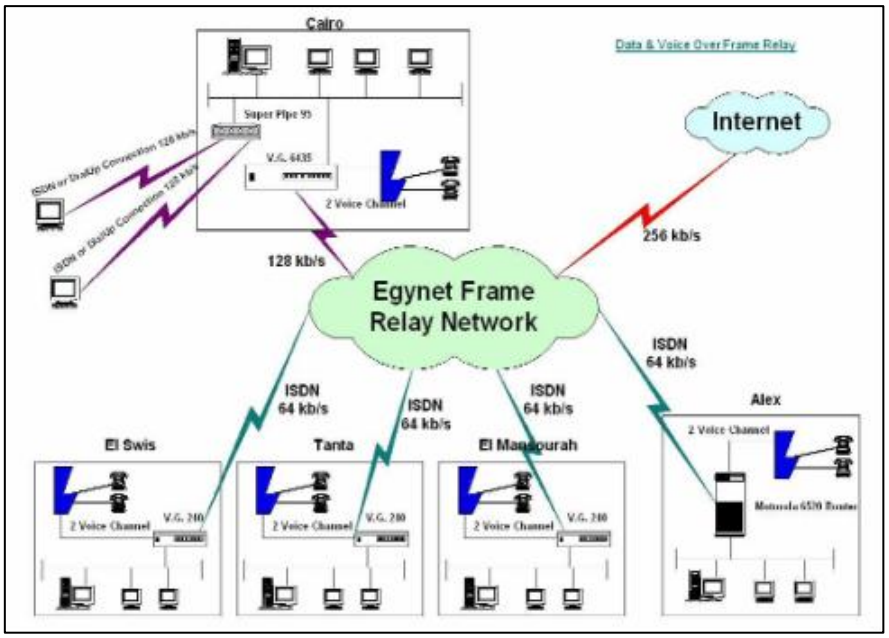


Figure 12 EEAA WAN Connection between the EEAA and the RBOs

3.3.1.5. ACTIVITIES

The EEIS includes four major initiatives:

- technical infrastructure;
- development of IT applications;
- environmental Information Strategic Plan;
- design of a Service Provision Plan.

Within these initiatives there are several activities that are carried out, for example:

- support to the EIA database system, the Early Warning System for air quality in Greater Cairo, monitoring of cement factories, the initiative concerned with the setting of municipal solid waste landfills in all Egyptian governorates, as well as the Egyptian Hazardous Substances Information Management System (EHSIMS), currently underway to be transformed into a web-based application;
- the implementation of risk assessment models through the application of GIS;
- the production of digital maps for Egypt;
- establishment of a database of all maps;
- preparation of standards for map making and publishing.

3.3.1.6. OUTPUTS

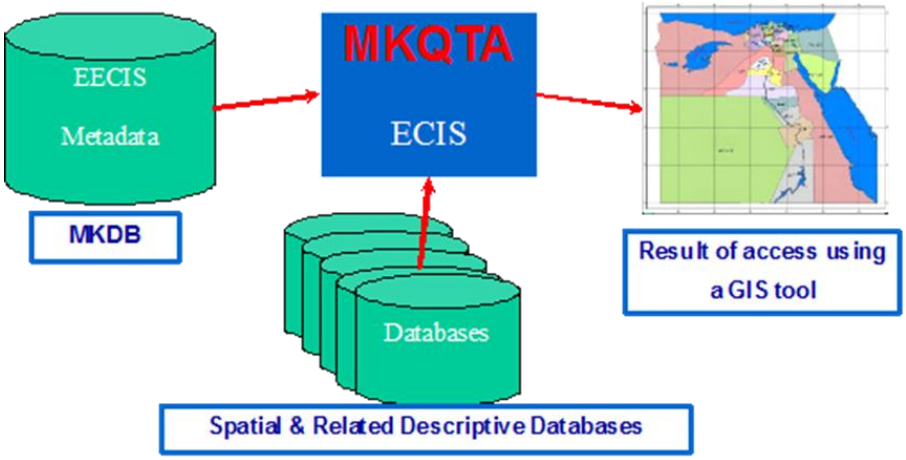
- publication of environmental reports such as the first Egyptian State of the Environment Report, 2004, and the second State of the Environment Report, 2005;
- reliable agency-wide technical infrastructure, such as hardware and software;
- effective and reliable collection of environmental information within and outside the EEAA;
- enhanced EEAA capacity to use environmental information through the development of IT applications;
- effective environmental information exchange and access within and outside the EEAA, creating an environmental information management and dissemination committee;
- implementation of a standardized planning system;
- increased production of EEAA documents, such as guidelines;
- a comprehensive environmental information metadata base;

