ENVIRONMENTAL PROFILE OF ASWAN GOVERNORATE - 2003

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1. ABSTRACT:

The preparation of an *Environmental Profile* for Aswan Governorate is part of the project "Environmental Management in the Governorates Component (EMG) in Egypt". The EMG is one of seven components of the EEAA-Danida supported Environmental Sector Programme (ESP), which is based on an agreement between the Egyptian and Danish governments to be implemented over a period of 6 years.
The *Environmental Profile* is one of four essential prerequisites for the preparation of the Governorate Environmental Action Plan (GEAP). The main findings of environmental profile are presented below:
Aswan Governorate is fortunate in having water of good quality of Lake Nasser and the Nile, the water quality generally meeting the water quality standards stipulated by Law 48/1982. The most polluted drains in the Governorate with very poor water quality are: El Sail (KIMA canal) in Aswan City, El Ganayen drain and El Berba drain. There are problems with high bacterial counts in many of the agricultural drains indicating that the drain water may be a health hazard to the public living around the drains.

The per capita share of drinking water in most cities of Aswan Governorate is very good and exceeds the Egyptian recommended standard (109-140%). The per capita share of drinking water in rural areas in Daraw, KomOmbo, and Edfu city is less than the recommended standard (60-73% of the recommended standard).

Households in Aswan Governorate discharge an estimated amount of wastewater of about 130,000m^3/day. About one third of this water is treated and the other two thirds is discharged as raw wastewater. The level of domestic wastewater treatment is poor in the rural villages. In contrast the treatment is quite well in the large cities. The industries are also major sources of pollution, the KIMA factory in Aswan, the sugar cane and integrated industries in Edfu and Kom Ombo perhaps being the worst polluting industry Other sources of water pollution are runoff from farmland areas, agriculture drains and wastewater from Nile cruisers.

Households in Aswan Governorate generate an estimated 665 tonnes of waste /day. Only 35% of this waste is collected by public waste collection systems. Public waste collection systems in villages are almost non-existent. Aswan City has the best coverage of waste collection, followed by Edfu -, Daraw - and Kom Ombo City.

An estimated amount of hazardous hospital waste of 650 kg/day is generated. There is a problem with this waste, because there is no

source separation of the hazardous and non hazardous fractions and because there are only four hospital waste incinerators in the Governorate of which only one is functioning and in compliance with the law (Aswan Fever Hospital).

Aswan Governorate is blessed with clean and fresh air. The available data indicate that the air in Aswan city comply with the air quality standards as indicated in law 4/1994. However, air pollution problems may occur locally at the KIMA factory in Aswan city.

Air pollution is a big problem in connection with the sugar factories in Kom Ombo and Edfu and the ferrosilicon factory in Edfu. The air in Kom Ombo and Edfu is polluted in the surrounding areas around the factories. The quality standards for small particles (PM_{10}) are severely violated as indicated in law 4/1994 limits.

A particular issue in Aswan is the El Seil (KIMA) Canal. The canal is currently polluted by domestic wastewater, industrial wastewater and municipal solid waste. The canal is thus a typical example of some of the major environmental problems in the city and its improvement has a very high priority among the local population.

2. INTRODUCTION

The preparation of an *Environmental Profile* for Aswan Governorate is part of the project "Environmental Management in the Governorates Component (EMG) in Egypt". The EMG is one of seven components of the EEAA-Danida supported Environmental Sector Programme (ESP), which is based on an agreement between the Egyptian and Danish governments to be implemented over a period of 6 years. The ESP commenced its operations in September 2001 and the EMG Component in January 2002.

The preparation of the Environmental Profile has involved the High Environmental Committee (HEC) for Aswan headed by the Governor of Aswan, General Samir Youssef, various Governorate Departments, the Egyptian Environmental Affairs Agency (EEAA), the Environmental Management Unit (EMU) in Aswan Governorate, the EMU representatives in markazes, the Local Environmental Committees in the Governorate and other stakeholders.

At the first High Environmental Committee meeting held on the 3rd February 2003 it was decided that, in order to be able to speed up the GEAP process, a first draft of the *Environmental Profile* be prepared based on existing information collected from the agencies/organisations in Aswan and agencies in Cairo.

This first draft of the *Environmental Profile* has been prepared by the Environmental Management Unit (EMU) in a team work with international and local consultants. The draft has formed the basis for the preparation of presentation material for the High Environmental Committee.

A final *Environmental Profile* will be prepared after the completion of the data collection through focal points within the governorate administration, the 40 local Environmental Committees, local units chairmen, working groups, laboratories and individual specialists.

3 OBJECTIVES

The *Environmental Profile* is one of four essential prerequisites for the preparation of the Governorate Environmental Action Plan (GEAP). The specific objectives of the *Environmental Profile* are: -

- to identify environmental problems and concerns;
- to enable the setting of realistic policies and goals in the GEAP for the improvement of the environment;
- to enable identification of priorities for actions to be included in the GEAP;
- to enable the specification of concrete solutions and projects to mitigate environmental problems in the governorate;
- to identify environmental indicators to assist in the process of monitoring and evaluating the effects of actions taken towards improving the environment.

4 SOURCES OF INFORMATION

A number of agencies/organisations and central agencies in Cairo have provided data for the *Environmental Profile*. The following authorities and organisations have kindly contributed with data for the *Environmental Profile*: -

Aswan Governorate, Ministry of Health, Aswan, General Authority for Water Supply and Sanitation, Aswan, National Authority for Water Supply and Sanitation, Aswan, Social Development Fund, Aswan, Mining Department, Aswan Governorate, Labour force Dept. Aswan Governorate, Ministry of Agriculture, Aswan, Central Agency for Water Resources and Irrigation, Aswan, General Authority for High Dam and Aswan Reservoir, General Authority for Lake Nasser Development, Environmental Information & Monitoring Programme (EIMP), EEAA, South Valley University, National Council for Population, Urban Development Unit, Tourism Office, Aswan, Social Affairs Department, El Wakf, Aswan, Church Representatives, Environmental Management Unit (EMU).

5 GEOGRAPHY

5.1 Basic geographical features

Aswan Governorate is located at the extreme south of Egypt. It is bounded by Qena governorate to the north, the Red Sea governorate to the east, the Wadi El Gadida governorate to the west and the Republic of Sudan to the south. The Governorate is located some 880 km from Cairo and provides the link between Egypt and Sudan, and further on to the African continent. As such Aswan has been an important trade centre over the centuries. The Governorate extends some 480 km from north to south. The total area of the governorate is 62726 km^2.

5.2 Population and administration

Aswan Governorate is divided into five administrative districts (Markaz) - Aswan, Daraw, Kom Ombo, Nasr El Nuba and Edfu. with a total of 10 cities and 30 Local Units (rural councils) (Table 5.1 Map 2 and Map 3), 102 main villages and 429 sub-villages. Aswan Governorate has a population of about one million. The estimated total population for 2002 is 1,059,784 of which about 56% were living in rural areas. People in the cities and villages affect the environment in several ways, including: - (1) Discharge of domestic wastewater

containing organic matter, nutrients (ammonia and phosphorous), pathogenic bacteria and viruses, and other decease causing organisms to drains, canals, rivers and lakes; (2)Generation of solid waste, and (3) Generation of air pollution.

6 COMMERCIAL ACTIVITIES

The commercial activities in Aswan Governorate include agriculture, fisheries, industrial activities, mining and tourism.

6.1 Agriculture

6.1.1 *Agricultural produce and production*

Agriculture is the main provider of employment in Aswan Governorate and approximately 29 % of the economically active population is engaged in agriculture and fishing.

Aswan Governorate has a cultivated area of about 150,000 feddans in the Nile Valley. Furthermore an area of between 15,000 and 23,000 feddans are cultivated on the shores of Lake Nasser and an additional 3,000 feddans are cultivated in the upland areas at Abu Simbel. Agriculture depends on irrigation by pumping water from the Nile and Lake Nasser. The saline nature of the cultivated soils requires efficient drainage networks. Drainage is usually by gravity through lateral drains ended by main drains, but in some cases drainage water is pumped back through pump station to the Nile.

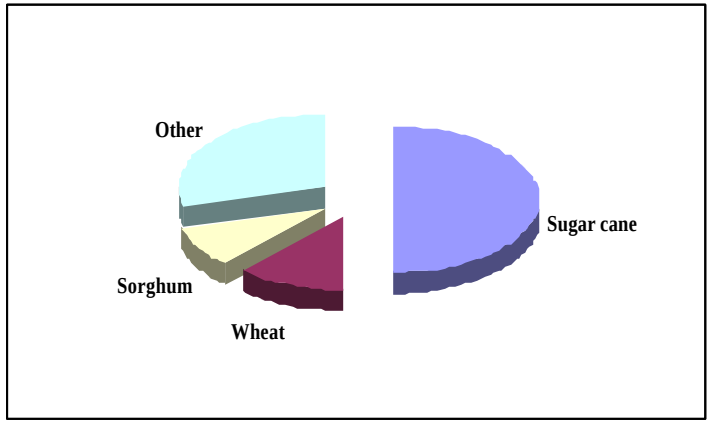


Figure 6.1.Distribution of crops on agricultural areas. Percentage of the total farm area grown with mentioned crop.

