



DRAFT

National Action Plan

Mid-term Report

**In the Framework of the Implementation of the SAP to address
Pollution in the Mediterranean from Land-Based Activities**

March 2005

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CHAPTER -1

Background

Since 1975 the Mediterranean region possesses a legal system (the Barcelona Convention and its Protocols) for the protection of the sea and its coastal zones. An updating of the text of the Convention was adopted by the Contracting Parties in 1995, followed by the updating of the text of the Protocol to combat land-based pollution (the LBS Protocol) in 1996. One of the major changes of the LBS Protocol was the extension of its coverage to include coastal zones and hydrologic basins and the provision for the preparation and implementation of a regional strategic programme and national action plans to combat land-based pollution. The Strategic Action Programme to Address Pollution from Land-based Activities (SAP MED) was prepared and adopted by the Contracting Parties in 1997. The SAP identifies the major problems and issues, lists the possible control measures, its costs and indicated targets and deadlines for their implementation both at the regional and national levels.

In the framework of its implementation –an operational strategy was adopted by the 12th Meeting of Contracting Parties to the Barcelona Convention (Monaco, November 2001)-, the Mediterranean countries are expected to prepare, adopt and implement National Action Plans (NAPs) to address marine pollution from land based sources and activities.

A GEF Project “Determination of priority actions for the further elaboration and implementation of the Strategic Action Programme for the Mediterranean Sea” (GEF-2328-4291-2731 & MEL-2328-4291-2664 or GF/ME/6030-00-08), was approved by the GEF Council in 2000 in order to create a solid ground at national and regional levels for the implementation of SAP MED. Among many activities the Project supports the preparation of NAPs. The GEF project also aims at the preparation and adoption of a Strategic Action Plan for Biodiversity (SAP BIO) for the Mediterranean, to serve the needs of the Specially Protected Areas and Biodiversity Protocol.

The formulation of National Action Plans (NAPs) represents the operational long-term aim of the SAP MED, as NAPs are expected to make use of the results of the individual activities identified in the SAP MED. According to the SAP Programme, the Contracting Parties will develop or review and adopt, by the end of 2005 at the latest, NAPs addressing pollution from land based sources. This implies the adoption of the targets and activities identified in the SAP. Action towards the implementation of the NAPs is to be pursued *inter alia* through bilateral, regional and international cooperation.

National programmes of actions are iterative processes that call for the phased implementation of priorities identified within a cross-sectoral, participatory framework. By enabling the long-term prioritisation, a country’s national programme of action becomes a cyclical process that enables stakeholders to progressively identify and address threats and impacts to the marine and coastal environments. Their fundamental goal is to develop concrete projects that:

- mobilise both stakeholders and resources;
- build upon National Diagnostic Analysis (NDA);
- are mainstreamed into relevant institutional, budgetary and policy frameworks; and incorporate lessons learnt in the process.

NAPs are foreseen to focus on sustainable, pragmatic and integrated environmental management approaches and processes, such as integrated coastal area management, harmonized, as appropriate, with river basin management and land-use plans. Towards this end the work actually executed under the GEF project for the sustainability of the SAP MED

through the development of economic instruments and on their implementation at the national level will play a significant role, as it is the capacity building of national professionals in the use of these instruments.

The process of the preparation of NAPs consists of three main steps:

- preparation of National Diagnostic Analysis (NDA) and national Baseline Budget of pollution releases and emissions (BB);
- preparation of Sectoral Plans (SPs);
- integration of SPs into NAPs.

Scope of the NAP

The focus of this initiative is to develop a NAP based on integrated thematic and geographical aspects and following a sectoral approach. The nature of the issues, and the cross-cutting interactions among them, indicate that national programmes of action should be an iterative and phased process, whose scope may be progressively broadened.

Overview of the national issues related to the LBS Protocol and SAP, administrative regions, development of the NAP, and methods of identification and assessment of issues are presented in Chapter 2

Stepwise Approach for the Preparation of SPs and NAP

		Collection of Data	Coordination between Activities	Completion of Report
Step 1	Review of NDA and BB	√	√	
Step 2	Formulation of Nat'l Expert Team			Established (Annex 1)
Step 3	Nat'l Committee of ICZM			Meeting in 6 February 2005 (Annex 2)
Step 4	Preparation of SPs	√	√	1st Draft Prepared in March 2005
Step 5	Integration of SPs in to NAP	√	√	March – April 2005 √
Step 6	Mid-term progress Report 1st Draft of NAP	√	√	Prepared and submitted in April 2005
Step 7	Preparation of 2 nd Draft of the NAP	√	√	2nd Draft, 30 April 2005
Step 8	Preparation of Final Draft of the NAP	√	√	Final, 31 May 2005

CHAPTER -2

NATIONAL ISSUES

Introduction

Egypt's Mediterranean coastline occupies the south-eastern corner of the Mediterranean. The primary and secondary coastlines stretch for about 1,550 km. Of this, 1000 km is primary coast (i.e. affected by waves) extending from Sallum (west) to Rafah (east), while the rest consists of the shores of sheltered coastal lagoons

Along the Mediterranean coast of Egypt, there are eight coastal governorates. These are from west to east Matruh, Alexandria, Behaira, Kafr El-Sheikh, Damietta, Daqahliya, Port Said, and North Sinai.



Fig. 1. The Mediterranean coast of Egypt: Focus on the three selected administrative regions

The densely populated cities are Alexandria (about 4 million) and Port Said (0.5 million). In the central delta, the population is more widely scattered. Population density varies from 400 to 1200 persons/km².

The coastal zone of Egypt is of great economic and environmental significance; and it combines localities of intensive socio-economic activities and urbanized areas. The pressure of the human activity on the coastal resources of the Mediterranean is very intense. The enormous urban population and adjacent agricultural areas, all contribute to the pollution load reaching coastal waters. This area receives high pollution loads discharged from the main urbanized, agricultural and industrial areas. These derived either directly from coastal cities discharge points; the Rosetta branch of the River Nile, the Mahmudiya and Nubariya irrigation canals, drainage canals discharged directly to the sea, such as " El-Tabia and El-Ummum", or from coastal lagoons "lakes" Maryut, Idku, Burullus and Manzala. These sources discharge about 8 billion m³y⁻¹ into the Mediterranean. This includes heavy loads of pollutants from various sources.

The maritime transport in the eastern Mediterranean, including oil tankers, commercial ships and passenger ships, affect the coast to a large extent. The entire beaches are frequently polluted by oil lumps, litter and plastic debris; even in the very far remote areas of the coast where there are no related activities.

Large parts of the Nile Delta suffer from severe coastal erosion, although adequate protection and mitigation measures have been considered.

Most of the coastal lagoons "lakes" are however in crisis, suffering from the excessive discharge of industrial, agricultural and domestic sewage flow.

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Most of the coastal lagoons "lakes" are however in crisis, suffering from the excessive discharge of industrial, agricultural and domestic sewage flow (EEAA, 1996 and UNEP/WHO, 1999).

