SEAM Programme

THE GOVERNORATE OF DAKAHLEYA
ENVIRONMENTAL PROFILE

Ministry of State for Environmental Affairs
Egyptian Environmental Affairs Agency

Entec UK Ltd., ERM
UK Department for International Development

THE GOVERNORATE OF DAKAHLEYA

ENVIRONMENTAL PROFILE

Compiled by

Egyptian Environmental Affairs Agency (EEAA)
Technical Cooperation Office for the Environment (TCOE)
and
Entec UK Ltd

Based on surveys of the Governorate by

Working Group Specialists
National Consultants and
Local Stakeholders

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GLOSSARY/ACRONYMS

AOYE	The Arab Office for Youth and Environment
a.s.l	above sea level
BPEO	Best Practical Environmental Option
BOD	Biological Oxygen Demand
CDA	Community Development Association
COD	Chemical Oxygen Demand
dB	decibel
DFID	Department for International Development (UK)
EA	Environmental Audit
EC	Electrical Conductivity
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
ELO	Environmental Liaison Office
EMD	Environmental Management Department
EMED	Environmental Monitoring and Enforcement Department
EMS	Environmental Management System
EMU	Environmental Management Unit
EPAP	Environmental Pollution Abatement Programme
EMPS	Environmental Management and Planning System
EQI	Environmental Quality International
ET	Environmental Tribunal
Feddan	Area of Land (4,200 m^2)
GDP	Gross Domestic Product
GEAP	Governorate Environmental Action Plan
GIS	Geographical Information System
GOE	General Office of the Environment
GOFI	General Organisation for Industries
GOPP	General Organisation for Physical Planning
K	One thousand
km	kilometre
LE	Abbreviation for Egyptian pound
M	One million
Markaz	Administrative District
MCM	Million cubic metres
mmhos/cm	millimhos per centimetre
NA	Not Applicable
na	not available
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organisation
NO_2	Nitrogen Dioxide
NOPWASD	National Organisation of Potable Water and Sanitary Drainage
ODA	Overseas Development Administration
PEA	Public Economic Authority
ppm	parts per million
RBO	Regional Branch Office
RPC	Regional Planning Centre
SEAM	Support For Environmental Assessment and Management
SEC	Supreme Environmental Council
STW	Sewage Treatment Works
SWM	Solid Waste Management
TCOE	Technical Co-ordination Office for the Environment
TDS	Total Dissolved Solids

TOR	Terms of Reference
TSP	Total Suspended Particles
WHO	World Health Organisation
WTP	Treatment Plant
WWTP	Waste Water Treatment Plant

PREFACE

Background

i. In 1995 the Egyptian Environmental Affairs Agency concluded an agreement with the UK Department for International Development (DFID) for funding a 3-year ,Support for Environmental Assessment and Management Project, colloquially referred to as the SEAM Project. The execution of the Project is jointly undertaken by the Technical Co-ordination Office for the Environment (TCOE) and a UK environmental consultancy, ENTEC.

ii. The Project entails several components, which include the preparation of both solid waste management strategies and environmental action plans for the Governorates of Dakahleya and Sohag. In addition, there are national programmes for environmental impact assessment, for industrial auditing in food, textiles, oil and soaps, as well as establishing an environmental database. Demonstration projects covering solid waste management and pollution control are planned. Capacity building, including training, is also a significant component of the entire Project. The National Environmental Action Plan (NEAP) was launched in 1992. This Project was initiated in support of that National Plan.

iii. This Environmental Profile of Dakhaleya Governorate has been prepared as part of the SEAM Project. It is intended to serve as a companion document to the Governorate Environmental Action Plan (GEAP) for Dakahleya.

iv. The Environmental Profile comprises two parts. The first, Part A, is a summary of resource surveys conducted by local and national technical specialists. The second, Part B, presents the perceptions of stakeholder groups concerning the top priority issues to be addressed in preparing a Governorate Environmental Action Plan for implementation. It provides insights into the social dynamics of the Governorate. The strategic approach agreed for managing solid wastes throughout the Governorate is also outlined.

v. The process used to compile this document is indicated by the Flow Process Chart presented in Box i.i.

Dakahleya

vi. Dakahleya Governorate is, as shown in Box i.ii, located in the Delta area. It has a population of over 4 million in rural and urban areas, and is one of the most densely populated Governorates of Egypt. Administratively, as indicated in Box i.iii, it is divided into Markazes (local District Authorities), which incorporate 17 cities, 109 main villages and 336 satellite villages.

vii. Whilst industry is expanding, agriculture is the predominant activity. Rice, wheat, cotton, maize, beans, fruit and vegetables are the principal crops. The larger industrial factories include textiles, fertiliser, particle board, bricks, oil and soaps, as well as dairy foods. Only 28 firms employ more than 50 workers.

viii. Box i.iv provides an overview of the principal issues respectively described and addressed in this Profile and the companion GEAP.

Objectives

ix. The compilation of an Environmental Profile is required to provide a firm basis for preparation of a Governorate Environmental Action Plan (GEAP). Experience suggests that the most useful form of Environmental Profile consists of two components, namely:

- a Summary of, and commentary on, the Social, Economic and Natural Environmental Resources of the area concerned; and
- a generally agreed Statement concerning the key Environmental Issues, which need to be addressed in preparing a GEAP. These issues relate in many instances to problems, which differ according to whether they are purely local or whether they have wider regional or national perspectives and significance.

x. This document attempts to cover both components. The first one has been drafted primarily on the basis of the reports prepared by the ten specialist members of the Working Group. Their inputs are gratefully acknowledged.

xi. At the same time it must be pointed out that this document covers only general information for the ‚layman„. For the specialist reader, reference should be made to the full reports prepared by the Working Group members. These are available upon request from either TCOE or Entec in Cairo.

xii. The second component is based primarily on consultations with both local and national stakeholder groups. The specialists referred to above constitute one of these groups.

xiii. The focus of the GEAP will be upon finding solutions to the priority problems and opportunities so that, as soon as is practicable, they can be integrated into the economic development plan for the Governorate.

Approach and Types of Resources

xiv. There are **three** main types of resources, which impinge directly and indirectly upon the nature (extent and condition) of the environment which exists in Dakahleya, namely:

- natural resources;
- economic resources (capital plant, equipment and infrastructure);
- social/human resources.

xv. The principal natural resources are land and water, together with the flora (plants) and fauna (animals) which these support. One of the objectives of the NEAP is to ensure that the stocks of these natural resources are conserved through sustained use, management and development. At the same time it is important that their management enables the annual outputs (yields) at least to be maintained and preferably to be increased.

xvi. A distinction needs to be made between economic resources, which contribute respectively to:

- the use, maintenance and conservation/protection of the natural and social resources; and in some cases
- degradation and depletion of these resources.

These are not necessarily inherent characteristics, but rather a reflection of the manner in which they are designed, used and managed.

xvii. Human skills and management capabilities, as well as institutional capacities, represent the most important social resources with respect to the environment.

xviii. In seeking to conserve and improve the environment of Dakahleya Governorate, or any Governorate, the inter-actions and relationships **between** the resources - in terms of their use and management - are as, if not more, important than the characteristics of the resources themselves.

Review Process

xix. This "vital resource statistics" review of Dakahleya commences with a review of the capital stocks of natural resources. It is recognised that the development potential - especially of such an agriculturally-dominated Governorate as Dakahleya - depends significantly upon the nature, size and condition of the natural resource stocks.

xx. The review then proceeds with an outline analysis of the economic capital stocks which have a direct bearing on both the state of the environment and its potential for change.

xxi. This is followed by examination of both the size and nature of the Governorate,s social capital stocks. This acknowledges the prime role played by human resources both in determining the state of the environment at any point in time and in influencing the rate of environmental change - for better, for worse - over time.

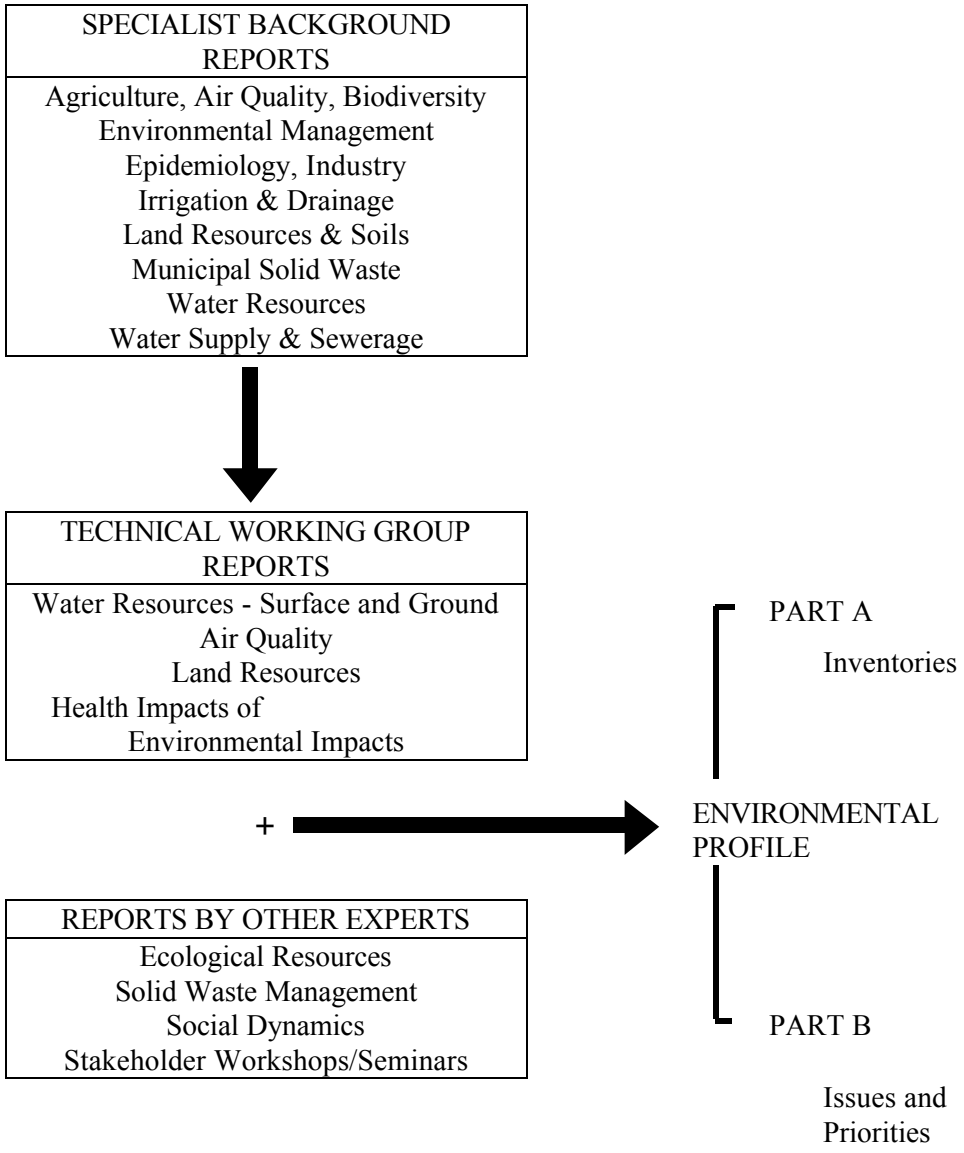
xxii. Logically, following this tri-partite review, attention focuses upon the resource interactions and environmental impacts. Two facets in particular are assessed, namely:

- economic and social forces, in influencing the depletion and degradation/pollution of the natural resource base;
- the potential, inherent in the economic and human capital stocks, for assisting the processes of environmental conservation and improvement.

xxiii. Locationally, as will be seen from the accompanying Boxes, the Governorate comprises part of the coastal belt of the Nile Delta, between the Rashid (Rosetta) and Dumyat (Damietta) Branches. It extends inland for about 100 kms.

xxiv. It is against this background that the review of the Governorate,s resources is conducted.

BOX i.i: COMPONENTS OF THE ENVIRONMENTAL PROFILE FOR DAKAHLEYA



BOX i.ii LOCATION MAPS OF DAKAHLEYA GOVERNORATE

BOX i.iii GENERAL MAP OF DAKAHLEYA GOVERNORATE AND COMPONENT MARKAZES

BOX i.iv DAKAHLEYA GOVERNORATE: LAND/WATER PROBLEMS AND DEGRADATION

PART A

RESOURCE SURVEY RESULTS

1 THE NATURAL CAPITAL RESOURCES

Introduction

1.1 The natural resources capital of the Governorate comprises its climate, air, water, soils, flora and fauna, landscape and visual features, as well as its cultural and natural tourist assets.

1.2 As expected, the characteristics of many of these natural resources are a function of their location within the Governorate, which itself is located within two main sub-Regions: the Nile System and the Deltaic Mediterranean coast.

1.3 The Nile System sub-Region of Egypt encompasses the lands affected mainly by the River Nile and its associated extensive and intricate irrigation network of canals and ditches. The former run along the higher tongues of land, with the latter lying in the hollows. It includes the length and breadth of the Nile valley from Aswan to the Delta Barrages, and the Nile Delta between the Delta Barrages northwards to the inland border of the Mediterranean coastal belt.

1.4 In contrast, the Deltaic Mediterranean coast is a narrow belt influenced by the sea. It runs from Abu Qir eastwards to Port Said: 180 km from west to east and approximately 15 km landwards from the sea.

Climate

1.5 The climate of Dakahleya is "semi-arid"; annual rainfall averages less than 100mm and decreases southwards. Winters are mild with rain, followed by hot dry summers. Meteorological data, based on Mansoura Station records for the past 50 years, are as follows:

Parameter	Annual Mean
Air Temperature	21.3° C
Relative Humidity	62.0 %
Evapo-transpiration	100.0 mm
Rainfall	60.0 mm

1.6 Dakahleya is part of a climatic province which can be sub-divided into a coastal belt under the maritime influence of the Mediterranean, with a shorter dry summer, and the inland area with a longer dry period. Reflecting this, the Governorate can be classified into two main sub-regions - the Deltaic Mediterranean coast and the Nile System.

Air in Urban Areas

1.7 Air quality is a function of community activities and weather conditions, including time. Climatic conditions in Dakahleya during both late autumn and winter favour the incidence of ground level temperature inversions. These lead to an aggravation of local pollution levels in certain urban centres, as does the fact that average wind speeds do not normally exceed 5.5 km/hour.

1.8 It is reported (Noweir, K & Youssef, A-F. 1995) that "the quality of air in Dakahleya is not satisfactory, although about 20 years ago this Governorate was known as a pleasant district in which to live". The seriousness of air pollution in the Governorate as a whole is evidenced by the following average statistics for the period 1989-94: Total Suspended Particles (TSP) (micrograms per cubic metre) have risen from 2.5 times the WHO standard to almost 3.5 times; in relation to

smoke the corresponding figures are 2.3 and 2.0 times, i.e. a slight reduction. In the case of sulphur dioxide, there has also been some reduction (from 2.4 times to 1.6 times), but still the WHO standard continues to be exceeded. In short, particulates generally represent the main ambient air pollutant in the Governorate. These are emitted as a result of a whole array of activities: fuel combustion, industrial processes (especially those used in brick kilns, foundries and workshops), construction works and the fly-tipping and burning of solid wastes in open areas. However, in some cities, such as Mit Ghamr, sulphur dioxide is the main pollutant.

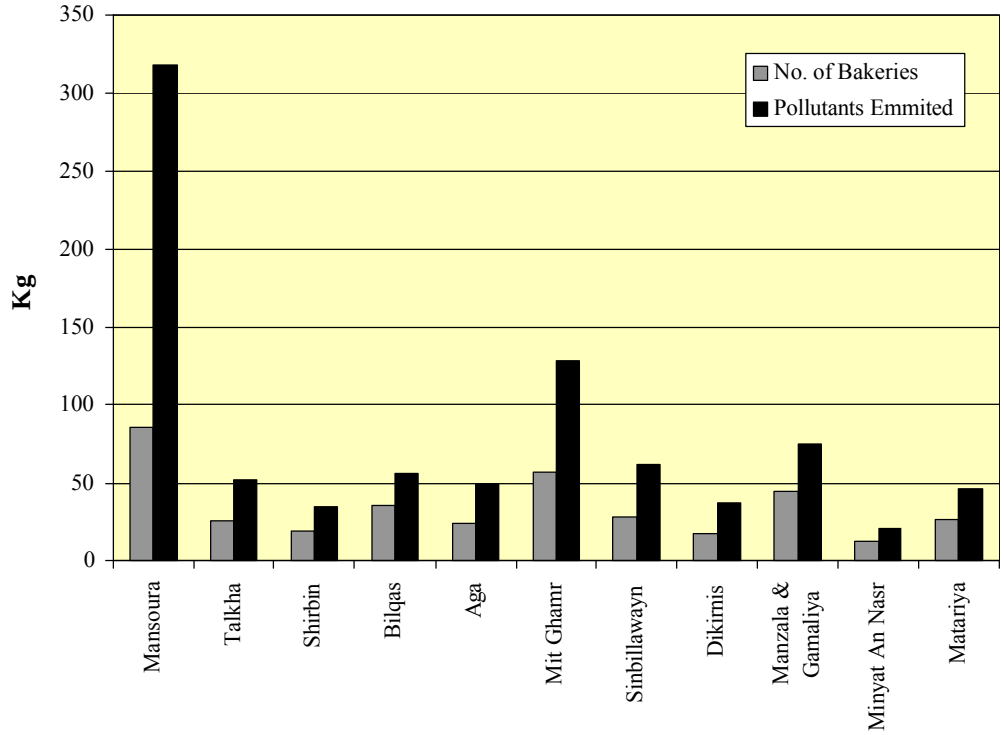
1.0 The causes for this deterioration in air quality are many: "the rapid growth of industrialisation, greater dependence on fossil fuels, high rates of construction, poor pollution control and other human activities". The levels of pollution associated with just three of the sources are displayed in Boxes 1.1, 1.2 and 1.3.

1.10 The types of pollutants differ across the Governorate depending upon the activities:

- industrial areas, such as Talkha City, have a fertiliser plant and electric power station; the main pollutants are ammonia, nitrogen oxides and particulates;
- in Mansoura City the main pollutants are particulates, sulphur dioxide and nitrogen oxides emitted from industrial plants and heavy traffic;
- the settlement which suffers the highest pollution levels within the Governorate is Mit Ghamr; the main pollutants are particulates, sulphur dioxide and carbon dioxide emitted from kilns and foundry workshops;
- in rural areas, particulates originating from fertiliser and pesticide dust and plant residues are the main pollutants.

1.11 Recent establishment of three new air quality monitoring stations in Mansoura has revealed that both TSP and lead concentrations exceeded national ambient air quality standards (by 225% and 26% respectively) over a one year period. The Egyptian standards for ambient air quality are as presented in Box 1.4.

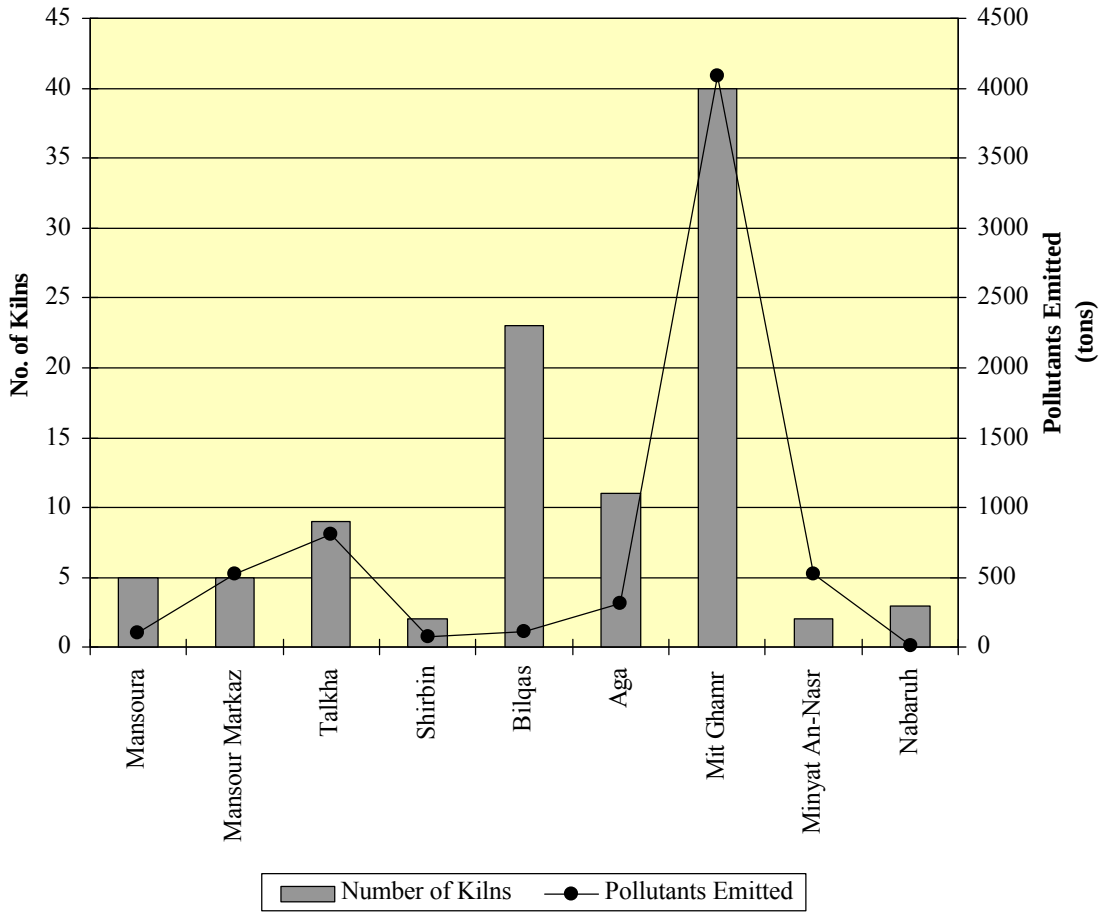
BOX 1.1 DAKAHLEYA GOVERNORATE: ESTIMATED TOTAL POLLUTANTS EMITTED DAILY FROM BAKERIES



District	Number of Bakeries	Total Daily Pollutants Emitted (Kg)
Mansoura	86	318.5
Talkha	26	52.1
Shirbin	19	34.3
Bilqas	36	56.2
Aga	24	49.3
Mit Ghamr	57	128.9
Sinbillawayn	28	62.1
Dikirnis	18	37.5
Manzala and Gamaliya	45	74.9
Minyat An Nasr	13	20.9
Matariya	27	46.1
Total	**379**	**880.8**

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995), Dakahleya Governorate Environmental Action Plan: Air Quality. TCOE/Entec

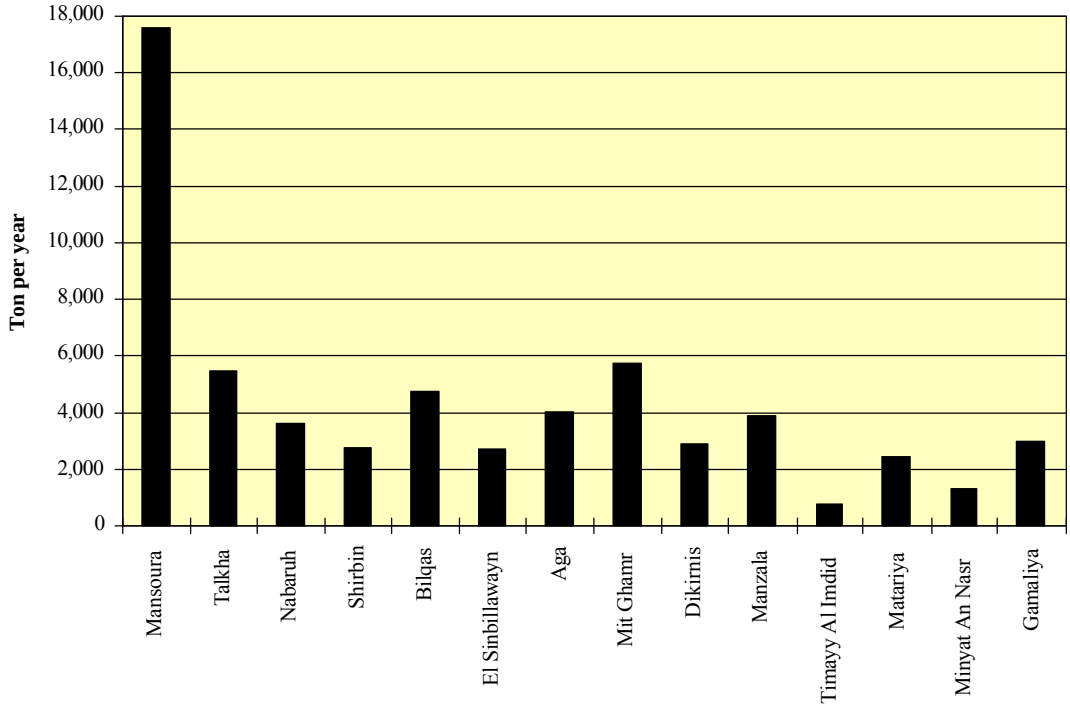
BOX 1.2 DAKAHLEYA GOVERNORATE: ESTIMATED TOTAL POLLUTANTS EMITTED ANNUALLY FROM BRICK KILNS



District	Number of Kilns	Total Pollutants Emitted (tons)
Mansoura	5	104.2
Mansour Markaz	5	520.9
Talkha	9	807.3
Shirbin	2	78.7
Bilqas	23	109.4
Aga	11	312.6
Mit Ghamr	40	4092.6
Minyat An-Nasr	2	520.9
Nabaruh	3	13
Total	**100**	**6559.6**

Source: Kamal Noweir, H and Abdel-Fattah Youssef (1995) Ibid

BOX 1.3 DAKAHLEYA GOVERNORATE: ESTIMATED TOTAL POLLUTANTS EMITTED FROM VEHICLES 1994 (based on daily average)



District	Total Emitted Pollutants (tons per year)
Mansoura	17,630
Talkha	5,486
Nabaruh	3,618
Shirbin	2,803
Bilqas	4,756
Sinbillawayn	2,685
Aga	4,015
Mit Ghamr	5,728
Dikirnis	2,910
Manzala	3,894
Timayy Al Imdid	788
Matariya	2,450
Minyat An Nasr	1,319
Gamaliya	2,977
TOTAL	**61,063**

The pollutants are Hydrocarbons, CO_2, SO_2 , NO_2 , Aldehydes and Particulates

BOX 1.4: EGYPTIAN AMBIENT AIR QUALITY STANDARDS

Substance	Maximum Level (micro grams/cubic metre)	Exposure Time
Sulphur Dioxide	350 150 60	1 hour 24 hours 1 year
Carbon monoxide	30 (milligrams) 10 (″)	1 hour 8 hours
Nitrogen dioxide	400 150	1 hour 24 hours
Ozone	200 120	1 hour 8 hours
Total Suspended Particulates	230 90	24 hours 1 year
Black Smoke	150 60	24 hours 1 year
Respirable Particulates (PM10)	70	24 hours
Lead	1	1 year

Source: Kamal Noweir, H. and Abdul Fattah Youssef (1995) Ibid.

1.12 The annual average ambient air quality statistics specific to Mansoura and Mit Ghamr, relative to WHO standards, were in 1992 as shown in Box 1.5.

BOX 1.5: AIR QUALITY STATISTICS RELATIVE TO STANDARDS

Pollutant	Mansoura	Mit Ghamr	WHO
	micrograms per cubic metre		
Sulphur dioxide	129	69	60
Total suspended particles (TSP)	299	300	90
Smoke	83	49	60

Source: Ministry of Health, National Air Pollution Monitoring Network.

1.13 It has been reported that "the emitted pollutants from the small-scale industries and workshops differ [as is to be expected] according to the activity, raw materials and fuel used. The main small-scale industries and workshops are primitive and virtually excluded from any environmental control. No data concerning the emission of air pollutants are available. Thus the workers are exposed to different types of hazards over which they have practically no control". The Governorate contains many brick kilns and bakeries which specifically represent a major source of air pollution.

1.14 Finally, mention must be made of the annual fuel consumption of industries in the cities of Dakahleya. This, together with the quantities of gasoline and diesel consumed by vehicles, is another source of air pollution, especially regarding sulphur dioxide and particulates.