Sugarcane is the most important cash crop, covering 57% of the cultivated area (Fig. 6.1). Wheat covers 15 %. Other crops include bersim, clover, barley, maize, onion, garlic, beans, chick peas, sesame, karkade and henna. The main crops around Lake Nasser are tomatoes and water melon. Cultivation of sugarcane mainly takes place in Edfu and Kom Ombo markaz, followed by Nasr El Nuba. Very little sugarcane is grown in Daraw and nothing in Aswan.

The average farm size in the Nile Valley is generally less than two feddans and cropping patterns are intensive. Farmers are using traditional surface water irrigation rather than sprinkler or drip irrigation, which result in severe water losses. In the lake area the Lake Nasser Development Authority distributes five feddans per farmer. The farming system is intensive but not sustainable. Crop rotation is hardly ever practised, few livestock are kept and the soil is supplied with very little organic matter.

Date is considered the second crop in Aswan Governorate. The number of fruitful Balm trees is 1735000. The average productivity increased from 35 kg/tree year 1987 to 82 kg/tree year 2002.

The Toskha Development Project

In 1996 the Toshka project was initiated to reclaim and cultivate several hundred thousand of feddans of the Western Desert using water from Lake Nasser. The project involved the installation of the worlds largest pumps, which will carry water into a long canal. Twenty four pumps have been installed to raise water to a canal. The canal is 70 km long and will have the capacity to provide 25 million m^3 per day. Four irrigation areas totalling 540,000 feddans are being planned for agriculture, and establishment of integrated agricultural and industrial communities based on agricultural produce, mining and power production.

6.1.2 Potential environmental effects of agriculture

Potential environmental impacts from agricultural activities include deterioration of the water quality in drains, irrigation canals, the River Nile and Lake Nasser by the emission of pesticide residues and nutrients (phosphor and nitrogen) from irrigated fields (Table 6.1 and 6.2). The disposal of animal waste also pollutes surface water and burning of agricultural waste creates air pollution. The pollution from agriculture is further discussed in section 7 and 9.

Table 6.1. Application of chemical fertilizers 2002 (source Ministry of Agriculture Aswan)

Type of fertilizer	Needed (Tons/year)	Distributed (Tons/year)*
Nitrogen	79873	40917
Phosphate	51527	1370
Potash	16892	800

**** Distributed by Development Bank, COUP, Mechanical Company***

Table (6-2) Application of Pesticides 2002 (source Ministry of Agriculture Aswan)

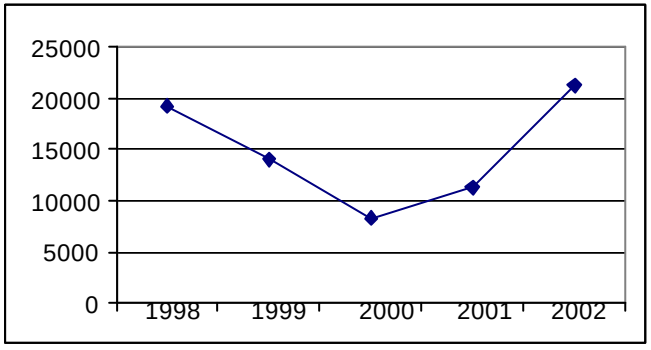
Pesticides Type	Applied	Usage
Bercale 48 %	21755 liter	Resistant of Termite
Brimore Methanole Gas	1000 Kg	Preserve Date & Grains Crops
Mineral Oil	2000 liter	Resistant of trees Insects
Cupper Sulfate	100 Kg	Resistant
Tobseen	10 Kg	of
Koseed 101	100 Kg	Balm trees diseaes
Glelaka	1000 liter	Resistant of

Glifoyam	9998 liter	Grass surrounding
Kalirote	10000 liter	Sugar Cane
Mlathiun 57%	8899 liter	Resistant
Liquid Sulfur	2000 liter	of
Shalinger	1500 liter	Sugar Cane disease
Sop Fertan	6000 liter	

6.2 Fisheries

Fishing primarily takes place on Lake Nasser, although some fishing activity is going on in the River Nile. Fishing is a major activity in Lake Nasser and is a significant source of fish for the Egyptian market. The Ministry of Agriculture has registered a total catch of 21186 tonnes for the year 2002. Figure (6.4) indicates that the fish caught is decreased from year 1998 up to year 2000 and then increased again up to year 2002. The reason of rate increase of fish caught is due to setting fish price according to Egyptian market. The bulk of the catch is Bolty or Tilapia (*Oreochromis aureus*) comprising as much as 81 % of the catch in 2002. Samos is the next most important fish with a catch of 11%..

Figure (6. 4) The Fish Caught in Tons Through Years 1998 - 2002



A total of 3,906 fishermen operated on Lake Nasser in 2002. The number of registered fishing boats in operation was 2,835 (Source: Ministry of Agriculture, Aswan). The boats are wooden, some of which are motorised. In the northern part of the lake fishing is mostly carried out using trammel nets, while in the southern part fishing by float gill nets predominates. Line fishing is also employed in Lake Nasser. The environmental impacts of fisheries are mainly related to overexploitation of resources.

6.3 Industrial activities

6.3.1 Large scale industries

The largest industries in Aswan Governorate are presented in table (6.3), which provides an overview of all the large industries in the Governorate.

Table 6.3. Large Scale industries in Aswan Governorate

Location	Company Name	Production	Remarks
Aswan	KIMA Egyptian Chemical Industry	Ammonium nitrate fertilizer (prilled & liquid) Low density pure ammonium nitrate (34.8% Nitrogen) Ferrosilicon Alloys Oxygen, Acids, Sodium hydroxide, and Ice	Employees: 2500 Labors
	Industrial Gases Company	Acetylene	Production: 200,000 m^3/year. Raw material: Calcium carbide 800 ton/year Employees: 91 Labors Location: Industrial zone El Hagar Street Area occupied by factory: 7,290 m^2
	Coca Cola Bottling Company	Soft drinks	Employee: 224 Labors Production: 8000 Box/year Location: Kornish El Nile, Aswan Entrance Area: 5846 m2
	Feialla Mill	Flour	
	Naser Mill	Flour	
	The Egyptian Company for Fish Marketing-Aswan	Frozen fish & fillets	Employees:225 Labors Production: 6365 tons/year fish without heads, 603 tons/year Fillets Raw Mat erials 11750 tons/year fish

			Area: 2880 m2 Location: El Semad - Aswan
	Misr Aswan Fisheries and Fish Processing Company	Fish processing Packing and freezing & fillets & ice	Employees: 308 Labors Production: 2008 tons/year fish, 544206 ice blocks, 76 tons powder fish Location: West of El Sad El Aaly Port Area occupied by factory: : 14 feddans
Kom Ombo	Sugar & Integrated Industries Company	Sugar Fibreboard	Employee: 1500 labors + 550 seasonal labors. Production: Sugar (A) & Sugar (B) & Molase. Raw Materials: Sugar cane Location: Kom Ombo Area: 500 Feddans
	Nasser Mill	Flour	
	Abu Simbel Mill	Flour	
Edfu	Egyptian Company for Ferro Alloys	Ferrosilicon alloys Silica dust	Employees: 1050 Labors Production: 46000 tons/year Ferro Alloys Raw materials: Quartz, Coke, Tons/year Location: Edfu, East El Attawany Area: 35.5 Feddans
	Sugar & Integrated Industries Company	Sugar an Paper pulp	Employee: 1087 Labors Production: 127027 tons/year sugar, 57242 tons/year Molase, 362961 tons/year Mosase Raw Materials: 1200000 tons/year Sugar cane

		Location: Edfu Area: 167 Feddans
Misr Edfu Printing& writing paper	Paper core pulp	Employee: 700 Labors Production: 60000 tons/year paper core pulp Raw material: El Bagas tons per year Location: Edfu Area: 97 Feddans
El Nasr Mining Company	Extraction Grinding and marketing of Phosphate rock Talc Almanite Quartz-Felspar Caoline Gypsum	Employee: 900 Labors Production: 455,000 tons high quality phosphate concentrate and 245,000 tons low quality phosphate per year Raw material: 700,000 tons/year Location: El Mameed 15 km north, El Sebaaia East, El Sebaaia West, and Aswan Area: 877700 m2, 39000 m2, 142350 m2 respectively
Horus Mill	Flour	

6.3.2 Industrial zone Aswan City

Recently, a new industrial estate has been built southeast of Aswan at the Aswan- al-Alaqi road, on an area of about 220 feddans and including 461 production units. The percent distribution of types of production in the industrial estate indicates that the engineering enterprises are dominating.

6.3.3 Small- scale industries

Along with the economic development of the governorate, small-scale industries for maintenance of vehicles, machineries for irrigation and industries etc. have developed. The small-scale industries play an important role, both in terms of economy and occupation.

There are 566 registered small-scale industries and workshops. Areas of activity include: -

Metal work and car services, Carpentry, Electrical services, Textile production, Food production, Tile manufacturing.

6.3.4 Potential environmental effects of industry

Although Aswan Governorate is not heavily industrialised, the present industrial activities constitute a threat to the environment, particularly in the form of air pollution, and water pollution from wastewater discharges.The specific problems in terms of water and air pollution in Aswan Governorate are described in section 7 and 9, respectively.

6.4 Mining and quarrying

6.4.1 Activities

The most important mineral resources in the Nile Valley are iron, phosphate, granite, marble, kaolin, limestone, sandstone, sand, gravel, copper, nickel, manganese, asbestos, quartz, chrome and feldspar. In the Eastern Desert of the Lake Nasser area, there are extensive reserves of granite, marble, quartz, feldspar, gold, gravel, barite, chrome and Asbestos. In the Western Desert, there are reserves of granite, gravel, sandstone, basalt, limestone and sand.