The coastal area may be roughly divided into three units, in accordance to the presence of the hot spots, sensitive areas and main geomorphologic characterization. The main unit is the central unit between Alexandria (west) and Port Said (east), including the Nile Delta, coastal lakes (lagoons) and wetlands, and stretched along the boundaries of six governorates. The second unit, to east from the central unit, extends from Port Said to Rafah (north Sinai Governorate), while the third unit, extends from Alexandria westwards to Sallum (Mersa Matruh Governorate).

Associated with the Nile Delta are the coastal lakes and wetlands, which represent another important feature of the Mediterranean coast of Egypt. These lakes and wetlands cover a total area of at least 280,000 hectares, representing more than 25% of all natural and semi-natural wetlands of the entire Mediterranean region.

Economic, development and related Activities in the Mediterranean coastal area of Egypt was detailed in the NDA (2003), the following table summarizes and ranking the activities corresponding to the coastal governorates.

	Tourism & Recreation	Industry & Energy	Ports & Constructions	Fisheries	Agriculture
Matruh	1	3	1	2	3
Alexandria	1	1	1	2	2
Beheira	3	1	3	1	1
Kafr El Sheikh	3	3	3	1	1
Damietta	3	2	1	1	2
Dakahleya	2	3	2	1	1
Port Said	2	2	2	2	3
North Sinai	2	3	2	2	3

1: High 2: Moderate 3: Low

IDENTIFICATION AND ASSESSMENT OF ISSUES

In accordance with the Focus of the Initiative that is the Establishment of National Priorities (Issues and Areas specific), the following will present the methodology applied to identify the administrative regions and the prioritization of issues.

Identification of Areas (Administrative Regions) Specific

Assessment revealed that three amongst the identified Hot Spots are confined to Alexandria, Beheira and Port Said Governorates. The Inter-ministerial National Committee of Integrated Coastal Zone Management in its special session that was held to approve the outlines of both SP and NAP (Annex 1) has recommended the identification of Alexandria, Beheira and Port Said Governorates as Administrative Regions for this phase of the preparation of the SP and NAP.

The selection was based on the nature of the issues, and the cross-cutting interactions among them, besides two additional specific aspects were considered; these are the thematic and geographic aspects.

Identification of Issues

Priority issues for the selected three governorates were established on the basis of the nature and severity of the problem; type of contaminants; and nature and extent of the affected area. The severity of the problem was assessed considering food security; public health; coastal and marine resources and ecosystem health and the economic and social benefits and uses.

Based on the earlier NDA and BB reports developed in 2003, besides the newly developed SP in 2005 and considering the NEAP (2002) the priority sources of land-based marine pollution were defined as follows: development of coastal areas, tourism, industrial activities, sewage, oil pollution, agricultural runoff, and litter.

Based on the above assessment the identified major source categories of marine pollution are:

- Domestic
- Industrial
- Agriculture
- Physical Alterations and Destruction of Habitats (PADH)

The activities and issues related to the identified major categories are listed in the following table:

Source Categories	Related Activities and Issues
Domestic	Sewage, solid waste, litter
Industrial	Chemical, Petrochemicals, Textile, Cement,
Agriculture	Pesticides, organic load
Physical Alterations and Destruction of Habitats (PADH)	Dredging, landfills, construction, coastal urbanization, tourism activities

Hot Spots and Sensitive Areas

According to the UNEP MAP Report (1999) and its update in 2001 "Identification of Priority Pollution Hot Spots and Sensitive Areas in The Mediterranean", the following are the identified Priority Hot Spots for Egypt ranked in descending order: Lake Manzala, Abu-Qir Bay, El-Mex Bay, Alexandria and Port Said, while *Sensitive Area is* Lake Bardawil

Pollution Hot Spots in the Mediterranean of Egypt and ranking of priorities are listed in table (UNEP 2001 Update)

Name	Type	Public Health	Drinking Water Quality	Aquatic Life	Recreation	Other beneficial use	Welfare and economy
El'Mex Bay	Domestic+Industrial	2	1	3	2	2	4
Alexandria	Domestic	2	1	2	2	1	2
Abu Qir Bay	Industrial	2	1	3	2	2	4
Lake Manzala	Domestic+Industrial	2	1	2	2	2	5
Port Said	Domestic	1	1	2	1	1	1

Refer to UNEP (1999) for the grades of ranking.



Fig. 2. Hot spots and sensitive area along the Mediterranean coast of Egypt.

Three of the hot spots are within Alexandria and its border with Beheira Governorates, the last two are within Port Said Governorate

Assessment of Issues

Liquid waste (Sewage)

The effluents of the Mediterranean coastal cities of Egypt reached the marine environment. In addition, heavily polluted agricultural and industrial wastewater discharged into the Mediterranean via the Delta coastal lakes, or occasionally through the Rosetta and Damietta branches of the Nile.

Data generated from the Coastal Water Monitoring Program of the Egyptian Environmental Affairs Agency (EIMP/CWMP, 2000; 2001), show high concentrations of nutrients in some localities, creating eutrophication conditions.

The discharge of untreated or partly treated sewage effluent into the sea also results in a widespread microbial pollution along the Egyptian Mediterranean coast.

According to (UNEP/MAP/MED POL/WHO; 2004) a total of 12 coastal cities with a resident population of 5,161,000 inhabitants was reported (2003), most of them concentrated to the cities of Alexandria and Port Said. The number of cities with a wastewater treatment plant is 6, or 50% of the total. However, according to the available information, the coastal city of Alexandria seems to produce large quantities of primary treated wastewater (74% of the population is served by wastewater treatment plant). Out of the six treatment plants reported, one provided primary treatment (Alexandria) and the remaining secondary treatment. Two additional secondary treatment plants were reported as being under construction (areas of Baltim and Rashid). With respect to the treated wastewater discharge, predominant site of discharge is at the mainland or freshwaters, while there is no direct discharge of treated sewage into the sea. Regarding the untreated sewage there is no adequate information on either quantities or way of discharge.

Solid waste

Solid waste pollution is a major problem in some areas along the Egyptian coastline. However, in the city of Alexandria, a new, highly effective management system has been developed and put into action. The new solid waste management system improved the situation in the city.

Solid waste management of summer resorts is not adequate in many places. Although collection and transportation of domestic solid waste from these resorts is often very well conducted, the disposal of the collected waste result major environmental problems within the coastal zone.

The first Sanitary Land-fill was established to the west of Alexandria and will be complemented by recycling activities, this will improve the solid waste management of the city and its surroundings.

Air pollution

Air pollution problem along the Egyptian Mediterranean coast is limited to the industrial areas around Alexandria in addition to areas with highly congested traffic in that city, and to a much lesser extent, other coastal cities, The impact of air pollution on the marine and coastal environment, however, appears to be limited to these areas and seems to be of a relatively

minor significance.

Heavy metals and Organometallic compounds

Heavy Metals

Five heavy metals were determined in sediments, fish and bivalves samples collected from the monitoring sites. These comprised copper, lead, zinc, cadmium and mercury (MED POL Monitoring Programme; 1994). Data shows levels higher than permissible in some localities particularly in or around the identified hot spots (NDA, 2003).