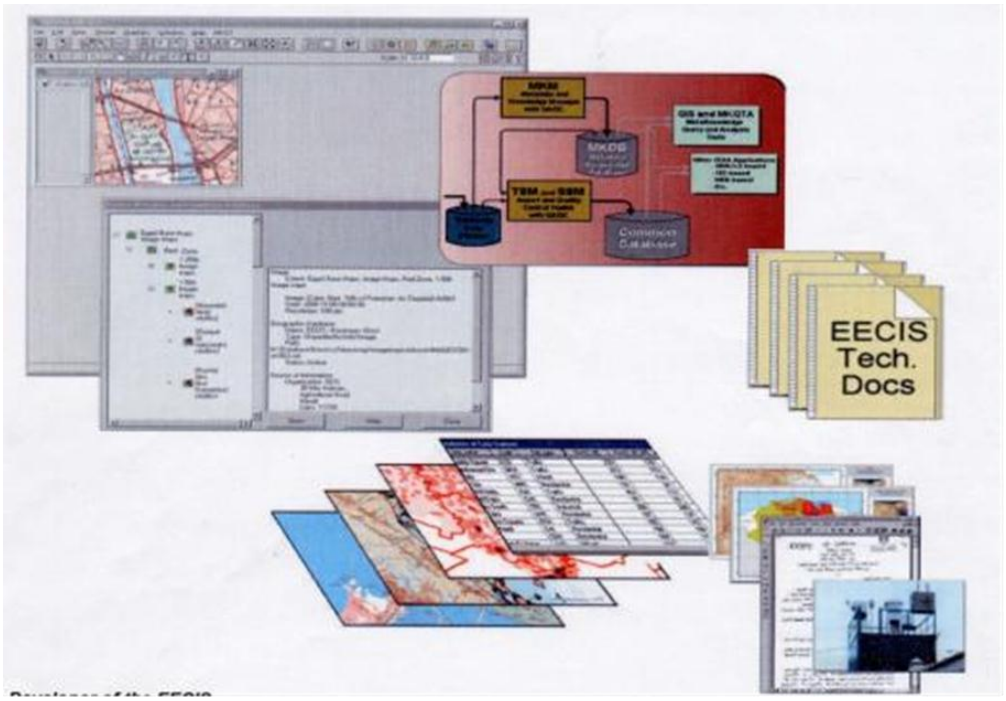
- establishment of planning system guidelines and supporting tools;
- production of planning documents;
- establishment of planning system guidelines and supporting tools; and
- production of planning documents.

3.3.2. AVAILABLE EEIS INFORMATION SYSTEMS

3.3.2.1. ENVIRONMENTAL COMMON INFORMATION SYSTEM (ECIS)

Developing and maintaining the ECIS, the data infrastructure to access and maintain environmental information that ensures standardization, data integrity and data inter-operability.

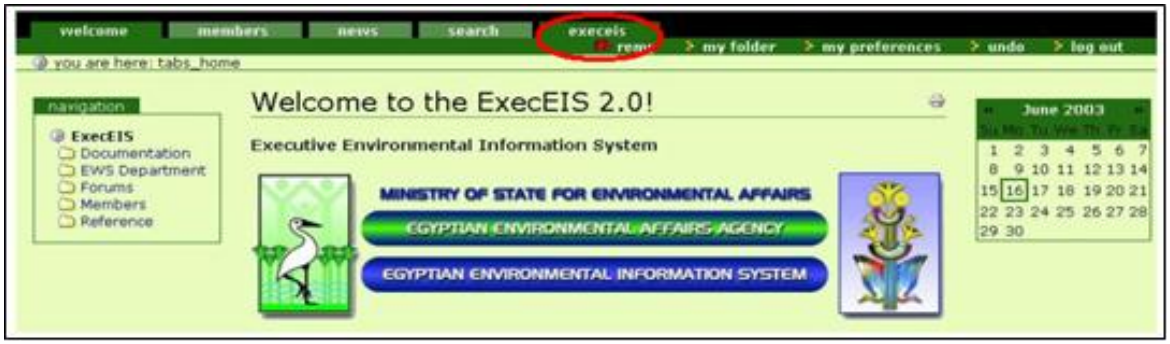


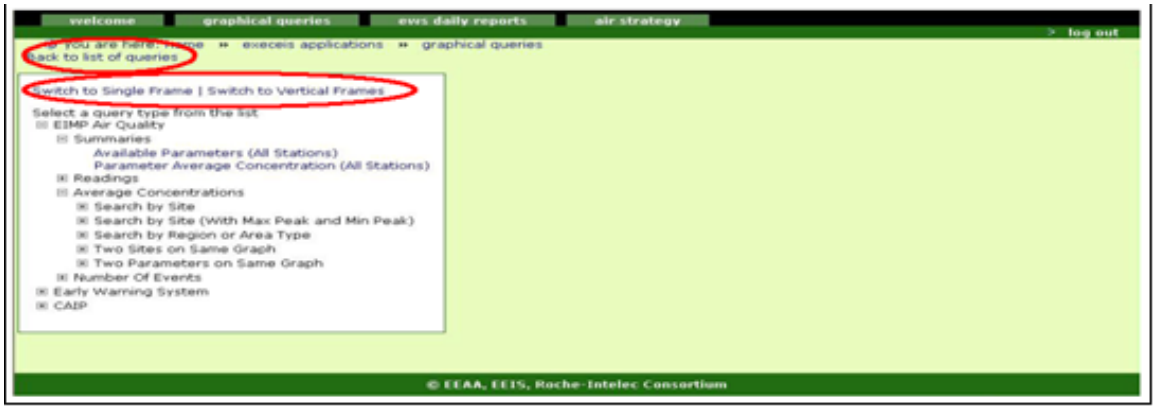


3.3.2.2. EXECUTIVE ENVIRONMENTAL INFORMATION SYSTEM (EXEC EIS)

The system provides decision-makers with rapid access to agency information and to make use of the application's analytical tools to facilitate decision-making.

Communication tool for Agency events





3.3.2.3. EARLY WARNING SYSTEM DAILY REPORTS

Available parameters for selected period:

site	parameter	unit of measurement	number of readings	starting date	ending date
Abbasseya	NRAD	W/m3	3349	2003/01/01	2003/05/31
Abbasseya	O3	ug/M3	3528	2003/01/01	2003/05/31
Abbasseya	PM10	ug/M3	3240	2003/01/01	2003/05/31
Abbasseya	RH	%	3420	2003/01/01	2003/05/31
Abbasseya	SO2	ug/M3	3456	2003/01/01	2003/05/31
Abbasseya	TempU	Deg C	3329	2003/01/01	2003/05/31
Abbasseya	WD	Deg	3596	2003/01/01	2003/05/31
Abbasseya	WS	m/s	3597	2003/01/01	2003/05/31
Alexandria Regional	CO	mg/M3	309	2003/01/03	2003/04/24
Alexandria Regional	NO	ug/M3 (as NO2)	986	2003/01/02	2003/04/30
Alexandria Regional	NO2	ug/M3	1180	2003/01/02	2003/04/30
Alexandria Regional	NOX	ug/M# (as NO2)	1116	2003/01/02	2003/04/30
Alexandria Regional	NRAD	W/m3	1240	2003/01/01	2003/04/30
Alexandria Regional	O3	ug/M3	2223	2003/01/01	2003/04/14
Alexandria Regional	PM10	ug/M3	928	2003/01/01	2003/04/25
Alexandria Regional	RH	%	1852	2003/01/01	2003/04/30
Alexandria Regional	SO2	ug/M3	1604	2003/01/01	2003/04/26
Alexandria Regional	TempU	Deg C	1648	2003/01/01	2003/04/30
Alexandria Regional	WD	Deg	1848	2003/01/01	2003/04/30
Alexandria Regional	WS	m/s	2112	2003/01/01	2003/04/30
Assyut1	NO	ug/M3 (as NO2)	2596	2003/01/14	2003/05/31
Assyut1	NO2	ug/M3	2596	2003/01/14	2003/05/31
Assyut1	NOX	ug/M# (as NO2)	2596	2003/01/14	2003/05/31
Assyut1	PM10	ug/M3	2427	2003/01/14	2003/05/29
Assyut1	SO2	ug/M3	1878	2003/01/14	2003/05/31

3.3.2.4. INDUSTRIAL POLLUTION INFORMATION SYSTEM (IPIS)

The Industrial Pollution Information System (IPIS) manages and analyses industrial data to obtain information needed to locate potential polluters and support the process of environmental planning and decision-making.

First input screen of the IPIS application

3.3.2.5. INDUSTRIAL ZONES INFORMATION SYSTEM (IZIS)

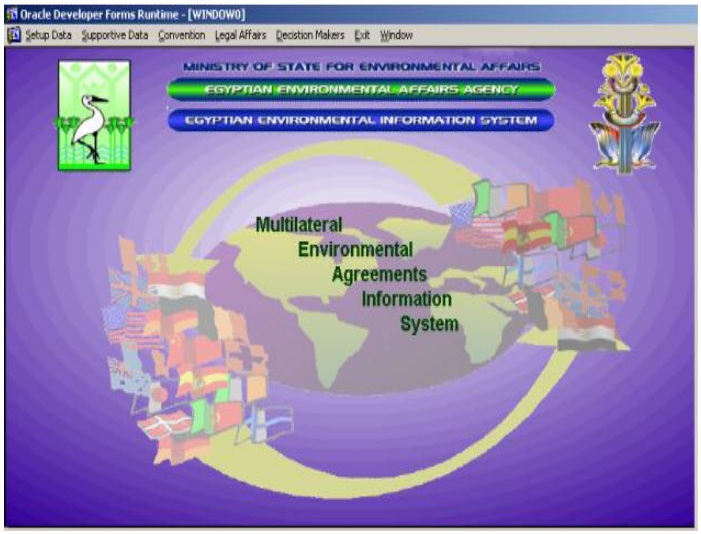
- The Industrial Zones Information System (IZIS) manages and analyses industrial and environmental data about officially recognized New Industrial Zones;
- The information system compares the collected data against permissible values established through Egyptian laws and policy.

3.3.2.6. URBAN AND RURAL DEVELOPMENT AREAS INFORMATION SYSTEM (URDAIS)

The objective of the Urban and Rural Development Areas Information System (URDAIS) is to assist personnel of the Egyptian Environmental Affairs Agency in the management, analysis and reporting of information regarding urban and rural development areas.

3.3.2.7. MULTILATERAL ENVIRONMENTAL AGREEMENTS INFORMATION SYSTEM (MEAIS)

The application stores all the Multilateral Environmental Agreements that Egypt has signed and approved in text format.



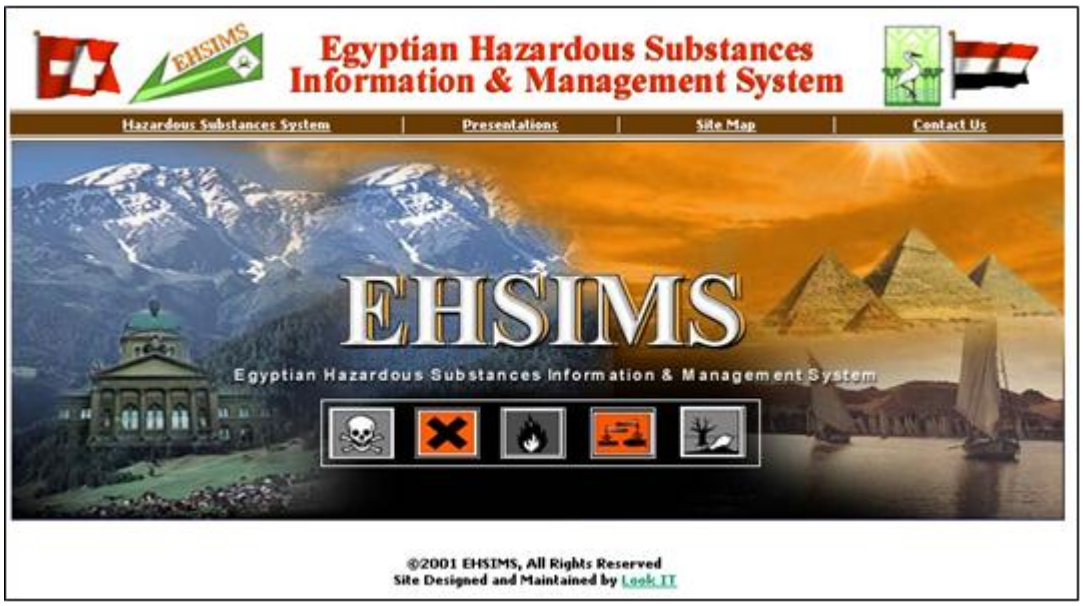
3.3.2.8. ENVIRONMENTAL PROJECTS INFORMATION SYSTEM (EPIS)