6.4.2 Potential environmental effects of mining and quarrying

The environmental impacts of mining are concentrated on: First, work environment and labors health. Second, Air quality and noise in neighboring residential areas as well as traffic accidents by trucks.

6.5 Tourism

6.5.1 Activities

Tourism is a very important economic activity in Aswan Governorate. The hotel capacity is estimated at 3,815 beds. In addition, 300 Nile cruisers plying between Aswan and Luxor, and six cruise vessels operating between Aswan and Abu Simbel. At present, tourism is dominated by the cruise sector as this currently accounts for over 60% of all nights spent by tourist in Aswan in 1999. The following numbers are representing tourism in Aswan year 2002: The Number of tourist, tourist nights, hotels, hotel beds are 442270, 779421, 29, 2525 respectively. The number of Nile Cruisers is 306.

6.5.2 Potential environmental effects from tourism

The environmental impacts from tourism are mainly related to improper location of hotels and resorts, as well as increased water consumption, wastewater and solid waste generation (these issues are discussed in sections 7 and 8).

7 WATER

7.2 Surface Water Quality

7.2.1 Agricultural Drains

In Aswan Governorate several agricultural drains discharges into the River Nile. Agricultural drains receive all types of wastewater and some of them are quite polluted. The National Water Research Centre (NWRC) of Ministry of Water Resources and Irrigation (MWRI) has measured the water quality of the drains in the Governorate. Survey data from 2001 are shown in Table 7.1 and compared with the standards stipulated in Law 48/1982. The values not complying with the standards are shaded.

The water quality of the El Ganayen, the Berba- and the Khor El Sail (Aswan) drains are very poor, violating all or most of the standard values as indicated in law 48/1982. The three drains are in fact major sources of pollution of the Nile with high discharge of organic matter. The highest organic load is discharged from El Ganayen, followed by Berba- and Khour El Sail Aswan Drain. (Cf. Table 7.2, Fig. 7.1 and Fig. 7.2).

Based on these results the agricultural drains have been classified in terms of good-, poor and very poor water quality, as indicated in Table 7.3 .

Table 7.1. Water Quality of agricultural drains in Aswan Governorate 2001. Shaded values indicate non-compliance with the Water Quality Standards of Law 48/1982 (Source: Ezzat M.N. et al (2002). Survey of Nile System Pollution Sources. MIWR/USAID Report No 64. September 2002)

Drain	COD mg O_2/l	BOD mg O_2/l	DO mg O_2/l	TDS mg/l	Faecal Coli form MPN/100ml
Khour El Sail Aswan	102	32.80	1.91	1190	3.25 E+04
El Tawasa	8	1.01	6.16	710	3.50 E+03
El Ghaba	11	1.00	7.80	570	1.85 E+03
Abu Wanass	7	1.28	7.03	463	3.00 E+03
Main Draw	17	1.48	7.34	460	3.00 E+04
El Berba	113	42.70	3.85	414	2.25 E+04
El Ganayen *	152	41.50	2.25	325	2.25 E+04
Menaha	4	1.52	7.86	285	7.50 E+03
Main Ekleet	4	1.53	9.21	340	1.50 E+03
El Raghama	10	1.55	8.56	390	1.75 E+03
Fatera	5	2.04	7.7	564	3.50 E+03
Khour El Sail	2	1.05	9.07	500	2.00 E+03
Selsela (canal)	3	1.25	6.38	380	3.20 E+03
Radisia	16	3.06	9.02	1430	2.30 E+03

Edfu	15	1.59	9.49	817	3.00 E+03
Houd El Sebaia	16	1.83	6.77	495	1.75 E+04
Houd El Sebaia	19	2.55	7.82	670	4.50 E+03
Water Quality Standard	15	10	5	500	5.00 E+03

* Discharges to Berba drain

Table 7.2. Loads of organic and inorganic pollutants discharged into the Nile from agricultural drains in Aswan Governorate. The drains with the highest load are indicated by shading (Source*: *Ezra M.N. et al (2002). Survey of Nile System Pollution Sources. MIWR/USAID Report No 64. September 2002).

Drain	**COD Tonnes/day**	**BOD Tonnes/day**	**Heavy Metals Tonnes/day**
Khour El Sail Aswan	10.1	3.2	0.03
El Tawasa	0.05	0.006	0.003
El Ghaba	2.1	0.19	0.15
Abu Wanass	1.4	0.25	0.08
Main Draw	0.06	0.005	0.002
El Berba	172.7	65.3	0.11
El Ganayen*	218.1	59.7	0.3
Main Ekleet	0.08	0.03	0.05
El Raghama	0.4	0.7	0.01
Fatera	3.9	1.59	0.4
Khour El Sail	0.3	0.18	0.06
Selsela	0.01	0.005	0.005
Radisia	2.1	0.4	0.03
Edfu	4.0	0.4	0.6
Houd El Sebaia	0.8	0.09	0.04
Houd El Sebaia	0.9	0.13	0.03

* Discharges to Berba drain

Table 7.3. Classification of the water quality of the seventeen Agricultural Drains in Aswan Governorate

Very poor water quality	Poor water quality	Good water quality
Khour El Sail Aswan	Main Ekleet	Abu Wanass
El Ganayen	Fatera	El Raghama
El Berba	Main Draw	Khour El Sail / Kom Ombo
	Houd El Sebaia (2)	Selsela
	Edfu	
	Radisia	

	Menaha El Tawasa El Ghaba	

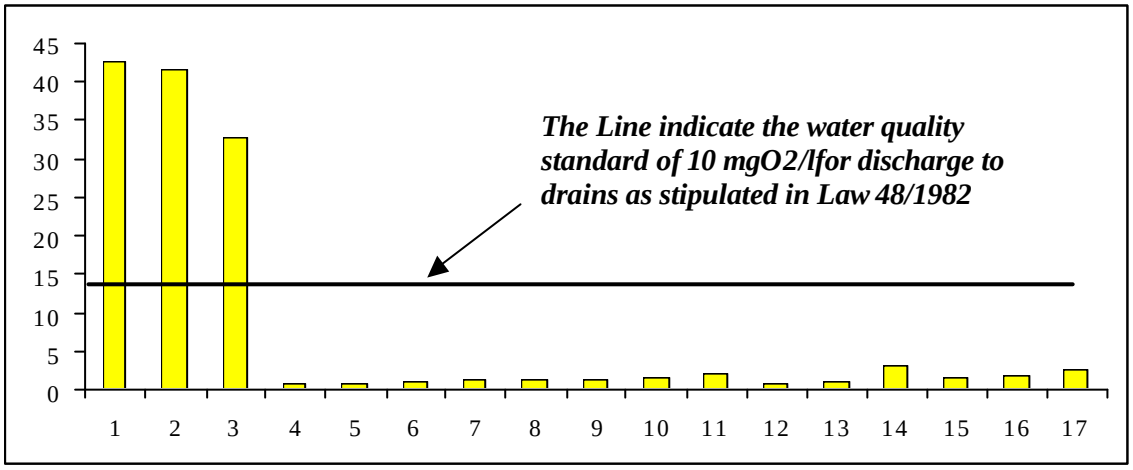


Figure 7.1. Organic matter (BOD)measured in drains in Aswan Governorate in 2001.

7.2.2 The River Nile

Data on water quality of the River Nile in Aswan Governorate is available from the Ministry of Health in Aswan and from the National Water Research Centre (NWRC) of Ministry of Water Resources and Irrigation (MWRI) assisted by CIDA.

The available data indicate that the water in the part of the Nile which is running through Aswan Governorate is clean. Generally the water quality is good and it generally complies with the water quality standards stipulated in Law 48/1982.

Figure 7.2 and 7.3 shows two examples of the results from Ministry of Health Aswan. Fig 7.2 shows the concentration of Dissolved Oxygen (DO) and Figure 7.3 the Biological Oxygen Demand (BOD) of the water samples during the period January 2001-October 2002. The concentrations of dissolved oxygen were always above 5 mg/l (Fig 7.2) and the BOD in most cases did not exceed 6 mg/l (Fig 7.3) as stipulated in the Water Quality Standards. The other parameters measured also generally complied with the water quality standards.

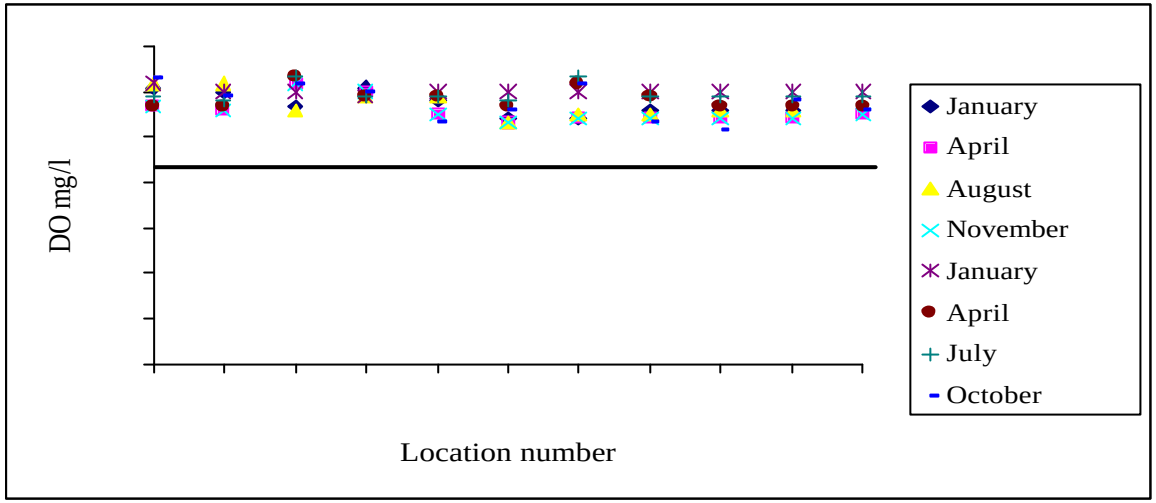


Figure. 7.2 Dissolved oxygen measured in water samples collected at eleven locations in the Nile during the period January 2001-October 2002 (Source of data: Line Ministry of Health Aswan).