Air in Rural Areas

1.15 Aerial application of fertilisers and pesticides, as well as by conventional methods, has been a major source of pollution.

Water Resources

1.16 The surface water resources of the Governorate comprise the River Nile (Dumyat Branch), the main irrigation canals, the irrigation-drainage network and open ditches. In total, under the 1959 Treaty, the Nile contributes approximately 55.5 billion m3/year. Groundwater resources (sand dune water, subsoil water and groundwater) by comparison amount to only 4.5% of that figure, of which about 50% is infiltration water from the Nile.

1.17 The groundwater source is a confined aquifer, which has an average thickness of more than 700 metres. Further details are displayed in Box 1.6. The aquifer is dominated by permeable sands and gravels with minor clay lenses. Deep percolation from flooded irrigation fields plays a major role in aquifer re-charge.

BOX .6 DAKAHLEYA GOVERNORATE: CONTOUR MAP OF AQUIFER THICKNESS

1.18 For the whole Nile Delta there is a positive groundwater balance. Indeed, it is estimated that an additional 450 million m3/year are available for use. Approximately 25% of the total water supply within the Governorate is contributed by groundwater. About one third of the Governorate,s population is dependent upon this water for drinking and domestic uses.

1.19 Groundwater, an important water source in the southern part of the Governorate, is deteriorating in quality which in part may relate to increased abstraction rates and pollution from agrochemicals and domestic sewage. The quality of both surface and groundwater resources cannot be relied upon, in relation to WHO and other standards. As is to be expected, the salinity levels of groundwater resources vary according to location as follows (in parts per million):

• at Mit Ghamr	from	390	to c.	800 ppm
• at Sinbillawayn	″	340	″	1,820 ppm
• at Aga	″	380	″	1,000 ppm
• at Mansoura	″	1,400	″	1,600 ppm
• at Bilqas			up to	5,000 ppm
• at Shirbin			″	10,000 ppm
• at Manzala/the coast			″	30,000 ppm

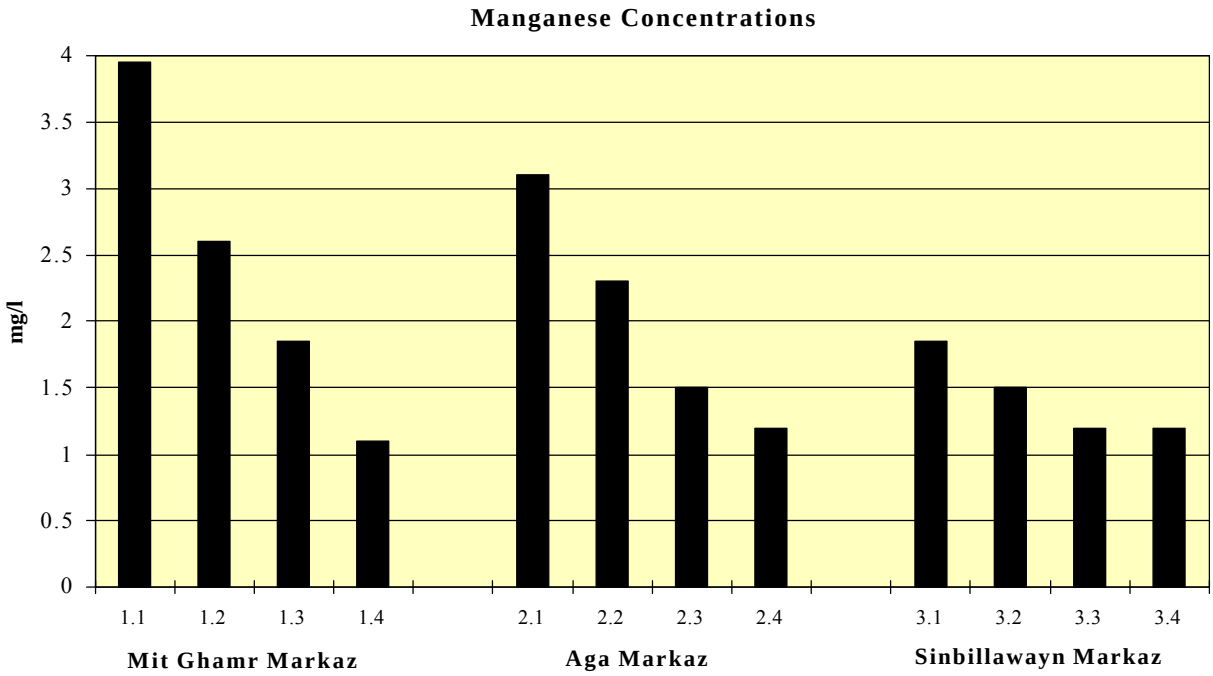
In three main locations (Mit Ghamr, Sinbillawayn and Aga), where groundwater is used for drinking, high concentrations of iron and manganese exist. Box 1.7 provides information on the manganese levels of well water for several different parts of the Governorate. To counter this problem the Ministry of Housing, through NOPWASD, has recently built a pilot water treatment plant to remove iron and manganese.

1.20 The quality of the groundwater for irrigating a broad range of plants is generally satisfactory. However, as is to be expected in the case of both the sub-soil and sand dune water, cropping is restricted to salt tolerant plants. The salinity levels for drainage water throughout the Delta Region are displayed in Box 1.8.

1.21 It is reported that "groundwater aquifers are threatened by salinisation and pollution from agricultural (nitrates and pesticide residues) practices as well as, in some cases, industrial activities. Irrigation canals and agricultural drains experience eutrophication, excessive growth of weeds and accumulation of pesticides. Coastal wetlands and shorelines are also being threatened" by a variety of pollutants which affect fishing and tourist activities.

1.22 The depth to groundwater resources varies across the Governorate, as indicated by Box 1.9. As will be observed, the water table in the Governorate, particularly in its northern half, is close to ground level. As a result evaporation rates are high, leading to capillary rise and progressive salinisation/deterioration of both soils and groundwater resources.

BOX 1.7 DAKAHLEYA GOVERNORATE: WELL WATER CONCENTRATIONS OF MANGANESE



		mg/l
	Mit Ghamr Markaz	
1.1	Mit El Faramawy well	3.95
1.2	Mit Mohsen well	2.6
1.3	El Maasara well	1.85
1.4	El Mohamadiya well	1.1
	Aga Markaz	
2.1	El Derris well	3.1
2.2	Minyet Sammanoud	2.3
2.3	Mit Abu El Hussein	1.5
2.4	Mit El Aamel	1.2
	Sinbillawayn Markaz	
3.1	Fanboul	1.85
3.2	Kafr El Shorafa	1.5
3.3	El Bashniny	1.2
3.4	El Bustan	1.2

Source: Abu Mandour, A Abdel-Daiem (1995), Water Resources: Groundwater, Ibid

BOX 1.8

BOX 1.9

1.23 In the case of most of the River Nile and irrigation canals, however, water is reported to be "still relatively unpolluted". Indeed, monitoring results obtained by NRC for the Dumyat Branch indicate that water quality parameters are within the permissible limits. Furthermore, there were some indications that between 1991 and 1992 water quality in the Branch actually improved. However, there are no grounds for complacency, especially in view of the fact that:

- due to industrial processes and a variety of environmentally unfriendly practices (the discharge of both untreated industrial effluents and raw sewage to drains), "progress towards implementing pollution control abatement facilities to meet the effluent standards of Law 48-1982 has been limited to-date";
- the cation levels of the irrigation water may be detrimental to soil structure and related physical properties;
- the faecal coliform counts grossly exceed the standards applied in Western countries;
- in terms of total dissolved solids, sulphates and COD, there is evidence that the quality of the Dumyat Branch water is deteriorating.

1.24 Although the Ministry of Health in Dakahleya has shown that the quality of potable water at the treatment plants meets the specified standards, in terms of ammonia, nitrites, iron and magnesium, there is other evidence which suggests that the water supplied by the compact units is sub-standard.

1.25 Some areas of the Governorate suffer from a shortage of public water supply, notably Bilqas, Shirbin, Talkha and Sinbillawayn Markazes. There agricultural drainage waters are a potential source of irrigation water. However, the conductivity of that water, coupled with pesticide and fertiliser residues, does in some locations give cause for concern. Indeed, there is evidence that in both the southern and northern parts of the Governorate the salinity of the drainage water exceeds acceptable levels for the normal suite of agricultural crops.

1.26 The biggest single environmental problem in the Governorate is the poor quality of potable water. There is a high incidence of water supply leakages which are responsible for contamination by raw sewage, industrial and other effluents.

1.27 Water quality is said to be deteriorating in association with "increased population and industrialisation, more intensive agricultural practices, accompanied by inadequate treatment of industrial and municipal wastewaters, agricultural run-off and solid waste disposal along the Dumyat Branch banks".

1.28 The water quality of Lake Manzala is a good example of this deterioration; the recorded levels of several heavy metals exceed permissible limits by more than a factor of 20. In terms of most of the standard chemical parameters (TDS, COD, BOD, sulphates) the recorded levels show excesses of between 3 and 10 times the permissible limits. The increase in phosphate levels associated with the use of detergents, as well as agricultural/industrial practices, is another disturbing trend.

1.29 Most of the problem is thought to be related to two factors, notably the pollution loads of the inlet waters and the reduced levels of sea water entering the Lake since the sea connections were restricted in 1967.

1.30 Generally less than 50% of the rural population has access to clean water, compared with urban areas where 80%-100% are connected to a water supply network.

Land Resources and Soils

1.31 Generally, the Governorate is flat, with a gentle slope to the north. The topography has been described thus: "elevation varies from about 12 metres above sea level (a.s.l) in the south to less than 1 metre a.s.l near the shore. The cultivated lands possess a network of irrigation and drainage channels related to the Dumyat Branch of the Nile. It contains wide areas, which are less than 1 metre a.s.l. Some parts in the north, including the coastal lagoons, are below sea level. High sand dunes protect some localities, but others are flooded by winter surges".

1.32 The coastal belt consists of 3 units: extensive back-shore flats, flooded low lands (sabkhas, salinas and marshes) and coastal, fore- and back-shore sand dunes (which are low and narrow).

1.33 Much of the land within the Governorate, especially along the eastern and western banks of the Dumyat Branch, is based on fine deltaic deposits of silt and clay. It is high in both organic matter and nitrogen. Good fertility is thus assured. Furthermore, most of these soils are non-saline.

1.34 The land resources are classified according to their suitability for cultivation. In total, 636,970 feddans or nearly 79% of the total land area of the Governorate (3,471 km^2) is presently cultivated. Of the suitable agricultural land, the classification - based on potential productivity - is as shown in Box 1.10.

BOX 1.10: DAKAHLEYA GOVERNORATE - AGRICULTURAL LAND CLASSIFICATION

Category of Soils	Area (Feddans)	% Area
1	6,370	1.0
2	238,146	37.4
3	320,379	50.3
4	72,075	11.3
Total	636,970	100.0

Source: Dakahleya Agriculture Under Secretary, 1993.

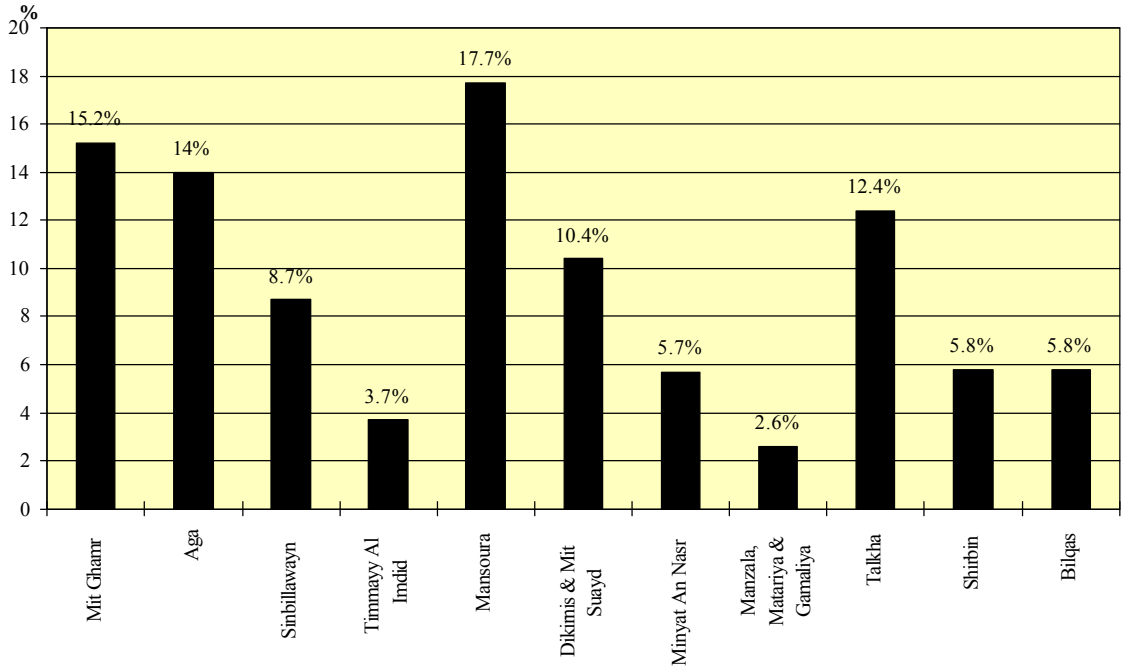
1.35 Extreme diversity exists between Markazes in terms of the incidence of the four categories, with the highest percentages of categories 1 and 2 (38% of the total cultivated land) being found in the following Markazes: Mit Ghamr, Aga, Mansoura and Talkha; as shown in Box 1.11. The highest incidences of categories 3 and 4 are foundin Bilqas, Dikirnis and Mit Suayd, Manzala, Matariya and Gamaliya (ref Box 1.12).

1.36 In terms of soil salinity the worst soils are located nearest to the coast and Lake Manzala, as indicated in Box 1.13.

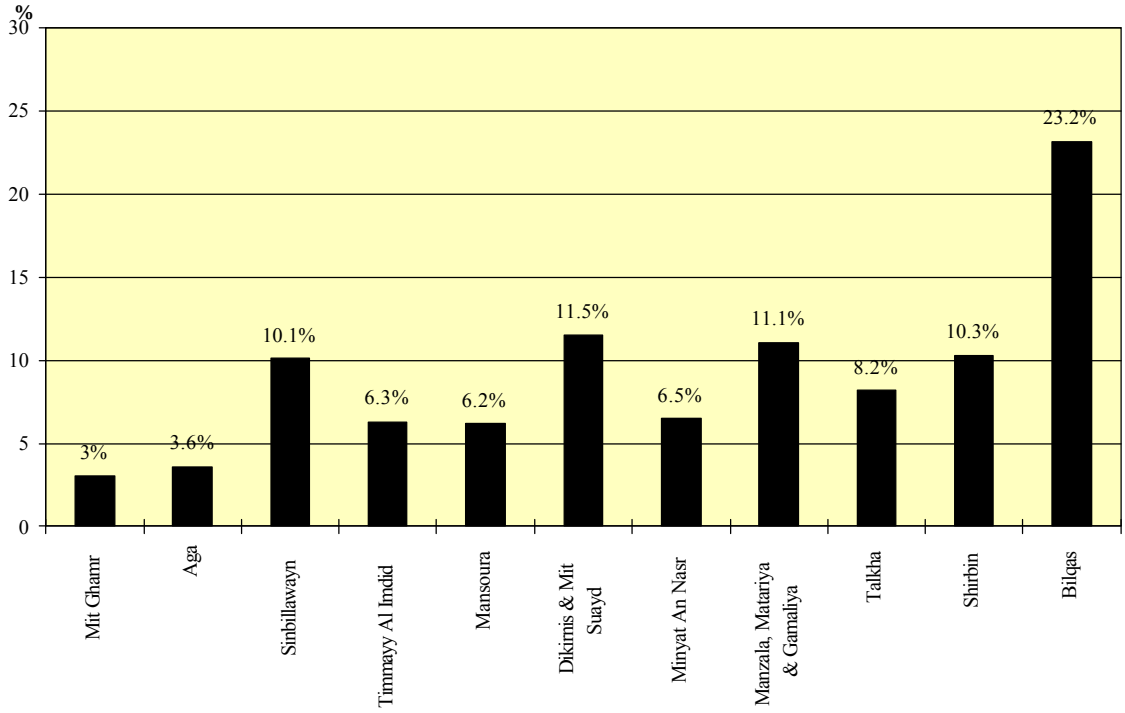
BOX 1.11

BOX 1.12: DAKAHLEYA GOVERNORATE: INCIDENCE OF 1st, 2nd, 3rd AND 4th CLASS CULTIVATED LAND (Percentages)

	Feddans	%
1st and 2nd Class	**238,146**	**38**



	Feddans	%
3rd and 4th Class	**392,454**	**62**



BOX 1.13

1.37 Reclaimed soils under cultivation are also found in the Governorate. They cover an area of over 22,600 feddans and are confined to the northern coastal strip, having been derived from the coastal barrier plains, the coastal plains/dune complexes and narrow areas of fluvio-marine deposits. In the main these soils are poorly drained. A further 76,000 feddans in the Bilqas and Manzala Markazes are under reclamation. It is reported that the potential exists to reclaim a further 83,000 feddans, which would increase the existing cultivated land area in the Governorate by over 10%.

Ecological and Biological Resources

1.38 Whilst the Governorate is highly cultivated, it contains a wide range of habitats and, correspondingly, many examples of Egypt,s rich natural flora. Although vegetation transects in Dakahleya have been made and the results published (Zahran and Willis, 1992), there is a need for an ecological map of the Governorate to be produced. Based upon a thorough vegetation survey, this should indicate, among other items, areas which would benefit from protection and/or habitat management.

1.39 These habitats relate to the two sub-Regions in which the Governorate is located, namely the Nile System and the Deltaic Mediterranean coast.

The Nile System

1.40 The habitats of the Nile System (aquatic canals, drainage channels and the Dumyat Branch, swampy areas, canal banks, cultivated lands and the largest of three northern shallow lakes, Lake Manzala) are inevitably dominated by the water of the River Nile.

1.41 The aquatic habitat is home to some 35 species of aquatic weed. The plants are either entirely submerged, free floating or may have roots which penetrate the soil at the bottom of shallow channels. Before the establishment of the Aswan High Dam, these water weeds were not especially troublesome. However, the Dam has caused a number of significant ecological changes. These include generally lower water levels and decreased water velocities. These, combined with the extensive use of inorganic fertilisers to compensate for the absence of formerly-plentiful silt, has resulted in the phenomenon of eutrophication - both an unnatural increase in fertility caused by nutrients leaching into the water bodies and lower oxygen levels - throughout most of the water channels in the Nile System. This frequently leads to large areas of water weeds, the most notorious being the Water Hyacinth or Nile Lily (*Eichhornia crassipes*), a native plant of Brazil which is now naturalised in Egypt. In places throughout the Delta its growth can be so dense that a person can actually walk across the water body in which it is growing. Many of these weeds also harbour pests serious to health, such as the water snail which is host to the *Bilharzia* parasite. In summary, aquatic weeds cause serious adverse impacts on irrigation, drainage, navigation, fishing, health and crop cultivation. In addition, significant financial resources are used to control these weeds mechanically and chemically.

1.42 Swampy areas involve shallow and very slow moving waters. They are the preferred habitat of several reed species and tall grasses. Many of these plants, such as the grass *Echinochloa stagnina* or the reed *Typha domingensis,* can spread from the swampy areas and choke adjacent water courses. In parts of the Governorate *E. stagnina* is cultivated as a fodder crop. This can exacerbate the spread of the plant as a noxious weed if it is not carefully controlled.

1.43 Canal bank habitat includes vegetation with bank-holding qualities, the roots of which bind soil and can shade out some of the aggressive water weeds at the seedling stage. These, under other conditions, would choke the water course. Plants in this category include cultivated trees and shrubs, such as acacia, fig and tamarix, as well as certain ,smothering, undershrubs, herbs and grasses. Other plants can tolerate and partly stabilise drift sand. They are also especially good for forming wind breaks. One common canal bank herb, *Kochia indica,* is salt tolerant and drought

resistant, as well as being rich in nutritive value as green or dry fodder for livestock. Canal and drain banks are usually cleared of weeds once or twice each year, with shrubs such as tamarix being cut to ground level for fuel and making mats or shelters. Cutting weeds or pulling them at an early stage promotes the bank retainers and smotherers, thereby both reducing the chances of aquatic weeds establishing and preventing the serious problem of bank slip.

1.44 Cultivated and irrigated lands form the largest single habitat in Dakahleya, with the majority of the water being supplied through a perennial irrigation system. Rain-fed agriculture is restricted to the winter and spring months, as well as being confined to a narrow strip of land (approx. 25 km wide in Dakahleya) running parallel to the Mediterranean coast. Two crops are grown annually. Among each set of crops, there is at least a cereal and a leguminous or oil crop. Most of the weeds of these crops are short-lived herbs.

1.45 Lake Manzala is separated from the Mediterranean Sea by a narrow strip of land, although there is one main breach at El Gamil and several smaller openings which connect the Lake with the sea. The area of the Lake has decreased progressively since records commenced in 1799. This has been due to siltation and man-made desiccation through closing some of the drains into the Lake and the construction of levees. The current area of the Lake is approximately 230,000 feddans (1993). Its water depth ranges between 0.7 and 1.5 metres.

1.46 The Dumyat Branch of the Nile flows adjacent to, but not into, Lake Manzala. The Lake receives water inputs along its southern coast via six main deltaic drains, particularly the Bahr el Baqar and the Bahr Hadous drains which carry largely untreated sewage from Cairo and other cities. The sheer volume of untreated sewage effluent together with industrial pollution is now threatening the viability of the fisheries and the general ecology of the Lake. Recorded changes since 1960 include a general reduction in oxygen concentration, increased phosphate and nitrate levels, and the disappearance of submerged aquatic vegetation from large parts of the Lake. Since the 1920s, the increased flow of drainage water into the Lake has decreased the overall salinity, which ranges between 0.8 and 1.0% (the corresponding figures for the Mediterranean are 3.3 and 3.9%). Since 1960 the increased nutrient loading and diminished salinity have transformed the dominant fish community from brackish to fresh water species (*Tilapia*). The latter is of much lower value, economically. Pesticide run-offs and industrial effluent are implicated in the increase of tumours and other illnesses observed in the fish catches. In addition to pollution, the ecology of the Lake is threatened by the ongoing reclamation of marshes and mudflats, as well as by coastal erosion.

1.47 Lake Manzala is extremely important ornithologically. It is of international significance for water birds as a staging, wintering and breeding area. International wildlife organisations are lobbying the Egyptian Government to designate the Lake as a Ramsar Convention site. Unfortunately, bird populations are further threatened by extensive and poorly controlled hunting.

1.48 The Lake is situated in five autonomous Governorates. The absence of an overall co-ordinating agency to monitor water standards, manage land use and address the priorities for sustainable human development on the Lake is strikingly evident.

The Deltaic Mediterranean Coast

1.49 The Governorate contains marine, coastal belt, deltaic (now largely agricultural), freshwater, urban/peri-urban and industrial ecosystems and habitats. Although agriculture has alcompletely replaced the original habitats of the Delta, a significant proportion of indigenous bird species has adapted well to this man-made landscape. These include the Black-shouldered Kite, Kestrel, Cattle Egret, Graceful Warbler, Goldfinch, Hoopoe and Barn Owl.

1.50 In terms of wildlife value, the marine and coastal wetlands, together with the inland wetlands, are the most important. Some of these areas, with their associated fauna and flora, are worthy of protection as natural refuges, although surveying is required to identify the best. In general, these wetlands are notable for their avian fauna, characteristic species being Greater Flamingo (*Phoenicopterus ruber*), Kentish Plover (*Charadrius alexandrinus*), Slender-billed Gull (*Larus genei*), Little Tern (*Sterna albifrons*) and many more. Smaller inland wetlands are frequented by Little Egret, Little Bittern, Painted Snipe, Spur-winged Plover, Pied Kingfisher and Clamerous Warbler.

1.51 The characteristics of the three coastal habitats deserve brief mention since they will call for special management inputs under the proposed GEAP:

The bare sandy beach zone: this is a strip approximately 250 metres wide along the coast. Moving progressively landwards, sand formations range from mounds forming low sand bars along the shoreline, through large mobile sand dunes with sparse vegetation, to dunes partially or fully stabilised by vegetation. Some stabilised dunes occur at the limit of the coastal sub-region, up to 15 km inland. The natural vegetation of many of the stabilised dunes has been severely disturbed by reclamation attempts for agriculture or other coastal developments. This particular section of the southern Mediterranean coastline is known to be one where sand accretion is taking place [ref: Frihy, O.E. (1996), ,some proposals for coastal management of the Nile delta coast, Ocean & Coastal Zone Management, Vol. 30, No.1 Elsevier Science Ltd]. In general this augers well for the Gamasa tourist resort but, because of lack of any existing protective measures, will nonetheless call for special beach management.

The salt marsh zone: this covers the extensive salt-affected areas. It extends for 2 to 3.5 km inland from the coast interspersed among or in place of the sand dune formations. Dry salt marshes occupy the depressed areas between sand dunes, whilst wet salt marshes occur in areas with a high water table caused by saline water seepage from the sea.

The swamp habitats: in the Governorate these occur predominantly in low-lying areas around Lake Manzala. Other swamps exist throughout Dakahleya, based on drainage water from surrounding cultivated lands. These habitats are characterised by the presence of reeds, rushes, bulrushes and sedges.

1.52 Manzala Lake also serves as an important bird and waterfowl sanctuary for migrants between Europe and Central/Southern Africa. In addition, Lake Manzala has long been a valuable ecosystem for fish species. However, due to a combination of severe pollution, related in particular to the shared ,ownership, of the Lake, and a reduction of sea-water ingress since 1967, the species composition has shifted significantly in favour of those which thrive in freshwater, notably cichlids (*Tilapia spp*).

Landscape and Cultural Features

1.53 Landscape and cultural features are particularly important with respect to the sustainable development of tourism facilities. Although formal visual or cultural surveys have yet to be conducted, it is readily apparent that the Governorate is well endowed with both landscape and cultural assets. These include:

- vertical elements, such as sand dunes, eucalyptus trees and casuarina shelter belts, farm-houses and pigeon towers, mosques and minarets, electricity pylons, brick factory chimneys and even industrial plants which, when well sited, provide variety in otherwise generally flat landscapes;
- vernacular architecture, including traditional rural and urban buildings, construction methods and materials, water towers, bridges etc., many of which are to be seen in Mansoura City;
- historic sites, such as the Monastery of Saint Demiana, near Bilqas and others, yet to be specified by the Curator of the Mansoura Museum;
- Manzala Lake, as a potential tourist attraction;
- the Gamasa Resort.

1.54 To date, such features have not received prominent attention except in the case of official Monuments and Antiquities. However, there are many features of contemporary rural and urban landscapes which merit both conservation and appreciation. In the face of seemingly more pressing environmental priorities, it is easy for the touristic, educational and inspirational benefits of cultural heritage to be overlooked. Reference to them as part of this Profile is intended to ensure that they receive increasing attention as the GEAP evolves and is periodically updated.

2 THE ECONOMIC CAPITAL RESOURCES

Introduction

2.1 The economic fabric of the Governorate consists of three main components, namely its built structures (urban and rural settlements), its industrial plant/equipment and its infrastructure. In all cases the fabric appears to be deficient.

2.2 The challenge facing the Governorate is to identify how best to address the deficiencies. That calls for the identification of solutions which are not only physically correct and financially achievable, but which are socially acceptable, as well as environmentally safe and sustainable. The fact that Dakahleya ranks fifth (LE 1,000) in the national Governorate league table of per capita annual income levels suggests that the challenge should be less daunting than in some other Governorates.

Urban and Rural Settlements

2.3 As Box 2.1 indicates, the Governorate has large numbers of cities, main villages and satellite villages which need to be maintained and developed. The need for improved maintenance services is ubiquitously evident; but particularly in the case of the urban centres displayed in Box 2.2. Likewise, there is a need for improved provision of residential housing. Statistics on ,informal, house building, presented in Box 2.3, testify to this.

Industrial Plant and Equipment

2.4 The industrial profile is as shown in Box 2.4.

2.5 Many of the larger industries suffer from having obsolete plant and processes. Furthermore, the financial resources do not exist internally to rectify the problems, either through refurbishment or replacement. The result is that these industries are responsible for significant pollution hazards as summarised in Box 2.5.