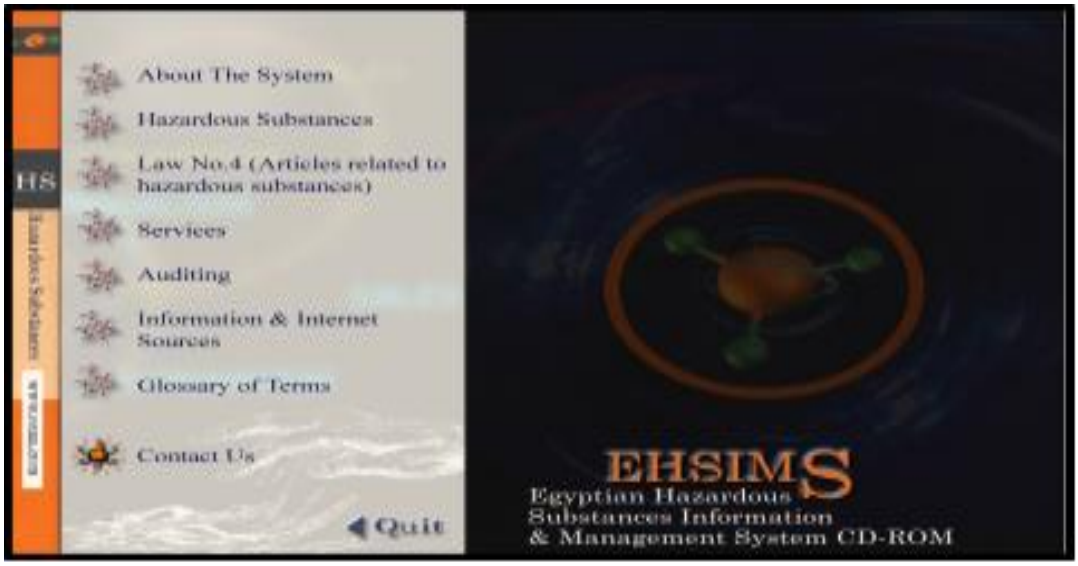
The application contains basic data about projects and donor agencies. This provides a general map for the environmental scope of Egypt; both geographical and technical. It can produce periodical reports about projects (progress reports, financial reports and status reports).

3.3.2.9. EGYPTIAN HAZARDOUS SUBSTANCES INFORMATION AND MANAGEMENT SYSTEM (EHSIMS)

Initiates a management system for hazardous substances in Egypt, through:

- providing basic guidelines and information for safe handling.
- information dissemination through information network:
    A. Production of guidelines.
    B. Computerization of the permitting procedures, as required by Law 4/1994.
    C. Computerization of tables and lists of hazardous substances.
    D. Setting up of the information network.
    E. Monitoring and Evaluation.





3.3.3. ENVIRONMENTAL APPLICATION USING GIS AND RS

The EEAA utilizes the Geographic Information Systems (GIS) in the Environmental Common Information System to ensure standardization, data integrity and data inter-operability.

Such a system provides detailed different environmental information, typographical maps, and land set images, mapping of solid waste and wastewater treatment stations; rice straw recycling, noise pollution identification and natural protectorates distribution in all Egypt. The system also outlines the ideal locations for landfill site selection areas in all governorates.

The GIS system has presented the EEAA with diverse information that has been utilized in its National Environmental Action Plan (2002–2017). The system forecasts water supply and treatment in the coming years, as well as growth of industrial areas, tourism activities, and agricultural expansion. The GIS system also detects the percentage of green areas, urban encroachment on vegetated land, and determines extensiveness of marine ecosystems along the Red Sea coast. Through GIS, oil pollution monitoring occurs in the Gulf of Suez, and air pollution is also monitored for inspection purposes.

3.3.4. Summary of Components of Egyptian Environmental Information Systems

Table 9 components of Egyptian Environmental Information Systems

No.	Information System Name	User Department	Developed By
1.	EHSIMS (Egyptian Hazardous Substances Information Management System)	Hazardous Substances and Materials Dept.	Information and Computer Centre Dept. Incorporation with Swiss Project.
2.	IPIS (Industrial Pollution Information System)	Inspection Dept.	Information and Computer Centre Dept. Incorporation with Canadian Project.
3.	URDAIS (Urban and Ruler Developed Areas Information System)	Environmental Management Sector	Information and Computer Centre Dept. Incorporation with

			Canadian Project.
4.	NIZIS (New Industrial Zones Information System)	Environmental Management Sector	Information and Computer Centre Dept. Incorporation with Canadian Project.
5.	EPIS (Environmental Projects Information Systems)	Environmental Management Sector	Information and Computer Centre Dept. Incorporation with Canadian Project.
6.	MEAIS (Multilateral Environmental Agreements Information System)	International Cooperation Dept, Protectorates Sector, Desertification Centre.	Information and Computer Centre Dept. Incorporation with Canadian Project extension by GEF.
7.	ALIS (Advanced Library Information System)	Library	IDSC
8.	EREMIS (Egyptian Regional Environmental Management Information System)	Branches Sector and EEAA Branches.	Information and Computer Centre Dept. Incorporation with Danish Project.
9.	POP's	Hazardous Substances and Materials Dept.	Danish Project.
10.	PIC's	Hazardous Substances and Materials Dept.	Danish Project.
11.	Asher	Hazardous Substances and Materials Dept.	Danish Project.