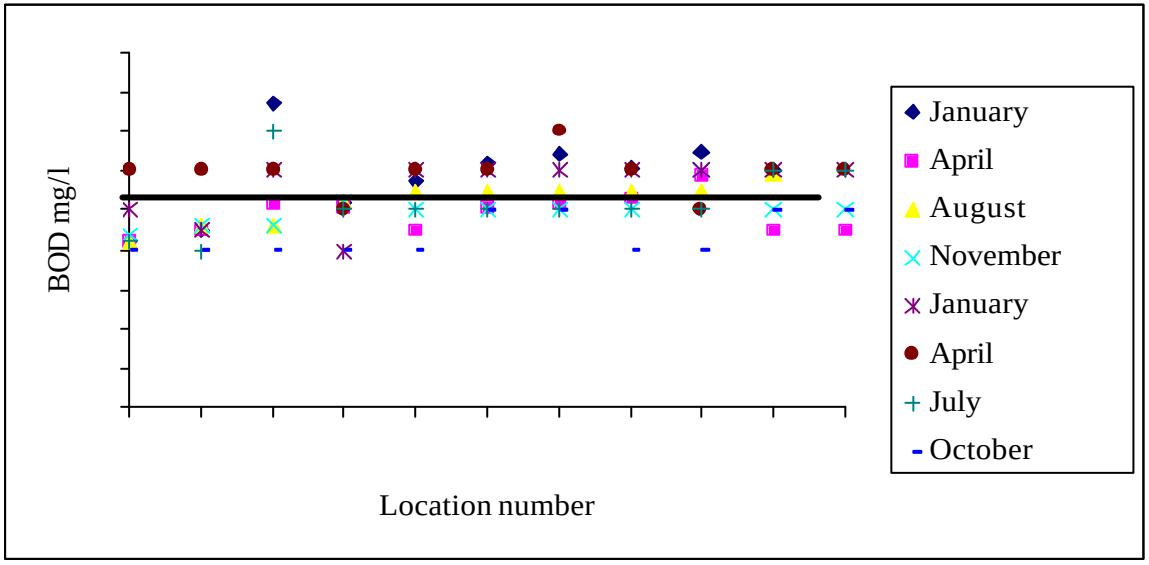


Figure. 7.3 Biological oxygen demand measured in water samples collected at eleven locations in the Nile during the period January 2001-October 2002 (Source of data: Line Ministry of Health Aswan).

The results from NWRC /CIDA confirm that the water quality of the Nile in Aswan Governorate is generally good and complies with the Water Quality Standards. A water quality index was estimated by combining the following parameters DO, pH, TS, BOD, NO_3, Tot-P, Turbidity, Faecal Coli forms. In February 2000 the water quality could be characterised as good on three stations in the Governorate and medium on three. In September 2000 the quality was even better. The water quality was good on five locations and medium at one (Table 7.4).

Table 7.5 shows another example from the NWRC data from February 2001 which also indicate the generally good water quality of the Nile.

Table 7.4. Water Quality Index (WQI) values on the seven river quality monitoring stations of NWRC/CIDA which are situated in Aswan Governorate. (Source: the Environmental Profile of Egypt 2002 Capacity 21 Unit Egyptian Environmental Affairs Agency (EEAA).

WQI-values	Classification of water quality	Number of samples in February 2000	Number of samples in September 2000
0-25	Very bad water quality	0	0
26-50	Bad water quality	0	0
51-70	Medium water quality	3	1
71-90	Good water quality	3	5
91-100	Excellent water quality	0	0

Table 7.5. Nile water quality data from NWRC/CIDA February 2001(Source: Ezzat M.N. et al (2002). Survey of Nile System Pollution Sources. MIWR/USAID Report No 64. September 2002)

Location	Distance from Aswan High Dam (Km)	COD (mg O_2/l)	BOD (mg O_2/l)	TDC (mg/l)	Faecal Coli forms (MPN/100ml)
St 4	5	7	1.3	171	1.6 E+02
St 5	21	10	1.0	170	3.5 E+02
St 6	53.8	15	1.5	169	6.5 E+02
St 7	83.4	15	1.0	175	1.2 E+02
St 8	110	7	1.0	188	4.0 E+02
St 9	148	22	1.5	184	1.2 E+02
Water Quality Standard		10	6	500	No standard

The water quality of the Nile is good in spite of very high organic loads discharged from some of the severely polluted agricultural drains such as El Ganayen, the Berba- and the Khor El Sail drain in Aswan. Water quality of the Nile is locally affected at the polluted

discharge points but due to the high natural purification capacity of the Nile, the water quality is good. At the present level of organic load the Nile water has the capacity to degrade the organic matter discharged from the drains without oxygen being depleted.

7.2.1 Lake Nasser

Data on water quality of the Nile in Aswan Governorate is available from the general authority of high Dam and Aswan Rreservoir.

The available data shows that the water quality of Lake Nasser is good and that the parameters generally comply with the Water Quality Standards for surface waters according to Law 48/1982 although violations may occasionally occur mainly in Abo Simbel (Examples from monitoring Lake Nasser are shown in Tables 7.6 and 7.7).

Table 7.6. Results of water analyses of surface samples collected on four sites in Lake Nasser in February and September 2000 (At Abu-Simbel, at Toshka, 2 km upstream Aswan High Dam and 10 km upstream Aswan High Dam (Source: Ministry of Water Resources and Irrigation. National Water Quality and Availability Management Project).

Parameters	February 2000	September 2000	Water Quality Standards of Law 48/1982
Dissolved oxygen (mg/l)	6.85 - 7.68	6.51 - 7.00	≥ 5
Ph	8.14 - 8.8	8.15 - 8.28	$7 < pH < 8.5$
Chemical oxygen demand (COD) mgO_2/l	3.0-12.0	6 -9	≤ 10
Biological oxygen demand (BOD) mgO_2/l	0.6 - 1.5	1.2 - 1.4	≤ 6
Nitrate (NO_3) mg/l	0.6 - 1.0	0.7 - 3.9	≤ 45
Total Dissolved Solids (mg/l)	135-152	154-173	≤ 500

Table 7.7. Results of water analyses of surface samples collected on six sites in Lake Nasser in February, May, August and December 2002 (Three sites at Abu-Simbel and three sites upstream Aswan High Dam (Source: the general authority of high Dam and Aswan Reservoir).n=number of samples analysed

Parameters	Abu Simbel (n=12)	High Dam (n=12)	Water Quality Standards of Law 48/1982
Dissolved oxygen (mg/l)	6-10 (3-3.1)*	6-8 (3)*	≥ 5
Ammonia (mg/l)	0.0-0.1	0.0-0.03	≤ 0.5
Nitrate (NO_3) mg/l	0.14-0.74	0.2-0.44	≤ 45
Total Dissolved Solids (mg/l)	129-157	148-168	≤ 500
Alkalinity (mg/l	110-137	116-127	$20 \leq Alk \leq 150$

*In August, concentrations of oxygen were 3-3.1, i.e. below standards

7.3 Potable water supply

The water quality of the Nile water is quite good and the treatment of the river water includes clarification, filtration and chlorination. Potable water supplies are provided to the majority of the populations of the Governorate by means of water treatment plants. It is reported that residual chlorine level often are below recommended standards, but generally the quality of piped potable water is not considered a major problem. Groundwater constitutes a smaller part of the water supply.

In some areas piped water supply is insufficient and this means that the consumers store water, sometimes in unclean vessels, and this causes contamination. The insufficient water supply is to a large extent due to large water losses through leakages and poor operation regimes of compact units. Sometimes, water supply contamination is attributed to surface water pollution at the intake.

Table (7.8) presents the estimated per capita share of drinking water in relation to the recommended production standards, (Egyptian Code). It appears from the table that:

- The per capita share level of drinking water in most Cities of Aswan Governorate exceeds the Egyptian recommended standard (109-140 %)
- The per capita share level of drinking water in both Aswan and Nasr El Nuba villages exceeds the Egyptian recommended standard (102-126 %)
- The per capita share level of drinking water in most villages in KomOmbo, Daraw, and Edfu Markaz is less than the Egyptian recommended standard (60-73 %)

About 5% of the potable water in Aswan City is consumed by the tourist industry.

7.4 Wastewater

In general the agricultural drains in the governorate (as is the case in most of Egypt) receive the bulk of the treated and untreated wastewater. The drain water discharges to the Nile, but some drain water is reused for irrigation according to the National Policy for reusing water as much as possible. As a result some of the water used for irrigation may be contaminated with wastewater pollutants. Four types of wastewater are discharged: - Domestic wastewater, Industrial wastewater, Agricultural run-off, and Wastewater from Nile cruisers.