2.6 It is noted that the aim of the General Organisation for Physical Planning (GOPP) is trying to minimise the loss of agricultural land, hitherto associated with the establishment of heavy industry. Increasingly the trend is to direct the development of major new industries to the industrial estates of new towns (e.g. 10th of Ramadan), thereby segregating residential and industrial areas. It is vitally important that the Strategic Guidelines published by GOPP for development of the Delta Region are closely observed in preparing the GEAP.

2.7 An overview of the main centres/locations of the most serious polluting industries throughout the Governorate is displayed in Box 2.6.

Infrastructure

2.8 The lack of adequate infrastructure appears to dominate the vital statistics. In terms of water, sewage treatment and refuse/solid waste disposal facilities, the Governorate,s existing infrastructures are stretched to their maximum.

BOX 2.1: DAKAHLEYA GOVERNORATE: NUMBERS OF URBAN AND RURAL SETTLEMENTS BY MARKAZ

Country (Markaz)	No of Settlement			
	City	Main Village	Satellite Village	Total
Mansoura	1	11	51	62
Talkha	2	7	35	42
Shirbin	1	7	18	25
Bilqas	2	8	16	24
Sinbillawayn	1	17	44	61
Timayy Al Imdid	1	6	14	20
Mit Ghamr	1	17	35	52
Aga	1	12	43	55
Dikirnis	2	9	35	44
Minyat An-Nasr	1	7	11	18
Manzala	2	8	30	38
Matariya	1	1	2	3
Gamaliya	1	1	-	1
Total	**17**	**109**	**336**	**445**

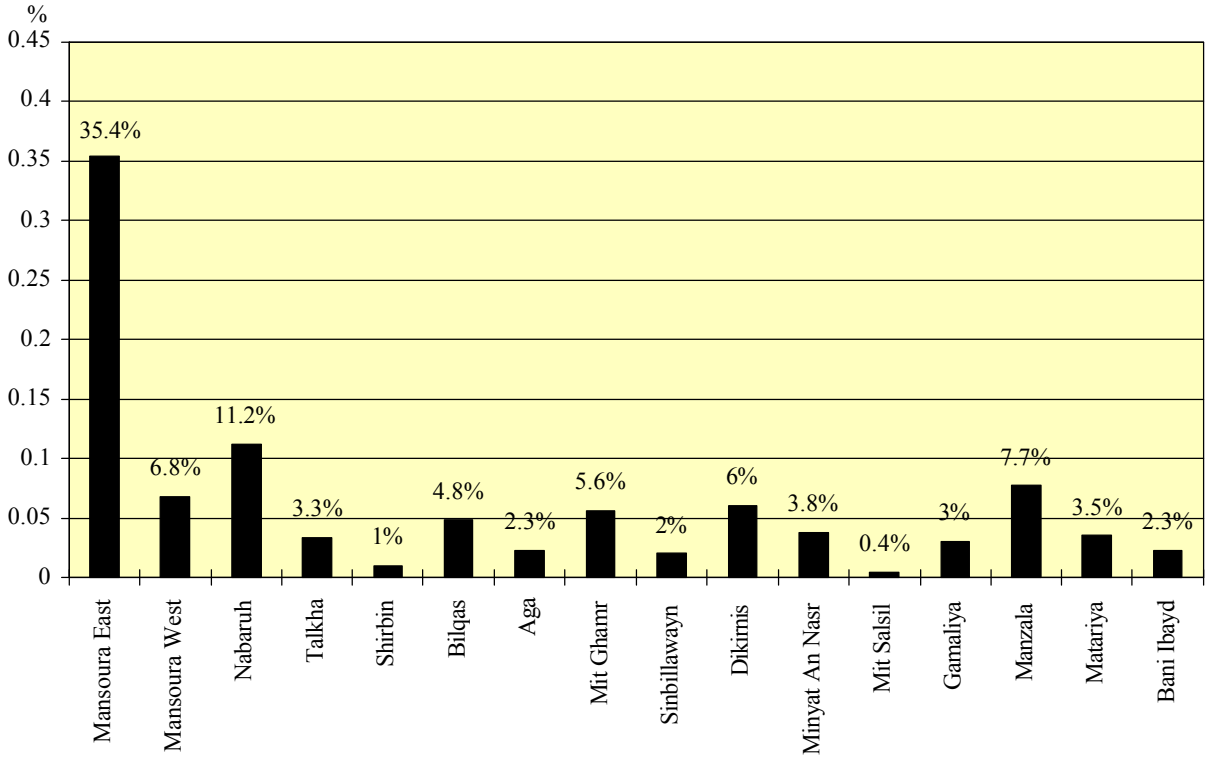
Source: Maksoud, FA and Meshref H (1995) Ibid. Based on Local Authorities of Dakahleya Governorate, 1994

Urban and rural settlements are classified according to the CAPMAS classification 1986, and updated modifications carried out until 1. Main Village: A village where a village council is located.

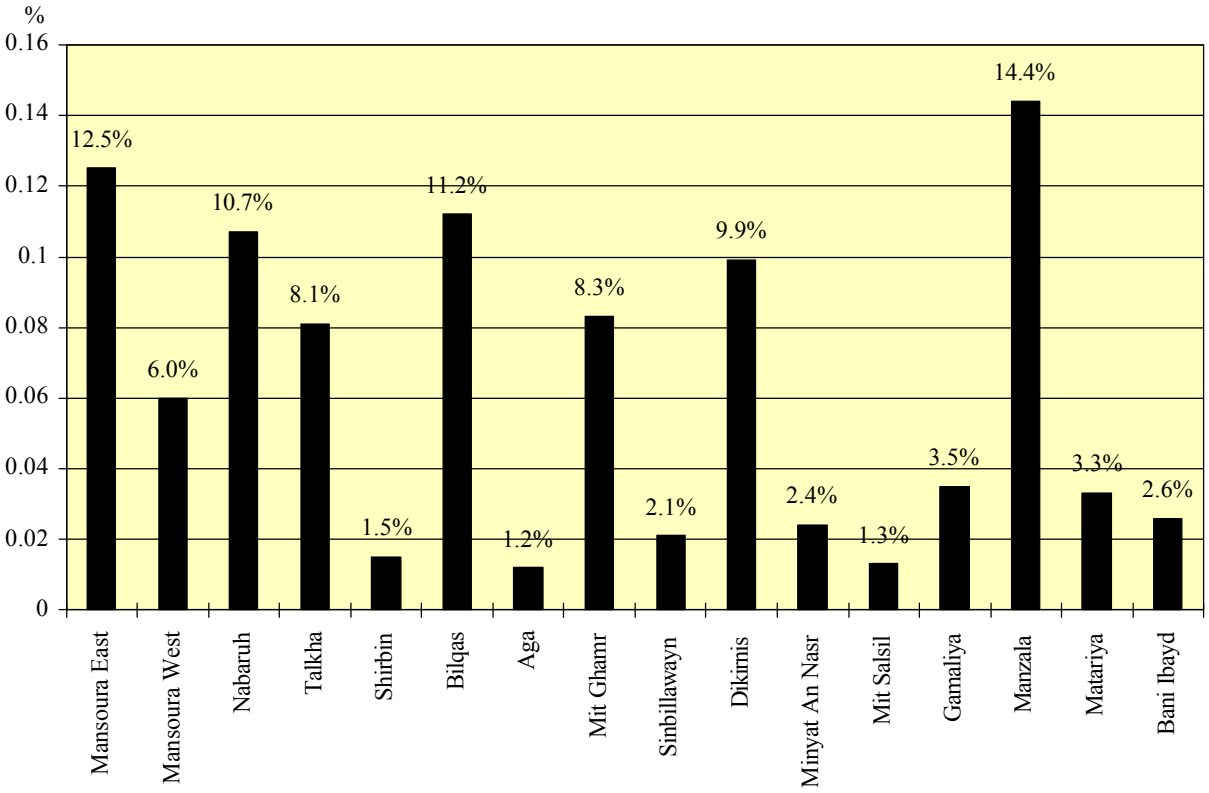
BOX 2.2

BOX 2.3: DAKAHLEYA GOVERNORATE: INFORMAL HOUSING AREA

Total Population = 630,108



Total Number of Buildings = 48,308



Source: Follow up Department, Mansoura Governorate, October 1994.
Maksoud, F.A. and Meshref, H. (1995) Ibid

BOX 2.4: DAKAHLEYA GOVERNORATE - THE INDUSTRIAL PROFILE

Markaz	Industrial Establishments No.	Workshops No.	Brick Kilns No.
Mansoura[1]	11	278	11
Talkha[2]	2	86	13
Mit Ghamr	2	124	40
Aga	2	73	11
Sinbillawayn	1	99	-
Timayy Al Imdid	-	15	2
Dikirnis[3]	1	94	1
Minyat An-Nasr	-	19	-
Shirbin	1	61	2
Bilqas	1	39	23
Manzala[4]	-	111	-
Total	21	949	103

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995) Ibid.

1 Mansoura and Sandoub
2 Talkha and Nabaruh
3 Dikirnis Bani Ibayd
4 Manzala, Matariya, Gamaliya and Mit Salsil

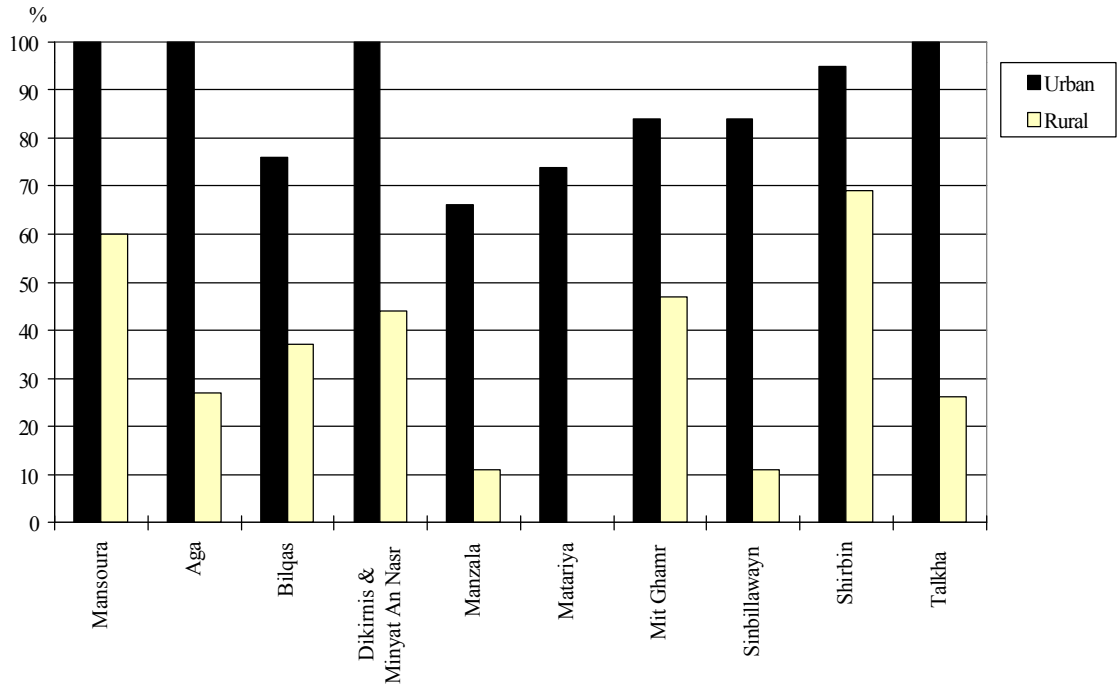
BOX 2.5: LARGE-SCALE INDUSTRIES AND THEIR POLLUTION HAZARDS

COMPANY AND LOCATION	OCCUPATIONAL EXPOSURES	AMBIENT AIR POLLUTANTS
El-Nasr Fertiliser Company and Chemical Industry (Talkha)	Particulates, noise, gases and vapours (ammonia, nitrogen dioxide, sulphur dioxide, methanol, carbon monoxide and hydrocarbons);	Particulates, gases and vapours
El-Nasr Particle Board and Resins Factory (Sandoub)	Heat, noise, particulates and hazardous vapours	Particulates, sulphur dioxide, NO_2, formalene and methanol vapours
Misr Company for Oil and Soap (Sandoub)	Heat and hazardous vapours	Soot particulates, hydrocarbons, sulphur dioxide and nitrogen dioxide
Dakahleya Textile Mills (Mansoura, Mit Ghamr, Aga and Dikirnis)	Noise and cotton dust	Particulates, sulphur dioxide and NO_2
Cotton Gins (Mansoura, Aga, Sinbillawayn, Shirbin, Mit Ghamr and Sandoub)	Noise and cotton dust	Particulates
Rice Mills (Mansoura and Bilqas)	Noise and dust	Particulates
Wheat Mills (Mansoura-East)	Noise, flour dust and wet-heat	Sulphur dioxide, NO_2 and particulates
Misr Company for Milk and Foods (Sandoub)	-	Sulphur dioxide, NO_2 and particulates
El-Nasr Soft Drinks	-	Ditto
Electric Power Station (Talkha)	Noise, microwave radiation and heat	Particulates, sulphur dioxide NO_2

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995) Ibid

BOX 2.6 DAKAHLEYA GOVERNORATE: SPATIAL DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS, WORKSHOPS, BRICK KILNS AND BAKERIES

BOX 2.7 DAKAHLEYA GOVERNORATE: PERCENTAGE OF HOUSE CONNECTIONS IN URBAN AND RURAL AREAS



Markaz	Percentage of Individual House Connections	
	Urban	Rural
Mansoura	100	60
Aga	100	27
Bilqas	76	37
Dikirnis & Minyat An Nasr	100	44
Manzala	66	11
Matariya	74	0
Mit Ghamr	84	47
Sinbillawayn	84	11
Shirbin	95	69
Talkha	100	26

Source: Tosson, M.S. and Abu Mandour A. Daiem (1995) Ibid.

Reticulated Drinking Water Supplies

2.9 These supplies are neither universal nor complete; the current reticulated coverage of water supplies to urban and rural areas respectively range between 76%-100% and 26%-69%, as displayed in Box 2.7. Main areas suffering from shortages of potable water are shown in Box 2.8. The most recent assessment of drinking water supply services covering the Governorate as a whole has been summarised as follows:

- provision of potable water supplies within the Governorate is presently and will continue to be a high priority. Indeed, over 40% of the current total production of potable water of 722,140 m^3 per day has been installed in the last seven years. The Governorate has recently established a ,Public Economic Authority, to improve water management and, with the assistance of USAID, is currently undertaking a major upgrade of the municipal water sanitation and sewage systems in the City of Mansoura. This includes the construction of a new 200,000 m^3/day water treatment plant to serve Mansoura City and the surrounding rural areas in Mansoura and Talkha Markazes.
- drinking water in the Governorate is presently supplied from five sources:

System	Units	Production m^3/day	Percentage
Large regional systems	Shirbin and Boosat Karim El-Din	200,000	27.7%
District systems	4 operational, 2 under construction	153,000	21.1%
City municipal systems	Mansoura and Sinbillawayn	130,000	18.0%
Compact units	111 operational	179,200	24.8%
Groundwater wells	Southern part of Governorate	59,940	8.3%
	Total	**722,140**	**100.0%**

Water Supply System Problem

2.10 A major problem is associated with the high incidence of water pipes with cracks/leaks and mal-functioning joints. In part this is a manifestation of a lack of both rehabilitation and maintenance operations. It is estimated that between 35 and 60% of the potable water supply leaks to the soil. Furthermore the problem is compounded by the fact that polluted ground/sub-soil water enters the drinking water system through these leaks and cracks. It has been estimated that ,an aggressive programme in leak detection and system rehabilitation could provide 20%, or more, increase in available water resources without additional capital investment,. In short, the scope for improving water supply and distribution services is undoubtedly large, particularly in the rural sector.

Water Treatment Services

2.11 Five WTPs exist, which are generally well sited upstream of pollutant discharge points. In addition, four large regional water treatment works are under construction through the National Organisation of Potable Water and Sanitary Drainage (NOPWASD). 51 Compact Units are provided in rural areas. A well system, comprising 59 independent supply systems exists in the south. This principally services the Markazes of Mit Ghamr, Aga and Sinbillawayn.

2.12 The regional treatment works, commissioned in the 1950s, and their trunk mains require some rehabilitation while the associated booster stations and elevated tanks are in poor condition. The booster stations which are used to restore pressure for the remotest areas receive intermittent and limited water. Raw water intakes also pose problems with the Kafr El Dabosi pump station, which lifts water to the Shirbin treatment works, being located 1.9 kms downstream from the El Nasr Fertiliser factory discharge. As a result ammonia is present in the plant influent and is still present in the treated water.

2.13 Compact units were installed in the late 1980s and early 1990
water problems in villages and remote areas. However, current production is only 67% of capacity. Lack of both maintenance and training, power cuts and inadequate chemical and dosing is adversely affecting the efficiency of these units.

Water Quality Monitoring Facilities

2.14 Continuous and comprehensive monitoring is essential, but the present facilities fall short of this requirement, even allowing for the Mansoura University laboratories.

Drainage and Irrigation Networks

2.15 These are extensive, as indicated by Boxes 2.9 and 2.10, but - owing to present practices - much of it is seriously polluted; particularly the main canals, which are used for the following functions: washing clothes and utensils (70% of population); ablutions (40%); washing animals (40%); human toilet (60%); solid and liquid waste disposal (80%). Box 2.11A and B display the main drains, which are sources of pollution in the Governorate.

Sanitation Services

2.16 These exist, but are seriously inadequate in the case of the treatment facilities for both liquid effluents and solid wastes.

2.17 In the case of **liquid effluents**: there is a shortage of sewage treatment plants: only two exist. Despite improvements planned under the Secondary Cities Project, inadequate capacities are forecast for the years 2010 and 2020 (48% and 37% respectively). Boxes 2.12 and 2.13 respectively show the locations of the existing waste water treatment plants, and the current position on the numbers of Main Villages within each Markaz which are without sewage treatment systems. It was estimated in 1995 that in Mansoura approximately 27,000 m^3 per day of untreated industrial effluent was discharged directly into the drains. Of the 26 pump stations that support the sewage network in Mansoura, 10 stations pump 40% of the wastewater into the drains without treatment. In the case of other towns within the Governorate, the corresponding figure was 50,000 m^3 of waste water per day. Overall, only 67% (urban areas) and 12% (rural areas) of the population is connected to a public sewage treatment facility. Many of the sewage collection systems suffer from leaks, especially those which were not installed either by contractors or under supervision by sanitary engineers. Some of these leaks have polluted groundwater resources, such that the use of well water has had to be stopped. Bo2.14 summarises the places where sanitation projects are either planned or under construction.

2.18 The extent of additional infrastructure provision required, not only to accommodate current shortfalls but the future needs of a fast growing population, is indicated by the following forecast: the volumes of waste-water requiring treatment are expected to double between 1994 and 2020 - from 656K m^3 per day to 1,257K.

2.19 **Solid wastes** represent a similarly large problem. The total quantity of solid municipal waste generated within the Governorate is estimated to be as shown in Box 2.15. More recent estimates of waste generation for urban cities and rural areas respectively are 1,435 and 1,373 tons per day. Mansoura City and Talkha together account for 35% of the urban total.

BOX 2.8 DAKAHLEYA GOVERNORATE: AREAS SUFFERING FROM SHORTAGES OF POTABLE WATER

BOX 2.9 DAKAHLEYA GOVERNORATE: DRAINAGE NETWORK IN EASTERN DELTA

BOX 2.10 DAKAHLEYA GOVERNORATE: IRRIGATION NETWORK

BOX 2.11A DAKAHLEYA GOVERNORATE: DRAINS - MAJOR SOURCES OF POLLUTION

BOX 2.11B: DRAINS USED FOR SANITARY DISPOSAL

Drain Name	Type of Disposal
A-Bahary El-Mansoura	
1- Badaway El-Gedeed	Waste Water Treatment Plant
2- Negeer	Domestic Disposal
3- Mit El-Nahal	Private Sewers
4- Higher Sirw	El-Khiriah WWTP *
5- Radwan	WWTP *
B-East Manzala	
1- El-Aziza	El-Aziza P.S
2- Mit Khodeer	El-Bosratt P.S
3- El-Amrah	El-Manzala P.S
4- Botteen	Botteen P.S
5- El-Taweel El-Bahary	El-Matariya P.S
6- El-Taweel El-Bahary	El-Assafarah
C-West Manzala	
1- El-Gamaliya	El-Gamaliya P.S
2- El-Gawaber	El-Kafr El-Gedeed P.S
3- El-Bawalis	Mit Salsil P.S
4- Brimbal	El-Riad P.S
D-Dikirnis	
1- El-Bashmour	El-Manzala P.S
2- Minyat An-Nasr	Minyat An-Nasr P.S
3- Tal Bellah	Dikirnis P.S
E-Qebly El-Mansoura	
1- El-Nezzam	El-Mansoura Oil Factory Sewers
2- Upper Bahr Tanah	Ezba El-Halawany Sewers
3- Bedin	Bedin Sewers

* WWTP = Waste Water Treatment Plant

Source: Tosson, M.S and Abu Mandour A Daiem (1995) Ibid

BOX 2.12: DAKAHLEYA GOVERNORATE: WASTE WATER TREATMENT PLANT LOCATIONS

City or Markaz	WWTP	
	Existing	Capacity m^3/day
El-Mansoura City	1	135,000
Mit Mazah Village	2	625

Source: Tosson, M.S. and Abu Mandour A Daiem (1995) Ibid.

Note: At present there are only two sewage treatment plants in operation in Dakahleya. One serves Mansoura City and is located at the western section of Mansoura; the other is located at Mit Mazah, 10 km from Mansoura City.

BOX 2.13: DAKAHLEYA GOVERNORATE: NUMBER OF MAIN VILLAGES IN EACH MARKAZ WITH AND WITHOUT SEWERAGE SYSTEMS/PUMPING STATIONS

BOX 2.14 EXISTING PROPOSALS FOR IMPROVING SANITATION AND SEWERAGE SERVICES

Objective	Targets Additional Capacity m^3/day	Number of Pump Stations Proposed
Building additional WWTPs and pump stations in the following cities:		
Dikirnis	20,000	4
Bani Ibayd	10,000	3
Minyat An-Nasr	20,000	3
Mit Salsil	10,000	4
Gamaliya	20,000	16
El Manzala	20,000	4
Matariya	40,000	3
Bilqas	20,000	4
Shirbin	20,000	5
El Sinbillawayn	20,000	4
Timayy Al Imdid	20,000	3
Talkha	20,000	4
Nabaruh	10,000	3
Gamasa	40,000	3
Aga	10,000	1
TOTAL	300,000	64

BOX 2.15: DAKAHLEYA GOVERNORATE - SOLID WASTE GENERATION

Locality	No. Cities and Markazes	Population	Tons/day
Urban Cities	4	1.23M	1,222
Rural Markazes	9	3.07M	2,303
TOTAL	**13**	**4.30M**	**3,523**

Source: Maksoud, F.A. and Meshref, H. (1995) Ibid

2.20 A detailed study of municipal solid waste management, undertaken by Drs Kamal and Salama in 1996, revealed that disposal of solid waste in open permanent or temporary dump sites is prevalent. Such sites include the banks of the River Nile, as well as drainage and irrigation canals. On land the waste is usually left to burn, causing local air pollution (smoke and odours). Fly tipping, in the absence of alternative acceptable and convenient facilities, is increasing. The practice of separation at source is strong among households, institutional and commercial waste generators. This applies particularly in the case of rural households. Re-use, recovery and re-cycling are also part of traditional rural lifestyles. Most of the organic waste is either fed to animals or used as a fuel.

2.21 In urban areas, these functions are undertaken through the informal sector. There scavengers, drawn from the poorest sectors of society and working usually in unsanitary conditions, recover paper, cartons, plastics, metal, glass and textiles. A robust trade in the recovered materials exists to service re-manufacturing industries, many of which, as in the case of scrap metal recycling, are centred in Mit Ghamr. In 1995, comparative waste disposal quantities per head were estimated to be follows:

- Mansoura 0.70 kg
- Other Cities 0.60 kg
- Rural Areas 0.06 kg

2.22 In contrast to rural areas, where there are no formal collection services, the high and middle income areas of some of the larger cities have reasonable waste collection services. However, collection vehicles and containers have left a lot to be desired. Furthermore, whilst some rudimentary collection points exist, in the past these were usually poorly designed, maintained and serviced. Since 1995 steps have been taken towards rectifying this. In 1996 a new fleet of 20 waste collection trucks was purchased for Mansoura City. This was followed in 1997 by the provision of additional funds for new collection equipment at Markaz level. New disposal sites have been designated for Mansoura, Shirbin and Matariya. In Mansoura not only has the previous burning tip site been remediated, but heavy equipment has been purchased to control tipping practices at the new site. Recycling and composting are now the preferred solutions. During 1997 the construction of two 150 tons per day plants commenced in Sandoub, coupled with a smaller plant for Matariya.

2.23 By comparison with the estimates in Box 2.15, the quantities of clinical wastes (approx. 5.1 tons per day) are small. Some major hospitals have incinerator facilities for safe disposal. However, like hazardous industrial wastes, there is no segregation for special incineration treatment in the case of many hospitals. Instead disposal takes place in open waste tips, where it represents a serious health risk. Thus, as throughout Egypt, clinical waste is a major problem. Even where incineration is undertaken, disposal problems arise as a result of both increased air pollution and the toxicity of the ash. The latter presents problems for sanitary landfill. Cost-effectiveness and management issues require careful consideration, especially in relation to initiating segregation of the different types of clinical wastes. The economic value associated with resource recovery is a major factor in this regard.

2.24 No integrated waste management systems currently exist, though a solid waste management strategy has been prepared jointly by ENTEC, TCOE, Mansoura University and the Dakahleya EMD, following the study by Kamel and Salama. It is founded upon the adoption of resource conservation and sustainable practices, involving minimisation, segregation, cost-effective collection, transportation and final disposal, including composting, recycling and recovery. Whilst one aim of the strategy is to dispense with unhealthy and hazardous scavenging activities, there is a strong desire to provide employment opportunities for all those currently involved in informal sector waste collection and disposal tasks. These informal sector workers are additional to the public sector workers formally employed in solid waste management in the urban areas of the Governorate. The latter are summarised in Box 2.16.

2.25 The solid waste management waste scene is also typified by the lack of standardised equipment for collection and disposal of waste. The extent of the inadequate facilities summarised in Box 2.17 fails to indicate the wide range of equipment used, much of which is ill-suited to the tasks which need to be performed. However, such deficiencies are comprehensively addressed in the Solid Waste Management Strategy, the implementation of which is already underway.

Road Network and Building F

2.26 The Governorate is in general serviced by a good road network, comprising the features displayed in Boxes 2.18 and 2.19. In total there are 3,067 km of roads in the Governorate (67% paved) carrying over 94,000 licensed vehicles. The exact numbers of vehicles are itemised in Box 2.20. The operation of these vehicles involves the levels of fuel consumption displayed in Box 2.21 for the different Markazes.

2.27 Whilst undoubtedly this network is economically important, it also serves as a further source of pollution by virtue of the population (1994) of 28,406 private cars, 12,218 cabs, 787 buses, 1,596 mini-buses, 24,278 trucks, 1,050 tractors, 3,496 containers and 23,210 motor cycles. Environmental and health impacts include effects on physical infrastructure and land use, air pollution from motor vehicle emissions, energy use and noise. Highway traffic studies have shown reduced crop yields of greater than 40% within 10 m of selected roads. Pollution will persist until catalytic converters and better quality fuels are widely used.

2.28 Finally, much of the built fabric in rural areas appears to provide unhealthy living conditions, owing to poor air circulation, rising damp, the presence of livestock and parasites, poor drainage and sanitation.

2.29 The environmental, as well as the socio-economic, impacts of many of the infrastructural deficiencies summarised above are amongst the priority issues to be addressed in preparing and implementing the Dakahleya GEAP.