4. OVERALL CROSS-ANALYSIS

The purpose of this study report is to highlight and identify consistent realities that constitute country-specific gaps and needs in content, infrastructure and institutional cooperation and address challenges to long-term implications through addressing locally grounded knowledge and reviewing recommendations based on institutional experiences that could support policy-making and capacity building as well as forge linkages between the Mediterranean countries which is a critical factor to making progress in any environmental strategy and assuring political support in strengthening the environment statistical system.

The study focused on the following issues:

- The inter-institutional cooperation. The main agencies were identified to analyse their mandate, organizational structure and their data inputs.
    a. Ministry of State for Environmental Affairs (MSEA).
        - Egyptian Environmental Affairs Agency (EEAA).
    b. The Central Agency for Public Mobilization and Statistics (CAPMAS).
    c. Ministry of Water Resources and Irrigation (MWRI).
    d. Ministry of Health and Population and the Environmental Monitoring Centre.

e. Ministry of Electricity and Energy.
   - Holding Company for Electricity.
   - New and Renewable Energy Authority (NREA)

f. Ministry of Local Development.

g. Ministry of Housing, Utilities and Urban Development.

- The capacities and infrastructure of the existing institutions. Capacities for monitoring pollution of fresh water, ground water, drainage water, coastal areas, air pollution and solid and hazardous wastes were identified.
- The existing environmental information systems in Egypt.
- The effectiveness of the available systems. It lists the constraints and barriers. It highlights the implementation challenges and the existing data sharing mechanisms.
- The country needs, ways for enhancing Egypt's monitoring systems and lists the main points that should be considered while implementing the SEIS at the country level.
- The recommendations for priority actions.

There are a number of achievements regarding the development of Environmental Information Systems in Egypt. Among these successes is the regular production of Egypt's state of the environment reports. Since 1995 and MESA is publishing these series of SOE reports. CAPMAS has also publishing its annual statistical report, which is considered an official publication of the country's statistical information including environmental data. The data is shared among various organizations including Ministries of health, water resources, housing, local development and energy. EEAA is continuing the first phase of the Egyptian information system. The second phase aims at managing and accessing the risk resulting from the hazardous substances. This is the stage of transferring the system to Web based application to avoid the problems in the communication net to connect a group of ministries through the Internet.

The hazardous substances information and management system provided a guiding model to form a contingency plan within the establishment, the warning system, the responsibilities of the contingency centre, moving within the location, the procedures of closing, a trial of plan implementation, and a national perspective on the hazardous substances management. Egypt is considered one of the countries that realized the national perspective of chemicals before year 2000.

The use of the geographical information system is used in MESA to construct a special system for the solid wastes (agricultural- industrial). It was applied on: agricultural wastes- industrial- garbage- health care- construction and demolishing wastes- sewage purification wastes. Moreover, the role of coordination between the various groups to solve the problems of these kinds of waste was assured.

EEAA Established a remote sensing unit for the different environmental applications such as development of the protected areas, monitoring the coastal zones as well as the follow up on the pollution resulted from oil spill, identifying of urban areas, and establishment of green belts after specifying the sources of air pollution.

4.1. CONSTRAINS AND BARRIERS

The most significant constraint to establish integrated environmental information systems in Egypt is the lack of reliable and timely information indicating how the various sectors of society impact on the environment and whether development is becoming more sustainable or not. Another constraint is that the existing data and information is not adequately managed due, in part, to a host of factors, including the lack of financial resources, trained workforce, awareness and availability of information and/or institutional setup. Other constraints related to the processes of environmental information collection, production, and dissemination are evident in Egypt. Furthermore, the monitoring organizations do not feed their results into a common information system; and there is an absence of a comprehensive methodological.

4.2. IMPLEMENTATION CHALLENGES

- relatively limited coordination and network of EEAA with other ministries makes it difficult for EEAA to express their needs except through different committees;
- absence of EEAA counterpart staff at management and technical levels;
- lack of understanding of cultural norms and how work is undertaken and completed differently in each culture;
- reluctance to provide or share data due to concerns about implications for data owners.

4.3. DATA SHARING MECHANISM

SEIS national committee is required to establish standards and protocols for the management of shared data within the data providers, as well as for the dissemination of environmental

information. Two technical working groups are recommended, one for environmental information management and another for environmental information dissemination.

SEIS Management Technical Working Group (SEIS-MTWG) would be concerned with shareable or common data.

The following activities are proposed:

1. The working group would have to define its role, responsibilities, working environment, expected results, and schedule.
2. Shareable data within Ministries must be defined in contrast to applications or department specific data.
3. Responsibilities for the management of shareable data must be established for its collection, quality control, maintenance, updating, and recovery. This may require the creation of a special unit to manage this activity or that some departments assume additional work for the benefits of other.
4. SEIS-MTWG will need to ensure that the data sets that are used in more than one application are managed efficiently and appropriately (e.g., hazardous substances, coastal pollution, waste data).
5. The impacts of the recommendations and standards should be evaluated and mitigated as they pertain to training of human resources and commitment of additional resources.

SEIS Dissemination Technical Working Group (SEIS-DTWG) would be concerned with the dissemination of environmental information within and outside data providers.

4.4. Country Needs

There are two main factors that are needed and can facilitate introduction of SEIS in Egypt:

- existence of administrative statistical system;
- more positive developments in environmental monitoring sphere.

This includes development of a complete list of main environmental indicators, which is consistent to one defined by the international environmental organizations and programmes, uses international standards and classification schemes, as well as ensures accessibility and inter-compatibility of national and international methodologies used in Egypt, in this field there are a number of constraints for implementation of coordinated SEIS in Egypt, namely:

- enhancement of appropriate legislative framework for introduction and maintenance of shared environmental information management system;
- information flow management among stakeholder organizations;
- state programs on implementation of integrated monitoring of the state of environment need to be improved;
- data exchange mechanisms through various governmental ministries and agencies through some committees only.