7.4.1 Domestic wastewater and treatment facilities

Domestic wastewater is a significant source of pollution caused by nutrients, oxygen demanding organic compounds and suspended solids, and is practically the source of bacteria and other pathogens (desease causing) organisms. About one third of the wastewater produced by households in Aswan Governorate, estimated at 46,250 m^3 /day, is treated. The other two third , estimated at 84,315 m^3/d, is discharged without any treatment.

Existing sewage treatment plants:

In order to reduce the pollution of the drains, a number of wastewater projects have been implemented in the Governorate and further projects are under construction. It is the general policy ultimately to use all treated sewage water for irrigation in sewage farms at the edge of the desert.
Presently there are eight sewage treatment plants in the Governorate.

Estimated Removal of Organic Matter BOD due to Wastewater Treatment:

The amount of organic matter expressed as BOD that is being removed from wastewater due to treatment has been estimated. The results are shown in Table 7.9 The level of treatment as indicated by removal of organic matter is quite well in the cities (Aswan, Kom Ombo Nasr El Nuba, Daraw and Edfu). About 25% of the organic matter is not removed in the cities. This is to a large extent within acceptable limits and complies with the 60 mg/l discharge limit. The treatment is poor in the rural villages and most of the villages in Aswan Governorate do not have sewer or treatment systems but discharge untreated sewage to the drains.

Table (7.8) Water Production Rates and Per Capita Share of Drinking Water

IN Relation to the Egyptian Recommended Standard

Markaz/City	Pop. 2002	Actual Water Production m3/day	Per Capita Share of Drinking Water (including Leakage) L.Cap. / day	Per Capita Share of Drinking Water (not including Leakage) L.Cap. / day	Per Capita Share of Drinking Water L.Cap. / day According to Egyptian Standards	% Per Cap. Share in relation to Standard
Aswan	**250328**	97030	388	252	180	140
Aswan Markaz	52119	12651	243	158	125	126
Daraw	**33909**	10007	295	192	150	128
Daraw Markaz	56698	6490	114	74	125	60
Kom Ombo	68560	**17182**	251	163	150	109
Kom Ombo Markaz	195226	27332	140	91	125	73
Nasr El Nuba	**73358**	17265	235	153	150	102
Edfu	102791	**25188**	245	159	125	127
Edfu Markaz	226793	37226	164	107	150	71
Aswan Gove.	**1059782**	**250371**	236	154		

Pop. Increse 2%

?? Average Leakag Percent

60 % of Kom Ombo Water Plant serve Kom Ombo City
40% of Kom Ombo Water Plant serve Kom Ombo Vilages
50% of New Kom Ombo Water Plant serve Kom Ombo Vilages
50% of New Kom Ombo Water Plant serve Nasr El Nuba Vilages

7.4.2 Industrial wastewater and treatment facilities

The industries are major sources of pollution. Table 7.10 shows the results of analyses of wastewater from different industries in 1998 and 1999. None of the industries complied with the standards stipulated in Law 48/1982. In general major sources of pollution from industrial activities are the Sugarcane & Integrated Industries in Edfu and Kom Ombo. Although treatment facilities are in place, they nevertheless discharge heavy loads of organic matter. As a result the BOD levels are violating the stipulated standards very significantly, see figure 7.4.

The sugar mill in Kom Ombo has an activated sludge treatment plant and is recycling wastewater in the factory. However, the water consumption at the plant is very high and it appears that the factory is discharging very large volumes of wastewater rich in organic materials and nutrients, which pollutes a nearby drainage canal and, eventually, the Nile. The sugar mill in Edfu may have the same problem.
The KIMA Industries formerly discharged wastewater into the El Sail storm water canal leading it through Aswan City to the Nile.

Other sources of industrial wastewater pollution are dairies and slaughterhouses. A 12 feddan sewage farm with Khaya trees has recently been established in connection with a slaughterhouse in the El-Shallal area near Aswan.
Waste oil from workshops and small industries is often disposed off to the drains, and the system for collecting and refining used oil needs improvement.

Other potential sources of pollution are mines, including a phosphate ore concentrating plant at Sibaiya East. There may also be a risk of organic pollution from the fish factory at Lake Nasser.

Agriculture is also a major source of water pollution. Saline irrigation return-flows or drainage containing agrochemical residues (pesticides etc.) may be serious pollutants. Agricultural Nitrate affects the surface water and groundwater. The disposal of liquid animal waste also pollutes surface water.

As mentioned in Section 6.5, about 300 Nile cruisers ply between Aswan and Luxor. The number of beds on the Nile cruisers is about 28,700, but the current occupancy rate is not known. The sewage from these ships is discharged into the Nile. While the load to the Nile is relatively small compared to land based pollution sources, this direct discharge is clearly unacceptable. A reception station is therefore being built in Al-Aqab, 15 km north of Aswan. This includes a pumping station and a pipeline to transfer the untreated sewage to the treatment plant. The station will be in operation during2003-2004.

Table 7.9 Estimated discharge of organic load (kg BOD/day), amount of organic load removed by wastewater treatment and disposal method.

City/Markaz	Pop. 2002	Water Consump. L/Cap. Day	Wastewater Discharge L/Cap. Day	Wastewater Discharge M3/day	Discharged Organic Load kg BOD / day	Wastewater Treatment Plant Design Capacity	Removed Organic Load kg BOD / day	Disposal Method
Aswan City	248648	252	202	50127	11028	56000	8020	Treated Wastewater is discharged temporary into El Sail Canal
Aswan Markaz Village	52119	158	126	6588	1449			Raw Wastewater is Discharged into Drains - Land - Canal
Abu Simbel City	2289	100	80	183	40			Raw Wastewater is Discharged into Lake Naser
***Daraw City**	33909	192	154	5208	1146		583	Treated Wastewater is discharged into Allocated Farm Trees and Raw Wastewater is Discharged into Drains - Land - Canal
Daraw Markaz Village	56698	74	59	3357	738			Raw Wastewater is Discharged into Drains - Land - Canal
***Kom Ombo City**	68560	163	130	8940	1967	32000	1001	Treated Wastewater is discharged into A llocated Farm Trees and Raw Wastewater is Discharged into Drains - Land - Canal
Kom Ombo Markaz Village	195226	91	73	14212	3127			Raw Wastewater is Discharged into Drains - Land - Canal
Nasr El Nuba City	6674	153	122	817	180	1400	131	Treated Wastew ater is discharged into Allocated Farm Trees and Raw Wastewater is Discharged into Drains - Land - Canal
Nasr El Nuba Markaz Village	66684	153	122	8162	1796			Raw Wastewater is Discharged into Drains - Land - Canal
Edfu City	102791	159	127	13075	2877	7000	2092	Treated Wastewater is discharged into Allocated Farm Trees and Raw Wastewater is Discharged into Drains - Land - Canal
Edfu Markaz Village	226793	107	86	19413	4271	2000	160	Treated Wastewater is discharged into Allocated Farm Trees and Raw Wastewater is Discharged into Drains - Land - Canal
Aswan Governorate	1059782	154	123	130565	28618		11988	41% of organic load is removed by treatment from the wastewater of Aswan Governorate

*** 70% of Daraw and KomOmbo Cities are covered by sewerage system**

Table 7.10 Concentration of pollutants in discharges from major industrial point sources in Aswan Governorate

Industry	Dist from AHD (Km)	BOD (mgO_2/l)		COD (mgO_2/l)		Oil & Grease (mg/l)		TSS (mg/l)	
		1998	1999	1998	1999	1998	1999	1998	1999
Kom Ombo Sugar Ind.	50	144	760	3070	1500	1.2	9.3	58	46
Ekleet power station	63.6	1.2	4.8	2	84	1.2	2.6	28	79
Kaleh power station	119.6	1.4	2.0	5	40	2.3	3.1	15	32
Edfu Paper Pulp A	122.5	12	78	27	622	1.5	11.1	9	158
Edfu Paper Pulp B	122.5	13	75	19	354	0.4	2.8	9	25
Edfu Sugar Ind.	123	12	260		370	0.2	7.4	72	35
Quality Standard		60		100		10		60	

Source: Ezzat M.N. et al (2002). Survey of Nile System Pollution Sources. MIWR/USAID Report No 64. Sept. 2002