BOX 2.16 DAKAHLEYA GOVERNORATE: MANPOWER RESOURCES USED IN THE MANAGEMENT OF SOLID WASTE IN URBAN AREAS

No.	Urban Area	Manpower No.	Shifts Per Day No.
1.	Mansoura	399	3
2.	Talkha	150	1
3.	Shirbin	65	1
4.	Bilqas	56	1
5.	Aga	115	1
6.	Mit Ghamr	351	3
7.	El-Sinbillawayn	109	1
8.	Timayy Al Imdid	15	1
9.	Dikirnis	140	2
10.	Minyat An-Nasr	42	1
11.	El Gamaliya	36	1
12.	El Manzala	110	2
13.	El Matariya	45	1
14.	Nabaruh	12	1
15.	Gamasa	75	1
16.	Bani Ibayd	25	1
17.	Mit Salsil	7	1
TOTAL		**1,692**	**na**

Source: Wolstenholme, R. (1995) Solid Waste Management in the Governorate of Dakahleya

BOX 2.17: DAKAHLEYA GOVERNORATE: COLLECTION AND TRANSPORT SYSTEMS FOR SOLID WASTE IN URBAN AREAS

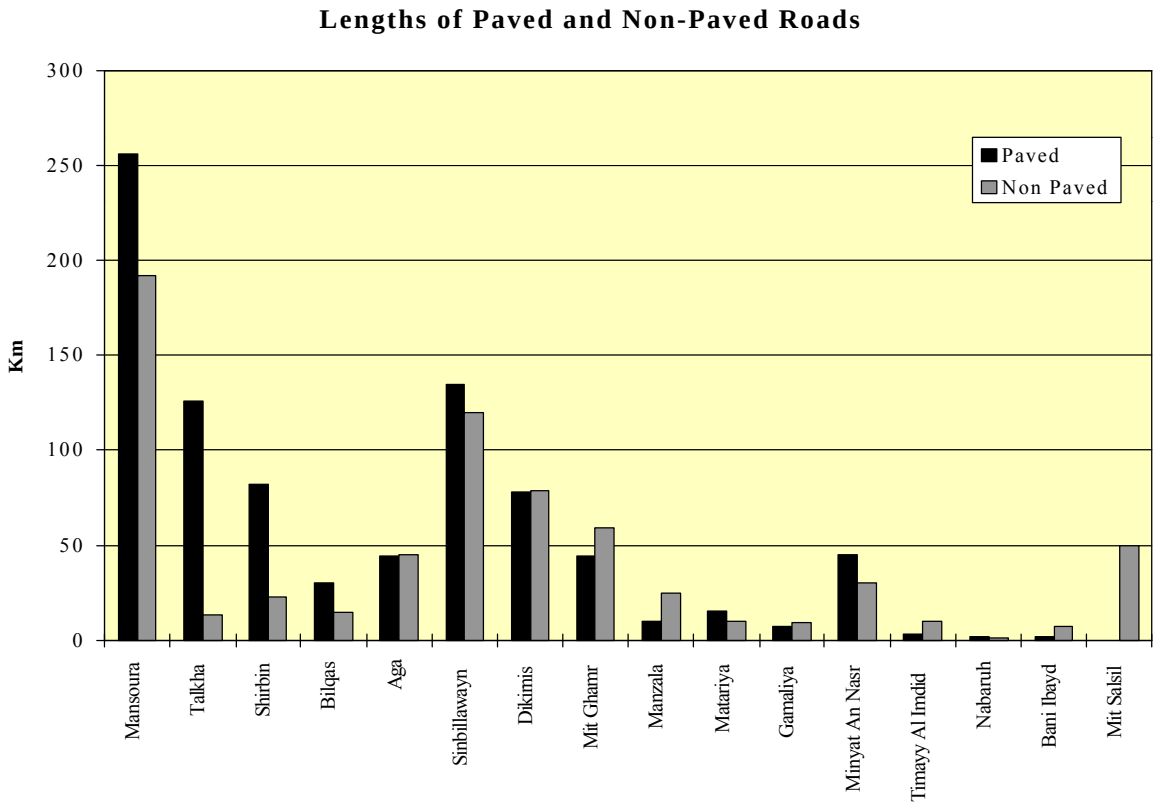
No.	Urban Area	Collection Boxes No.	Tractors No.	Trucks No.
1.	Mansoura	380	31	5
2.	Talkha	120	13	2
3.	Shirbin	na	na	na
4.	Bilqas	115	6	1
5.	Aga	85	6	2
6.	Mit Ghamr	110	11	2
7.	El Sinbillawayn	25	8	1
8.	Timayy Al Imdid	-	1	-
9.	Dikirnis	na	11	3
10.	Minyat An Nasr	20	13	1
11.	El Gamaliya	na	8	-
12.	El Manzala	na	7	1
13.	El Matariya	na	17	2
14.	Nabaruh	-	9	2
15.	Gamasa	20	4	3
16.	Bani Ibayd	63	3	-
17.	Mit Salsil	na	8	-
TOTAL		**938**	**156**	**25**

Source: Wolstenholme, R. (1995) Solid Waste Management in the Governorate of Dakahleya

BOX 2.18: DAKAHLEYA GOVERNORATE - ROAD NETWORK

Feature	No.	Km
Main Roads	50	1168
Regional Roads	51	291
Local Roads: Paved	54	880
Local Roads: Unpaved	157	688
TOTAL	**312**	**3067**

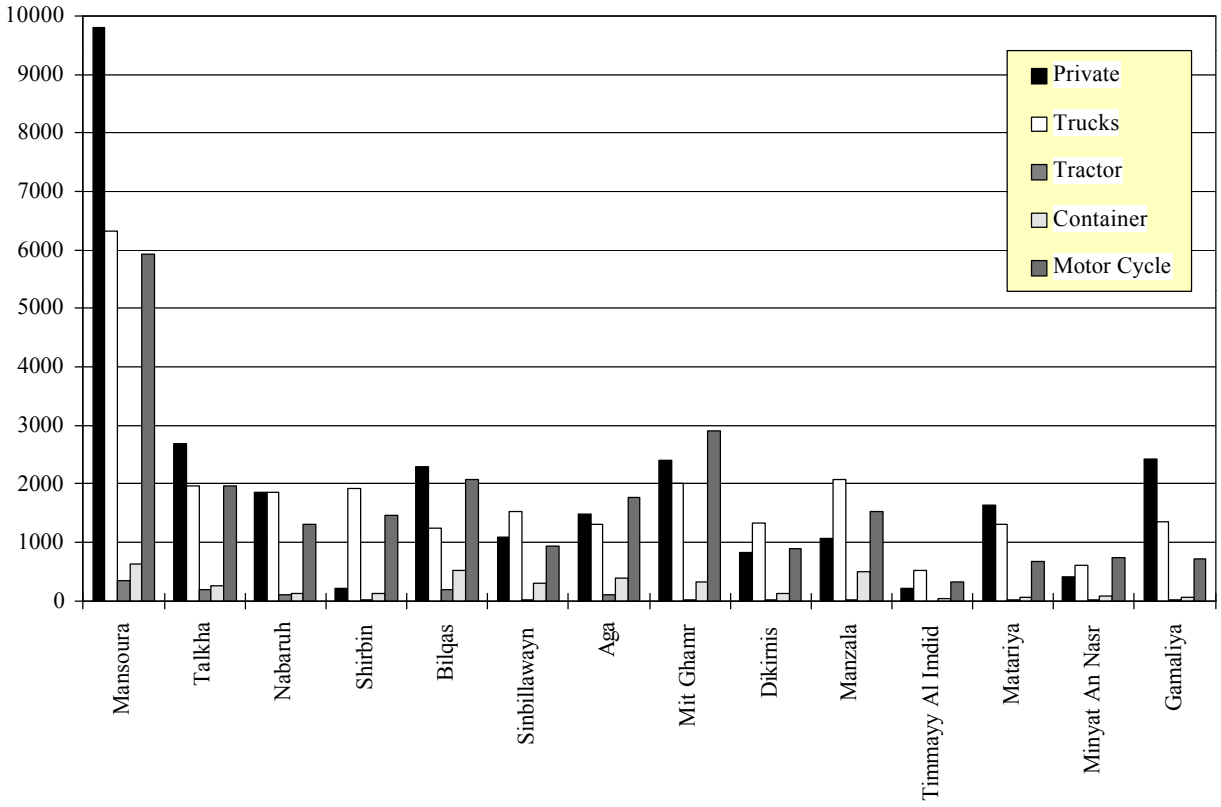
BOX 2.19: DAKAHLEYA GOVERNORATE: TYPES AND LENGTHS OF ROADS BY MARKAZ



District	Main Roads Km	Regional Roads Km	Local Roads	
			Paved Km	Non Paved Km
Mansoura	121	0	256	192
Talkha	98	0	126	13
Shirbin	125	0	82	23
Bilqas	112	25	30	15
Aga	90	0	44	45
Sinbillawayn	150	0	135	120
Dikirnis	75	0	78	79
Mit Ghamr	107	40	44	59
Manzala	86	20	10	25
Matariya	7	9	15.5	10.25
Gamaliya	60	7	7	9
Minyat An Nasr	0	75	45	30
Timayy Al Imdid	100	100	3	10
Nabaruh	13	8	2	1
Bani Ibayd	20	0	2	7
Mit Salsil	4	7	0	50
Total	**1168**	**291**	**879.5**	**688.25**

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995), Ibid

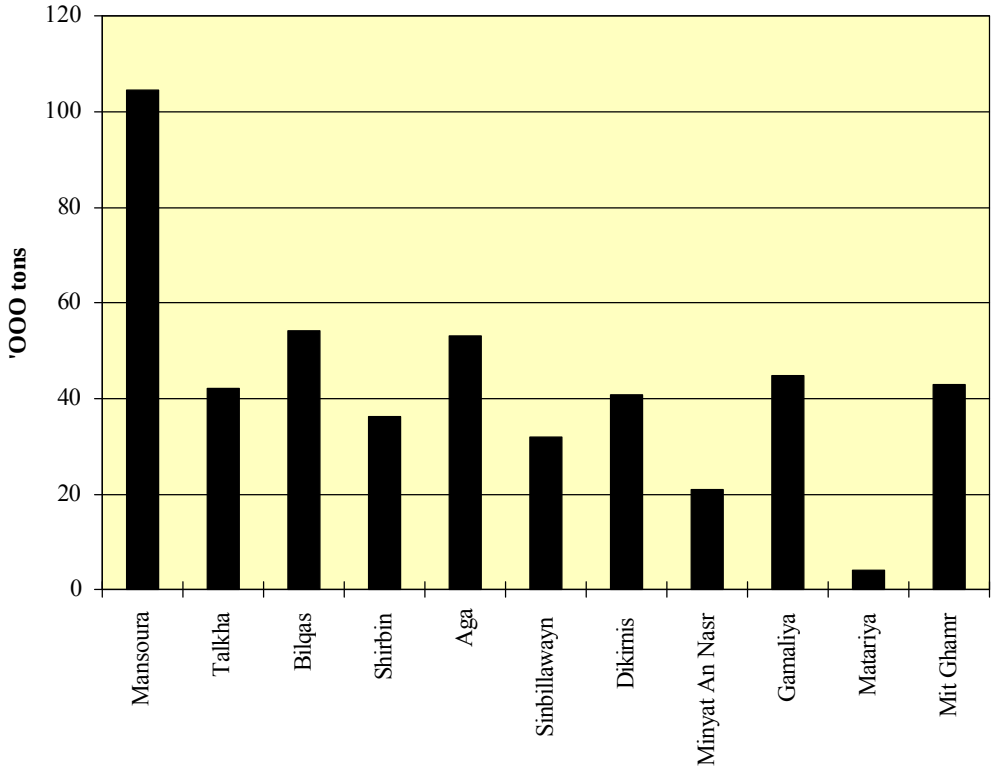
BOX 2.20: DAKAHLEYA GOVERNORATE: NUMBERS AND TYPES OF VEHICLES IN 1994



District	Private	Trucks	Tractor	Container	Motor Cycle
Mansoura	9797	6317	346	624	5914
Talkha	2700	1950	188	244	1970
Nabaruh	1860	1850	110	120	1311
Shirbin	202	1915	20	130	1476
Bilqas	2303	1250	181	515	2070
Sinbillawayn	1100	1526	25	299	940
Aga	1497	1300	100	400	1770
Mit Ghamr	2392	1994	23	308	2895
Dikirnis	830	1330	7	130	881
Manzala	1061	2071	10	499	1531
Timayy Al Imdid	200	525	0	37	326
Matariya	1640	1300	15	68	680
Minyat An Nasr	406	609	10	72	726
Gamaliya	2418	1341	15	60	720
Total	**28406**	**25278**	**1050**	**3506**	**23210**

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995), Ibid

BOX 2.21: DAKAHLEYA GOVERNORATE: MAIN CITIES - ANNUAL FUEL CONSUMPTION



District	Total Fuel Consumption 000 Tons
Mansoura	104.50
Talkha	42.10
Bilqas	54.10
Shirbin	36.30
Aga	53.20
Sinbillawayn	31.90
Dikirnis	40.80
Minyat An Nasr	20.90
Gamaliya	44.70
Matariya	4.10
Mit Ghamr	43.00
Total	**475.60**

Source: Kamal Noweir, H. and Abdel-Fattah Youssef (1995), Dakahleya Governorate Environment Action Plan - Air Quality Report, TCOE/Entec.

3 THE SOCIAL/HUMAN CAPITAL RESOURCES

Introduction

3.1 This section of the review is based upon statistics compiled by the Technical Specialists, together with the results of a Social Dynamics Study and a SWM Study conducted respectively by Environmental Quality International Consultants, EQI, and Drs Kamel and Salama, CID. The former was based on twelve focus group discussions with primary stakeholders, plus twenty individual and group interviews with formal and informal environmental service providers.

Demographic and Locational Trends

3.2 The total population of the Governorate in 1994 was estimated to be 4,197,640, with an approximate rural:urban split of 3:1. The total population is forecast to grow from 4.2 million to just over 8.0 million by 2020. The rural:urban split is predicted to remain broadly 78:22. The urban population is concentrated in 17 centres, in contrast to approximately 445 rural settlements (109 main villages and 336 satellite villages) dispersed throughout the Governorate. A significant trend is the change in the size and character of many previously rural villages, which are in the process of becoming towns. As a result, the encroachment on agricultural land has been growing.

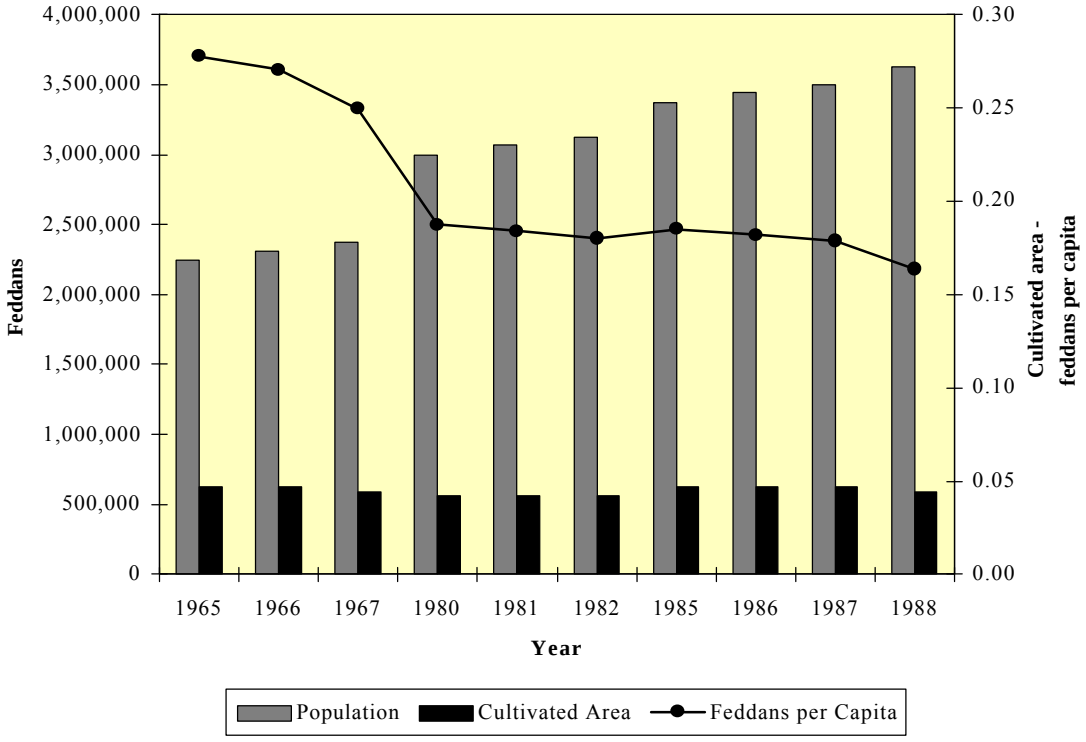
3.3 The demographic trends, in terms of rates of births, deaths, infant mortalities, family size etc., all confirm the expectation that population pressures will grow significantly over the next 25 years. Already population density, as indicated in Boxes 3.1 and 3.2, is high; indeed, it is amongst the highest in rural Egypt. Within the Delta region, Dakahleya has the third highest population density, as displayed in Box 3.3. The population densities of the individual Markazes differ significantly, as indicated in Box 3.4.

BOX 3.1: DAKAHLEYA GOVERNORATE: TRENDS IN POPULATION DENSITIES AND GROWTH RATES: 1960-1994

Item	**Year**			
	1960	**1976**	**1986**	**1994**
Persons/ km^2	582	789	1006	1392
Rate of Increase		26.2%	21.6%	38.4%

Source: Maksoud, F.A. & Meshref, H. (1995) Ibid

BOX 3.2: DAKAHLEYA GOVERNORATE - POPULATION GROWTH, CULTIVATED AREA AND PER CAPITA CULTIVATED AREA



Year	Population	Cultivated Area (Feddans)	Cultivated Area Feddans Per Capita
1965	2,250,000	625,000	3,875,000
1966	2,312,500	625,000	3,875,000
1967	2,375,000	592,500	3,562,500
1980	3,000,000	562,500	2,687,500
1981	3,062,500	562,500	2,687,500
1982	3,125,000	562,500	2,500,000
1985	3,375,000	625,000	2,375,000
1986	3,437,500	625,000	2,375,000
1987	3,500,000	625,000	2,375,000
1988	3,625,000	592,500	2,312,500

Source: Maksoud, F.A. and Meshref, H. (1995), Dakahleya Governorate Environmental Action Plan - Land Resources and Problems, TCOE and Entec.

BOX 3.3: POPULATION DENSITIES OF DELTA REGION GOVERNORATES

BOX 3.4: POPULATION DENSITIES OF DAKAHLEYA GOVERNORATE MARKAZES

Country and Markaz	Population	Area (Km^2)	Population Density (Person/Km^2)
Mansoura	756,961	346.6	2184
Talkha and (Nabaruh)	431,034	298.7	1443
Shirbin	275,419	268.1	1027
Bilqas	354,424	761.2	466
Aga	337,529	233.6	1445
Sinbillawayn and Timayy Al Imdid	478,049	443.2	1079
Mit Ghamr	520,968	244.8	2128
Dikirnis and (Bani Ibayd)	323,229	359.6	899
Minyat An Nasr	195.352	189.2	1033
Manzala/Matariya/Gamaliya and Mit Salsil	440,414	3142.3	140
Total	**4,113,379**	**6287.1**	**654**
Total without Manzala and Bilqas	3,318,541	2383.7	1392

Source: Maksoud, F.A and Meshref, H. (1995) Ibid. Based on Dakahleya Environmental Affairs Department Information Unit, 1995

Skills, Aptitudes and Attitudes

3.4 The employment profile indicates the importance of agriculture, relatively large-scale manufacturing industry and the small to medium sized workshop units. However, that is only part of the picture. Both the social dynamics and solid waste management studies, respectively conducted by EQI and Drs Kamel and Salama, revealed that in many respects the poorer sectors of the Governorate are extremely resourceful. Specifically, in relation to environmental problems, local communities display significant skill and fortitude in coping with the lack of reliable environmental infrastructure and public services.

3.5 Social customs and traditions are evidently responsible for some of the environmental and associated health problems experienced in the Governorate, e.g.:

- storage and use of drinking water;
- washing clothes and utensils;
- lack of hand washing;
- disposal of sewage and sullage in canals;
- unclean practices employed in preparing food;
- use of canals for washing livestock;
- unhygienic house-keeping practices.

3.6 However, in many cases these practices and their associated problems mask the fact that there is generally a good level of awareness concerning environmental problems amongst all sectors of society. The cause of the problems stems fundamentally from the lack of key solid waste management, sanitation, potable water drainage, slaughterhouse etc. facilities and services, as well as from inadequate management. In general there is a strong desire to participate in self-help initiatives. Regrettably this is often frustrated by failure on the part of authorities to provide ,the missing link, e.g. the provision of a dump site or the basic sewage treatment facilities once a local community has contributed the land. Malpractices, such as the deliberate puncturing of septic tanks, to reduce the frequency and thus cost of emptying, do not stem from a lack of awareness about public health dangers and environmental problems. Personal enchoices and trade-off decisions are driven by the harsh realities of the immediate needs for family survival. Longer-term ,desirables,, such as environmental enhancement, are invariably accorded a lower priority.

3.7 As noted by EQI, many local communities, in the absence of effective municipal services, display an impressive degree of initiative. Box 3.5 records an array of makeshift solutions adopted by people, **as measures of last resort**, in meeting their environmental service needs. This resourcefulness clearly needs to be harnessed in ways which yield collective environmental benefits.

3.8 The survey conducted by EQI provided insights into some disturbing underlying reasons for the fact that the demand for environmental services exceeds the capacity to deliver. ,This is largely due to a shrinking work force caused by dissatisfaction with wages and with working conditions. This situation is causing a significant amount of frustration that is often translated into friction between service operators and beneficiaries. While the former complain that people abuse the service and are not co-operative, the latter object that operators treat the visible areas as their priorities., The visible areas are claimed to be ,the upper-income districts and main streets,, which ,receive more care and better service than the poorer or less visible areas., This problem is exacerbated by what is said to be a lack of communication and co-ordination between the sectors responsible for infrastructural services.

3.9 Ironically, there is widespread evidence of a willingness on the part of local residents to pay reasonable fees, provided that sewage and solid waste services are efficient. It is reported that private waste collection services have had to be aborted because of a failure on the part of the authorities to provide adequate dump sites. In other cases the service has been discontinued because it was unreliable.

Institutional Structures, Resources and Performances

3.10 An ,embryonic, Environmental Management and Planning System (EMPS) exists within the Governorate. Boxes 3.6 and 3.7 respectively indicate its structure and roles within the overall organogram for the Governorate (ref Box 3.8). The System is seemingly complicated - unnecessarily so on first inspection - in that there are two advisory Committees, one University-based, the other a Pollution Prevention and Control Committee drawn from local Directorates and Departments. However, the very fact that it is possible to present such Boxes indicates that a foundation exists upon which the compilers of the GEAP can base institutional initiatives for the future.

3.11 Hitherto environmental planning, as distinct from management, functions have not received very much attention. This is somewhat surprising in view of the extensive network of planning departments and sections that exist in the following broad locations throughout the Governorate:

- the Governorate Planning Department in Mansoura (40 staff);
- the Planning Sections in the Line Ministries and Directorates in Mansoura;
- the Planning Sections in the Council Offices of the Markazes.

Together the last two employ a further 105 planning staff. Whilst these numbers may look impressive, it has to be borne in mind that almost all planning functions are project-orientated. As a result, the preparation of strategic, structure and subject plans receives little or no attention. This is a serious deficiency which will need to be rectified progressively through the GEAP process. It is noteworthy in passing that the Director of the Planning Department expressed a strong interest in adding the missing skills and resources to the Department.

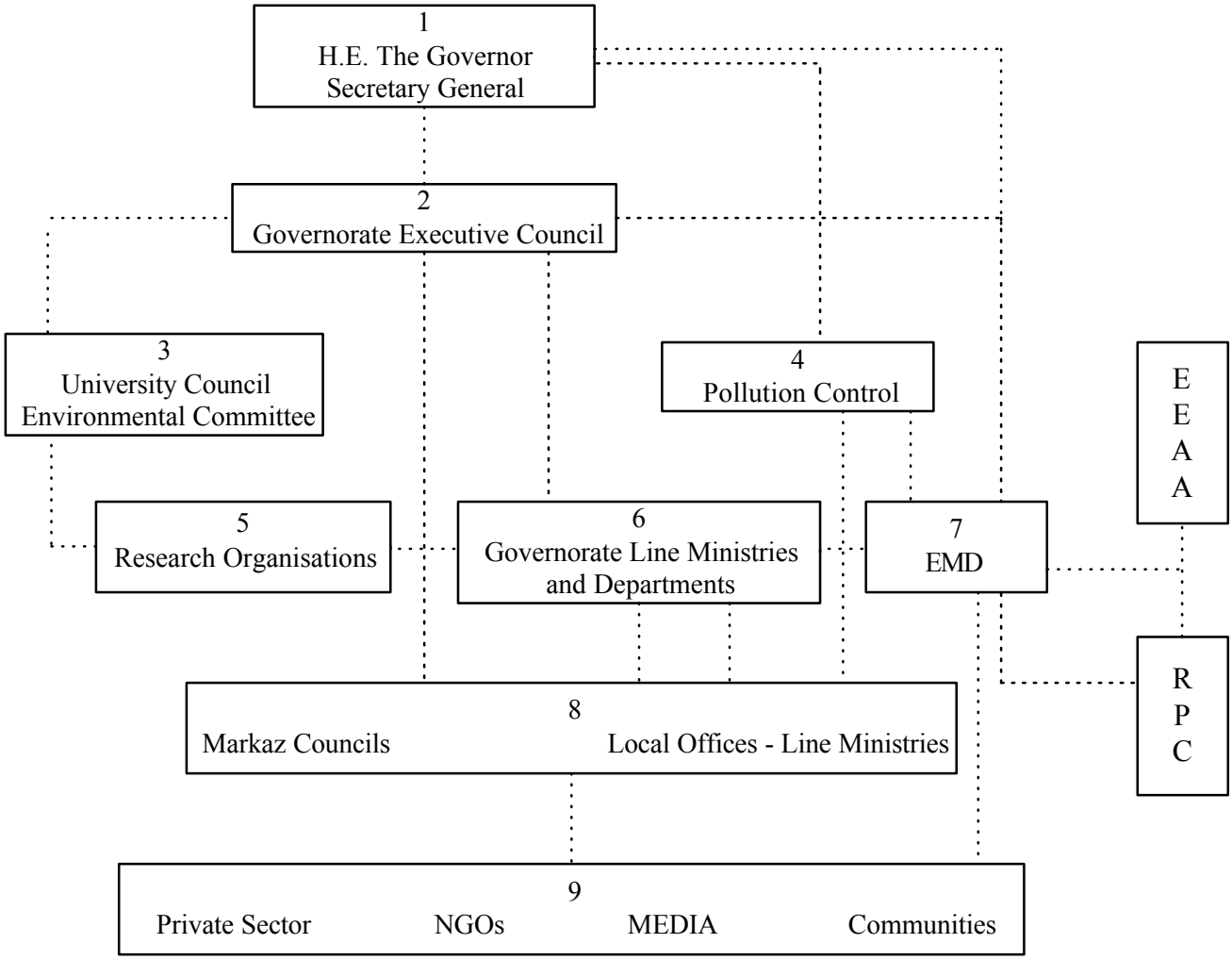
3.12 An item of particular concern is the apparent minimal level of liaison between the Regional Planning Centre (RPC) at Tanta, which has been commissioned to prepare a Physical Development Plan for the Governorate, and the Dakahleya Planning Department. This is a further serious deficiency, as is the lack of environmental inputs to the physical planning process.

3.13 The lack of environmental planning resources is not, however, an isolated feature. Both social and economic development dimensions from an environmental standpoint have also been neglected and need to be strengthened.