4.5. ENHANCING THE ENVIRONMENTAL MONITORING CYCLE

This could be conducted through integrating the monitoring programmes in the different ministries and agencies and avoiding the duplication and overlapping of efforts, procedures and actions taken by these agencies.

Also develop the cooperation between these agencies in implementing the monitoring programmes and exchange expertise between them.

4.6. POINTS TO CONSIDER FOR THE IMPLEMENTATION PLAN

The next steps to reach positive cooperation with SEIS project can be defined in some specific points which are very important for implementing an integrated environmental information system as follows:

- promote the setting up of national and regional environmental information systems;
- improve capacities in the field of monitoring, collection, storage, assessment, and reporting of environmental data;
- support an environmental indicators system based on the international standards and methodologies.

4.7. RECOMMENDATIONS OF PRIORITIES FOR ACTION

- There are numerous ways of cooperation and protocols of cooperation that have to be drawn.
- There are data gaps and data inconsistencies which need to be addressed and cooperation grounds should entail exchange and dissemination of information especially on the website. (CAPMAS stated this in reference to Ministry of Water Resources and Irrigation)

- Data quality control and efficiency needs to be addressed. Data differs from one organization to the other and conflicting data that is sent by organizations. Some organizations do not provide raw data and send images of data instead. Other organizations develop the same reports (duplication of efforts).
- Accessing information is apparently difficult. Delays have been noticed in transferring, disseminating or relaying data.
- There should be a clear definition as to national security information and determining and defining what and how much of that environmental information can be classified as national security.
- There should be a mechanism for coordination between organizations, authorities and stakeholders and such coordination has to have a secretariat. It is suggested that EEAA handle this assignment.
- A national environmental database network has to be developed and roles have to be identified and comply with International standards. Such network should include all data providers and it should specify information they collect and publish and the network members have to sign protocols.
- It is advisable to use IRMES and develop it to include all information.
- There should be information exchange between Mediterranean countries. This exchange will ensure regular meetings such as quarterly meetings and databases to be developed for Mediterranean countries.
- For a national database to be developed, or a hub of information, a survey should be conducted on the stakeholders, available data infrastructures, a map of data sources, data gap analysis, and data inconsistency reports. All this should also be accessible for environmental specialists and CAPMAS.
- Capacity building should be conducted.
- Egypt's regional, international and contractual obligations should be reviewed periodically.
- Supplying data producers with equipment (computers / printers / servers) and connecting them to the Ministry of Environment Information Network.
- Developing the Environmental Information Network currently in force to go in line with the "Horizon 2020 Initiative" and its systems.
- Upgrading capacities and human resources through organizing courses and participating in local and international and regional environmental seminars.

- Providing technical assistance and training support to finalize the following topics:
  - National Environmental Accounts in the fields of water and air.
  - Development of methodological frameworks for the production of indicators and statistics of the green economy.
- Finalizing technical and environmental cooperation projects with Germany particularly the Twinning Project to complete and develop the statistical work in the field of waste.
- Making optimum utilization of GIS data as well as remote sensing.
- Cooperating with the European Union to implement joint environmental surveys.
- Participation in implementing the ambitious plan adopted by the United Nations and the European Union regarding training on means of calculating and estimating national environmental accounts.
- Following up the use of new and renewable energy in Egypt and connectivity to the National Grid for Electricity.
- The necessity of increasing the use of natural gas in the production of electricity due to its economic dimension and impact on the environment in Egypt
- Promotion of cooperation among concerned ministries to facilitate the timely flow of data to ensure the adoption of the appropriate decision.
- The importance of receiving required technical assistance from international institutions for the completion of the missing data on environment and the calculation of the cost of environmental pollution transmitted from one state to the other.
- The necessity of supplying the General Administration of Environment Statistics with potentialities to set up a fully-equipped computer lab.
- Providing ministries and concerned parties with necessary equipment and fax machines for the smooth and timely exchange of data.
- The importance of connecting various ministries together through the Environmental Information Network
- Development of human capacities in the field of Data Environmental Analysis as well as providing the technical support necessary to achieve this objective.

4.8. CONSTRAINS AND BARRIERS:

The most significant constraints to establish integrated environmental information systems in Egypt are:

- lack of reliable and timely information indicating how the various sectors of society impact on the environment and whether development is becoming more sustainable or not;
- the existing data and information are not adequately managed due to the lack of the following elements:
  - financial resources,
  - state of the art technology,
  - trained workforce,
  - awareness, and
  - information and/or institutional setup;
- constraints related to the processes of environmental information collection, production, and dissemination are evident in Egypt;
- the monitoring organizations do not feed their results into a common information system; and there is an absence of a comprehensive methodology.

4.9. COUNTRY'S NEEDS

There are two main factors that are needed and can facilitate introduction of SEIS in Egypt:

- existence of sustainable environmentally-sound information statistical system.
- more specific developments in environmental monitoring sphere particularly in thematic areas.

This includes development of a complete list of main environmental indicators, which is consistent to one defined by the international environmental organizations and programs, uses international standards and classification schemes, as well as ensures accessibility and inter-compatibility of national and international methodologies used in Egypt. In this field there are a number of constraints for implementation of coordinated SEIS in Egypt, namely:

- ***information flow management*** among stakeholder organizations;
- state programs on implementation of ***integrated monitoring*** of the state of environment need to be improved;
- ***data exchange mechanisms*** through various governmental ministries and agencies is limited to specific specialized committees.