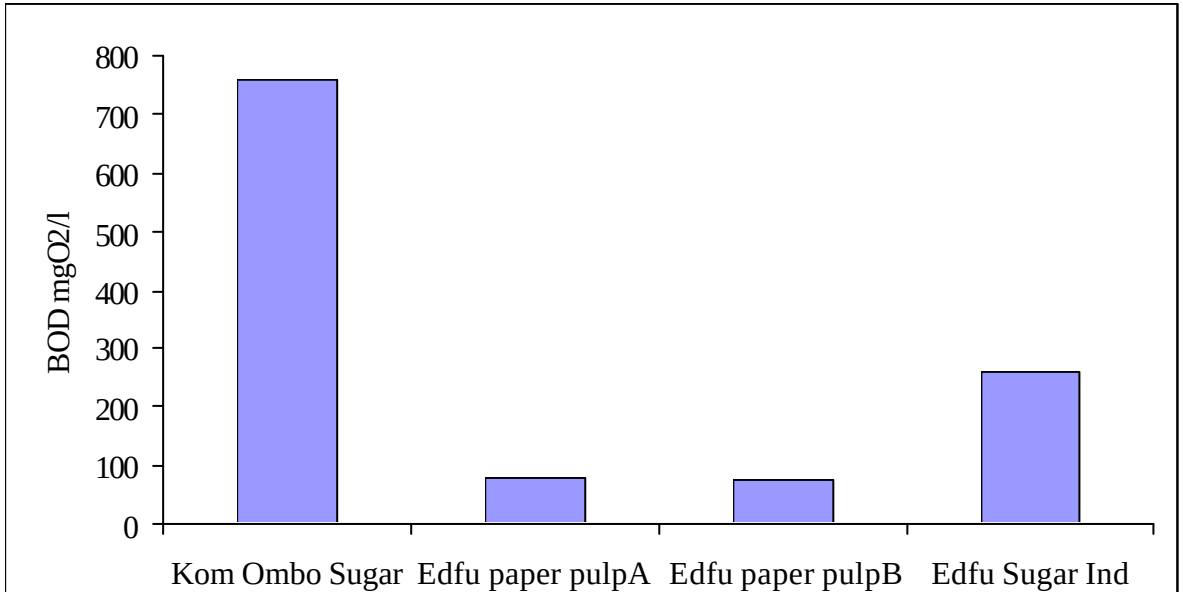


Fig 7.4 BOD in wastewater from sugar/paper pulp industries in 1999. The line indicate concentration quality standard of 60 mg/l

Table 7.11 Significant sources of wastewater pollution in Aswan Governorate on the Nile according to Aswan Governorate Authorities. Remarks on inspection and monitoring of these sources are also presented.

Wastewater pollution Source	Source of Information	Remarks
El Sail Canal is a constant source of wastewater pollution	Nile Aswan Engineering (Central Authority for Water Resources and Irrigation Aswan)	Supervised by the General Administration for Irrigation-Aswan (10 km east side
Nile cruisers and ships	Nile Aswan Engineering (Central Authority for Water Resources and Irrigation Aswan)	Supervised by regular inspection of treatment units for domestic wastewater and implement penalties for violations of law 48/1982.
Berba drain, which receives the industrial wastewater from Kom Ombo Sugar Cane Wood factories and slaughter house.	Nile Kom Ombo Engineering (Central Authority for Water Resources and Irrigation Aswan)	It is supervised by The General Administration for Irrigation - Aswan and the Kom Ombo General Administration for Drainage .
The Ferro Silicon Factory (The Egyptian Company for Ferro Alloys Edfu).	Nile Edfu Engineering (Central Authority for Water Resources and Irrigation Aswan)	It has permission from the General Administration for Nile Protection in Esna. Regular sampling every three months is carried out and the analysis results are within the limit of law 48/1982. In case of violation, the factory is subjected to penalties for violation (Transformer and Furnace cooling water).
The Sugar Cane and Integrated Industries Co. – Edfu	Nile Edfu Engineering (Central Authority for Water Resources and Irrigation Aswan)	Closed drain pipe and no drains to the Nile. Procedures in process to get permission.
Sugar Cane and Integrated Industries Co., which discharge on El Ganaine drain (2.16 km).	Egyptian General Agency for Drainage Projects, The General Authority for Drainage – Kom Ombo Aswan under the supervision of The Ministry of Water Resources, Egypt.	There are two Monitoring Stations to record the Nile water quality. These stations are as follows: Hager El Sebaia Drainage Station:Location : 144 Km on west side. Water Type: Irrigation Drainage. El Kalh Drainage Station: Location : 121 Km on west side. Water Type: Irrigation Drainage
Misr Edfu Pulp Writing and Printing Paper Co.	Nile Edfu Engineering (Central Authority for Water Resources and Irrigation	The factory has permission from the General Administration for Nile Protection in Esna. Regular sampling is carried out and the

	Aswan)	analysis results are within the limit of law 48/1982. In case of violation, the factory is subjected to penalties for violation.

8 WASTE

8.2 Municipal Solid waste

8.2.1 Waste generation

Households and tourists in Aswan Governorate generate an estimated 665 tonnes of waste /day. Cf. Table 8.1.

8.2.2 Waste collection and disposal

Only about 35% of the generated waste is registered as being collected by public services. This does not mean that 65% of the waste is left in streets or disposed on the suburbs. It is evident that virtually none of the generated waste generated in rural areas is collected by public service systems. In Edfu and El Nuba Markaz , there are limited number of Villages, which have simple waste collection system operated by CDA. Aswan City has the best coverage of public waste collection, followed by Edfu City, Daraw City and Kom Ombo City.

Table 8.1. Estimated solid waste generated in Aswan Governorate and amount collected in year 2002.

	Population 2002	Tourists	Population estimated SW generated kg/cap/day	Tourist Estimated SW generate kg/cap/day	Population Solid Waste generated T/day	Tourist Solid Waste generated T/day	Total Solid Waste generated T/day	Solid Waste collected T/day
Aswan								
Urban	250,328	15,000	0,72	1	180,2	15	195,2	150
Abu Simbel	2,289		0,72		1,6		1,6	1
Rural	52,119		0,5		26,1		26,1	
Total	**302,447**				207,9		222,9	
Daraw								
Urban	33,909		0,72		24,4		24,4	10
Rural	56,698		0,5		28,3		28,3	
Total	**90,607**				52,8		53,0	
Kom Ombo								
Urban	68,560	10,000	0,72	1	49,4	10	59,4	15
Rural	195,226		0,5		97,6		97,6	

Total	**263,786**				147,0		157,0	
Nasr El Nuba								
Urban	6,674		0,5		3,3		3,3	0,5
Rural	66,684		0,5		33,3		33,3	0,4
Total	**73,358**				36,7		37,0	
Edfu								
Urban	102,791	10,000	0,7	1	72,0	10	82,0	40
Rural	226,793		0,5		113,4		113,0	8
Total	**329,584**				185,4		195,0	
Aswan Gov.								
Urban	459,946				331		366	216,5
Rural	599,838				299		298	8,4
Total	**1,059,784**				630		665	224

There are nine waste disposal sites in Aswan Governorate. Two of the existing sites are controlled (Aswan and Balana) and the remaining seven are uncontrolled. There are plans for upgrading the uncontrolled site to controlled facilities.

Collection and disposal of solid waste is the responsibility of the city councils. Solid waste collection and management in Aswan City is being privatised and new facilities for solid waste controlled landfill and transfer station of solid waste from Nile cruisers have recently been established with GTZ support.

Waste collection in the tourist areas is carried out by a private company under contract to the Tourist Development Authority. There is much less solid waste on these streets than in other parts of the city. Recently a tender was held for collection of solid waste in Aswan City, Kom Ombo and Edfu. The services by the private company starts in August 2003. In some villages Community Development Associations (CDAs) are managing solid waste collection after initial support by SDF , Danida and Shorouk. The CDAs are collecting fees from the serviced households and the operation is reported to be financially sustainable.

The responsibility for industrial waste rests with the industries. Filter cake from sugar production is used as fertilizer. Silicon dust from KIMA Industries and excess dust from the ferrosilicon plant in Edfu is disposed of in the desert. So is urea-formaldehyde dust from the wood factory in Kom Ombo.

8.3 Hazardous waste

Disposal of hospital waste is a big problem in Aswan Governorate. An estimated amount of hazardous hospital waste of 650 kg/day is generated in Aswan Governorate (Cf. Table 8.2). There are problems with this waste, firstly, because there is no separation at source of the hazardous and non-hazardous fractions, and secondly, because only one out of four hospital waste incinerators in the Governorate is functioning properly and in compliance with the law (Aswan Fever Hospital) (Table 8.2). Two of the other incinerators are functioning

but not in compliance with the law (i.e the incinerators at Aswan Educational Hospital and Al Ramadi Qebli Hospital), and the fourth has been closed due to complaints (Aswan Health Insurance Hospital).

Table (8.2) Estimates of Hospital Waste Generated in the Five Markaz of Aswan Governorate

Markaz	Number of Hospital Beds	Generation rate (kg/unit/day)	Quantity Generated (Kg/day)	Number of Clinics	Generation rate (kg/unit/day)	Quantity Generated (Kg/day)	Total Quantity Generated (Kg/day)
Aswan	678	0.3	203	105	0.75	78.75	282
Daraw	111	0.25	28	19	0.5	9.5	37
Kom Ombo	288	0.25	72	47	0.5	23.5	96
Nasr El Nuba	210	0.25	53	16	0.5	8	61
Edfu	575	0.25	144	56	0.5	28	172
Total	**1862**		**499**	**253**		**148**	**647**

Table 8.3 Incinerators for hospital waste in Aswan Governorate

	Aswan Educational Hospital	Aswan Fewer Hospital	Aswan Health Insurance Hospital	Al Ramadi Quebli Hospital
Place	Behind hospital	Northeast of hospital	Behind hospital	North of hospital
Type of incinerator	Aramco German	Hoval-German	Goldfin	unknown
Capacity	100kg//hour	50 kg/hour	50kg/hour	
State of functioning	functions properly	functions properly	functions but not in operation due to complaints	Functioning
Compliance with law No 4/1994	Does not comply with law. causing workers to feel suffocated	Complies with law	Does not comply with law due to too high emission levels	Does not comply with law

9 AIR POLLUTION

In general Aswan Governorate is blessed with clean and fresh air. Air pollution is largely linked to industries, and car exhaust may be a problem in urban areas. Other sources, from which the air is polluted (highlighted as problems at environmental committee workshops during Feb.-March 2002), are brick production and bakeries, where mazot is used as fuel, and burning of solid waste.