Organochlorine Pesticides and Polychlorinated Biphenyls

The following Organochlorine Pesticides and Polychlorinated Biphenyls in the Egyptian Mediterranean sediments, water and bioata were determined during the period 1994 – 1995 (MED POL Monitoring Programme): Hexachlorobenzene, Lindane , p,p' DDE , Arachlor 1254 and, Aldrin. Levels are presented in details in the NDA (2003). The SP (2005) reported that data reported on POP's in Egypt (MTS 156) are listed in Annex

Nutrients and Eutrophication

Marine eutrophication is mainly an inshore problem that affects lagoons, harbours, estuaries and coastal areas adjacent to river mouths. Coastal marine areas and lagoons prone to eutrophication problems exist in practically every country.

Although the main body of the Mediterranean Sea as a whole is not yet seriously threatened by eutrophication, areas of pronounced eutrophication are expanding in the Mediterranean specially at the southern basin.

The following is the ranking of contaminants corresponding to the coastal governorates:

	Liquid wastes	Solid Wastes	Air Pollution	H. Metals , Org. Pollut	Nutrients & Eutrophication
Matruh	3	2	3	3	3
Alexandria	1	1	1	1	1
Beheira	1	2	1	1	1
Kafr El Sheikh	2	1	2	2	2
Damietta	2	2	2	2	1
Dakahleya	2	2	1	1	1
Port Said	2	2	2	2	2
North Sinai	3	3	3	3	3

1: High 2: Moderate 3: Low

Physical Alteration and Destruction of Habitat

Tourism, industry and urban development

By virtue of its nature, this type of development is strictly linear, being confined to a narrow strip of land rarely exceeding few hundred meters in width between the coastal highway and the coastline.

At present, the coastal area is urbanized from Alexandria to Mersa Matruh, and some coastal resort areas have been developed along the Delta coast. In north Sinai, some coastal resorts have been constructed west of El Arish during the past three decades.

The new industrial city of New Borg El Arab, west of Alexandria, was established about 6 km south of the Mediterranean coast. The westward expansion of Alexandria has resulted in the complete urbanization of the coastal land westward to El Agami to Sidi Krir.

The most important new urban center along the Mediterranean coast of the Nile Delta is the New Damietta port city which was established a short distance west of the mouth of the Damietta Branch. The city was built around the new port facility but has since become an urban extension of the neighbouring Damietta and Ras El Bar cities.

Construction activities

Resort construction on the Egyptian Mediterranean coast has resulted in the destruction of the natural landscape. Most of the resorts have actually been built on the Pleistocene calcareous ridges, which ran parallel to the coastline. In many cases these ridges were removed to provide land for different tourist installations. The natural vegetation and native plantations (olive and figs) grown in the depressions between the ridges were removed was destroyed.

Besides quarrying activities have been so extensive that most of the coastal limestone ridges have exhausted.

Artificialization of the coast

Artificial shoreline modification in the Mediterranean coast of Egypt is largely experienced. Many of the resorts that now line the coastline from Alexandria westwards to Mersa Matruh caused a shoreline modification to enhance the quality of their beaches. Dredging of artificial lakes with inlets to the sea has been carried out at many of these resorts. Intricate system of channels, lakes and islands has been constructed at some resorts.

Infrastructure development

Infrastructure developments of urban areas along the Mediterranean coast of Egypt are not complete. Although major cities like Alexandria and Port Said are provided with basic infrastructure needs.

Coastal erosion and implications of climatic changes

Coastal erosion has become a major problem following the massive reduction in the river Nile sediment discharged into the Mediterranean. Erosion is most severe in the northern delta from Rosetta, eastwards. Coastal erosion has been considerably reduced and mitigated by the installation of coastline protection structures fringing most of the Egyptian coasts.

In the context of the Fuka-Matruh PAP/RAC ICAM Project, a scenario of future climate change and its implications was developed (UNEP, 1996). Besides, several scenarios were developed for the Nile Delta coastal area, and associated with accelerating erosion rate.

Change in land use

The most important change in land use in the Mediterranean coastal areas of Egypt is the spread of the coastal development. Consequently, a shift in the population and activities are expected to take place along the Mediterranean coast and hence exert more pressure in this area.

Wetlands and Salt march alterations

Drainage of parts of the northern Delta lakes and wetlands for cultivation, urban expansion, or industrial development has been a major ecologic problem affecting all the lakes to different extents. Drying and clearing of large tracks of wetlands and marshes have resulted in reducing the sizes of most of these lakes considerably. Lake Maryut has been reduced to a mere 25% of its original size. The original area of Lake Manzala was 1710 km², was reduced to 1400² km by 1970 to 1200 km² in 1980

Marine Waters and Coastal Watershed Alteration

Along the Egyptian coast of the Mediterranean, three areas show distinctly higher levels of eutrophication parameters. The first is the area around Alexandria, the second is the area of Abu Qir, and the third is the area from the new Damietta to Port Said. The three areas are characterized by the existence of discharge of domestic sewage and agricultural runoff from the River Nile, the coastal lakes and its related drainage system.

Ranking of the magnitude of the Physical Alterations & Destructions in the different Coastal Governorates is presented below.

	Shoreline construction & alteration	Wetlands alteration	Marine Waters & Coastal Watershed alteration	Biological threats
Matruh	1	3	2	3
Alexandria	2	3	1	1
Beheira	3	2	1	1
Kafr El Sheikh	3	2	2	2
Damietta	2	3	1	1
Dakahleya	2	1	1	1
Port Said	2	3	2	2
North Sinai	1	3	3	3

1: High 2: Moderate 3: Low

CHAPTER -3

ADMINISTRATIVE REGION

Alexandria Governorate

Introduction

Alexandria Governorate is located along the Mediterranean Sea, north of Egypt on the. It is bounded from the east and south by west of Abu Qir Bay in the Beheira Governorate, and from the west by El-Hammam area in Matruh Governorate.

The total surface area of Alexandria Governorate is nearly 2818 km², including an inhabited area of 1054 km². Its coastline (administrative boundary) extends for about 80 km between Abu Qir (east) to east of El Hammam (west).