BOX 3.5: DAKAHLEYA GOVERNORATE: MAKESHIFT SOLUTIONS ADOPTED TO MEET PERSONAL ENVIRONMENTAL NEEDS

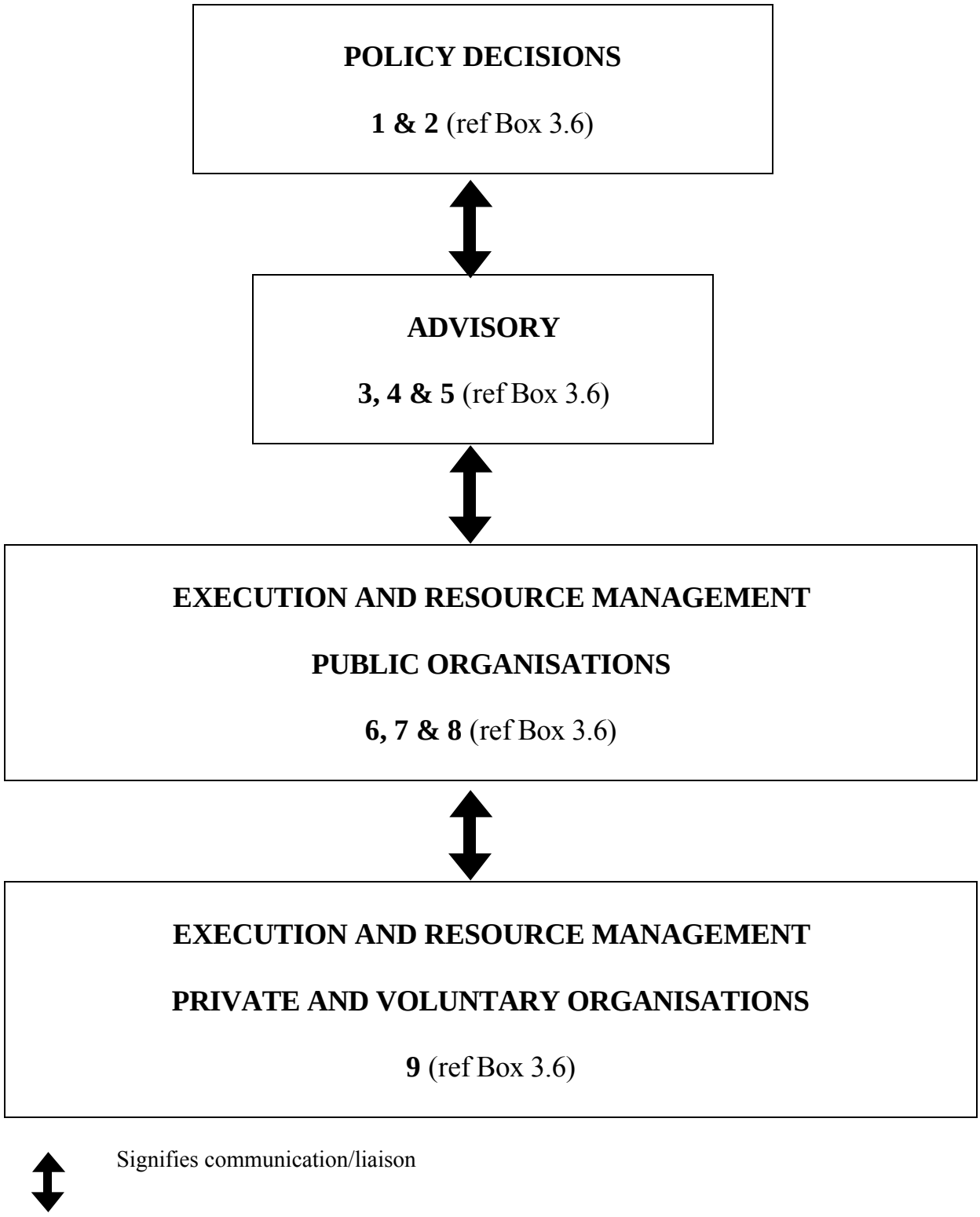
Service	
Reliable Water Provision	• People make their own connections from the main pipes, or dig water wells. • People resort to water from water wells because the flow is more constant and the quality/taste is better (chlorine free) than from the main pipes. • On a limited scale (because of the high costs entailed) people use motorised pumps to increase their water pressure.
Good Quality Potable Water	• Rare use of filters (because of the high costs entailed) to remove sewage and other contaminants; use of cotton wool as a filter sometimes on taps. • The water is frozen in the belief that harmful microbes are killed. • Storage of water for drinking in containers, which allow sediments to settle. • Use of neighbouring water pumps.
Disposal of Solid/Household Waste	• People throw waste onto nearby empty land or onto canal banks, or set on fire. • Use of the organic component as a fuel for traditional ovens, when available. • Farmers mix it with mud to provide a fertiliser. • Urban residents throw it into municipal waste containers, if available; when not, they throw it in street corners to await collection, unless scavengers intervene. • Some urban residents paid for garbage collection service, until these were discontinued. • Hospital and clinical waste thrown into sewage pipes.
Disposal of Sewage and Waste Water	• Abuse of sewage pipes for disposal of garbage, plastic bags etc.

BOX 3.6: DAKAHLEYA GOVERNORATE: EXISTING ENVIRONMENTAL MANAGEMENT SYSTEM - ORGANOGRAM



Key: EEAA = Egyptian Environmental Affairs Agency
EMD = Environmental Management Department
RPC = Regional Planning Centre (based in Tanta)
----- = Lines of liaison and reporting

BOX 3.7: COMPONENTS OF THE TYPE OF ENVIRONMENTAL MANAGEMENT STRUCTURE REQUIRED



BOX 3.9 DAKAHLEYA GOVERNORATE: NGOs PARTICIPATING IN ENVIRONMENTAL AWARENESS DEVELOPMENT PROGRAMME

1. Environment Development Protection Society of Dakahleya (Mansoura University)
2. Women Society for Health Improvement at Dikirnis
3. Holy Quran Preservation Society at Shirbin
4. Local Community Development Society at Bilqas Village
5. Local Community Development Society at Bilqas City
6. Holy Quran Preservation Society at Bilqas City
7. Community Development Society at Touk Al-Aqlam, Sinbillawayn Markaz
8. Students Care Society at Dakahleya
9. Women Society for Health Improvement at Talkha
10. Community Development Society at Nusa Al-Gheit, Aga Markaz
11. Child Care and Family Upgrading Society at Talkha
12. Islamic Charity Society at Brembal Al-Qadima, Minyat An Nasr Markaz
13. Residential Community Development Society at Aga
14. Community Development Society at Shoha, Mansoura Markaz
15. Community Development Society at Danabeik, Mansoura Markaz
16. Community Development Society, Mit Tareif, Dikirnis
17. Child Care and Family Upgrading at Manzala
18. Local Community Development Society at Gamaliya
19. Local Community Development Society at Matariya
20. Local Community Development Society at Al-Muqata, Sinbillawayn Markaz
21. Islamic Care Society at Mit Ghamr
22. Holy Quran Preservation Society at Mansoura

The above societies can be reached via the Regional Federation of NGOs at Mansoura, Nuqrashi St, Mit Hadar. Telephone: 325008

3.14 However, the institutional shortcomings are not particular to local Government offices. They extend to NGOs. Although Box 3.9 suggests that the list of NGOs assisting in environmental awareness campaigns is quite large, the reality isthat, overall, NGOs have not been strong when it comes to addressing environmental issues and achieving significant improvements. With respect to institutional structures, neither liaison nor co-ordination of environmental improvement operations within Government and between Government and external organisations (NGOs, private industries) has been very effective.

3.15 Measures which seek to enforce environmental laws are currently carried out by a variety of organisations. They include the Directorate/Department of Security (Traffic, Water Surface and Infrastructure Police), the Magistrates, the Line Ministries (especially the Department of Industrial safety in the Manpower Directorate), the University,s Department of Engineering, the El Nasr Fertiliser Company (Analytical Laboratories), and the EMD, on behalf of the Governor/Council.

3.16 It is evident that the resources available to undertake the policing functions in all of the Markazes are seriously inadequate by a factor of 300% - 400%. The position concerning the administration of enforcement in the case of violations is no better, though this has been exacerbated by the fact that there is said to be some uncertainty still concerning the procedures for implementing Law 4 (1994).

3.17 Both the Security Directorate and the EMD have attempted to undertake the inspection, policing and legal enforcement roles. However, until recently neither has been successful in bringing cases to court which result in effective prosecutions.

3.18 Before Law 4 (1994) can be fully effective, substantial training in its administration is required, not least with regard to the determination of penalties which are appropriate to the violations. The training of magistrates and legal officials will be particularly important.

3.19 To date there has been only limited involvement of the EMD in Industrial Audit and EIA work.

3.20 Undoubtedly the biggest contribution that the EMD has made so far relates both to the inspection of degradation and associated clean-up/restoration projects. This applies particularly to the management and restoration of solid waste sites.

3.21 Overall, the EMD seems to have been more involved in enforcement than advisory functions. However, there is little evidence that either Governorate-wide co-ordination or strategic planning roles are being undertaken by the Department.

Environmental Management Skills and Capacities

3.22 The Environmental Management Skills vary significantly according to the different facets of the environment, as follows:

- The City of Mansoura is renowned for the skills and expertise associated with both its medical facilities, particularly concerning the treatment of renal problems, and its University.
- Abundant, traditional skills exist for management of rural environment in the case of the production of food and raw materials for industry.

- Skills are largely limited to engineering, technology, chemical and biological/earth sciences and research in the case of manufacturing, secondary and service industries. Pollution prevention and control skills are limited.
- A good range of community health care services exists in all the Markazes of the Governorate. In total approximately 900 health care units are operating (6.9 per 100,000 population, while the national average is 5.9), employing more than 9,000 personnel, in addition to the services provided by the University Hospital in Mansoura.
- Inadequate personal hygiene skills are evident in the rural areas.
- Insufficient skills exist for the efficient provision and management of public utilities.
- There is a real shortage of integrated planning and design skills to cover the needs of both the broad regional/national scale and the built environment at a detailed level.
- Mansoura enjoys an international reputation for certain specialist medical services and facilities.
- Environmental Extension Services are strong in the agricultural sector:

  → the Extension and Rural Sociology Department in the Faculty of Agriculture at Mansoura University has five Professors who co-ordinate the extension activities of some 500 staff;

  → the ‚formal, Extension Service in the Dakahleya Department of Agriculture employs a total of 578 staff deployed as follows: 80 at Governorate level; 73 at Markaz level; and 425 at village level.

These are impressive numbers. Furthermore, the co-operation and co-ordination links which have reportedly been established between the ‚formal, Governorate Extension Service and the University Department are also encouraging. Laboratories and experts are shared, likewise field officers. Two joint programmes are underway. They are geared towards improving the overall effectiveness of the agricultural services within the Governorate. However, by comparison the industrial sector overall is not so well endowed in terms of environmental extension services. This is being addressed in relation to the medium-scale enterprises through a current Canadian-Egyptian joint venture project agreement. For small and micro-enterprises, the position is even better. The Regional Centre for Rural Development, under the aegis of the Dakahleya Businessmen Association, provides an advisory service to the enterprise operators. This is organised through a Technical Office, supported by the Social Fund for Development and the Industrial Safety Department. The Office administers a Field Support Unit, comprising ten Engineers and ten University experts.

3.23 The ‚formal, environmental extension services are confined to the existing members (2-3 no.) of the Governorate Environmental Management Department. Understandably such small staff numbers are not able to cover the full spectrum of environmental extension needs. The primary fields currently covered are SWM, air pollution abatement, water and sewage treatments, as well as afforestation for shelter and amenity purposes. Resources do not permit the Department to fulfil the essential co-ordination role sought by many stakeholder groups. This is hardly surprising, bearing in mind that the EMD has no annual budget, no vehicles and no monitoring or surveillance equipment.

3.24 Preliminary assessments of the existing environmental management capacities within the Governorate suggest that they are underdeveloped with respect to:

- Government, NGO and voluntary sectors. This concerns the quantity and in most cases the quality of environmental management resources available.
- The public and private corporate sector, in terms of the broad environmental management skills. However, with respect to technical environmental skills, the shortfalls in some industries, e.g. fertilisers, are far less.
- Community and social services. The deficiencies relate in particular to the poor application of realistic environmental standards and practices.
- Individual, especially the poorer, members of society. In many cases public health and hygiene practices leave much to be desired.
- Formal education establishments: schools, Colleges and Universities. Although the technical aspects of environmental subjects may be covered, the important topics of environmental planning, remediation, conservation, enhancement and overall management are largely missing.
- Members of the professions and extension services. They are not well equipped to conduct state of the environment reviews, EIAs or Environmental Audits.

3.25 It will be important that, progressively, as part of the GEAP, the above shortcomings will be rectified. This will entail looking at the "agents of change", such as the extent to which public awareness campaigns are organised and sustained through the media and in schools, as well as in working environments and women,s meeting places. In the course of preparing this Environmental Profile, the need for an additional study has readily become apparent. This is a study, specifically orientated towards identifying the leaders of change within each of the stakeholder organisations across the Governorate.

Summary

3.26 In seeking to summarise the challenge facing those concerned with rectifying the combined shortcomings in infrastructural and social capital, EQI is best placed to provide an overallperspective:

the main problem in the Governorate of Dakahleya, as in almost all Egyptian Governorates, is related to deficiencies in water supply, waste-water disposal and solid waste management services. These deficiencies are due to many factors. Lack of funds, ineffective management and administration of existing resources, and neglect of civil society potential combine to render service extension a losing proposition. Self-help initiatives are for the most part constrained by bureaucratic procedures resulting from the centralisation of the decision-making process. Similarly, the leverage of NGOs is greatly diminished by the centralisation of authority. Consequently, residents resort to temporary or make-shift solutions that add to environmental degradation and are often the cause of friction between the residents themselves and the service

3.27 The challenge is **not** perceived as being one of improving environmental awareness, but rather of providing the community with affordable and viable alternatives.

4 USES MADE OF SOCIAL, ECONOMIC AND NATURAL CAPITAL RESOURCES

Land Uses

4.1 The land-use profile for the Governorate is broadly as shown in Box 4.1A and Box 4.1B.

BOX 4.1A DAKAHLEYA GOVERNORATE: LAND USE PROFILE

Use	Feddans (K)	%
Cultivated	634.0	78.6
Uncultivated	173.6	21.6
Cultivable	83.7	10.3
Public Utilities	80.0	9.9
Water Covered	9.7	1.2
Uncultivable	0.2	< 0.1
TOTAL	**810.2**	**100.0**

Source: Maksoud, F.A. and Meshref, H. (1995) Dakahleya Governorate Environmental Action Plan - Land Resources and Problems, TCOE and ENTEC

4.2 The distribution of cultivable land across the Governorate,s Markazes is displayed in Box 4.2.

Agricultural Land Uses

4.3 The crop profile (area and production levels rounded) for the Governorate is displayed in Box 4.3 (one item is missing, namely the area of fodder crops grown - principally alfalfa). Agricultural productivity increased for the main crops over the period 1989-1994. However, in the case of some vegetable and fruit crops the converse applied.

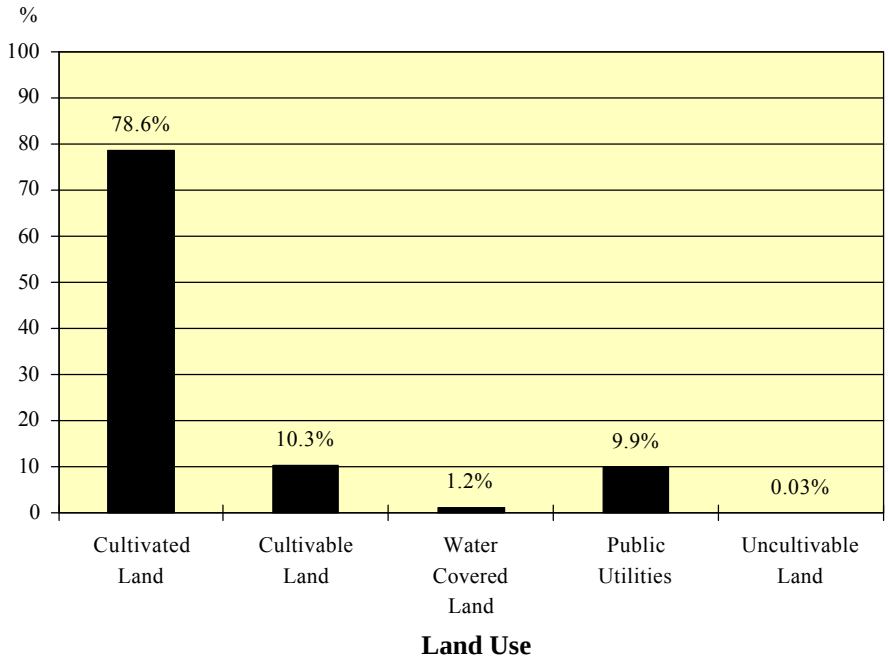
4.4 Special soil problems are experienced in many places. These relate to increasing salinity levels and a high and rising water-table, where land drains do not exist. Significant soil improvement programmes, involving the application (as well as effective storage) of gypsum, land drainage and the use of organic dressings (dung and compost), are required in order to raise productivity levels.

4.5 Another important feature is the fish harvest of Lake Manzala. This Lake used to occupy 470K feddans. However, its size has decreased by more than 50% to approx. 213K feddans (1993), as a result of construction and reclamation processes. The water quality of Lake Manzala has also declined, due to pollution principally from adjacent Governorates (ref Box 4.4).

4.6 In spite of the high pollution levels, it is claimed that Lake Manzala contributes 30% of total fish production in Egypt and 39% of all fish caught from lakes.

4.7 Also "it is estimated that at least 200 out of 35,000-40,000 of the Lake,s fishermen are bird hunters", with 100 of them being fully involved in bird hunting. The annual catch of waterfowl is estimated to range between 98,000 and 162,000 birds. The approximate annual value of these birds ranges between LE 60,000 and LE 85,000. However, this is a modest contribution (0.5%) when compared with the value of the fish contributed to the national income, the annual production of which reaches LE 225 million (60,000 tonnes).

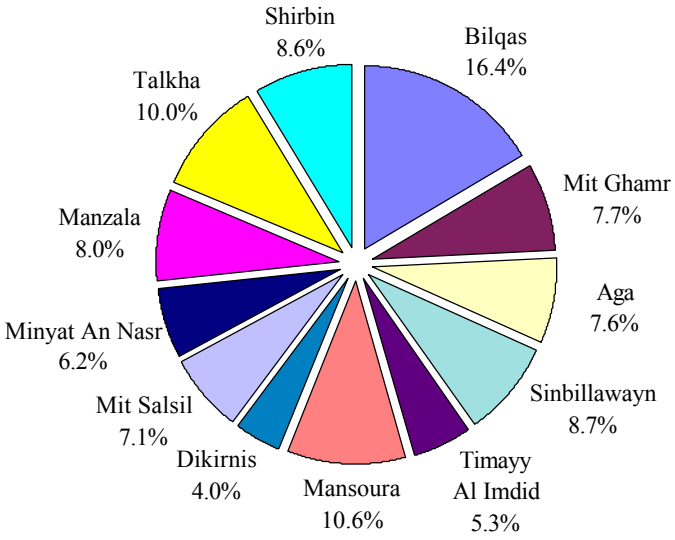
BOX 4.1B: DAKAHLEYA GOVERNORATE: GENERAL LAND USE



Land Use	%	Feddans
Cultivated Land	78.6	636,974
Cultivable Land	10.3	83,738
Water Covered Land	1.2	9,720
Public Utilities	9.9	80,052
Uncultivable Land	0.03	215
Total	100	810,699

Source: Maksoud, F A and Meshref, H (1995), Dakahleya Governorate Environmental Action Plan - Land Resources and Problems, TCOE/Entec.

BOX 4.2: DAKAHLEYA GOVERNORATE: CULTIVATED LAND USES BY MARKAZ



Source: Maksoud, F A and Meshref, H (1995), Dakahleya Governorate Environmental Action Plan - Land Resources and Problems, TCOE/Entec.

BOX 4.3: DAKAHLEYA GOVERNORATE - CROP AREA AND PRODUCTION PROFILE

CROP	1989-1990		1991-1992		1993-1994	
	Area feddans 000	**Units 000**	**Area feddans 000**	**Units 000**	**Area feddans 000**	**Units 000**
Main Crop						
Cotton	154	682	127	736	125	915
Rice	283	571	324	992	370	1,142
Summer Maize	121	1,943	115	-	87	1,658
Wheat	172	2,422	206	3,129	218	4,191
Beans	34	215	31	220	38	388
Vegetables						
Tomatoes	26	172	14	130	9	65
Cabbage	1	13	4	15	0.6	6
Zucchini	0.4	3	0.5	4	0.2	1
Egg Plant	0.6	5	0.6	7	0.5	4
Green Pepper	1	6	0.6	4	0.6	3
Fruits						
Grapes	12	73	12	63	8	49
Citrus	6	25	6	42	5	43
Guava	0.6	4	0.6	5	0.4	3
Banana	2	15	1	15	1	14
Peach	2	13	2	16	2	14

Source: Dakahleya Agriculture Directorate, 1994

BOX 4.4: LAKE MANZALA AND THE SURROUNDING GOVERNORATES

5 CHIEF NEGATIVE IMPACTS OF THE USE/MANAGEMENT OF THE THREE TYPES OF CAPITAL RESOURCE

Introduction

5.1 Inevitably the main negative impacts are associated with all forms of pollution and their principal sources. These are summarised first, in terms of intermediate or indirect human impacts. They are followed by an outline of the direct human impacts as manifest by ill-health and food production losses.

5.2 There are three principal areas which are polluted by industrial activities, notably: the Middle Governorate (Mansoura, Talkha and Sandoub); Southern part (Mit Ghamr) and the North (Abou Madi and Lake Manzala).

Intermediate or Indirect Impacts

5.3 The impacts of **air pollution** are difficult to determine with any degree of precision. In certain areas plants show evidence of pollution through the bleaching and yellowing of leaves, as well as growth reductions. It may not be possible, though, to determine the associated level of yield reduction.

5.4 In the case of **water pollution**, Lake Manzala is a good example. There, the negative impacts occur on the land surrounding the Lake as well as the Lake itself through industrial and sewage effluents. However, the pollution concerns go beyond that, due to the use made of the Lake for livestock watering and washing. As a result, fishermen in particular are at risk through parasitic infection.

5.5 It is known that ,the principal fresh water flowing to the Lake comes from polluted drains (Bahr El-Baqar, Hadous, Ramsis and Faraskor). These, together with untreated wastewater discharges from Port Said, Dumyat, Sharqiya, Qaliubiya and Cairo, expose the Lake to serious pollution inputs (...) High concentrations of some heavy metals, e.g. cadmium, at levels of more than 10 micrograms per litre are found in the southern part of the Lake, mainly as a result of a high input from the Bahr El-Baqar drain,. Again, the health of fishermen is at risk; the blood levels of heavy metals in the case of fishermen has been found to exceed the norm by 40%, 161% and 22% respectively in relation to lead, cadmium and mercury.

5.6 The sources of pollution cited above serve to illustrate that regional, as well as local, solutions will need to be sought.

5.7 Extensive reference has already been made to water pollution through the inadequate provision of water, effluent and solid waste treatment facilities. Thus no further mention is made to the impacts of these misuses here.

5.8 The **loss of land** is a controversial matter, especially regarding the possible impacts of subsidence and inundation due to sea level rise. There is also controversy about the future level of land loss that may or will arise as a result of the establishment of ,informal housing areas,, which contravene the law, but have nonetheless been tolerated within the Governorate. The extent of the problem cannot be ignored, bearing in mind that c. 53% of the Governorate urban population is estimated to live in such areas. Over the past 24 years up to 5,500 feddans of rural land have been lost to these informal housing areas. This is further emphasised by forecasts which point to additional losses of c. 6,692 feddans of agricultural land by 2020.

5.9 Other harmful impacts arise from the **unauthorised dumping and burning of wastes,** especially solid wastes due to lack of infrastructure.

5.10 **Pollution of land**, in addition to its loss, is another serious intermediate impact. This arises through a whole series of agricultural activities, namely:

- degradation of soils, due to salinisation stemming from faulty [flood] irrigation and drainage practices (involving excess application of irrigation water in some months and shortages in others), sea water intrusion, tidal flooding and a naturally high water table in the northern parts of the Gover;
- contamination of both surface and groundwater through over-use of fertilisers and pesticides/ insecticides. There has been a complete lack of import controls for all types of agricultural chemicals, as well as irresponsible use in the total absence of any cost-effectiveness data/guidelines. Indeed, there is evidence of much wastage of the active ingredients, since the levels of crop losses due to pests are still high. The media have failed to alert people to the dangers. Moreover, farm workers responsible for the application of chemicals are largely unsupervised.

Direct Human Impacts

5.11 These are mainly associated with reductions in public health. The principal impacts of the environmental deficiencies outlined in this review, are:

Diarrhoeal diseases and gastro-enteritis, parasitic infections, other intestinal problems and water-borne infections (dysentery, cholera, typhoid and hepatitis) associated with:

- pollution of both surface and undergroundwater supplies and soils from a myriad of sources, including hospital and other hazardous wastes;
- unsanitary sewage disposal (it is reported that in rural areas only 12% of the population is connected to the sewage system and 88% has no access to any latrine facilities; waste-water and latrine deposits are discharged into canals and drains, or are directly absorbed into the ground);
- lack of solid waste disposal facilities;
- poor quality housing, over-crowding and poverty;
- the poor location of water treatment plants, relative to sewage drains, and the erratic use of chlorine in the treatment process;
- social attitudes/customs and human behaviour, concerning personal and civic hygiene.

Respiratory tract diseases (e.g., a high incidence reported in Diast Village [1991/2]), as well as **liver and kidney malfunctions**, arising from a wide range of air pollutants. The latter include:

- industrial emissions;
- the burning of solid waste;
- the inhalation of toxic pesticides and chemicals.

Acute respiratory infectious (ARI) diseases are reported to be on the increase in Mansoura and Mit Ghamr as a result of pollution: ‚ARI is the leading cause of death in infants and young children in Dakahleya,. Deaths from this cause increased by 12% between 1982 to 1987;

Bilharzia, which is endemic and associated with perennial irrigation practices;

Industrial occupational hazards, which occur or may occur due to a wide array of causal factors, including: deafness associated with excessive noise levels, chronic respiratory diseases (asthma and bronchitis), skin infections, secondary hyperuricemia, gout, liver mal-functions, chronic lung disorders arising from cotton dust, possible genetic mutations through exposure to electro-magnetic fields and carcinogens (pesticides). The last hazard is particular to agricultural workers.

5.12 The impacts of poor sanitation and polluted potable water supplies are more acute in rural areas, where 72% of the population resides. In contrast, urban dwellers tend to suffer more from air and noise pollution, solid waste disposal problems and chronic illnesses associated with industrial activities.

5.13 The trends in patient numbers suffering from water-borne diseases between 1984 and 1992 in three main Markazes of the Governorate are generally not encouraging, as indicated by the rates of change displayed in Box 5.1. All figures for 1984-85 equal 100 (=index level) in order to compare them more easily with the figures for 1991-92. For example, Box 5.1 shows that the level of renal infection and failure increased to more than twice its level in 1991-92.

5.14 Food production losses remain to be estimated.

BOX 5.1 DAKAHLEYA GOVERNORATE - CHANGE IN WATER-BORNE DISEASE PATIENTS

Markaz/Disease	Indices 1984-85 Average	Rates of Change 1991-92 Average
El Manzala		
Renal Infection and Failure	100	207
Liver Infection and Failure	100	135
Parasitic Diseases	100	134
Fish Poisoning	100	203
El-Matariya		
Renal Infection and Failure	100	700
Liver Infection and Failure	100	266
Parasitic Diseases	100	219
Fish Poisoning	100	384
Aga		
Renal Infection and Failure	100	636
Liver Infection and Failure	100	71
Parasitic Diseases	100	57
Fish Poisoning	100	13

Source: Wagida. A.A. and Ahmed Niazi (1985) Health Impact of Environmental Pollution in Dakahleya Governorate. ENTEC/TCOE

6 ECONOMIC IMPLICATIONS OF ENVIRONMENTAL IMPACTS

The Challenge and Inevitable Caveat

6.1 An attempt has been made to estimate, albeit in an exploratory manner - with the aid of some "heroic assumptions" - the impacts of existing (often negative) environmental practices. Estimation of the benefits associated with their rectification is also required. That is well recognised, but can only come later once further insights and - where possible - data are available. There is widespread recognition, confirmed by the figures presented in Box 6.1, that the social environment and its determinants - including local traditions and social customs - can and do vary significantly. Where the awareness of the environmental and public health impacts of such behaviour is poor, the detrimental consequences can be significant. This points to the need to improve the connections between environmental conditions and public health.