9.1 Existing Air Quality in Aswan

With support from Danida the EIMP-Programme at EEAA has been measuring air quality at three locations in Aswan Governorate on a regular basis: - (1) Aswan City, (2) Kom Ombo City (3) Edfu City.

The following parameters have been measured: SO_2, NO_x, O_3, CO, Black smoke, PM_{10}, VOC, TSP, Dust fall and Soot, although not all are included at the 42 sites throughout Egypt. Table 9.1 provide an overview of the parameters measured on the stations in Aswan Governorate.

Table 9.1. Air pollution parameters measured by EIMP on the monitoring sites in Aswan Governorate. Measurements started in July 1999.

	SO_2	Black smoke	PM_{10}	O_3	Dust fall	Soot
Aswan	x			x	x	
Kom Ombo	x	x	x		x	x
Edfu			x		x	

The available data indicate that the air in Aswan city is quite clean and comply with the air quality standards stipulated in the Egyptian Law for Environment No 4 of 1994(example Fig 9.1).

However, there are problems with air pollution in Kom Ombo and Edfu.

The data indicate that Kom Ombo is one of the most air polluted sites in Egypt:

- The annual average air quality exceeds the limit of 60µg/m^3 for SO_2 . Of the 42 measurement stations in Egypt, only Kom Ombo station and two others exceed this limit (Cairo City El Qualay (st 1) and Giza Cairo university (11) (Fig. 9.1).
- The annual average air quality exceeds dramatically the limit of 60µg/m^3 for soot and represents by far the highest level in Egypt (Fig. 9.2)
- The air quality exceeds the PM_{10} limit for 24 exposure by 97.2 % of the time in 2000 and 100% in 2001. (Table 9.2).

In Edfu there are also problems with air pollution by particles (PM_{10}) with measurements exceeding 100% of the measurement time in both 2000 and 2001.

9.2 Sources of air pollution

The major sources of air pollution in Aswan Governorate are: - The KIMA factory (in Aswan), Ferrosilicon plant (in Edfu), Sugar factories (in Kom Ombo and Edfu), Brick production, Bakeries, Burning of solid waste and Car emissions.

Figure 9.1. Annual average concentration of SO_2 measured under the EIMP-programme in year 2000 and 2001.

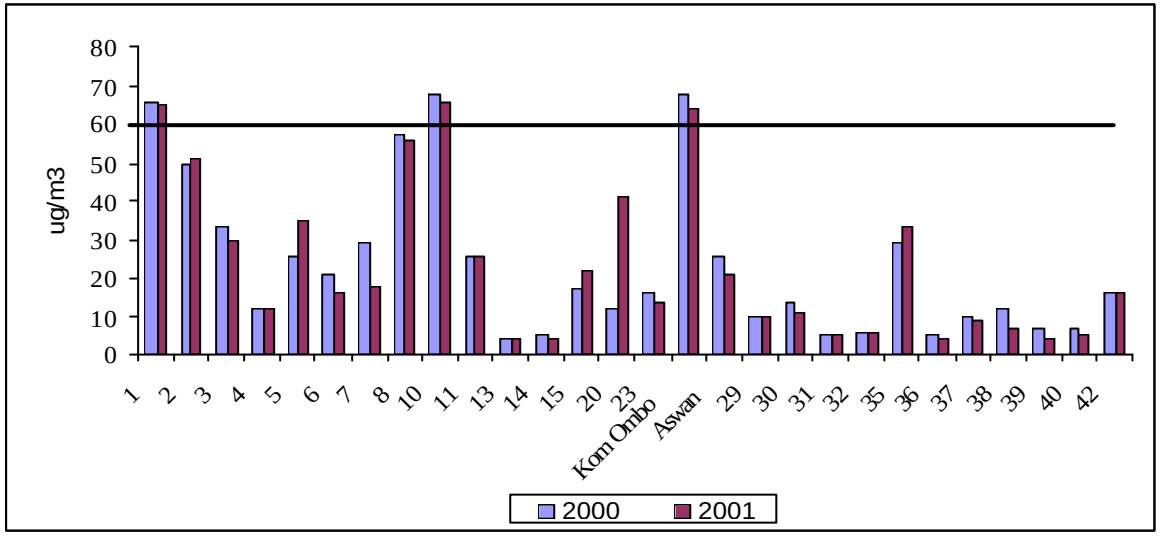


Figure 9.2. Annual average concentration of soot measured under the EIMP-programme in year 2000 and 2001.

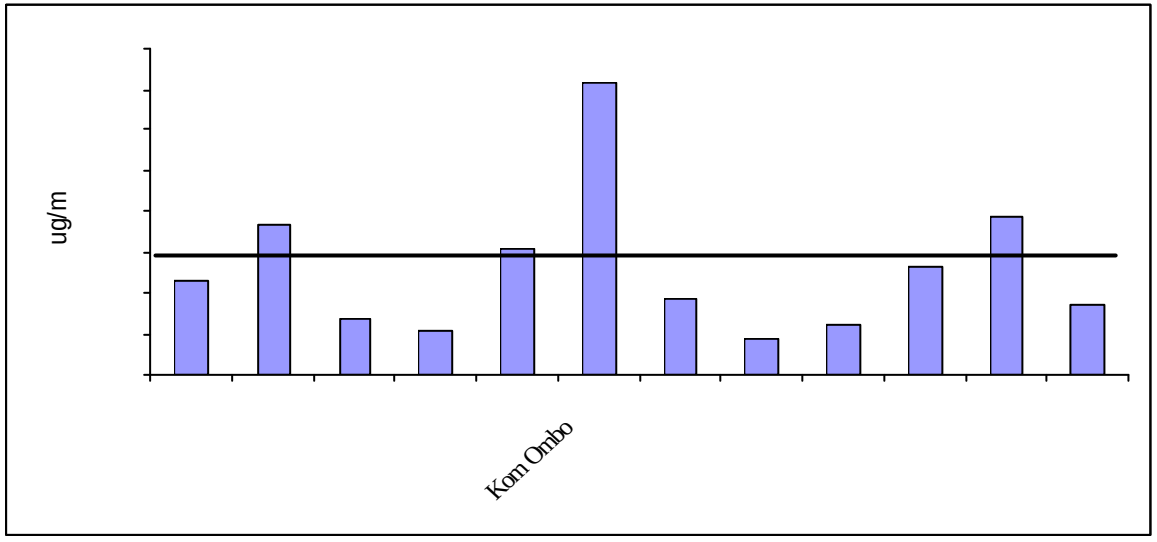


Table 9.2. Air quality limit values for 24-hour exposure as given by executive regulations of the Egyptian Law for Environment No 4 of 1994.

	SO_2		Black smoke		PM_{10}	
	N	%	N	%	N	%
Edfu 2000	0	-	0	-	12	100
Edfu 2001	0				12	100
Kom Ombo 2000	33	9.4	104	29.7	35	97.2
Kom Ombo 2001	35	11.4	258	78.8	44	100

N = number of days measured.
% = Percentage of days exceeding the set limit

10 HEALTH

10.1 Water borne diseases

As mentioned in section 7.2.1 there are problems with high bacterial counts in many of the agricultural drains in the Governorate, indicating that the drain water may be a health hazard to the public living around the drains. There may be a risk of outbreak of waterborne deceases such as diarrhoea, typhoid, paratyphoid, dysentery, cholera, poliomyelitis and hepatitis.

Many of the health care problems in Aswan Governorate are in fact attributed to poor standards of sanitation and hygiene. Registrations from the Ministry of Health Aswan show, that the most frequent registered diseases among population in the Governorate are the water borne deceases Hepatitis and Typhoid (Fig. 10.1). It should however be mentioned that no distinction is made between Hepatitis A and B, only Hepatitis A is waterborne.