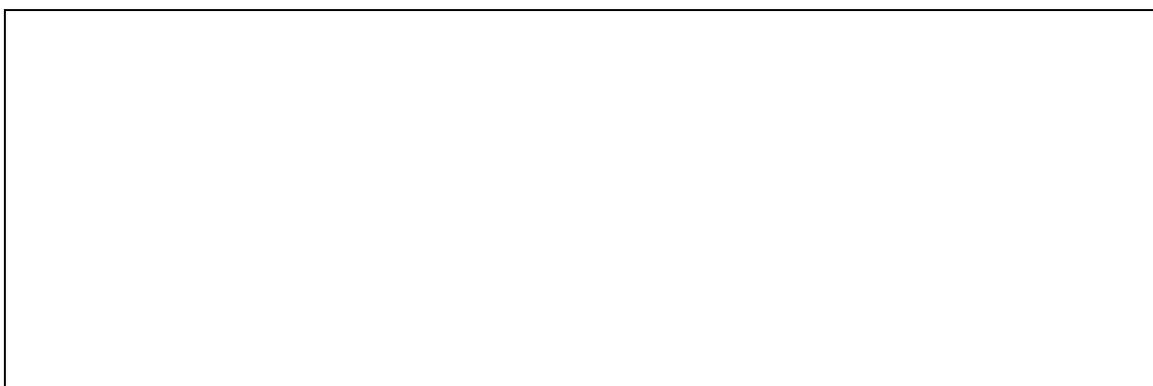


Fig. 3.The main features of Alexandria coastal area including hot spots

The total population of Alexandria Governorate is nearly 4 millions, and receiving an extra of 1,500,000 visitors in summer. Alexandria hosts three harbours; namely the Western Harbour, which is the main harbour of the country that handles about 60% of the country trade, El'Dekhiela Harbour just west of the Western Harbour, and the Eastern Harbour which is a fishing and yachting harbour. About 30% of the country's industry is located in Alexandria and Beheira; there are about 700 industrial establishments; most of them are engaged in chemicals, petrochemicals, spinning and weaving and processed food. The Governorate comprises the main city and several other satellite suburbs and rural areas.

Alexandria is one of the most attractive tourism areas (in summer) because of its location. It comprises about 52 hotels with about 3842 rooms and 7275 beds.

The fish product is nearly 11×10^3 tons yearly within the fishing activities in the Mediterranean and Lake Maryut.

IDENTIFICATION AND ASSESSMENT OF ISSUES

Alexandria is currently under severe and ever increasing pressure. A number of factors contribute to this situation: a) rapid urbanization of the coast; b) pollution from residential commercial and industrial activities, c) tourism development, d) resource users and conflicts.

The main city is served by a good sewer and rainwater network and two WWTP's of the primary-treatment type with a total capacity of 1,320,000 m³/day. However, many of the new unplanned communities developed under exponential population increase and housing issue

and rural areas lack sewer network. Due to industrial activities in the city, sewage effluent to the WWTP's is mixed in nature (industrial + domestic). Effluents from the two WWTP's are discharged into the landlocked Lake Maryut southwest of the city. Water of the Lake is pumped to the sea through El'Max Pumping Station.

The maritime transport in the eastern Mediterranean, including oil tankers, commercial ships and passenger ships, affect the coast to a large extent. The entire beaches are frequently polluted by oil lumps, litter and plastic debris; even in the very far remote areas of the coast where there are no related activities.

Alexandria coastal waters have been subjected for several decades to pollution stress from Land-Based Activities. The problem is identified as an industrial versus agricultural derived pollutants from one hand and sewage derived pollutants from the other.

Many industries discharge their wastewater in the heavily polluted Lake Maryut. An anaerobic condition is prevailing. In addition concentrations of heavy metals in sediments and biota are high.

The coastal area of Alexandria is divided to four recipient zones of which is the Mex Bay receiving mixed industrial/agricultural/ sewage discharge, through Ummum Drain that discharging mainly agricultural wastewaters amounting to about 6 million m^3d^{-1} , beside sewage discharged to lake Mayut and pumped to the Bay through this drain. The second zone is the Western Harbour (WH main trading harbour) receiving agricultural discharge from Noubaria Canal. The Eastern Harbour (EH Fishing and Yachting Harbour), the third zone, used to receive sewage. Finally, the fourth zone is Abu Qir bay receiving industrial discharge from Abu Qir drain discharging through Tabia Pumping Station (TPS).

It is worth mentioning that out of the five identified hot spots (UNEP, 2001); three are within the Alexandria region.

According to the draft SP (2005) the following are the main identified issues:

Urban Solid Waste

Using the urban solid waste generation index of 0.6 kg/cap/day given by Hamza (1994) for low-income countries would result in a total estimate of 2280 ton/day. This rises to about 3000 t/day in summer.

Air Pollution

The only data provided for air pollution in Alexandria Governorate are those given for emissions from industrial activities in the Governorate in BB (2003).

Pollution Hg, Cd, Pb

The only data provided for pollution by Hg, Cd and Pb in Alexandria Governorate are those given for emissions from industrial activities in the Governorate in BB (2003).

Organohalogenes

Data reported on POP's in Egypt (MTS 156) are listed in Annex 1.

In general, total water pollutant loads emitted from each industrial sector in Alexandria Governorate is as follows (SP, 2005):

Industry	ISIC Code	Water pollutants Load (kg/y)				
		TDS	TSS	BOD	COD	O & G
Food Production	3100	10332788-10522988	1954904-2012230	3793071	6769735-6921457	66815-102759
Textile & Weaving	3200	5600268-5652896	1963987-1984738	2691333-2707796	5013881-5029265	944713-987370
Pulp, Paper, Printing & Publishing	3400	19466237-19469312	27238949-27240179	7574153-7575076	16918750-16919672	111292-5322836
Chemical Products	3500	75766646-128730471	11610786-22248535	10565449-11606980	18903578-19793181	655943-842339
Non-metallic mineral products	3600	191640-222640	46320-58720	20580- 41580	51900-71100	1810- 14190
Iron steel and non Ferrous metal industries	3700	1419848-1424138	71463-73179	12012-216969	36473-37760	1016-5452
Metal products, machinery and equipments	3800	3988-21659	399-5467	0-3802	2834- 7771	665-2069
Power generation	4100	676096	306747	82164	650568	28171

While total solid and hazardous waste loads emitted from each industrial sector in Alexandria Governorate is as follows (SP, 2005).

Industry	ISIC Code	Solid waste load (kg/y)					Hazardous waste load (kg/y)
		Paper	Plastic	Metals	Organic material	Others	
Food Production	3100	491430-506430	123438-138888	27661-57661	287010-2890310	870150-785150	0-10000
Textile manufacturing	3200	210940	31960	157800	990603-1035603	3699540-3774540	70000
Pulp and paper printing and publishing	3400	310980-2320980	1197000-127000	36400 -41400	3328336-3338336	730-20730	21000-31000
Chemical products	3500	165455-167455	258691-273691	241552-266552	957500-1017500	2021862-2101862	77720-97720
Non-metallic mineral products	3600	25000	10000	65000	10000-20000	20 x 10 20.5 x 10	20000
Iron steel and non Ferrous metal industries	3700	--	--	--	--	92638167	172500-197500
Metal products, machinery and equipments	3800	45200-50200	48000-53000	748000	0-5000	23840-33840	3600
Power generation	4100	--	--	--	--	5000- 10000	5000- 10000

Areas Specific

The following is the identification of the hot pollution areas specific in Alexandria

Mex Bay

The Mex Bay is a semi-enclosed water body located west of Alexandria. The Bay receives agricultural, industrial and domestic wastewaters from several effluents. The Western harbour contributes about 3.1 million m³ d⁻¹ from its water to Mex Bay.

According to UNEP (1999), the total BOD load in Mex is 219.498 t yr⁻¹, and the COD load is 175.654 t yr⁻¹.