Air Pollution Impacts

6.2 The impacts which beg quantification are numerous. They relate to the diverse damage caused by air pollution, namely:

"residents of the Governorate breathe the polluted air, and suffer respiratory damage; the pollution settles on crops and food is ingested, potentially causing health problems; the pollution causes damage to materials and buildings, requiring additional maintenance and replacement; it increases cleaning and laundry costs, damages statues and antiquities, reduces visibility, and a host of other effects. Adopting measures to reduce the magnitude of air pollution will in turn reduce these damages, resulting in benefits for residents of the Dakahleya Governorate".

6.3 Responding to this challenge is daunting, because of a number of problems, which include:

- the difficulty of estimating the associated physical damage;
- the possible synergistic effects arising from the presence of other pollutants;
- the time-lags which frequently occur between cause and effect, as in the case of the erosion caused to both historic and contemporary buildings;
- the only data available to assist quantification comes from international, albeit other developing country, sources.

6.4 Gamaleldin and Sarhan estimate the annual costs of air pollution, particularly in Mansoura, to be in excess of LE 44 million in terms of Restricted Activity Days (RDA) and medical costs arising from high concentrations of particulates and lead pollution.

Water Pollution Impacts

6.5 In general the deterioration of water quality has severe impacts on both the ecosystem and public health.

6.6 For evaluation purposes the following hierarchy of pollutants has been assumed: pathogens and parasites; bio-cides; heavy metals; and finally salinity.

6.7 The different impact dimensions are considered to be:

- the medical care costs associated with water-borne diseases;
- the working days and thus output lost, due to water related diseases;
- the associated loss of income;
- the clearance of weed growth from irrigation canals;
- the loss of agricultural production induced by soil and salinity problems;
- the decline in groundwater quality.

6.8 Gamaleldin and Sarhan estimate the medical costs for just treating renal failure caused by water pollution to be in the range of LE 5.5 - 10.0 million per year. Impacts on Lake Manzala have also caused potential losses of LE 27.7 million per annum.

BOX 6.1: DAKAHLEYA GOVERNORATE: DISTRIBUTION OF HUMAN BEHAVIOUR RELATED TO THE ENVIRONMENT

Outdoor Environment		
Practice Human Behaviour	**P (%)**	**NP (%)**
A. Water Usage		
Directly from canals for domestic use	20	80
Washing clothes and utensils in canals	70	30
Bathing in canals	40	60
Ablution in canals	40	60
Bathing of animals in canals	40	60
B. Waste Disposal		
Human excretion practice in canals	60	40
Solid and liquid waste disposal in canals	80	20
Sewage disposal in canals	20	80
C. Air Pollution		
Biomass fuel burning	45	55
Brick manufacture	30	70
Refuse burning	40	60

Indoor Environment			
Rank Human Behaviour	**FH (%)**	**A (%)**	**UH (%)**
Household water supply	40	40	20
Water storage	35	35	30
Food hygiene (cooking and storage)	60	10	30
Indoor biomass fuel combustion	1	30	69
Animal and poultry breeding	35	30	35
Waste and excrdisposal	35	30	35
Housekeeping	35	30	35
Concern for insects and rodents	35	30	35

Key: P = % Practised
NP = % Not Practised
FH = Fairly Hygienic
A = Accepted
UH = Unhygienic

Source: Wagida, A. Anwar and Ahmed Niazi (1995), Health Impact of Environmental Pollution in Dakahleya Governorate, ENTEC/TCOE.

7 IMPLICATIONS OF IMPACTS IN TERMS OF CAPACITY BUILDING

7.1 It is clear that much effort needs to be devoted to helping to develop a strong Environmental Management and Planning System (EMPS) for the Governorate. This will entail the evolution of a collaborative relationship between the existing EMD and the Regional Branch Office of EEAA, which is to be established in Mansoura.

7.2 Two additional elements of strengthening will be required, namely:

- The relationship between the EMUs, EEAA and the Line Ministries, especially regarding the preparation and evaluation of EIAs.
- The services of the General Organisation for Industries (GOFI) in the Governorate.

7.3 However, an effective EMPS will depend on more than just developing the links between the official organisations. The environmental management capacities of all other stakeholder groups, particularly those involving NGOs, the local communities and women,s groups, also need to be significantly improved.

8 AN OVERVIEW

8.1 What are the main impressions which emerge from this review; a review of the stocks of the three types of capital resources? This is an important question, because it is upon these very resources that the improvements of the Governorate,s environment - BY ITS OWN CITIZENS - depend.

8.2 Preliminary reflections suggest that the Governorate presents three very different faces to the world, namely those of:

- A rich set of natural resources, which represent the physical and cultural heritage of the Governorate and its rural communities. Yet there is evidence that, due to population and economic pressures, these resources - which are primarily devoted to farming - are under stress. Their undoubted potential for servicing the sustained development of niche tourism and other diversification opportunities has yet to be harnessed. The availability of reasonably priced land for the siting of improved environmental facilities, such as sewage treatment plants, solid waste management processing equipment and public open space, is very limited. This represents a serious constraint.
- A set of economic resources, which - as reflected by industrial plant and infrastructures - are variously obsolete, starved of finance for refurbishment/replacement and appear to be at least partly incapable of meeting the multiple and growing needs of the Governorate.
- An energetic population, which - apart from traditional agrarian skills and some industrial expertise - is ill-equipped in terms of technical and managerial skills to manage an increasingly complex environment, in the face of growing population/development pressures and human aspirations. Civic and personal hygiene practices cry out for change through assistance. Generally, environmental NGOs are not yet well developed. Yet there are grounds for optimism, since the potential for self-help at community level appears to be high. There is growing evidence of a desire to find and invest in technical solutions to pollution problems, within both the private and public business communities. The administrative infrastructure, required to address environmental issues effectively, has recently been improved through both national and local initiatives. Respectively, these are:
  - → he introduction of Law 4 (1994), which, despite some deficiencies, has raised public awareness of the need to reduce pollution levels;
  - → he finalisation of a Governorate-wide strategy for solid waste management.

Finally, there is strong evidence that survival skills amongst the poorer sections of the community are well developed. Although at times these militate against environmental improvement, they represent a potential which is there to be harnessed. The biggest single management resources required in future are co-ordination and leadership skills.

8.3 The cumulative environmental impacts of the combined pressures and stresses make the preparation and implementation of a GEAP not only timely, but a compelling activity for Dakahleyans, one and all.

PART B

PRIORITY ISSUES AND POTENTIAL SOLUTIONS

1 INTRODUCTION

Evolutionary Process

1.1 Part B of this Environmental Profile presents the results of the consultation process involved in laying the foundations for the Governorate Environmental Action Plan.

1.2 Six stages of consultations were involved, namely:

Stage 1: Discussions in January and February 1996 with the Environmental Experts responsible for preparing the specialist Technical Working Papers.

Stage 2: Meetings in January and February 1996 with primary and secondary Stakeholders in key parts of the Governorate.

Stage 3: Three Workshops held during March 1996 in three of the main cities: Mansoura, Mit Ghamr and Gamasa. The purpose of the Workshops was ,to advise on progress towards preparation of the GEAP, to stimulate interest in the GEAP and - most importantly - to obtain the views of people and their perceptions of environmental issues, problems and potential solutions., These Workshops were attended primarily by secondary stakeholders. The total number of participants was about 350 individuals. Views concerning priority environmental issues and problems were sought at the Workshops, as well as from a random sample of Dakahleyans a few days before the events. (It should be noted that the random sample was ,skewed, in that half of the respondents were Mansoura residents and 21 per cent were students). Analysis of the results features later in this section of the Profile.

Stage 4: The twelve focus group sessions, which were held in different parts of the Governorate by EQI during July 1996 and which were supplemented by twenty individual and group interviews with formal and informal service providers.

Stage 5: Discussions with primary and secondary stakeholders during the period July to December 1996, concerning the formulation of Project Concept Proposals which seek to address the priority environmental issues. The preparation of the Proposals was facilitated by AOYE in close liaison with the Dakahleya EMD.

Stage 6: Seminars with primary and secondary stakeholders to identify the measures which should be combined to form the supporting Programmes of the GEAP.

1.3 The first four of these stages are described in Part B, since they formed the starting point for preparation of the GEAP.

Twin Foci

1.4 From the outset it was stressed that, whilst the consultation process initially involved identifying priority environmental issues/problems and sustainable development opportunities, this was regarded merely as a vehicle for focusing upon the main purpose of the exercise. That inevitably was the definition of practicable, affordable and cost-effective solutions. Even though stakeholders were reassured several times on this point, it had to be repeated regularly. The need for this stemmed from many previous problem identification exercises, which had yielded no improvements and merely left stakeholders with a growing sense of frustration.

1.5 Against this background, Part B of the Profile records both **the range of solutions suggested and proposed** by the various consultees, as well as the priority environmental issues/problems and sustainable development opportunities. To that extent, the Profile can be regarded as innovative.

2 THE PRIORITY ISSUES/PROBLEMS AND OPPORTUNITIES

2.1 From the outset of the consultation process attention focused, not just on environmental problems but equally upon the opportunities for sustainable development of the Governorate,s natural resources. The underlying logic for covering these dual dimensions was the recognition that solving the environmental problems would inevitably need to be financed and that such finance would need to be generated locally. Furthermore, as the population grows so will the need for new jobs. It was thus appreciated that the GEAP would have to be more than just a environmental problem-solving exercise.

2.2 The technical reports prepared by national and local experts, and the Stage 1 discussions which followed, focused on these dual dimensions.

2.3 The priorities which the experts identified were subsequently verified, and in some cases confirmed, with even greater emphasis during the initial meetings (Stage 2 consultations) held with local stakeholders. The lists of local and other stakeholders consulted at that stage are contained in Annex 1.

2.4 It will be observed from Box B.2.1 that at that stage the key environmental issues were classified into two wide-ranging groups. The first related to what were broadly regarded as priority technical problems either directly or indirectly affecting public health. In contrast, the second group focused on shortcomings in the existing management systems and institutional capacities.

2.5 A similar dual classification was adopted concerning the identification of sustainable development opportunities, namely attention to existing and new resource-use activities.

2.6 The Stage 2 consultations revealed a number of contradictions between the reports of the Technical experts and the local stakeholders. These are displayed in Box B.2.2. The contradictions are hardly surprising, bearing in mind that the stakeholders consulted included several senior officials of the Governorate Directorates and Departments, primarily responsible for the provision of environmental services.

2.7 The Stage 3 consultations provided an opportunity for the priorities which emerged from Stages 1 and 2 to be paraded for public comment and debate. They enabled a consolidated list of priorities to be agreed, thereby providing a firm foundation for preparation of the GEAP. This list is presented in Box B.2.3. It is based upon the report prepared by Hanan Sabea, entitled ,SEAM Project - Evaluation of the Issues arising from and the success of the three Workshops held in Dakahleya, March 1996,.

2.8 Box B.2.3 indicates clearly the need to distinguish between top priority environmental issues which are Governorate-wide and those which are of more local importance. Altogether **ten priority issues** were identified, which the GEAP needs to address: It will be observed that five of these, since they featured in discussions at all three Workshops, can be classified as being of generic concern, namely:

- the ineffective collection and disposal of solid waste;
- the pollution of drinking water;
- the lack of sewerage treatment plants and networks;
- the inadequacies of urban planning services;
- the high water table due to insufficient drainage.

2.9 Box B.2.3 needs to be read in conjunction with Box B.2.4, which summarises what the Workshop participants considered to be the main sources of pollution in the Governorate.

2.10 Several other useful lessons emerged from analysis of the Workshops and the earlier consultations, namely:

- the large Workshops primarily served the function of raising awareness about issues and solutions. By comparison the smaller consultation meetings were helpful in identifying and prioritising issues and eliciting solutions.
- subsequent stakeholder discussions concerning solutions are best organised in relation to geographic units and the over-arching need for institutional strengthening, since the issues to be addressed have a strong geographic basis.
- subsequent Workshops, concerning the content of the draft GEAP, need to be organised at appropriate scales, so as to achieve technical consensus on the solutions proposed. A clear distinction needs to be made between this type of event and a large scale Workshop, the prime function of which is to make all stakeholders aware of the finalised GEAP.
- considerable attention needs to be given to the most effective ways of combining the scientific experts with a stakeholder group, so that it would be readily accepted by other stakeholder groups.
- understandably, strong views are held concerning the impracticability of applying the ‚polluter must pay‚ principle before people are provided with alternative solutions to their environmental problems. Thus both environmental laws and their enforcement have limited value until the infrastructural deficiencies are rectified.
- the case of Lake Manzala has been described as ‚one of the most serious examples of surface water pollution‚. The consequences are contaminated drinking water, polluted and poisoned fish and poor environmental conditions in general. Solutions are seen in conjunction with the installation of proper sewerage systems.
- behavioural patterns, which reflect traditional beliefs, are one of the main causes for the continuous pollution of surface water-ways. These activities include the disposal of umbilical cord remains of new-born babies in the Nile, the importance of cooking certain items from canal water, the washing of dark clothes in canal water, and the disposal of dead animals in the canals. The need to change anti-social and environmentally damaging wasteful practices is evident. This includes the misuse/wastage of potable water and the failure to segregate wastes.
- the persistence of environmental problems is stated to stem from political, social, administrative and financial, as well as technical forces. These include apathy on the part of Government, lack of awareness amongst communities, administrative red-tape, inadequate funding sources and laxity over law enforcement.
- action plans need to be specific to different parts of the Governorate.

BOX B.2.1: PRIORITY ENVIRONMENTAL ISSUES AND OPPORTUNITIES TO BE ADDRESSED WHICH WERE IDENTIFIED BY THE TECHNICAL EXPERTS AND CONFIRMED BY THE LOCAL STAKEHOLDER GROUPS CONSULTED, but not listed in order of importance.

CATEGORY A: KEY URBAN AND RURAL ENVIRONMENTAL ISSUES/PROBLEMS	
1.	**PUBLIC HEALTH ISSUES**
1.1	Contamination of potable and irrigation water supplies by sewage and industrial effluents.
1.2	Lack of reticulated water supply and sewage services to all urban and rural households.
1.3	Treatment facilities for solid waste and garbage through incineration, recycling, composting, bio-gas production, sanitary land-fill etc.
1.4	Treatment of sewage, industrial/other liquid effluents.
1.5	Control of the importation of pesticides, the issuance and enforcement of regulations re-usage and application practices, promotion of biological/integrated pest control methods. (This is an increasingly important issue, since certain countries have stopped the importation of Egyptian fruit and vegetables because of lack of pesticide controls).
1.6	Extension, through demonstrations, of the results of canal bank planting to control/eliminate the Bilharzia host.
1.7	Progressive pollution of Lake Manzala and the dominance by lower value fresh-water fish species.
1.8	Air and noise pollution at specific point sources in industrial/urban environments.
1.9	Inadequate repair and rehabilitation of the potable water supply pipe systems.
2.	**STRENGTHENING OF ENVIRONMENTAL MANAGEMENT SYSTEMS / INSTITUTIONAL CAPACITIES**
2.1	Lack of adequate facilities for monitoring emissions, covering all features of urban, industrial and rural environments.
2.2	Inadequate enforcement of environmental laws.
2.3	Absence of an effective Authority to manage the Lake Manzala ecosystem, including the reopening of marine inlets. (Currently there is only an Advisory Committee in existence, which has no effective powers to reduce pollution).
2.4	Lack of a comprehensive network of Environmental Management (public, private, NGO and voluntary organisations) which is well coordinated and equipped to address the key issues, problems and opportunities.
2.5	Insufficient funds available to large, medium and small firms to enable them to raise industrial emission performances and to comply with realistic environmental standards.
2.6	Inadequate professional skills and capacities to improve the quality of urban and rural environments through: • short-term house-keeping improvements; • better settlement planning, including the zoning and siting of new industrial facilities.

BOX B.2.1: (Cont,d) PRIORITY ENVIRONMENTAL ISSUES AND OPPORTUNITIES TO BE ADDRESSED WHICH WERE IDENTIFIED BY THE TECHNICAL EXPERTS AND CONFIRMED BY THE LOCAL STAKEHOLDER GROUPS CONSULTED, but not listed in order of importance

CATEGORY B: KEY SUSTAINABLE DEVELOPMENT ISSUES/OPPORTUNITIES	
1.	**EXISTING RESOURCE USE ACTIVITIES IMPROVED**
1.1	Modification of agricultural drainage and irrigation systems to be more efficient and, in particular, to remove unacceptable levels of soil and irrigation water salinity.
1.2	Establishment of potential new enterprises, which diversify/strengthen the local economy and employment opportunities.
1.3	Reduction in the losses of prime agricultural land (categories 1 and 2) to urban/industrial development.
1.4	Introduction of modern irrigation methods (sprinkler and drip) as appropriate.
1.5	Optimal use of reclaimed areas (Bilqas, etc).
2.	**NEW RESOURCE USE ACTIVITIES SUSTAINABLE DEVELOPMENT**
2.1	Development/management of rural industries, based on agricultural and natural raw materials.
2.2	Restoration/management of the fisheries potential of Lake Manzala.
2.3	Establishment of niche tourism enterprises (ornithological, eco-, agro-, nature and religious tourism).

BOX B.2.2: INFORMATION SUPPLIED AT STAKEHOLDER MEETINGS WHICH APPEARS TO CONTRADICT THAT CONTAINED IN THE WORKING GROUP REPORTS

1.	**POTABLE WATER SUPPLIES**
1.1	There is said to be no problem concerning water supplies from a public health standpoint. The Department of Drinking Water takes samples bi-weekly from the Water Treatment Plants and individual household all over the Governorate.
1.2	Where the underground water supply was found in one case to be polluted, it was reported that the Treatment Plant was shut down and the activity transferred elsewhere.
1.3	Drinking water is said to have reached all parts of the Governorate; only 5% of houses do not have a tap.
2.	**AIR POLLUTION**
2.1	As a result of the progress made by the Fertiliser Company in cleaning its processes, ammonia pollution is reported to be no longer a problem.
3.	**DIRECTORATE OF HEALTH**
3.1	The Directorate is equipped to combat all problems. Both trends in life expectancies, mortality and birth rates and comparative international statistics indicate the significant progress which has been made during the past 10 years.
3.2	The environmental health problems within the Governorate are considered to be well under control. However, the severe pollution viewed at Al-Muqata Village, which is reported to have suffered already from a serious cholera epidemic, would suggest that considerable infrastructural investments are still required in rural areas.

BOX B.2.3: THE CONSOLIDATED LIST OF PRIORITY ISSUES/PROBLEMS TO BE ADDRESSED AND IMPROVEMENTS TO BE ACHIEVED IN THE NEXT 5-10 YEARS

Key: Numbers indicate the priority ranking accorded to the issue during the Workshops and through a Random Sample Survey.

TYPE OF ISSUE	WORKSHOP LOCATIONS			GOVERNORATE	TOTAL
	Gamasa	**Mit Ghamr**	**Mansoura**	**Random Sample**	
TOP 10					
SWM	1	1	1	3	1
Potable Water	2	3	4	1	2
Sewerage	3	2	5=	6=	3
Town Planning	4	5	5=	2	4
Industrial Hazards	6	4	-	5	5
Surface Water	5	7	5=	6=	6
Public Awareness	-	6	2	6=	7
Clean Air	7	8	3	-	8
Comprehensive Environmental Development	8=	-	8	-	9
Schistosomiasis Control	10	-	9=	-	10

Others

- Improper Uses of Pesticides and Fertilisers
- Inadequate Environmental Law Enforcement
- Urban Encroachment on Agricultural Production
- Air Pollution through Car Exhaust
- The Need for Committed Leadership
- Population Growth
- Poor Levels of Public Health
- Noise Levels
- Ground Water Contamination
- The Need for Greater Local Participation
- Coordination of Government and NGOs

Source: Hanan Sabea (1996), The 3 Dakahleya Workshops: Table 13

BOX B.2.4: THE MAIN SOURCES OF POLLUTION IN THE GOVERNORATE

Key: Numbers indicate the priority ranking accorded to the issue during the Workshops and through a Random Sample Survey.

SOURCE	WORKSHOP LOCATIONS			GOVERNORATE	TOTAL
	Gamasa	Mit Ghamr	Mansoura	Random Sample	
TOP 10					
Industries	1	1	1	1	1
Solid Waste	4	3	5=	2	2
Sewage	5	2	2	5	3
Surface Water	2	5	5=	4	4
Manzala Lake	3	10	3=	-	5=
Brick Kilns	10	4	8=	7	5=
Drinking Water	6	6	-	6	7
Car Exhaust	9	7=	8=	3	8
Pesticides and Chemical Fertilisers	7	7=	3=	9=	9
Slum Areas	8	7=	8=	8	10
People,s Behaviour	-	-	5=	-	-
Population Growth	-	-	-	9=	-

Source: Hanan Sabea (1996), Table 15

3 THE SOLUTIONS SUGGESTED/PROPOSED BY CONSULTEES

Introduction

3.1 Three sets of recommendations and suggestions, which were intended to contribute to the formulation of GEAP Policies, Supporting Programmes and Projects, are summarised in the Profile. Their respective sources are:

- the Technical Experts;
- the representatives of the Governorate Directorates and Departments who attended the initial consultations organised by ENTEC and the EMD;
- the consultees involved in the Social Dynamics focus group discussions facilitated by EQI.

3.2 A possible distinction needs to be made between the manner in which these different sets of recommendations were formulated. In the case of the Technical Experts, the recommendations were clearly the product of careful investigation and considered analysis. They were formulated over weeks rather than days or hours. By comparison, the recommendations proposed by the other two sets of consultees were much more reactive. Whilst the ideas voiced may have been the result of previous careful consideration and discussion, they nonetheless were merely expressed verbally and in a forum which sought almost instantaneous reactions. However, it should also be noted that Governorate Directorate and Department consultees were assisted in formulating their proposals through the distribution and explanation in Arabic of an aide memoire during the meetings. These observations are not intended to belittle any of the contributions, but merely to draw attention to the fact that care should be exercised before attaching equal weight to all recommendations.

The Recommendations of the Technical Experts

3.3 As expected, the coverage of the recommendations from this source is quite extensive. The recommendations are summarised in Box B.3.1. It will be noted that the recommendations relate primarily to correcting environmental and resource problems rather than to the sustainable development of opportunities. Whilst, for the most part, the recommendations focus upon technical matters, some reference is made to the need for administrative and management improvements. Measures designed either to develop social capital stocks or to improve their performance are conspicuous by their absence.

The Recommendations proposed by Local Stakeholder Consultees

3.4 By comparison, the recommendations of these groups, summarised in Box B.3.2, were even more wide-ranging. Moreover, they not only covered technical solutions but also addressed the need to identify opportunities for both sustainable development and the generation of additional employment.

3.5 Possibly the most notable feature of Box B.3.2 is the fact that the issue for which the largest number of recommendations was made did not relate to technical matters. Instead it focused on the need for investment in increasing social capital stocks through improving the Environmental Management System.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS PREPARED BY THE WORKING GROUP SPECIALISTS

1. PREVENTION AND CONTROL OF AIR POLLUTION RECOMMENDATIONS

1.1 These relate to the reduction of the main pollutant, namely particulates.

1.2 The introduction of cleaner fuels for use in vehicles and industrial engines/processes would contribute major improvements.

1.3 The introduction of technology and equipment, specifically geared to the reduction of particulate emissions (e.g. through cyclones and electrostatic precipitators) and gaseous pollutants (e.g. through scrubbers).

1.4 The adoption of better house-keeping practices.

1.5 The adoption of strict testing of vehicles in relation to their exhaust emission levels.

1.6 The zoning of industrial activities, so that they are distanced from residential areas.

1.7 The introduction of building and construction regulations

2. RECOMMENDATIONS FOR ENVIRONMENTAL PROTECTION AND IMPROVEMENT OF WATER RESOURCES

2.1 Potable water supplies should be expanded in villages and settlements with no water supplies.

2.2 High priority should be given to supply the villages with sewage systems. Disposal of raw sewage into canals and drains represents a major health hazard and is responsible for the incidence of water-borne diseases.

2.3 Projects for potable water and sewage treatment in most urban areas of the Governorate should be implemented in ,due time,.

2.4 Law 48, regarding the protection of the Nile and related water-ways from pollution, must be enforced, subject to realistic progressive phasing of emission standards.

2.5 A public educational campaign, relating to all aspects of water treatment, use, personal hygiene and management, should be established and sustained for all Stakeholder Groups.

2.6 A Water Quality Board should be established, with representation from all of the appropriate organisations, in the interest of protecting Egyptian water-ways.

2.7 The limits of phosphorus allowed in imported or locally manufactured detergents must be regulated so as not to exceed 1%.

2.8 The discharge of industrial effluents (especially in the case of the fertiliser plant at Talkha) must both comply with national standards and be upheld through enforcement of Law 48/1982.

2.9 ,A central laboratory for environmental quality monitoring should be established in Dakahleya to provide a comprehensive and accurate assessment of the environmental quality of the surface water, ground water and soils associated with Damietta Branch, canals, drains, lakes and ground water aquifers,.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS (Cont,d) PREPARED BY THE WORKING GROUP SPECIALISTS

2.10 It is reported that ,the Egyptian Government has plans to provide all factories that are disposing their effluents into the Nile (or its two branches and canals) with treatment plants. ... Through governmental funds and foreign aid, it is believed that the factories will be supplied with the treatment plants in the future and that pollution levels will be always within the WHO limits,.

2.11 Specific filtration and other measures should be taken in the case of Water Treatment Plants servicing those three main locations where ground water concentrations of iron and manganese are known to be high (Mit Ghamr, Sinbillawayn and Aga).

2.12 Specific schemes for pumping, drainage and the lining of canals/main irrigation channels need to be devised to lower the ground water table by removing those volumes of surplus drainage water, which are not suitable for irrigation purposes, to non-cultivated areas.

2.13 More efficient irrigation methods (sprinkler and drip) should be introduced wherever appropriate.

2.14 Re-use of treated effluent, where the quality is suitable for irrigation purposes, should be encouraged.

2.15 The maintenance of drinking water wells should be efficiently programmed and undertaken.

3. RECOMMENDATIONS FOR CONSERVATION AND IMPROVEMENT/RESTORATION OF LAND AND SOIL RESOURCES

3.1 National and regional, as well as Governorate, solutions are required.

3.2 Research into potential sea level rise and its impacts is required.

3.3 Lake Manzala,s problems require more than just technical solutions; administrative co-ordination is also required.

3.4 Effective control of urban encroachment onto good agricultural land is required, involving the determination of urban borders in compliance with Urban Planning Law No. (3) 1982.

3.5 Pollution of potable water, low levels of sanitation, inadequate solid waste facilities and poor personal hygiene practices leading to public health hazards, must be corrected.

3.6 Eradication of land pollution by:

- obsolete industrial plant processes and poor house-keeping;
- low levels of sanitation in rural and urban areas;
- excessive and inappropriate use of agricultural chemicals;
- contaminated irrigation water;
- irrigation problems;
- high water table and drainage problems.

3.7 The classification of soils within the Governorate needs to be up-dated.

3.8 The installation of land drainage facilities is required in many areas which have a high water table.

3.9 The finance required for the purchase of modern land-levelling equipment (lasers) needs to be procured.

3.10 Adequate storage facilities need to be provided for gypsum storage.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS (Cont,d) PREPARED BY THE WORKING GROUP SPECIALISTS

3.11 EIAs need to be conducted for all major development projects, eg. the international northern road.

3.12 Improvement of the quality of urban housing environments, especially the informal housing areas

3.13 Re-location of industries that cause serious industrial pollution of residential areas, especially brick kilns (Mit Ghamr).

4. RECOMMENDATIONS FOR ACHIEVING REDUCTIONS IN HEALTH RISK HAZARDS AND IMPROVEMENTS IN HEALTH RISK MANAGEMENT

4.1 Small adjustments or changes in management: eg maintenance of village pumps; technical training to provide skills required in handling toxic chemicals or controlling machinery; monitoring and surveillance.

4.2 An environmental clean-up programme for Lake Manzala, based upon a co-ordinated approach to the reduction and ultimate control of pollution entering the Lake from six different Governorates.

4.3 The careful zonation of industrial and residential areas so that the pollution prevention controls are optimised.

4.4 The provision of essential infrastructure and service facilities (safe potable water supplies, management of solid waste etc) to all communities.