RECOMMENDATIONS OF IMPLEMENTATION AND PRIORITIES FOR ACTION

- Enhancement of appropriate legislative framework for introduction and maintenance of shared environmental information management system.
- Inter-institutional Cooperation: There is an urgent need for full cooperation among participating parties (ministries, authorities, organisations, and stakeholders) through better coordination and integration. Protocols of cooperation have to be drawn. EEAA can assume the role of secretariat responsible for the development of mechanism for coordination and integration.
- Knowledge Hub: It is important to connect various ministries together through an Environmental Information Network. The Environmental Information Exchange Network (Exchange Network) is an Internet-based system used to securely exchange environmental data among partners. The benefits of using such a network are: improved data quality, better data integration, timely availability of environmental data, reduced burden associated with reporting data, improved decision making, automated data submission and retrieval, authorization and authentication and security. A national environmental database network has to be developed and roles have to be identified and comply with International standards. Such network should include all data providers and it should specify information they collect and publish and the network members have to sign protocols. The development of the Environmental Information Network is currently in force to go in line with the "Horizon 2020 Initiative" and its thematic areas. The necessity of supplying the General Administration of Environment Statistics with potentialities to set up a fully-equipped computer lab (software, hardware and networks).
    - monitoring: methodologies and techniques must be revised and updated using state of the art technology of monitoring and measuring. This could be conducted through integrating the monitoring programs in different ministries and agencies and avoiding duplication and overlapping of efforts, procedures and actions taken. Also develop the cooperation between these agencies in implementing the monitoring programs and exchange expertise between them.
    - data: all issues of data sources, collection, transfer, access, gaps, inconsistencies, quality control, redundancy, efficiency, timely exchange, and integrity should be reviewed and resolved to cope with international standards.
    - information: access, dissemination, national security level, exchange.

- Indicators: Continue to work on the completion of Egypt environment indicator to support an environmental indicators system based on the international standards and methodologies.
- Capacity and awareness building: upgrading capacities and human resources through organizing courses and participating in local and international and regional environmental seminars. Improve capacities in the fields of monitoring, collection, storage, assessment, and reporting of environmental data.
- Providing technical assistance and training support to finalize the following topics:
  - National Environmental Accounts in the fields of water and air.
  - Development of methodological frameworks for the production of indicators and statistics of the green economy.

4.10. IMPLEMENTATION CHALLENGES

- relatively limited coordination and integration between EEAA and other ministries makes it difficult for EEAA to express their needs except through different committees;
- absence of EEAA environmentally technical counterpart staff in other ministries at management and technical levels;
- lack of understanding of cultural norms and how work is undertaken and completed differently in each culture;
- reluctance to provide or share data due to concerns about implications for data owners (data custodianship).

5. IMPLEMENTATION PLAN

Efforts should be made to gather information from various sources to form a more complete Environmental profile of Egypt and be the base for better decision-making process. The implementation of a programme to establish Egyptian Environmental Information Network, The Network has two main objectives:

- strengthening local, regional, and national capacity to collect, analyse, and use multi-sectoral information for decision making by better identification of users, both public and private, and of their information needs at the local, regional, and national levels; and

- improving overall quality (i.e., validity and reliability), coverage, and timeliness of and access to environmental information.

The required implementation activities include:

- carry out inventories of environmental, resource and development data for determining gaps and organizing activities to fill those gaps;
- develop a coordinated, standardised data collection and assessment framework;
- establish systems to verify quality of data gathered (i.e. a source check);
- establish procedures for measurement and evaluation;
- organise continuous and accurate data-collection systems, making use of Geographic Information System (GIS), databases, expert systems and models;
- cooperate with the private sector and international bodies to facilitate transfer of technology and technical know-how;
- improving the quality of environmental data and statistics requires strengthening institutional capacity, promoting on-going education, awareness, and training and ensuring financial commitment as well.

Role of EEAA and CAPMAS:

Build on the existing EEIS work and provide the required technical staff and office space to host the Network.

Role of SEIS:

1. To provide experts to assess the current situation and develop a needs assessment report.
2. To assist in the required infrastructure of the network (computer servers, software etc.).
3. To provide the technical state of the art network methodology and data standards to share the data between ministries.
4. To assist in the capacity building by providing a training programme on environmental data, indicators, standards, report cards etc., based on the needs assessment report.

IMPLEMENTATION PLAN FOR ENHANCING THE INFRASTRUCTURE AND TO DEVELOP THE NETWORK THROUGH THE FOLLOWING ACTION PLAN:

5.1. ENHANCING TECHNICAL INFRASTRUCTURE

One of the outcomes of the strategic objective is the availability of a reliable agency technical infrastructure to support the collection, processing and dissemination of environmental information. This is the most technological oriented outcome and is best attained when the infrastructure is accessible anytime, anywhere, and by all data sources and vendors with granted privileges. It also should be cost-effective. It includes 3 outputs as follows:

1. an efficient use of hardware and software technology;
2. a stable and secure EEAA and CAPMAS network; and
3. system security.

To produce these outputs, a number of activities are planned. The impacts of these activities should be evaluated at different levels (human, technical, and financial), an annual work plan produced to support the activities, and the results of the activities monitored annually so that their effectiveness can be measured and appropriate actions taken when needed.

5.1.2. EFFICIENT USE OF HARDWARE AND SOFTWARE TECHNOLOGY

This output requires that EEAA, CAPMAS and other Miniseries and data providers have a good knowledge of its hardware and software assets as well as their use, so that upgrades are performed in a systematic and efficient way and so that personnel have the required expertise to use the hardware and software. The following implementation activities were identified:

1. maintain an inventory of all their hardware and software (e.g., servers, workstations, peripherals, operating systems, and word processing software, database management software). The inventory should include the dates that items were acquired, version numbers, warranties, and on-going maintenance contracts.
2. maintain information on the use of hardware and software, as well as reported bugs and/or problems. Tools should be implemented to manage this information.
3. Using the information produced by the previous activities, develop a systematic way to upgrade its hardware and software. General policies on minimum requirements for different types of use should be established so that users most in need of upgrades are the first to receive them. It also allows elements to be transferred from one user to another, where possible, and allows technologies causing problems (bugs, repairs) to be identified.