High levels of chlorophyll-a were encountered at El Mex, which receive a huge amount of waste water resulting from industrial area through El-Mex drain. This area shows very high levels of Nutrients and chlorophyll-a (NDA, 2003; BB, 2003)

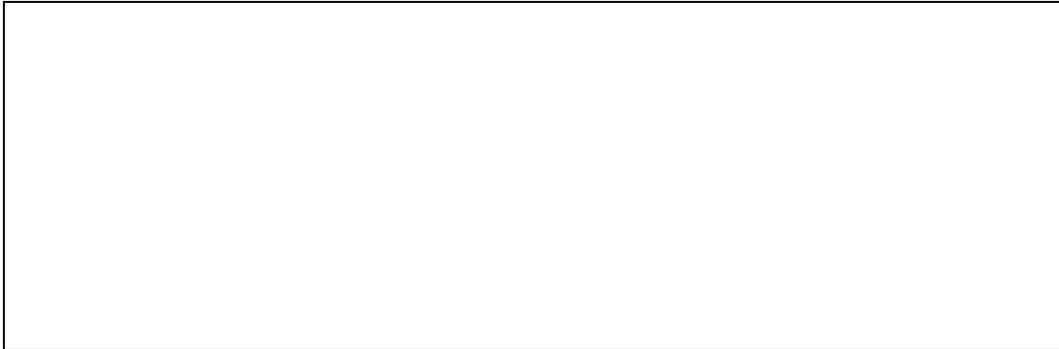


Fig. 4. The Mex Bay

Urban Effluent & Pollution Loads at El'Mex Bay (BB, 2003)

Administrative Region	Source	Type	BOD	COD	T-N	T-P	TSS	Oil	Flow Rate (m ³ /day)
Alexandria Governorate	Nubarya Canal	Freshwater	1018	4180	-	-	5815	-	90x10 ⁶ ??
	El-Umum Dain	Mixed agriculture+ domestic + industrial) wastewater	28470	175200	2081	2628	91433	-	6x10 ⁶

Abu Qir Bay

Abu Qir bay is a semi-circular basin located about 36 km east of Alexandria. The southwestern area of the bay receives a mixture of untreated sewage and industrial wastes amounting to about 2 million m³ d⁻¹. This waste dumped into the bay through the Tabia Pumping Station. Industrial wastes include fertilizers, textiles, chemicals, dyes, food processing and paper mill effluents. Sewage is introduced into the basin from the household activities of the nearby towns.

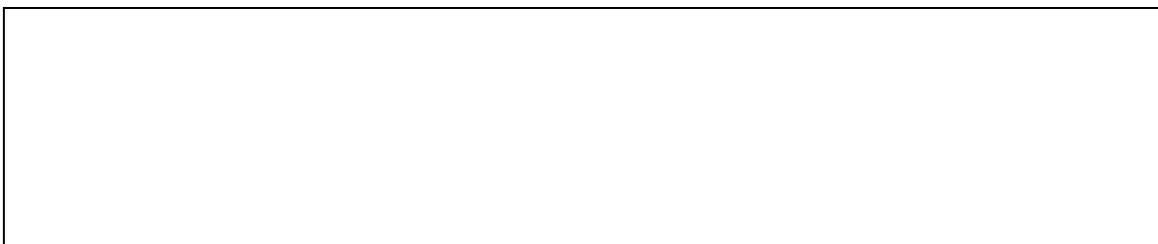


Fig. 5. Abu Qir Bay and Lake Idku

Abu Qir Bay receives a huge amount of the industrial wastewaters, from:

- Abu Qir complex that pump its water directly into the Bay (Fertilizer, Electricity , Rakta and National Paper, Kaha Factories).
- Kafr El-Dawar complex (Textile Factories).which dumps its wastes in El-Amia drain,
- El- Siouf discharged its wastewater indirectly into the Bay through El-Gharbi drain which transfers the wastewater to El-Amia drain then to Abu Qir Bay

Industrial pollution loads (t/y) to Abu Qir Bay from major industrial company (BB, 2003)

Industrial Company	BOD	COD	Total-N	Total-P	TSS	Flow m ³ /day
Fertilizer production	362	5140			1770	16,000
Rakta for pulp and paper mill	20624	80470			78050	56,000
National paper	444	2573			377	12,000
Siclam	197	245	1095	913	180	300
Edfina for food preservation	354	347	1132	1971	363	2,800
Kaha company	14.2	48.7	1132	1971	26.3	300
Siouf spinning	622	1866	913	1131	362	5,300
United Arab for textile	2330	3355	913	1131	312.5	2,900
Oriental lines and cotton company	2.3	4.8	913	1131	5.5	2,500

Lake Maryut

Lake Maryut is situated in the northwestern corner of the Nile Delta. The lake has no direct connection to the Mediterranean Sea and its water level is 2.8 m below sea level. Pumps discharge water from the lake into the sea. It has a maximum length of about 13 km and its present area is about 61 km² which is considerably smaller than its former area. Large areas of the lake have been drained and reclaimed for agriculture.

Due to the close proximity of Alexandria, the lake suffered intensively from pollution. Water from the Alexandria drainage system is mixed with industrial wastes and sewage, discharge into the southeastern part of the lake through the Qalaa drain. The Umum drain supplies the western side of the lake with drainage water from the Beheira province.

Several industries used to discharge their wastewater in the heavily polluted Lake Maryut. An anaerobic condition with odors of hydrogen sulphide is prevailing. In addition concentrations of heavy metals in sediments and biota are high. A hazardous level of mercury has thus been measured in fish from the lake



Fig. 6.Lake Maryut

CHAPTER -4

ADMINISTRATIVE REGION

Beheira Governorate

Introduction

Beheira Governorate lies southeast and east of Alexandria Governorate on the Mediterranean coast of Egypt with a total area of 9123 km² and a population of 4,800,000 inhabitants in 2004. Agriculture is the main activity in the governorate followed by industry and fishing. However, industry is of much limited scale and localized distribution being only limited to textile and weaving in Kafr El'Dawar area.



Fig. 7. Beheira Governorate

The Nile water loaded with sediments that used to flow into the Mediterranean formed an impressive onshore delta plain in the coastal area of the NE of Egypt, including the Beheira region, and build through history a submarine alluvial cone in the Levantine.

The remaining two active natural branches of the Nile are the Rosetta Branch in the west (Beheira Governorate), and the Damietta Branch in the east.

The following table represents the pollution load (t/y) from river and water courses (source: UNEP,1999) .

Name	Type	BOD	COD	Total-N	Total-P	TSS	Oil	Flow rate m ³ /day
Nile Branch at Rosetta	Freshwater	10512	33638	5361	1612	35040	9566	9.6x10 ⁶
Nile Branch at Damietta	Freshwater	21812	10906	21903		76343	34718	
Nubariya Canal	Freshwater	4	200	3	23994	40	0	249x10 ⁶
El-Umum Dain	Mixed industrial; agriculture wastewater	1018	4180	-	-	5815	-	90x10 ⁶
El-Tabia Drain	Industrial wastes	28470	17520	2081	2628	91433	-	6x10 ⁶
		87376	48606	-	-	35746	15697	2.13x10 ⁶

Lake Idku (Beheira Governorate)

Lake Idku "eutrophic lake", is situated about 30 km east of Alexandria and west of the Rosetta branch of the Nile. It is shallow brackish water with one connection to the Mediterranean through a short canal at Maadia. The lake receives water from three major drains. The catchments area of the lake is mainly through rural districts. The lake receives water from three major drains along its southern shores. The source of nutrients is mainly agricultural run off and sewage from villages and small towns.