4.5 The regulation of the use of fertilisers and pesticides.

4.6 The modification of public and private hygiene practices, such that irrigation and drainage canals are not used for waste disposal.

BOX 3.2: SUMMARY OF RECOMMENDATIONS PROPOSED BY LOCAL STAKEHOLDER CONSULTEES

1.	**PREVENTION AND CONTROL OF INDUSTRIAL AIR POLLUTION RECOMMENDATIONS**
1.1	Rehabilitation of the chemical plants owned by the Al Nasr Fertiliser Co to improve both overall commercial and environmental performances, especially with respect to air and drainage pollution, noise and energy levels.
1.2	The introduction of modern technology to reduce pollution emissions from brick factory stacks with the co-operation of the Brick Manufacturers Association.
2	**ENVIRONMENTAL PROTECTION AND IMPROVEMENT OF WATER RESOURCES**
2.1	The Sanitary Drainage Department of the Ministry of Health to replace the obsolete water pipe system.
2.2	The provision of an effective sanitary drainage plant, purification plant (lead removal) and biological treatment plant to improve/protect/control the quality of water entering Lake Manzala.
2.3	The protection of canal water abstraction points.
2.4	Investment in water treatment facilities (Compact Units) for individual rural settlements.
2.5	Sewage Treatment Plants required for each village.
3.	**CONSERVATION AND IMPROVEMENT/RESTORATION OF LAND AND SOIL RESOURCES**
3.1	Re-open/widen the NW channel from the Mediterranean Sea to Lake Manzala.
3.2	Designate Lake Manzala as a Ramsar site or a Man and Biosphere Reserve.
3.3	The substitution of liquid for granular fertilisers leading to an estimated reduction in consumption of 50% and yield increases of approximately 25%.
3.4	Provision of a treatment plant for irrigation water.
3.5	The adoption of more efficient irrigation methods based on sprinkler and, preferably, drip systems for ,reclaimed land, projects in particular.
4.	**REDUCTIONS IN HEALTH RISK HAZARDS AND IMPROVEMENTS IN HEALTH RISK MANAGEMENT**
4.1	Investment in bio-gas generation plant for the re-cycling of solid waste from both households and factories.
4.2	Provision of public incinerators for each village/settlement.
4.3	Investment in sewage treatment facilities (LE 490,000) required to overcome the chronic sanitary drainage problems of Al-Muqata village, where there is a naturally high water table.

BOX B.3.2: SUMMARY OF RECOMMENDATIONS PROPOSED BY LOCAL STAKEHOLDER CONSULTEES (Cont,d)

5. DEVELOPMENT OF NEW/EXPANDED ECONOMIC ENTERPRISES AND EMPLOYMENT OPPORTUNITIES

5.1 Investment in a fish processing plant for the Lake Manzala Fishery.

5.2 Investigation of alternative business development opportunities and incentives to assist brick factory businesses which are forced to re-locate or close for environmental reasons.

5.3 Diversification into new rural enterprises which supplement low farm incomes; such enterprises to include weaving, electric engine assembly, ironmongery, carpet making, car painting, milk processing, etc.

6. GENERAL ENVIRONMENTAL MANAGEMENT SYSTEM IMPROVEMENTS

6.1 Introduction/adoption of realistic environmental performance standards.

6.2 Introduction of the more punitive type of Dutch laws used to control discharges by the Oil and Soap industry.

6.3 Introduction of a system of environmental performance rewards.

6.4 Provision of more noise measurement equipment for use inside factories (via a Factories Inspectorate service).

6.5 Decision as to what Laboratory facilities need to be harnessed for provision of an effective environmental monitoring system.

6.6 Requirement to improve central water analysis laboratories so that municipal and ground water supplies used for washing wheat are properly tested.

6.7 Individual (larger) companies should be encouraged to establish their own environmental measurement facilities, covering dust, noise and heat emissions.

6.8 Provision of investment funds and privatisation incentives to enable industrial plant to be up-dated for compliance with environmental standards.

6.9 Appointment by the Banks of an Environmental Liaison Officer to service the branches within the Governorate and to liaise with the EMU, EEAA and donors.

6.10 Provision of environmental training courses for the management staff of Banks.

6.11 Co-funding of infrastructural improvements by Governorate and local communities is required.

6.12 The demand exists for the EMU to provide a technical extension service to local communities covering environmental management matters. (This is currently not provided due to lack of funds).

The Recommendations resulting from the Focus Group and Service Provider Discussions

3.6 As expected, and as presented in Box 3.3, the recommendations were location specific. Interestingly, they display both significant interest in effective privatisation of environmental services and a willingness to pay provided that the services are efficient.

3.7 In addition, the EQI report draws attention to the need for comprehensive solutions that entail co-operation between stakeholder groups and effective co-ordination by the EMD. For instance, private sector waste collection and disposal initiatives require the Government to make available dumpsites through either realistic provision or leasing arrangements. The same applies to the provision of some Government assistance towards the coverage of open drains by local communities. Such ,joint ventures, would facilitate the establishment of much needed community parks which could be created and maintained substantially through self-help initiatives. However, without a Government catalyst, such opportunities are unlikely to be realised, at least in the foreseeable future.

3.8 Other solutions mooted include the provision of extended credit through the establishment of a revolving fund to finance the purchase of vehicles for emptying septic tanks, and the installation of filters. Community involvement, through the introduction of a range of sponsored environmental improvement competitions, was also raised as a further possible measure.

3.9 Finally, the possibility of ,allowing the NGOs to become extension arms of the EMD, is seen as meriting investigation. This includes the involvement of University staff and students in environmental awareness and improvement schemes throughout the Governorate. The potential of the voluntary sector to contribute towards environmental improvement is regarded as considerable. This applies particularly in the case of religious leaders.

BOX B3.3: RECOMMENDATIONS RESULTING FROM THE SOCIAL DYNAMICS STUDY FACILITATED BY EQI (Items are not presented in order of priority)

ISSUE/PROBLEM	SOLUTION(S) PROPOSED
1. Air and Water Pollution	
Mansoura and Villages	• Sources of pollution to be relocated to non residential areas. • Enforcement of environmental laws • Exposure of detrimental practices by the media.
Mit Ghamr and Villages	• Relocation of brick factory stacks, workshops and industries to non-residential area on the outskirts of the town. • Law enforcement. • Use of cleaner car fuels and replacement/repair of faulty exhausts.
Sinbillawayn and Villages	• Closer monitoring and regular water testing. • Installation of filters at personal expense.
Aga and Village	• Relocate brick kilns in the desert far from the Delta. • Closer monitoring of the use of pesticides and irrigation process. • Stricter enforcement of Law 48/1982 to protect waterways.
Gamasa	• Provision of a water supply/treatment plant. • Introduction of charges to prevent excessive water-use by tourists.
2. Garbage and Sewage	
Mansoura and Villages	• Establishment of a private waste collection system, based on levying realistic charges.
Mit Ghamr and Villages	• Reinstatement of private sector collection service through tax incentives, realistic charges and regular collection times. • Provision of an effective municipal collection and disposal service on village market days. • Connecting septic tanks to the main sanitary drainage network, based on realistic service charges (and thereby preventing contamination of surface water).
Sinbillawayn and Villages	• Effective private sector collection and disposal service, based on realistic charges.
Gamasa	• Anti-littering awareness campaigns.
3. Insects and Rodents	
Mit Ghamr and Villages	• Control over the use of space in residential areas for keeping livestock. • Covering open drains and forbidding animal owners to deposit wastes in canals.

ANNEXES

ANNEX 1

ORGANISATIONS WHICH PARTICIPATED IN THE PREPARATION OF THE DAKAHLEYA GEAP

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Participatory/Consultee Organisations

Central Government

- Ministry of Local Administration
- Regional Planning Centre, Tanta
- General Organisation for Physical Planning

Dakahleya Governorate Directorates and Departments

- Environmental Management
- Planning
- Tourism
- Industry
- Social Affairs
- Water Supply and Sanitation
- Agricultural
- Security Department
- Labour Research
- Manpower and Training

- Environmental Healt
- Youth and Sports
- Development
- Public Health and Population
- Education
- Information
- Cleansing
- Fisheries
- Lake Manzala Executive
- Supply

Aga Markaz

- Youth and Sports Department
- Agriculture Department
- Social Department
- Health Department

Bilqas City Council

- Labour Department
- Irrigation Department

Dikirnis City Council

- Education Department
- Youth Department
- Quran Learning Protection Department
- Engineering Department
- Consumer Protection Department
- Control Department
- Supply Department

Deraka Council

- Education Department

Gamaliya City Council and Markaz

- Municipality
- Labour Department
- Social Department

Gamasa City Council and Local Unit

- Planning and Follow-up Department
- Environmental Department
- Local School
- Supply Department

Mansoura City Council

- Cleansing Department
- Fisheries Department
- Water and Sanitation Department
- Gardens Department
- Solid Waste Department
- Services and Utilities Directorate
- Organisation and Administration Department
- Education Department
- Quality and Media Unit
- Public Department of Agricultural Co-operatives
- Shop Permits Department
- Culture Centre

Manzala City Council

- Engineering Department
- Labour Department
- Municipal Department
- Quality Department
- Industrial Safety Department

Matariya City Council and Local Unit

- Water Networks Department
- Cleansing Department
- Development Department
- Education Department
- Electricity Department
- Engineering Department

Mit Ghamr City Council

- Accounting Department
- Solid Waste Department
- Citizens, Services Department
- Gardens Department
- Commercial Licences Department
- Planning and Highways Department
- Public Relations Department
- Utilities Department
- Emergencies Department
- Cleansing Department
- Sewage Department
- Agriculture Department
- Industrial Security Department
- Social Affairs Department
- Agricultural Co-operation Department
- Planning and Monitoring

- Health Department
- Labour Office
- Kafr Serenga Mosque
- Youth Centre
- Industrial Safety Department

Mit Salsil Council

- Environmental Management Unit
- Utilities Department

Nabaruh City Council

- Engineering Department

Sinbillawayn Council

- Environment and Population Department
- Education Department
- Manpower Department

Shirbin City Council

- Education Department
- Health Department
- Industrial Safety
- Supply

Talkha City Council

- Social Affairs Department
- Education Department
- Youth Centre
- Labour Office
- Health Department

Timmayy Al Imdid Council

- Industrial Safety Department
- Social Affairs Department
- Labour Office
- Agriculture Department
- Education Department
- Engineering Department

University of Mansoura

- Faculty of Engineering
- Department of Education
- Faculty of Agriculture
- Faculty of Science
- Faculty of Medicine
- University Environmental Council
- Faculty of Engineering

Business and Financial Organisations

- Agricultural Development Bank, Manzala
- Chamber of Commerce, Nabaruh
- Chamber of Commerce, Mansoura
- Mit Ghamr Theatre Company
- Development Bank, Mit Ghamr

Industrial Companies and Co-operatives

- Misr Co for Dairy and Food Products
- El Nasr Co for Fertilisers and Chemicals
- El Nasr Company for Pressed Board and Resins
- Misr Co for Oils and Soaps
- Dakahleya Co for Spinning and Weaving
- Misr Brick Company
- Crops Co-operatives
- Mit Ghamr Aluminium Factory

Local Communities

- Ezbet Sakr
- Mansoura Markaz Villages:
    - Awish El Hagar
    - Kolongeel
    - Badaway
    - Mehalet Demnah
    - Baramone
    - Shawah
    - Barque El Ezz
    - Shoha
    - Mit El Sarrem
    - Tanah
    - Gedelah
- Mokataa
- Salamoun El Kommesh
- Shirbin
- Sinbillawayn Markaz Villages
- Tanboul El Kobra

Media

- Middle Delta New Journal

NGOs (National and Local) and CDAs

- CARE
- Health Improvement Association
- Oxfam
- Professional Industries and Co-operative Production
- Regional NGO Union, comprising the following organisations:
    - Environment Development Protection Society of Dakahleya (Mansoura University)
    - Women,s Society for Health Improvement at Dikirnis
    - Holy Quran Preservation Society at Shirbin
    - Local Community Development Society at Bilqas Village
    - Local Community Development Society at Bilqas City
    - Holy Quran Preservation Society at Bilqas City
    - Community Development Society at Touk Al-Aqlam, Sinbillawayn Markaz
    - Students, Care Society at Dakahleya
    - Women,s Society for Health Improvement at Talkha
    - Community Development Society at Nusa Al-Gheit, Aga Markaz
    - Child Care and Family Upgrading Society at Talkha
    - Islamic Charity Society at Brembal Al-Qadima, Minyat An-Nasr Markaz
    - Residential Community Development Society at Aga
    - Community Development Society at Shoha, Mansoura Markaz
    - Community Development Society at Danabeik, Mansoura Markaz
    - Community Development Society, Mit Tareif, Dikirnis
    - Child Care and Family Upgrading at Manzala
    - Local Community Development Society at Gamaliya
    - Local Community Development Society at Matariya
    - Local Community Development Society at Al-Muqata, Sinbillawayn Markaz
    - Islamic Care Society at Mit Ghamr
    - Holy Quran Preservation Society at Mansoura
- Social Development Fund
- The Ford Foundation
- The Women,s Association
- UNDP
- UNICEF

ANNEX 2

REPORTS PREPARED AS PART OF DAKAHLEYA GEAP

SERIAL	REPORT TITLE	AUTHOR	DATE
1	Dakahleya Governorate Environmental Action Comments on Working Group Draft Reports: Water, Land Air Health, Economics.	Dina El Naggar, Phil Jago, John Warburton	October 1995
2	Water Resources Groundwater	Dr. Abu Mandour A Abdel Daiem	1995
3	Water Resources: Groundwater, Dakahleya	Dr. Abu Mandour A Abdel Daiem	April 1995
4	Report on the Environmental Legislation & Institutional Framework in Dakahleya Governorate	Dr. Ahmed Abdel Daiem Salama	March 1995
5	Dakahleya Governorate Environmental Action Plan	Dr Faisal Abdul Maksoud and Prof. Hassan Meshraf	November 1995
6	Preliminary Report on the Biodiversity and Natural resources of Dakahleya	Dr. M.A. El Dermedash	March 1995
7	Environmental Profile: First Draft on Water	Dr. M Samir Tosson & Dr Abu Mandour A Daiem	September 1995
8	Environmental Profile: Final Report on Water	Dr. M Samir Tosson & Dr Abu Mandour A Daiem	November 1995
9	Dakahleya Environmental Profile: Economic Chapter	Dr M Walid Gamal Eldeen & Dr Alaa Sarham	January 1996
11	A Preliminary Report on Environmental Management Development	General Talat Sherif	March 1995
12	A Preliminary Report on Air Quality in Dakahleya Governorate	Dr Abdel Fattah Youssef	March 1995
13	Environmental Grading of the Governorate of Dakahleya Industry Sector	Dr Abdel Gelil M Khalil	March 1995
14	Environmental Profile Project Dakahleya Governorate: Industry Sector	Dr Abdel Gelil M Khalil	March 1995
15	Water and Sanitation in Dakahleya Governorate	Dr Ahmed Fadel	March 1995
16	A Report on the Land Resources and Soil for Dakahleya Governorate	Dr. H. Meshref	March 1995
17	Health Impact of Environmental Pollution in Dakahleya Governorate	Dr Wagida A. Anwar & Prof. Dr. Ahmed Niazi	September 1995
18	Final Report on Air Quality	Dr Kamal H. Noweir & Prof. Dr. Abdel Fattah Youssef	October 1995
19	Surface Water in Dakahleya Governorate Irrigation and Drainage Systems	Dr Z. M. Zaghloul	March 1995
20	Workshop on the Preparation of the Environmental Action Plan (GEAP) for the Governorate of Dakahleya	Tom Hall	January 1995
21	Epidemiological Issues of Health Aspects in Dakahleya Governorate	Dr Adel Abdel Ghaffar El Saied	March 1995
22	Environmental Profile of Dakahleya Governorate	Tom Hall	
23	Composting Domestic Waste in Egypt (Desk Study)	Ecological Sciences Limited	November 1995
25	Evaluation of the Issues Arising from and the Success of the Three Workshops Held in Dakahleya Governorate, March 1996	Hanan H. Sabea	June 1996
26	Report on the Social Study of Dakahleya	EQI	August 1996
27	Proposal for a Social Development Study of Dakahleya	EQI	May 1996
28	Social Study on Dakahleya	EQI	August 1996
29	The Dakahleya Social Dynamics Study	EQI	October 1996
30	Dakahleya Governorate Environmental Action Plan Working Groups Inaugural Meeting	Entec/TCOE	July 1995
31	Preliminary Report on Agricultural Environmental Profile for Dakahleya Governorate	Dr. Mohamed Ewaida	March 1995
32	Community Environmental Project Details of Dakahleya Governorate	AOYE	January 1997
33	Dakahleya Governorate Environmental Action Plan	Entec/TCOE	February 1997
34	Dakahleya Governorate Waste Management Strategy -Draft Project Concept Notes	Entec/TCOE	September 1996
35	Dakahleya Governorate Waste Management Strategy -Draft Report	Entec/TCOE	September 1996
40	Sohag Governorate Waste Management Strategy -Draft Report	Entec/TCOE	December 1996
41	Dakahleya Governorate Environmental Profile	Ralph Cobham	January 1997

PART B

PRIORITY ISSUES AND POTENTIAL SOLUTIONS

1 INTRODUCTION

Evolutionary Process

1.1 Part B of this Environmental Profile presents the results of the consultation process involved in laying the foundations for the Governorate Environmental Action Plan.

1.2 Six stages of consultations were involved, namely:

Stage 1: Discussions in January and February 1996 with the Environmental Experts responsible for preparing the specialist Technical Working Papers.

Stage 2: Meetings in January and February 1996 with primary and secondary Stakeholders in key parts of the Governorate.

Stage 3: Three Workshops held during March 1996 in three of the main cities: Mansoura, Mit Ghamr and Gamasa. The purpose of the Workshops was ,to advise on progress towards preparation of the GEAP, to stimulate interest in the GEAP and - most importantly - to obtain the views of people and their perceptions of environmental issues, problems and potential solutions., These Workshops were attended primarily by secondary stakeholders. The total number of participants was about 350 individuals. Views concerning priority environmental issues and problems were sought at the Workshops, as well as from a random sample of Dakahleyans a few days before the events. (It should be noted that the random sample was ,skewed, in that half of the respondents were Mansoura residents and 21 per cent were students). Analysis of the results features later in this section of the Profile.

Stage 4: The twelve focus group sessions, which were held in different parts of the Governorate by EQI during July 1996 and which were supplemented by twenty individual and group interviews with formal and informal service providers.

Stage 5: Discussions with primary and secondary stakeholders during the period July to December 1996, concerning the formulation of Project Concept Proposals which seek to address the priority environmental issues. The preparation of the Proposals was facilitated by AOYE in close liaison with the Dakahleya EMD.

Stage 6: Seminars with primary and secondary stakeholders to identify the measures which should be combined to form the supporting Programmes of the GEAP.

1.3 The first four of these stages are described in Part B, since they formed the starting point for preparation of the GEAP.

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1.4 From the outset it was stressed that, whilst the consultation process initially involved identifying priority environmental issues/problems and sustainable development opportunities, this was regarded merely as a vehicle for focusing upon the main purpose of the exercise. That inevitably was the definition of practicable, affordable and cost-effective solutions. Even though stakeholders were reassured several times on this point, it had to be repeated regularly. The need for this stemmed from many previous problem identification exercises, which had yielded no improvements and merely left stakeholders with a growing sense of frustration.

1.5 Against this background, Part B of the Profile records both **the range of solutions suggested and proposed** by the various consultees, as well as the priority environmental issues/problems and sustainable development opportunities. To that extent, the Profile can be regarded as innovative.

2 THE PRIORITY ISSUES/PROBLEMS AND OPPORTUNITIES

2.1 From the outset of the consultation process attention focused, not just on environmental problems but equally upon the opportunities for sustainable development of the Governorate,s natural resources. The underlying logic for covering these dual dimensions was the recognition that solving the environmental problems would inevitably need to be financed and that such finance would need to be generated locally. Furthermore, as the population grows so will the need for new jobs. It was thus appreciated that the GEAP would have to be more than just a environmental problem-solving exercise.

2.2 The technical reports prepared by national and local experts, and the Stage 1 discussions which followed, focused on these dual dimensions.

2.3 The priorities which the experts identified were subsequently verified, and in some cases confirmed, with even greater emphasis during the initial meetings (Stage 2 consultations) held with local stakeholders. The lists of local and other stakeholders consulted at that stage are contained in Annex 1.

2.4 It will be observed from Box B.2.1 that at that stage the key environmental issues were classified into two wide-ranging groups. The first related to what were broadly regarded as priority technical problems either directly or indirectly affecting public health. In contrast, the second group focused on shortcomings in the existing management systems and institutional capacities.

2.5 A similar dual classification was adopted concerning the identification of sustainable development opportunities, namely attention to existing and new resource-use activities.

2.6 The Stage 2 consultations revealed a number of contradictions between the reports of the Technical experts and the local stakeholders. These are displayed in Box B.2.2. The contradictions are hardly surprising, bearing in mind that the stakeholders consulted included several senior officials of the Governorate Directorates and Departments, primarily responsible for the provision of environmental services.

2.7 The Stage 3 consultations provided an opportunity for the priorities which emerged from Stages 1 and 2 to be paraded for public comment and debate. They enabled a consolidated list of priorities to be agreed, thereby providing a firm foundation for preparation of the GEAP. This list is presented in Box B.2.3. It is based upon the report prepared by Hanan Sabea, entitled ,SEAM Project - Evaluation of the Issues arising from and the success of the three Workshops held in Dakahleya, March 1996,.

2.8 Box B.2.3 indicates clearly the need to distinguish between top priority environmental issues which are Governorate-wide and those which are of more local importance. Altogether **ten priority issues** were identified, which the GEAP needs to address: It will be observed that five of these, since they featured in discussions at all three Workshops, can be classified as being of generic concern, namely:

- the ineffective collection and disposal of solid waste;
- the pollution of drinking water;
- the lack of sewerage treatment plants and networks;
- the inadequacies of urban planning services;
- the high water table due to insufficient drainage.

2.9 Box B.2.3 needs to be read in conjunction with Box B.2.4, which summarises what the Workshop participants considered to be the main sources of pollution in the Governorate.

2.10 Several other useful lessons emerged from analysis of the Workshops and the earlier consultations, namely:

- the large Workshops primarily served the function of raising awareness about issues and solutions. By comparison the smaller consultation meetings were helpful in identifying and prioritising issues and eliciting solutions.
- subsequent stakeholder discussions concerning solutions are best organised in relation to geographic units and the over-arching need for institutional strengthening, since the issues to be addressed have a strong geographic basis.
- subsequent Workshops, concerning the content of the draft GEAP, need to be organised at appropriate scales, so as to achieve technical consensus on the solutions proposed. A clear distinction needs to be made between this type of event and a large scale Workshop, the prime function of which is to make all stakeholders aware of the finalised GEAP.
- considerable attention needs to be given to the most effective ways of combining the scientific experts with a stakeholder group, so that it would be readily accepted by other stakeholder groups.
- understandably, strong views are held concerning the impracticability of applying the ‚polluter must pay‚ principle before people are provided with alternative solutions to their environmental problems. Thus both environmental laws and their enforcement have limited value until the infrastructural deficiencies are rectified.
- the case of Lake Manzala has been described as ‚one of the most serious examples of surface water pollution‚. The consequences are contaminated drinking water, polluted and poisoned fish and poor environmental conditions in general. Solutions are seen in conjunction with the installation of proper sewerage systems.
- behavioural patterns, which reflect traditional beliefs, are one of the main causes for the continuous pollution of surface water-ways. These activities include the disposal of umbilical cord remains of new-born babies in the Nile, the importance of cooking certain items from canal water, the washing of dark clothes in canal water, and the disposal of dead animals in the canals. The need to change anti-social and environmentally damaging wasteful practices is evident. This includes the misuse/wastage of potable water and the failure to segregate wastes.
- the persistence of environmental problems is stated to stem from political, social, administrative and financial, as well as technical forces. These include apathy on the part of Government, lack of awareness amongst communities, administrative red-tape, inadequate funding sources and laxity over law enforcement.
- action plans need to be specific to different parts of the Governorate.

BOX B.2.1: PRIORITY ENVIRONMENTAL ISSUES AND OPPORTUNITIES TO BE ADDRESSED WHICH WERE IDENTIFIED BY THE TECHNICAL EXPERTS AND CONFIRMED BY THE LOCAL STAKEHOLDER GROUPS CONSULTED, but not listed in order of importance.

CATEGORY A: KEY URBAN AND RURAL ENVIRONMENTAL ISSUES/PROBLEMS	
1.	**PUBLIC HEALTH ISSUES**
1.1	Contamination of potable and irrigation water supplies by sewage and industrial effluents.
1.2	Lack of reticulated water supply and sewage services to all urban and rural households.
1.3	Treatment facilities for solid waste and garbage through incineration, recycling, composting, bio-gas production, sanitary land-fill etc.
1.4	Treatment of sewage, industrial/other liquid effluents.
1.5	Control of the importation of pesticides, the issuance and enforcement of regulations re-usage and application practices, promotion of biological/integrated pest control methods. (This is an increasingly important issue, since certain countries have stopped the importation of Egyptian fruit and vegetables because of lack of pesticide controls).
1.6	Extension, through demonstrations, of the results of canal bank planting to control/eliminate the Bilharzia host.
1.7	Progressive pollution of Lake Manzala and the dominance by lower value fresh-water fish species.
1.8	Air and noise pollution at specific point sources in industrial/urban environments.
1.9	Inadequate repair and rehabilitation of the potable water supply pipe systems.
2.	**STRENGTHENING OF ENVIRONMENTAL MANAGEMENT SYSTEMS / INSTITUTIONAL CAPACITIES**
2.1	Lack of adequate facilities for monitoring emissions, covering all features of urban, industrial and rural environments.
2.2	Inadequate enforcement of environmental laws.
2.3	Absence of an effective Authority to manage the Lake Manzala ecosystem, including the reopening of marine inlets. (Currently there is only an Advisory Committee in existence, which has no effective powers to reduce pollution).
2.4	Lack of a comprehensive network of Environmental Management (public, private, NGO and voluntary organisations) which is well coordinated and equipped to address the key issues, problems and opportunities.
2.5	Insufficient funds available to large, medium and small firms to enable them to raise industrial emission performances and to comply with realistic environmental standards.
2.6	Inadequate professional skills and capacities to improve the quality of urban and rural environments through: • short-term house-keeping improvements; • better settlement planning, including the zoning and siting of new industrial facilities.

BOX B.2.1: (Cont,d) PRIORITY ENVIRONMENTAL ISSUES AND OPPORTUNITIES TO BE ADDRESSED WHICH WERE IDENTIFIED BY THE TECHNICAL EXPERTS AND CONFIRMED BY THE LOCAL STAKEHOLDER GROUPS CONSULTED, but not listed in order of importance

CATEGORY B: KEY SUSTAINABLE DEVELOPMENT ISSUES/OPPORTUNITIES	
1.	**EXISTING RESOURCE USE ACTIVITIES IMPROVED**
1.1	Modification of agricultural drainage and irrigation systems to be more efficient and, in particular, to remove unacceptable levels of soil and irrigation water salinity.
1.2	Establishment of potential new enterprises, which diversify/strengthen the local economy and employment opportunities.
1.3	Reduction in the losses of prime agricultural land (categories 1 and 2) to urban/industrial development.
1.4	Introduction of modern irrigation methods (sprinkler and drip) as appropriate.
1.5	Optimal use of reclaimed areas (Bilqas, etc).
2.	**NEW RESOURCE USE ACTIVITIES SUSTAINABLE DEVELOPMENT**
2.1	Development/management of rural industries, based on agricultural and natural raw materials.
2.2	Restoration/management of the fisheries potential of Lake Manzala.
2.3	Establishment of niche tourism enterprises (ornithological, eco-, agro-, nature and religious tourism).