4. SEIS and EEAA should establish technical orientations for different types of technologies (OS, DBMS, development tools). Personnel involved in the selection of technologies (applications and tools) should be encouraged to follow these orientations so that the sustainability of these technologies, which will be recommended by SEIS team expert, is ensured by appropriate expertise (e.g., standardization of DBMS - Oracle). These orientations should be updated regularly, i.e., every two years.
5. The roles and responsibilities of each Ministry should be defined and publicized so that ownership about the involvement or non-involvement of data producer in technology-oriented activities are reduced (e.g., who has the final decision on acquisition, who decides who obtains new computers, how much technical support is available, and in what period of time).
6. IT personnel should be properly trained (programs provided by the SEIS project) so that they can efficiently manage the technologies and monitor new ones.

5.1.3. Develop a Stable and Secure EEAA Network

This requires that EEAA and CAPMAS maintain an efficient, stable, and secure network to access both internal and external data, as well as services, and those personnel have the required expertise to use the network. The following activities are required in the implementation plan:

- all Agency computers are efficiently connected to frequently used applications, e.g., subgroups;
- all employees should have standardized email addresses;
- access to the Internet must be fast and secure (e.g., adequate response time at all times of day, specific web sites prohibited, and access from the Internet to data providers' network protected);
- all employees must understand and use the network efficiently;
- IT personnel should be properly trained through annual programs (Assistance from EEA is required) so that they can manage the network efficiently and ensure its stability.

5.1.4. Network System Security

This output requires that CAPMAS, EEAA and other partners manage the security of the environmental information. The following implementation activities are required:

- Network must be protected from external, non-authorized access (e.g., configuration of firewall).
- Data must be backed-up and regularly archived including the identification of off-site locations for backed-up data.
- Each application must be password protected with the appropriate restrictions (e.g., types of users and available functions).
- Security procedures should be publicized so that, they are understood by all users.
- Security procedures should be documented and personnel trained on how they must be applied.

5.2. Effective and Reliable Collection of EI within and Outside EEAA and CAPMAS

This activity requires that data providers identify the appropriate data sources for environmental information and implements techniques, technologies, and methodologies to access these sources. When the sources already exist, EEAA will need to establish agreements with other Agencies managing the relevant data holdings.

This requires the following outputs:

- efficient and reliable collection of environmental information by EEAA; and
- partnerships for the collection of environmental information.

To produce these outputs, a number of activities are planned. The impacts of these activities should be evaluated at different levels (human, technical, and financial), an annual work plan produced to support the activities, and the results of the activities monitored annually so that their effectiveness can be measured and appropriate actions taken where needed.

5.2.1. Efficient and Reliable Collection of Environmental Information by EEAA

This output requires that EEAA implement efficient and reliable ways of collecting environmental information not available from other Agencies (e.g., water quality, location of pollution sources, etc.). The following activities were identified to meet this output:

- EEAA identifies the required sources for environmental information not available from external Agencies.
- EEAA identifies the best techniques and technologies (e.g., use of sampling stations, use of laboratories, use of GPS) and methodologies (e.g., sampling processes, classification schemes and tolerances) for environmental information collection.
- EEAA adopts the best techniques and technologies and develops appropriate methodologies for their use.
- EEAA implements the techniques, technologies and methodologies.
- The impacts of implementing the adopted techniques, technologies and methodologies are evaluated (e.g., training, maintenance costs).
- Users are trained in the use and maintenance of the adopted techniques, technologies and methodologies.
- Quality control is performed on the collected environmental information according to established principles.

5.2.2. Partnerships for the Collection of Environmental Information

This output requires that EEAA, CAPMAS and other ministries and data providers establish partnerships with Agencies that own or distribute needed environmental information (e.g., data on water quality, population, topography, transportation networks). The following activities are recommended:

- EEAA identifies the needed environmental information sources and the Agencies responsible for this information, e.g., CAPMAS, Egyptian Survey Authority.
- Agreements are established for the initial acquisition of information, as well as for updating information. If EEAA requires modifications to the environmental information provided, they should be discussed and evaluated (e.g., more frequent updates, synthesis of information). If EEAA would like to distribute the environmental information to others, this also should be negotiated.
- The sources are acquired and the information is checked for quality and assurance.

- The impacts of collecting and acquiring the information are evaluated (e.g., staff training and data maintenance costs).

5.3. Enhanced EEAA and CAPMAS Capacity to Use Environmental Information through the Development of IT Applications

In order to achieve this outcome, EEAA and CAPMAS will need to plan and implements the development of IT applications such environmental information is efficiently managed, processed, and disseminated in a standardized and systematic way.

Five outputs were identified as essential to this outcome, as follows:

1. standardized methodologies for the development of IT applications;
2. identification of required IT applications;
3. design of specific IT applications;
4. development of specific IT applications; and
5. implementation and operation of specific IT applications.

To produce these implemented activities a number of activities are planned. The impacts of these activities must be evaluated at different levels (human, technical, financial), an annual work plan prepared to support the associated activities, and the results of the activities monitored annually so that their effectiveness can be measured and appropriate actions taken where needed.

5.3.1. Standardized Methodologies for Application Development

This implementation plan requires that SEIS helps EEAA and CAPMAS to adopt and implement standardized methodologies for application development using a variety of technologies (Oracle, Web, GIS) and techniques (Object/Oriented). These methodologies will ensure the following:

- developers and users know the phases, activities and deliverables planned at each step of the development cycle; and
- managers can better control development resources and schedules.

Methodologies need to be planned for the various types of technologies. Most activities will be similar for most technologies, with the exception of techniques (UML, data modelling,

CASE) and development environments. Most of the methodologies already exist in Europe can be implemented with little modification. Proper training and management commitment are keys to their efficient implementation.