IDENTIFICATION AND ASSESSMENT OF ISSUES

According to the draft SP (2005) the following are the main identified issues:

Urban Effluents

The potable water production in the governorate amounts to 212,653,950 m³/year with a consumption of 158,601,036 m³/year and a loss of 63,071,402 m³/year. There are 13 WWTP's in the governorate with a total capacity of 253946 m³/day. It is expected that effluents from WWTP's are discharged into drains that ultimately discharge their water into the Mediterranean.

Urban Solid Waste

Using the urban solid waste generation index of 0.6 kg/cap/day given by Hamza (1994) for low-income countries would result in a total estimate of 2880 ton/day. Aside from these, substantial volumes of agricultural solid wastes are expected to be also generated in the governorate but no values or estimates of these wastes are available or can be given.

Air Pollution

No data are available on air pollution in Behira Governorate.

Pollution Hg, Cd, Pb

The only data provided for pollution by Hg, Cd and Pb in Behira Governorate are those given for effluents from industrial plants in the Governorate in BB (2003).

Organohalogenes

Data reported on POP's in Egypt (MTS 156) are listed in Annex 1.

Industrial Wastewater & Solid Waste

Effluents from Main Industrial Plants in Beheira Governorate (m³ x 10⁶ /yr), different parameters (t /yr) (Source: BB, 2003)

	Volume m ³ /Y	Loads of different parameters inputs from industrial plants (Ton/Yea)r									
		DIP	DOP	PP	N03	N01	NH4	DON	PN	RSI	TSM
Bida Dyes	16.4	1.92	2.19	4.36	3.47	0.5	8.47	26	12	19	1652
Misr Rayon	18.3	2.77	2.66	6.2	2.96	0.22	3.02	31	22	18	3148
Dyes & Chemicals	5.5	1.08	1.25	3.43	1.56	0.25	3.86	5.7	2.4	6.8	254
Weaving & Textile	10.9	1.53	1.41	3.47	2.4	0.26	2.76	21	4.7	14	624
TOTAL	51.1	10.8	12.9	29.4	16.3	2.39	21.7	141	61.5	126	9066
Tabia Pumping Station	730	132	129	319	215	160	303	1299	548	2161	71905

(b)

Name	DFe	PFe	DMn	PMn	DPb	PPb	DCd	PCd	DHg	PHg
Bida Dyes	2.63	7.81	1.61	0.15	0.31	1.54	0.12	4.4x10 ⁻³	3.64x10 ⁻⁵	5.31x10 ⁻³
Misr Rayon	0.36	1.77	0.48	0.034	0.075	0.11	0.038	0.9x10 ⁻³	1.24x10 ⁻⁵	1.17x10 ⁻³
Dyes & Chemicals	0.62	2.66	1.06	0.036	0.12	0.21	0.074	1.1x10 ⁻³	2.88x10 ⁻⁵	2.39x10 ⁻³
Weaving & Textile	0.29	1.39	0.13	0.05	0.063	0.12	0.039	0.5x10 ⁻³	1.54x10 ⁻⁵	1.26x10 ⁻³
TOTAL	3.9	13.63	3.28	0.27	0.568	1.98	0.271	6.9x10 ⁻³	9.3x10 ⁻⁵	10.13x10 ⁻³
Tabia Pumping Station	0.79	5.76	0.1	0.31	0.28	0.33	0.106	15.7x10 ⁻³	0,12x10 ⁻³	0.038

CHAPTER -5

ADMINISTRATIVE REGION

Port Said Governorate

Introduction

Port Said is the second port in Egypt, after Alexandria. The history of establishing Port Said dates back to digging the Suez Canal.

Port Said Governorate lies at the northern end of Suez Canal with a total area of 1344.96 km² and a populated area of 1320.68 km². It's bounded by North Sinai Governorate to east; Damietta Governorate to west; Lake Manzalah, Dakahlia, Sharkia and Ismalia Governorates to south. The total population was 529,684 inhabitants in 2004. Administratively, the governorate comprises 7 districts.

Activities in the governorate are diversified as they include agriculture, industry, and maritime services and industries (shipyards). The agricultural land area in the governorate was 40,000 feddans in 2004 with rice, barely, wheat and alfalfa as the main crops. Industrial activities in the governorate include metallurgical, textiles, petrochemicals and natural gas liquefaction, chemical (detergents, paints and cosmetics) and ceramic.



Fig. 8. Port Said

In Port Said, the major source of marine pollution is sewage discharged into Lake Manzala, which is connected to the Mediterranean Sea west of Port Said.

Lake Manzala

Lake Manzala, the largest of the northern Delta lakes, is located west of Port Said between the Damietta branch of the Nile and the Suez Canal. It is a shallow brackish water lake. The lake is connected to the Mediterranean sea via El Gamil outlet, about 5 km west of Port Said in addition to a number of other minor outlets to the sea. Several drains bring agricultural drainage water to the lake. The drains of Faraskur, Bahr Al Baqar, Al Sarw, Abu Garida, and Baghus are among the main delta drainage canals which bring large volumes of agricultural waste water to the southern shore of the Lake.

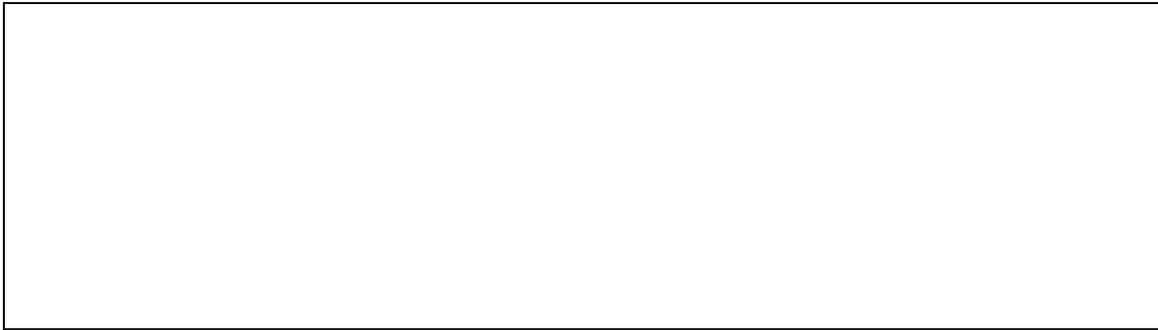


Fig. 9. Lake Manzala

Several factors are threatening and deteriorating this most important wetland area in Egypt. Widespread reclamation has resulted in major reduction in the area of the lake and its marshlands. In addition large areas of the lake have been modified by dredging and removal of natural vegetation. Large amounts of untreated sewage end up at the lake, and also agricultural drainage water carrying huge quantities of agrochemicals including pesticides and fertilizers.