BOX B.2.2: INFORMATION SUPPLIED AT STAKEHOLDER MEETINGS WHICH APPEARS TO CONTRADICT THAT CONTAINED IN THE WORKING GROUP REPORTS

1.	**POTABLE WATER SUPPLIES**
1.1	There is said to be no problem concerning water supplies from a public health standpoint. The Department of Drinking Water takes samples bi-weekly from the Water Treatment Plants and individual household all over the Governorate.
1.2	Where the underground water supply was found in one case to be polluted, it was reported that the Treatment Plant was shut down and the activity transferred elsewhere.
1.3	Drinking water is said to have reached all parts of the Governorate; only 5% of houses do not have a tap.
2.	**AIR POLLUTION**
2.1	As a result of the progress made by the Fertiliser Company in cleaning its processes, ammonia pollution is reported to be no longer a problem.
3.	**DIRECTORATE OF HEALTH**
3.1	The Directorate is equipped to combat all problems. Both trends in life expectancies, mortality and birth rates and comparative international statistics indicate the significant progress which has been made during the past 10 years.
3.2	The environmental health problems within the Governorate are considered to be well under control. However, the severe pollution viewed at Al-Muqata Village, which is reported to have suffered already from a serious cholera epidemic, would suggest that considerable infrastructural investments are still required in rural areas.

BOX B.2.3: THE CONSOLIDATED LIST OF PRIORITY ISSUES/PROBLEMS TO BE ADDRESSED AND IMPROVEMENTS TO BE ACHIEVED IN THE NEXT 5-10 YEARS

Key: Numbers indicate the priority ranking accorded to the issue during the Workshops and through a Random Sample Survey.

TYPE OF ISSUE	WORKSHOP LOCATIONS			GOVERNORATE	TOTAL
	Gamasa	**Mit Ghamr**	**Mansoura**	**Random Sample**	
TOP 10					
SWM	1	1	1	3	1
Potable Water	2	3	4	1	2
Sewerage	3	2	5=	6=	3
Town Planning	4	5	5=	2	4
Industrial Hazards	6	4	-	5	5
Surface Water	5	7	5=	6=	6
Public Awareness	-	6	2	6=	7
Clean Air	7	8	3	-	8
Comprehensive Environmental Development	8=	-	8	-	9
Schistosomiasis Control	10	-	9=	-	10

Others

- Improper Uses of Pesticides and Fertilisers
- Inadequate Environmental Law Enforcement
- Urban Encroachment on Agricultural Production
- Air Pollution through Car Exhaust
- The Need for Committed Leadership
- Population Growth
- Poor Levels of Public Health
- Noise Levels
- Ground Water Contamination
- The Need for Greater Local Participation
- Coordination of Government and NGOs

Source: Hanan Sabea (1996), The 3 Dakahleya Workshops: Table 13

BOX B.2.4: THE MAIN SOURCES OF POLLUTION IN THE GOVERNORATE

Key: Numbers indicate the priority ranking accorded to the issue during the Workshops and through a Random Sample Survey.

SOURCE	WORKSHOP LOCATIONS			GOVERNORATE	TOTAL
	Gamasa	Mit Ghamr	Mansoura	Random Sample	
TOP 10					
Industries	1	1	1	1	1
Solid Waste	4	3	5=	2	2
Sewage	5	2	2	5	3
Surface Water	2	5	5=	4	4
Manzala Lake	3	10	3=	-	5=
Brick Kilns	10	4	8=	7	5=
Drinking Water	6	6	-	6	7
Car Exhaust	9	7=	8=	3	8
Pesticides and Chemical Fertilisers	7	7=	3=	9=	9
Slum Areas	8	7=	8=	8	10
People,s Behaviour	-	-	5=	-	-
Population Growth	-	-	-	9=	-

Source: Hanan Sabea (1996), Table 15

3 THE SOLUTIONS SUGGESTED/PROPOSED BY CONSULTEES

Introduction

3.1 Three sets of recommendations and suggestions, which were intended to contribute to the formulation of GEAP Policies, Supporting Programmes and Projects, are summarised in the Profile. Their respective sources are:

- the Technical Experts;
- the representatives of the Governorate Directorates and Departments who attended the initial consultations organised by ENTEC and the EMD;
- the consultees involved in the Social Dynamics focus group discussions facilitated by EQI.

3.2 A possible distinction needs to be made between the manner in which these different sets of recommendations were formulated. In the case of the Technical Experts, the recommendations were clearly the product of careful investigation and considered analysis. They were formulated over weeks rather than days or hours. By comparison, the recommendations proposed by the other two sets of consultees were much more reactive. Whilst the ideas voiced may have been the result of previous careful consideration and discussion, they nonetheless were merely expressed verbally and in a forum which sought almost instantaneous reactions. However, it should also be noted that Governorate Directorate and Department consultees were assisted in formulating their proposals through the distribution and explanation in Arabic of an aide memoire during the meetings. These observations are not intended to belittle any of the contributions, but merely to draw attention to the fact that care should be exercised before attaching equal weight to all recommendations.

The Recommendations of the Technical Experts

3.3 As expected, the coverage of the recommendations from this source is quite extensive. The recommendations are summarised in Box B.3.1. It will be noted that the recommendations relate primarily to correcting environmental and resource problems rather than to the sustainable development of opportunities. Whilst, for the most part, the recommendations focus upon technical matters, some reference is made to the need for administrative and management improvements. Measures designed either to develop social capital stocks or to improve their performance are conspicuous by their absence.

The Recommendations proposed by Local Stakeholder Consultees

3.4 By comparison, the recommendations of these groups, summarised in Box B.3.2, were even more wide-ranging. Moreover, they not only covered technical solutions but also addressed the need to identify opportunities for both sustainable development and the generation of additional employment.

3.5 Possibly the most notable feature of Box B.3.2 is the fact that the issue for which the largest number of recommendations was made did not relate to technical matters. Instead it focused on the need for investment in increasing social capital stocks through improving the Environmental Management System.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS PREPARED BY THE WORKING GROUP SPECIALISTS

1. PREVENTION AND CONTROL OF AIR POLLUTION RECOMMENDATIONS

1.1 These relate to the reduction of the main pollutant, namely particulates.

1.2 The introduction of cleaner fuels for use in vehicles and industrial engines/processes would contribute major improvements.

1.3 The introduction of technology and equipment, specifically geared to the reduction of particulate emissions (e.g. through cyclones and electrostatic precipitators) and gaseous pollutants (e.g. through scrubbers).

1.4 The adoption of better house-keeping practices.

1.5 The adoption of strict testing of vehicles in relation to their exhaust emission levels.

1.6 The zoning of industrial activities, so that they are distanced from residential areas.

1.7 The introduction of building and construction regulations

2. RECOMMENDATIONS FOR ENVIRONMENTAL PROTECTION AND IMPROVEMENT OF WATER RESOURCES

2.1 Potable water supplies should be expanded in villages and settlements with no water supplies.

2.2 High priority should be given to supply the villages with sewage systems. Disposal of raw sewage into canals and drains represents a major health hazard and is responsible for the incidence of water-borne diseases.

2.3 Projects for potable water and sewage treatment in most urban areas of the Governorate should be implemented in ,due time,.

2.4 Law 48, regarding the protection of the Nile and related water-ways from pollution, must be enforced, subject to realistic progressive phasing of emission standards.

2.5 A public educational campaign, relating to all aspects of water treatment, use, personal hygiene and management, should be established and sustained for all Stakeholder Groups.

2.6 A Water Quality Board should be established, with representation from all of the appropriate organisations, in the interest of protecting Egyptian water-ways.

2.7 The limits of phosphorus allowed in imported or locally manufactured detergents must be regulated so as not to exceed 1%.

2.8 The discharge of industrial effluents (especially in the case of the fertiliser plant at Talkha) must both comply with national standards and be upheld through enforcement of Law 48/1982.

2.9 ,A central laboratory for environmental quality monitoring should be established in Dakahleya to provide a comprehensive and accurate assessment of the environmental quality of the surface water, ground water and soils associated with Damietta Branch, canals, drains, lakes and ground water aquifers,.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS (Cont,d) PREPARED BY THE WORKING GROUP SPECIALISTS

2.10 It is reported that ,the Egyptian Government has plans to provide all factories that are disposing their effluents into the Nile (or its two branches and canals) with treatment plants. ... Through governmental funds and foreign aid, it is believed that the factories will be supplied with the treatment plants in the future and that pollution levels will be always within the WHO limits,.

2.11 Specific filtration and other measures should be taken in the case of Water Treatment Plants servicing those three main locations where ground water concentrations of iron and manganese are known to be high (Mit Ghamr, Sinbillawayn and Aga).

2.12 Specific schemes for pumping, drainage and the lining of canals/main irrigation channels need to be devised to lower the ground water table by removing those volumes of surplus drainage water, which are not suitable for irrigation purposes, to non-cultivated areas.

2.13 More efficient irrigation methods (sprinkler and drip) should be introduced wherever appropriate.

2.14 Re-use of treated effluent, where the quality is suitable for irrigation purposes, should be encouraged.

2.15 The maintenance of drinking water wells should be efficiently programmed and undertaken.

3. RECOMMENDATIONS FOR CONSERVATION AND IMPROVEMENT/RESTORATION OF LAND AND SOIL RESOURCES

3.1 National and regional, as well as Governorate, solutions are required.

3.2 Research into potential sea level rise and its impacts is required.

3.3 Lake Manzala,s problems require more than just technical solutions; administrative co-ordination is also required.

3.4 Effective control of urban encroachment onto good agricultural land is required, involving the determination of urban borders in compliance with Urban Planning Law No. (3) 1982.

3.5 Pollution of potable water, low levels of sanitation, inadequate solid waste facilities and poor personal hygiene practices leading to public health hazards, must be corrected.

3.6 Eradication of land pollution by:

- obsolete industrial plant processes and poor house-keeping;
- low levels of sanitation in rural and urban areas;
- excessive and inappropriate use of agricultural chemicals;
- contaminated irrigation water;
- irrigation problems;
- high water table and drainage problems.

3.7 The classification of soils within the Governorate needs to be up-dated.

3.8 The installation of land drainage facilities is required in many areas which have a high water table.

3.9 The finance required for the purchase of modern land-levelling equipment (lasers) needs to be procured.

3.10 Adequate storage facilities need to be provided for gypsum storage.

BOX B.3.1: SUMMARY OF THE RECOMMENDATIONS CONTAINED IN THE REPORTS (Cont,d) PREPARED BY THE WORKING GROUP SPECIALISTS

3.11 EIAs need to be conducted for all major development projects, eg. the international northern road.

3.12 Improvement of the quality of urban housing environments, especially the informal housing areas

3.13 Re-location of industries that cause serious industrial pollution of residential areas, especially brick kilns (Mit Ghamr).

4. RECOMMENDATIONS FOR ACHIEVING REDUCTIONS IN HEALTH RISK HAZARDS AND IMPROVEMENTS IN HEALTH RISK MANAGEMENT

4.1 Small adjustments or changes in management: eg maintenance of village pumps; technical training to provide skills required in handling toxic chemicals or controlling machinery; monitoring and surveillance.

4.2 An environmental clean-up programme for Lake Manzala, based upon a co-ordinated approach to the reduction and ultimate control of pollution entering the Lake from six different Governorates.

4.3 The careful zonation of industrial and residential areas so that the pollution prevention controls are optimised.

4.4 The provision of essential infrastructure and service facilities (safe potable water supplies, management of solid waste etc) to all communities.

4.5 The regulation of the use of fertilisers and pesticides.

4.6 The modification of public and private hygiene practices, such that irrigation and drainage canals are not used for waste disposal.

BOX 3.2: SUMMARY OF RECOMMENDATIONS PROPOSED BY LOCAL STAKEHOLDER CONSULTEES

1.	**PREVENTION AND CONTROL OF INDUSTRIAL AIR POLLUTION RECOMMENDATIONS**
1.1	Rehabilitation of the chemical plants owned by the Al Nasr Fertiliser Co to improve both overall commercial and environmental performances, especially with respect to air and drainage pollution, noise and energy levels.
1.2	The introduction of modern technology to reduce pollution emissions from brick factory stacks with the co-operation of the Brick Manufacturers Association.
2	**ENVIRONMENTAL PROTECTION AND IMPROVEMENT OF WATER RESOURCES**
2.1	The Sanitary Drainage Department of the Ministry of Health to replace the obsolete water pipe system.
2.2	The provision of an effective sanitary drainage plant, purification plant (lead removal) and biological treatment plant to improve/protect/control the quality of water entering Lake Manzala.
2.3	The protection of canal water abstraction points.
2.4	Investment in water treatment facilities (Compact Units) for individual rural settlements.
2.5	Sewage Treatment Plants required for each village.
3.	**CONSERVATION AND IMPROVEMENT/RESTORATION OF LAND AND SOIL RESOURCES**
3.1	Re-open/widen the NW channel from the Mediterranean Sea to Lake Manzala.
3.2	Designate Lake Manzala as a Ramsar site or a Man and Biosphere Reserve.
3.3	The substitution of liquid for granular fertilisers leading to an estimated reduction in consumption of 50% and yield increases of approximately 25%.
3.4	Provision of a treatment plant for irrigation water.
3.5	The adoption of more efficient irrigation methods based on sprinkler and, preferably, drip systems for ,reclaimed land, projects in particular.
4.	**REDUCTIONS IN HEALTH RISK HAZARDS AND IMPROVEMENTS IN HEALTH RISK MANAGEMENT**
4.1	Investment in bio-gas generation plant for the re-cycling of solid waste from both households and factories.
4.2	Provision of public incinerators for each village/settlement.
4.3	Investment in sewage treatment facilities (LE 490,000) required to overcome the chronic sanitary drainage problems of Al-Muqata village, where there is a naturally high water table.

BOX B.3.2: SUMMARY OF RECOMMENDATIONS PROPOSED BY LOCAL STAKEHOLDER CONSULTEES (Cont,d)

5. DEVELOPMENT OF NEW/EXPANDED ECONOMIC ENTERPRISES AND EMPLOYMENT OPPORTUNITIES

5.1 Investment in a fish processing plant for the Lake Manzala Fishery.

5.2 Investigation of alternative business development opportunities and incentives to assist brick factory businesses which are forced to re-locate or close for environmental reasons.

5.3 Diversification into new rural enterprises which supplement low farm incomes; such enterprises to include weaving, electric engine assembly, ironmongery, carpet making, car painting, milk processing, etc.

6. GENERAL ENVIRONMENTAL MANAGEMENT SYSTEM IMPROVEMENTS

6.1 Introduction/adoption of realistic environmental performance standards.

6.2 Introduction of the more punitive type of Dutch laws used to control discharges by the Oil and Soap industry.

6.3 Introduction of a system of environmental performance rewards.

6.4 Provision of more noise measurement equipment for use inside factories (via a Factories Inspectorate service).

6.5 Decision as to what Laboratory facilities need to be harnessed for provision of an effective environmental monitoring system.

6.6 Requirement to improve central water analysis laboratories so that municipal and ground water supplies used for washing wheat are properly tested.

6.7 Individual (larger) companies should be encouraged to establish their own environmental measurement facilities, covering dust, noise and heat emissions.

6.8 Provision of investment funds and privatisation incentives to enable industrial plant to be up-dated for compliance with environmental standards.

6.9 Appointment by the Banks of an Environmental Liaison Officer to service the branches within the Governorate and to liaise with the EMU, EEAA and donors.

6.10 Provision of environmental training courses for the management staff of Banks.

6.11 Co-funding of infrastructural improvements by Governorate and local communities is required.

6.12 The demand exists for the EMU to provide a technical extension service to local communities covering environmental management matters. (This is currently not provided due to lack of funds).

The Recommendations resulting from the Focus Group and Service Provider Discussions

3.6 As expected, and as presented in Box 3.3, the recommendations were location specific. Interestingly, they display both significant interest in effective privatisation of environmental services and a willingness to pay provided that the services are efficient.

3.7 In addition, the EQI report draws attention to the need for comprehensive solutions that entail co-operation between stakeholder groups and effective co-ordination by the EMD. For instance, private sector waste collection and disposal initiatives require the Government to make available dumpsites through either realistic provision or leasing arrangements. The same applies to the provision of some Government assistance towards the coverage of open drains by local communities. Such ,joint ventures, would facilitate the establishment of much needed community parks which could be created and maintained substantially through self-help initiatives. However, without a Government catalyst, such opportunities are unlikely to be realised, at least in the foreseeable future.

3.8 Other solutions mooted include the provision of extended credit through the establishment of a revolving fund to finance the purchase of vehicles for emptying septic tanks, and the installation of filters. Community involvement, through the introduction of a range of sponsored environmental improvement competitions, was also raised as a further possible measure.

3.9 Finally, the possibility of ,allowing the NGOs to become extension arms of the EMD, is seen as meriting investigation. This includes the involvement of University staff and students in environmental awareness and improvement schemes throughout the Governorate. The potential of the voluntary sector to contribute towards environmental improvement is regarded as considerable. This applies particularly in the case of religious leaders.

BOX B3.3: RECOMMENDATIONS RESULTING FROM THE SOCIAL DYNAMICS STUDY FACILITATED BY EQI (Items are not presented in order of priority)

ISSUE/PROBLEM	SOLUTION(S) PROPOSED
1. Air and Water Pollution	
Mansoura and Villages	• Sources of pollution to be relocated to non residential areas. • Enforcement of environmental laws • Exposure of detrimental practices by the media.
Mit Ghamr and Villages	• Relocation of brick factory stacks, workshops and industries to non-residential area on the outskirts of the town. • Law enforcement. • Use of cleaner car fuels and replacement/repair of faulty exhausts.
Sinbillawayn and Villages	• Closer monitoring and regular water testing. • Installation of filters at personal expense.
Aga and Village	• Relocate brick kilns in the desert far from the Delta. • Closer monitoring of the use of pesticides and irrigation process. • Stricter enforcement of Law 48/1982 to protect waterways.
Gamasa	• Provision of a water supply/treatment plant. • Introduction of charges to prevent excessive water-use by tourists.
2. Garbage and Sewage	
Mansoura and Villages	• Establishment of a private waste collection system, based on levying realistic charges.
Mit Ghamr and Villages	• Reinstatement of private sector collection service through tax incentives, realistic charges and regular collection times. • Provision of an effective municipal collection and disposal service on village market days. • Connecting septic tanks to the main sanitary drainage network, based on realistic service charges (and thereby preventing contamination of surface water).
Sinbillawayn and Villages	• Effective private sector collection and disposal service, based on realistic charges.
Gamasa	• Anti-littering awareness campaigns.
3. Insects and Rodents	
Mit Ghamr and Villages	• Control over the use of space in residential areas for keeping livestock. • Covering open drains and forbidding animal owners to deposit wastes in canals.

ANNEXES

ANNEX 1

ORGANISATIONS WHICH PARTICIPATED IN THE PREPARATION OF THE DAKAHLEYA GEAP

Contributors

Dakahleya Governorate

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His Excellency the Secretary General
Mr. Saad Hassan

Dakahleya Environmental Management Department

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Mr. Atef Ahmed El Menabawy
Dr. Khaled Tollan

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Participatory/Consultee Organisations

Central Government

- Ministry of Local Administration
- Regional Planning Centre, Tanta
- General Organisation for Physical Planning

Dakahleya Governorate Directorates and Departments

- Environmental Management
- Planning
- Tourism
- Industry
- Social Affairs
- Water Supply and Sanitation
- Agricultural
- Security Department
- Labour Research
- Manpower and Training

- Environmental Healt
- Youth and Sports
- Development
- Public Health and Population
- Education
- Information
- Cleansing
- Fisheries
- Lake Manzala Executive
- Supply

Aga Markaz

- Youth and Sports Department
- Agriculture Department
- Social Department
- Health Department

Bilqas City Council

- Labour Department
- Irrigation Department

Dikirnis City Council

- Education Department
- Youth Department
- Quran Learning Protection Department
- Engineering Department
- Consumer Protection Department
- Control Department
- Supply Department

Deraka Council

- Education Department

Gamaliya City Council and Markaz

- Municipality
- Labour Department
- Social Department

Gamasa City Council and Local Unit

- Planning and Follow-up Department
- Environmental Department
- Local School
- Supply Department

Mansoura City Council

- Cleansing Department
- Fisheries Department
- Water and Sanitation Department
- Gardens Department
- Solid Waste Department
- Services and Utilities Directorate
- Organisation and Administration Department
- Education Department
- Quality and Media Unit
- Public Department of Agricultural Co-operatives
- Shop Permits Department
- Culture Centre

Manzala City Council

- Engineering Department
- Labour Department
- Municipal Department
- Quality Department
- Industrial Safety Department

Matariya City Council and Local Unit

- Water Networks Department
- Cleansing Department
- Development Department
- Education Department
- Electricity Department
- Engineering Department

Mit Ghamr City Council

- Accounting Department
- Solid Waste Department
- Citizens, Services Department
- Gardens Department
- Commercial Licences Department
- Planning and Highways Department
- Public Relations Department
- Utilities Department
- Emergencies Department
- Cleansing Department
- Sewage Department
- Agriculture Department
- Industrial Security Department
- Social Affairs Department
- Agricultural Co-operation Department
- Planning and Monitoring

- Health Department
- Labour Office
- Kafr Serenga Mosque
- Youth Centre
- Industrial Safety Department

Mit Salsil Council

- Environmental Management Unit
- Utilities Department

Nabaruh City Council

- Engineering Department

Sinbillawayn Council

- Environment and Population Department
- Education Department
- Manpower Department

Shirbin City Council

- Education Department
- Health Department
- Industrial Safety
- Supply

Talkha City Council

- Social Affairs Department
- Education Department
- Youth Centre
- Labour Office
- Health Department

Timmayy Al Imdid Council

- Industrial Safety Department
- Social Affairs Department
- Labour Office
- Agriculture Department
- Education Department
- Engineering Department

University of Mansoura

- Faculty of Engineering
- Department of Education
- Faculty of Agriculture
- Faculty of Science
- Faculty of Medicine
- University Environmental Council
- Faculty of Engineering

Business and Financial Organisations

- Agricultural Development Bank, Manzala
- Chamber of Commerce, Nabaruh
- Chamber of Commerce, Mansoura
- Mit Ghamr Theatre Company
- Development Bank, Mit Ghamr

Industrial Companies and Co-operatives

- Misr Co for Dairy and Food Products
- El Nasr Co for Fertilisers and Chemicals
- El Nasr Company for Pressed Board and Resins
- Misr Co for Oils and Soaps
- Dakahleya Co for Spinning and Weaving
- Misr Brick Company
- Crops Co-operatives
- Mit Ghamr Aluminium Factory

Local Communities

- Ezbet Sakr
- Mansoura Markaz Villages:
    - Awish El Hagar
    - Kolongeel
    - Badaway
    - Mehalet Demnah
    - Baramone
    - Shawah
    - Barque El Ezz
    - Shoha
    - Mit El Sarrem
    - Tanah
    - Gedelah
- Mokataa
- Salamoun El Kommesh
- Shirbin
- Sinbillawayn Markaz Villages
- Tanboul El Kobra

Media

- Middle Delta New Journal

NGOs (National and Local) and CDAs

- CARE
- Health Improvement Association
- Oxfam
- Professional Industries and Co-operative Production
- Regional NGO Union, comprising the following organisations:
    - Environment Development Protection Society of Dakahleya (Mansoura University)
    - Women,s Society for Health Improvement at Dikirnis
    - Holy Quran Preservation Society at Shirbin
    - Local Community Development Society at Bilqas Village
    - Local Community Development Society at Bilqas City
    - Holy Quran Preservation Society at Bilqas City
    - Community Development Society at Touk Al-Aqlam, Sinbillawayn Markaz
    - Students, Care Society at Dakahleya
    - Women,s Society for Health Improvement at Talkha
    - Community Development Society at Nusa Al-Gheit, Aga Markaz
    - Child Care and Family Upgrading Society at Talkha
    - Islamic Charity Society at Brembal Al-Qadima, Minyat An-Nasr Markaz
    - Residential Community Development Society at Aga
    - Community Development Society at Shoha, Mansoura Markaz
    - Community Development Society at Danabeik, Mansoura Markaz
    - Community Development Society, Mit Tareif, Dikirnis
    - Child Care and Family Upgrading at Manzala
    - Local Community Development Society at Gamaliya
    - Local Community Development Society at Matariya
    - Local Community Development Society at Al-Muqata, Sinbillawayn Markaz
    - Islamic Care Society at Mit Ghamr
    - Holy Quran Preservation Society at Mansoura
- Social Development Fund
- The Ford Foundation
- The Women,s Association
- UNDP
- UNICEF

ANNEX 2

REPORTS PREPARED AS PART OF DAKAHLEYA GEAP

SERIAL	REPORT TITLE	AUTHOR	DATE
1	Dakahleya Governorate Environmental Action Comments on Working Group Draft Reports: Water, Land Air Health, Economics.	Dina El Naggar, Phil Jago, John Warburton	October 1995
2	Water Resources Groundwater	Dr. Abu Mandour A Abdel Daiem	1995
3	Water Resources: Groundwater, Dakahleya	Dr. Abu Mandour A Abdel Daiem	April 1995
4	Report on the Environmental Legislation & Institutional Framework in Dakahleya Governorate	Dr. Ahmed Abdel Daiem Salama	March 1995
5	Dakahleya Governorate Environmental Action Plan	Dr Faisal Abdul Maksoud and Prof. Hassan Meshraf	November 1995
6	Preliminary Report on the Biodiversity and Natural resources of Dakahleya	Dr. M.A. El Dermedash	March 1995
7	Environmental Profile: First Draft on Water	Dr. M Samir Tosson & Dr Abu Mandour A Daiem	September 1995
8	Environmental Profile: Final Report on Water	Dr. M Samir Tosson & Dr Abu Mandour A Daiem	November 1995
9	Dakahleya Environmental Profile: Economic Chapter	Dr M Walid Gamal Eldeen & Dr Alaa Sarham	January 1996
11	A Preliminary Report on Environmental Management Development	General Talat Sherif	March 1995
12	A Preliminary Report on Air Quality in Dakahleya Governorate	Dr Abdel Fattah Youssef	March 1995
13	Environmental Grading of the Governorate of Dakahleya Industry Sector	Dr Abdel Gelil M Khalil	March 1995
14	Environmental Profile Project Dakahleya Governorate: Industry Sector	Dr Abdel Gelil M Khalil	March 1995
15	Water and Sanitation in Dakahleya Governorate	Dr Ahmed Fadel	March 1995
16	A Report on the Land Resources and Soil for Dakahleya Governorate	Dr. H. Meshref	March 1995
17	Health Impact of Environmental Pollution in Dakahleya Governorate	Dr Wagida A. Anwar & Prof. Dr. Ahmed Niazi	September 1995
18	Final Report on Air Quality	Dr Kamal H. Noweir & Prof. Dr. Abdel Fattah Youssef	October 1995
19	Surface Water in Dakahleya Governorate Irrigation and Drainage Systems	Dr Z. M. Zaghloul	March 1995
20	Workshop on the Preparation of the Environmental Action Plan (GEAP) for the Governorate of Dakahleya	Tom Hall	January 1995
21	Epidemiological Issues of Health Aspects in Dakahleya Governorate	Dr Adel Abdel Ghaffar El Saied	March 1995
22	Environmental Profile of Dakahleya Governorate	Tom Hall	
23	Composting Domestic Waste in Egypt (Desk Study)	Ecological Sciences Limited	November 1995
25	Evaluation of the Issues Arising from and the Success of the Three Workshops Held in Dakahleya Governorate, March 1996	Hanan H. Sabea	June 1996
26	Report on the Social Study of Dakahleya	EQI	August 1996
27	Proposal for a Social Development Study of Dakahleya	EQI	May 1996
28	Social Study on Dakahleya	EQI	August 1996
29	The Dakahleya Social Dynamics Study	EQI	October 1996
30	Dakahleya Governorate Environmental Action Plan Working Groups Inaugural Meeting	Entec/TCOE	July 1995
31	Preliminary Report on Agricultural Environmental Profile for Dakahleya Governorate	Dr. Mohamed Ewaida	March 1995
32	Community Environmental Project Details of Dakahleya Governorate	AOYE	January 1997
33	Dakahleya Governorate Environmental Action Plan	Entec/TCOE	February 1997
34	Dakahleya Governorate Waste Management Strategy -Draft Project Concept Notes	Entec/TCOE	September 1996
35	Dakahleya Governorate Waste Management Strategy -Draft Report	Entec/TCOE	September 1996
40	Sohag Governorate Waste Management Strategy -Draft Report	Entec/TCOE	December 1996
41	Dakahleya Governorate Environmental Profile	Ralph Cobham	January 1997