Lake Manzala is eutrophic. Along its western and southern coasts fresh and drainage water flows via seven main sources, with the Bahr El Baqar and Hadous Drains contributing about 75% of the total inflow to the lake. Bahr El Baqar carries partly treated domestic wastewater of Cairo and a number of east central delta cities to the lake.

IDENTIFICATION AND ASSESSMENT OF ISSUES

According to the draft SP (2005) the following are the main identified issues

Urban Effluents

The potable water production was 163,672 m³/day in 2004 with a per capita of 209 l/day. Port Said city is served by sewer network and a WWTP of the secondary type with a capacity of 190,000 m³/day. Effluents from the WWTP are discharged into Lake Manzalah connected to the Mediterranean through El'Gamil outlet. Two WWTPs are under construction to serve Port Fouad district (37,000 m³/day) east of Suez Canal, and El'Garabaa-El'Manasra area west of the city. A WWTP is under construction also in the industrial zone south of Port Said

Urban Solid Waste

No data are available or were provided urban solid waste volumes or recycling or processing plants in the governorate. However, using the generation index of 0.6 kg/capita/day given by Hamza (1994) would result in an estimate of 318 ton/day.

Air Pollution

No data are available on air pollution in Port Said Governorate.

Pollution Hg, Cd, Pb

No data are available on pollution by Hg, Cd and Pb in Port Said Governorate.

Organohalogenes

Data reported on POP's in Egypt (MTS 156) are listed in Annex 1.

Industrial Wastewater & Solid Waste

All industrial plants in Port Said Governorate discharge their effluents into Lake Manzalah.

CHAPTER-6

National Policy Framework and Initiatives for Managing the coastal area within the Framework of the SAP NAP

Institutional arrangements related to LBA

The Egyptian Environmental Affairs Agency (EEAA)

The Egyptian Environmental Affairs Agency (EEAA) is the central institution involved in environmental protection and co-ordination in Egypt. EEAA, which operates under the Ministry of Environment, has multi-functions mandates, including administering to the comprehensive requirements and regulations encompassed under Laws No. 4/94 and No. 102/83.

National Environmental Action Plan (NEAP) for 2002 - 2017

In 1992 Egypt prepared and adopted its First National Environmental Action Plan (NEAP). In 2002 the Second National Environmental Action Plan (NEAP) has been developed.

The primary aim of the Plan is to provide support for the introduction of a participatory and demand-driven environmental planning process, favourable to sustainable development.

The NEAP includes programmes and projects that address several environmental issues including the management of national marine coastal zones. The main objectives of this programme include establishing a dynamic process for national comprehensive coastal zoning, and achieving sustainable use of marine and coastal resources through a combination of scientific research, appropriate quotas and regulations, active monitoring and enforcement, and pilot projects allowing use of certain resources by local citizens.

Addressing the environmental issues of the Mediterranean in Egypt, the NEAP recognized the presence of some pollution hot spots located mainly in semi enclosed areas, close to harbours, large cities and industrial areas. It further emphasized that current threats as localized eutrophication, heavy metal and organic/microbial pollution, oil spills introduction of alien species are mainly resulted from anthropogenic activities. **Land-based activities** represent the major source of pollution of the Mediterranean and the Red Sea.

The projected LBA/NAP will be consistent with NEAP.

National Committee for Integrated Coastal Zone Management

The EEAA was given specifically the authority to “participate with the concerned agencies and ministries in the preparation of a National ICZM Plan for the Mediterranean Sea and Red Sea coasts”.

With this mandate the EEAA has initiated the coordination of ICZM planning, in which the first step was to establish the National Committee for ICZM (NCICZM). A Ministerial Decree constituting the establishment of the NCICZM was issued in 1994, amended in 1996 and 2002. The function of the committee is not only to draw-up a consistent policy and strategy for future development, but also to resolve conflicts between users interests.

The NCICZM comprises top rank representatives of all concerned ministries (inter-ministerial), NGO's and major stakeholders.

The assignments of the NCICZM are as follows:

- To coordinate all coastal activities between the competent authorities towards ICZM, through the drafting, setting and approval of general guidelines for all activities, including EIA.
- To ensure that all land use plans and development activities in the coastal area take into account contingency arrangements.
- To harmonize between the proposed development activity and the carrying capacity of the ecosystem for the sustainable use of available resources.
- To ensure efficient commitments to the Regional and International conventions concerning the protection of the marine environment and the coastal areas.
- To approve programmes and plans aims at restoring and rehabilitation of coastal ecosystem that suffers from environmental stress, damage and deterioration.
- To coordinate and specify mandates for different authorities in the coastal area.
- To approve national arrangements related to the protection of the environment in the coastal areas and the contingency plans.
- To review and evaluate all major projects to be executed in the coastal zone, particularly those of a conflict natures.
- To review any future activities or projects, adding to the above, relevant to the ICZM

The preparation and implementation of the activities to be identified in the NAP/LBA will be under a national umbrella which is the existing National Committee for Integrated Coastal Zone Management, established The management of coastal activities, including LBA, affected the marine environment was included in the committee's mandates.

Management and Actions

The following are brief presentations of the past achieved and or ongoing activities to address marine pollution from land based activities

Environmental monitoring:

The Environmental Information and Monitoring Program (EIMP) of the EEAA is implementing a comprehensive program for monitoring water quality in the coastal water of Egyptian Mediterranean (Coastal Water Monitoring Program, CWMP). This Monitoring Programme comprising the monitoring of Water Quality parameters on water samples, and levels of contaminants in sediments along the entire Egyptian Mediterranean coastline.

National Oil Spill Contingency Plan

Egypt prepared a National Oil Spill Contingency Plan within an overall National Environmental Disaster Management Plan. The Mediterranean part of this plan was prepared in full cooperation with the Regional Marine Pollution Emergency Response Center for the Mediterranean Sea (REMPEC).The plan covers ports, harbors, and waters within the exclusive economic zone. On land, it includes the foreshore and adjacent land affected by an oil spill.

Egyptian Pollution Abatement Project (EPAP)

Egyptian Pollution Abatement Project (EPAP) is one of the main projects of the EEAA, its main goal is to assist the industry to comply with law.

The Technical and Institutional Support Component of the EPAP, includes the initiation of an inventory of industrial emissions at the Governorate level. This exercise would enable EEAA as well as the local administration to assess the extent and impact of each industrial activity/sector on environmental conditions in the Governorates.

- In this project, eighty-four companies in Alexandria governorate were selected to perform this exercise. Companies' summary data sheet (SDS) for each company is included in this volume and grouped according to the International Standard for Industrial Classification "ISIC".

Inventories for the emission from these industries will be presented and used for the BB (2003).

Lake Manzala Engineered Wetland Project

The GEF is funding a five-year demonstration wetland project at Lake Manzala. The executing agency of this project is the Egyptian Environmental Affairs Agency EEAA. The main objective of the project is to reduce the discharge of pollutants from Lake Manzala into the Mediterranean Sea. This is accomplished by reducing the pollution load reaching the lake via agricultural drains through a series of constructed wetlands.

The engineered wetland will treat 25,000 m³ d⁻¹ of wastewater before its discharge into Lake Manzala and hence the Mediterranean.

CHAPTER- 7

- **IDENTIFICATION OF PRIORITIES ACTIONS**
 - sewage management
 - urban solid waste
 - air pollution
 - pollution caused by Hg,Cd,Pb
 - organohalogens: halogenated aliphatic hydrocarbons' halogenated aromatic hydrocarbons, chlorinated phenolic compounds, organohalogenated pesticides
 - wastewater and solid waste from industrial installations.
 - additional activities
- **SETTING GOALS AND MANAGEMENT OBJECTIVES**
- **IDENTIFICATION OF CRITERIA FOR EVALUATION OF EFFECTIVENESS**
- DEVELOPMENT OF PROGRAMME SUPPORT ELEMENTS**

EGYPT

Conventions and Protocols

Montreal	9.5.1988(R)
CB	08.01.93 (a)
PIC	
Rat.PIC	
Sign POP	
Rat POP	
	†09/06/1992†
Rat Biodiv	†02/06/1994†trf

POPs inventory

Location	Common name	Commercial name	Qty. Kgs	Qty. Lts	Year	Origin
12 Governorates	Fenthion	Lebaycid 50%		83575	1992	Bayer AG, Germany
Various sites	Flamprop-M-Isopropyl	Suffix 20%		434	1994	Cyanamid, USA
South Sinai	Flocoumafen	Storm 0.005%	155		1989	Cyanamid, USA
Sharkia	Fluazifop Butyl	Fusilade 25%		136	1989	ICI (Zeneca), UK
10 Governorates	Flumethrin	Bayvarol strips	232606		1991	Bayer AG, Germany
Menofia	Fluometuron+ Metolachlor	Cotoran Extra	26		1990	Ciba (Novartis),
Kafr El-Shaykh, Behera	Fluometuron	Cotoran 80%	32		1990	Ciba (Novartis),
11 Governorates	Furathiocarb	Deltanet 40%		1083	1991	Ciba (Novartis),
10 Governorates	Glufosinate ammonium	Basta 40%		20350	1992	Hoechst AG, Germany
South Sinai	Glyphosate	Round up 48%		2	1987	Monsanto, Belgium
Qalyubia, Gharbia	Malathion	Malathion 57%		84	1990	Cheminova, Denmark
Menofia	Mancozeb	Dithane M 44	22		1994	Rohm & Haas, Italy
Kafr El-Shaykh, Ismailia	Methomyl	Lannate		435	1992	Du Pont, USA
Matruh	Methomyl	Lannate 90%	40		1990	Du Pont, USA
South Sinai	Methomyl	Nudrin 90%	3		1989	Cyanamid, USA
Various sites	Metribuzin	Sencor 70%		2812	1982	Bayer AG, Germany
Qalyubia, Gharbia	Mineral oil	Folk oil 82%		1310	1987	Al-Amria Petrol Refining, Egypt

Alexandria	Mineral oil	Super Royal 95		495	1990	Societe Co-op de Petrp, Egypt
South Sinai	Mixture Metalaxyl + copper	Ridmil plus 50%	7		1991	Ciba (Novartis)
Gharbia	Molinate	Ordram		82	1989	ICI (Zeneca), UK
Various sites	Monocrotophos	Azodrin 40%	0	1010	1991	Cyanamid, USA
Matruh	Paraquat dichloride	Gramaxone 20%	0	4	1987	ICI (Zeneca), UK
Kafr El-Shaykh	Pencycuron	Monceren 25%	47		1994	Bayer AG, Germany
Kafr El-Shaykh	Phenmidipham	Betanal		7264	1992	Shering, Germany
Kafr El-Shaykh	Phenthoate	Cidial K		283	1990	Isagro, Italy
Giza	Phosalone	Zolone 35%		2	1984	Rhone-Poulenc,
Gharbia	Pirimicarb	Pirimor 50%	1		1990	ICI (Zeneca), UK
Demyat, Gharbia	Pirimiphos Methyl	Actellic 50%		343	1989	ICI (Zeneca), UK
Ismailia	Thiabendazole	Tecto 45%		766	1987	Merck Sharp, Holand
Various sites	Thiobencarb	Saturn 50%		1972	1991	Kumiai, Japan
Kafr El-Shaykh	Thidiazuron	Dropp (defoliant)	3		1984	Shering, Germany
15 Governorates	Tralkoxydim	Grasp 10%		24722	1992	ICI (Zeneca), UK
Demyat, Minia	Tolclofos-methyl	Rizolex 50%	23		1990	Sumitomo, Japan
Menofia	Triadimefon	Bayleton	2811		1991	Bayer AG, Germany
Ismailia, Menofia	Tridemorph	Calixin 75%		1742	1992	BASF, Germany
Menofia	Trifluralin	Treflan Super		5415	1984	DowElanco, USA
11 Governorates	Unknown	Abistan	87280		1991	Sandoz, Switzerland
Suhag	Fenitrothion	Sumithion 30%		7062	1984	Sumitomo, Japan
Matruh	Fenitrothion	Sumithion 50%		100	1991	Sumitomo, Japan
Various sites	Edifenphos	Hinosan 50%		3605	1991	Bayer AG, Germany
Gharbia	Dinocap	Karathane	86		1991	Rohm & Haas, Italy
Various sites	Diphacinone	T.C.R. 0.005%	1030		1994	Hopkins Agric. Chem,
Ismailia	Difenacoum	Rat killer	4877		1993	ICI (Zeneca), UK
Various sites	Diafenthuron	Polo 50%		558	1991	Ciba (Novartis),
South Sinai	Cupric hydroxide	Cupric hydroxide		7	1985	Griffin International
Gharbia, Giza, Minia	Coumachlor	Tomorine 1%	1030		1993	Bayer AG, Gernmay
Gharbia	Coumatetralyl	Racumin Tech.	9350		1990	Bayer AG, Germany

15 Governorates	Copper Sulphate	Copper sulphate	36363		1987	
South Sinai	Copper Oxychloride	Copper oxychloride	34		1991	
Gharbia	Chlorpyrifos	Dursban 485	0	200	1993	DowElanco, UK
Kafr El-Shaykh	Chloridazon	Pyramin 65%	1821	0	1992	BASF AG, Germany
Kafr El-Shaykh	Chloridazone	Pyradur	10081	0	1989	BASF, Germany
Giza	Carbosulfan	Marshal 25%	12		1993	FMC Corp., USA
Matruh	Carbofuran	Furadan 10%	497		1984	FMC Corp., USA
Kafr El-Shaykh, Sharkia	Butachlor	Machete 60%		708	1991	Monsanto, Belgium
Various sites	Butachlor	Machete 60%		3043	1991	Monsanto, Belgium
South Sinai	Bromopropylate	Neoron		5	1987	Ciba (Novartis),
Various sites	Buprofezin	Applaud	1854		1992	ICI (Zeneca), UK
Ismailia	Bromadiolone	Super Caid 0.005%	1696		1993	Lipha Lyon, France
10 Governorates	Bifenox	Modown 4F 48		29821	1989	Rhone-Poulenc, France