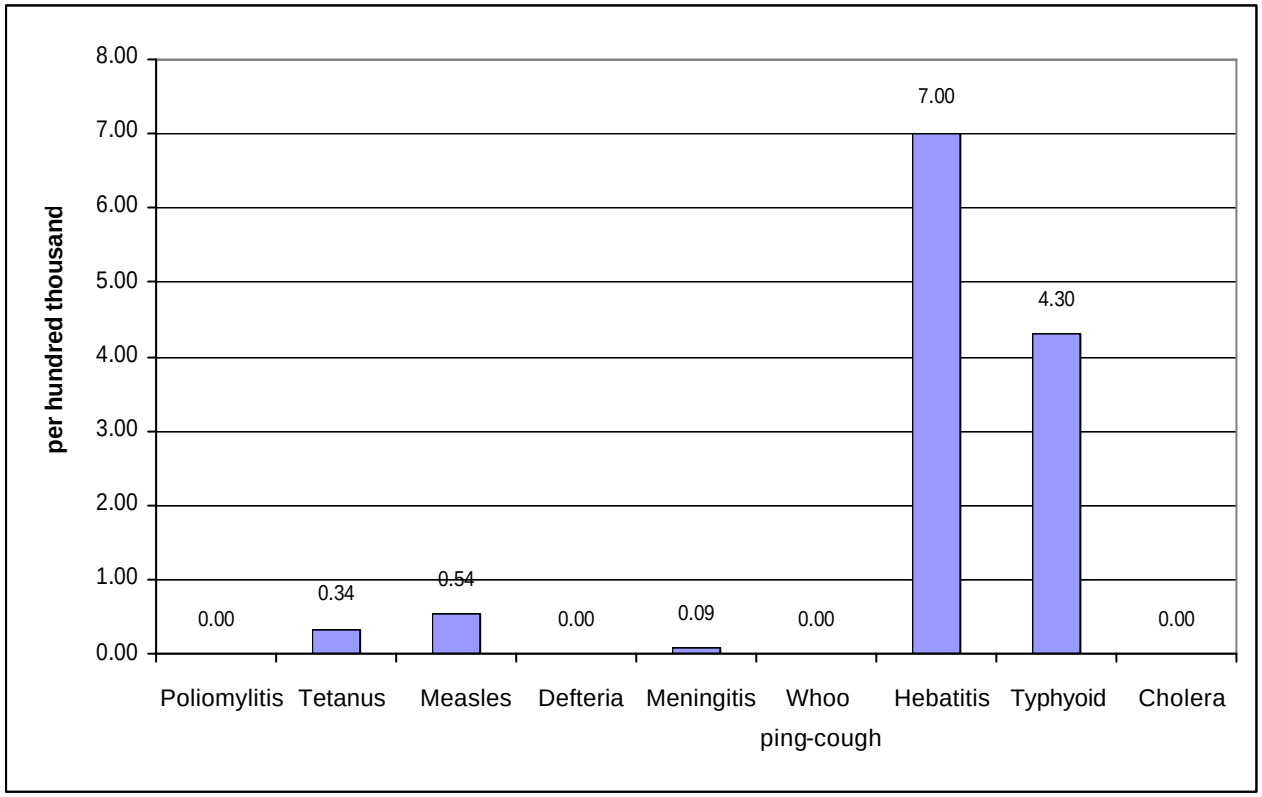


Figure 10.1 Frequency of registered main diseases among population in Aswan Governorate year 2002. (Source Ministry of Health Aswan)

Typhoid is caused by the bacteria *salmonella typhy*. The symptoms of this disease are: diahorrea, nausea, vomiting and fever. Transmission is via faecally contaminated food and water. Kom Ombo markaz is the most affected area followed by Aswan markaz (Fig. 10.3). The numbers of registered cases have increased, during the period 1999-2000. This is probably a result of improved reporting and treatment by the authorities and not a real increase.

Hepatitis A is a viral disease also associated with faecally contaminated water and food. The symptoms are fever, dark urine, malaise, nausea, vomiting and abdominal discomfort followed by jaundice.

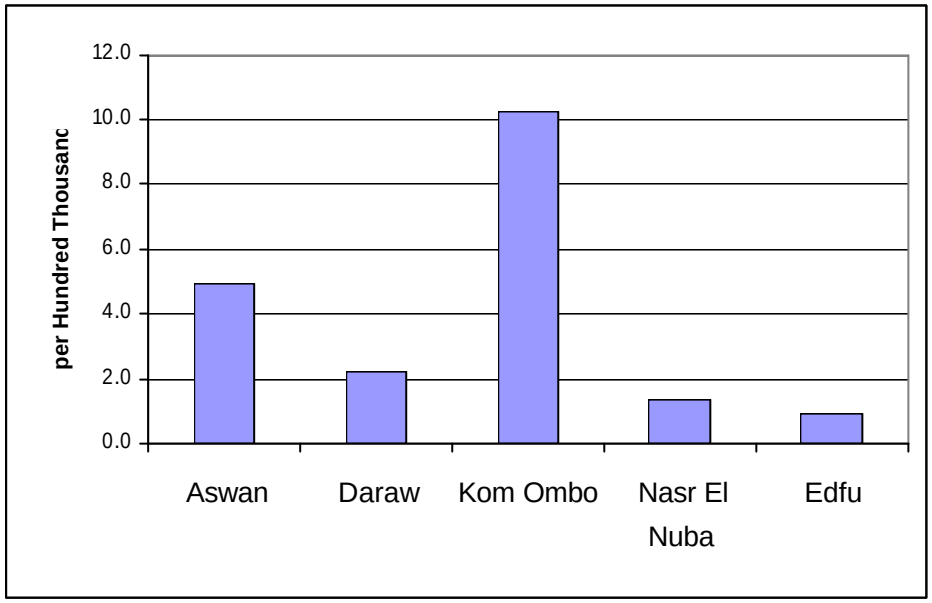


Figure 10.2: Records of Typhoid cases in different markaz in Aswan Governorate 2002. Number of cases per 100,000.

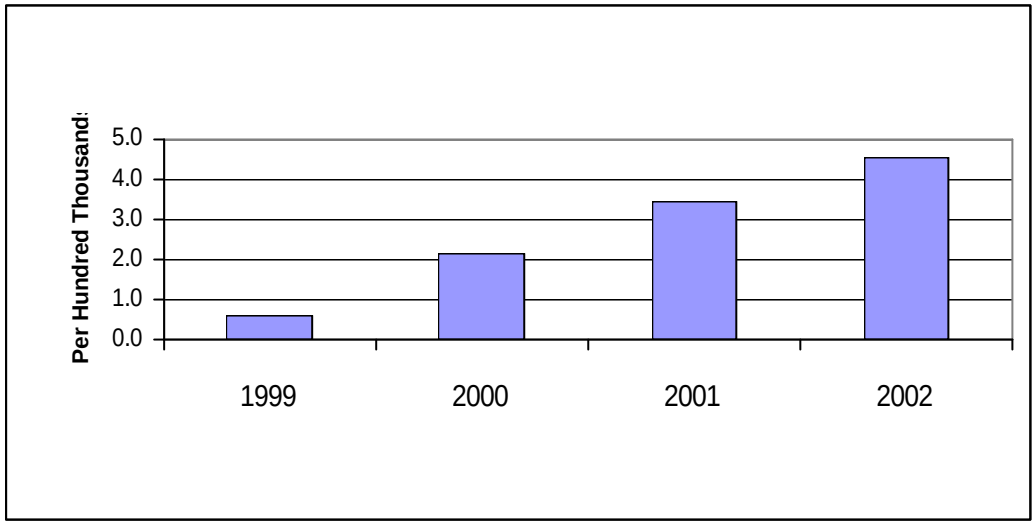
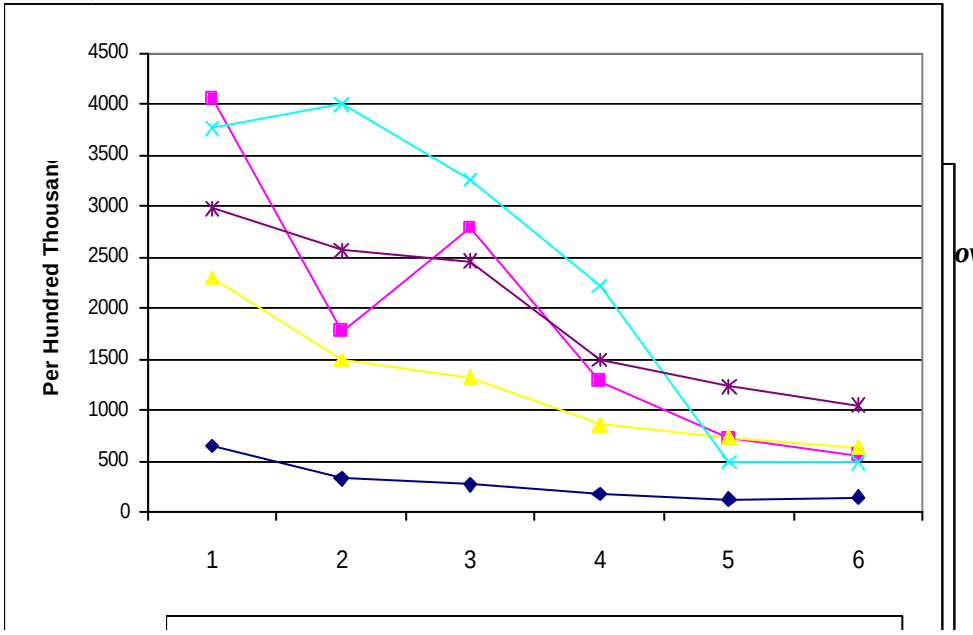


Figure 10.3: Records of Typhoid cases in Aswan Governorate 1999-2002. Number of cases per 100,000.

Schistosomiasis (bilhartziosis) is another relatively common waterborne disease. It is a parasitic disease of tropical and subtropical regions not related to pollution. It is primarily spread by contact with water during bathing, washing etc. The larval stage (cercarida) released by infected aquatic snail penetrates the skin. The most affected area in the governorate is Daraw markaz followed by Nasr El Noba markaz (Figure 10.5)



overnorate 2002. Number of cases per 100,000.

Figure 10.5 Records of Schistosomisis cases in different markaz in Aswan Governorate 1997- 2002. Number of cases per 100,000.

The number of Schistosamiasis cases has decreased significantly during the period 1997- 2002 this is a result of the intensive health programmes carried out by the health authorities, including awareness raising campaigns and better medical treatment (Figure 10.5).

Combating Schistosomiasis has been a priority for the Egyptian Ministry of Health and a number of projects and programmes to combat the disease has been initiated including the WHO supported Schistosomiasis Vaccine Development Project.

Parasites (Other than Schistosoma):

The highest occurrence of parasite infections (other than Schistosomiasis is encountered in Daraw and Edfu markaz. (Figure 10.6) The infection rate has apparently decreased in Nasr El Noba from 1998 to 2002. An increase is seen in Edfu from 2001 to 2002. In all other markaz the infection rate is quite stable in the period 1997-2002 (Figure 10.7).

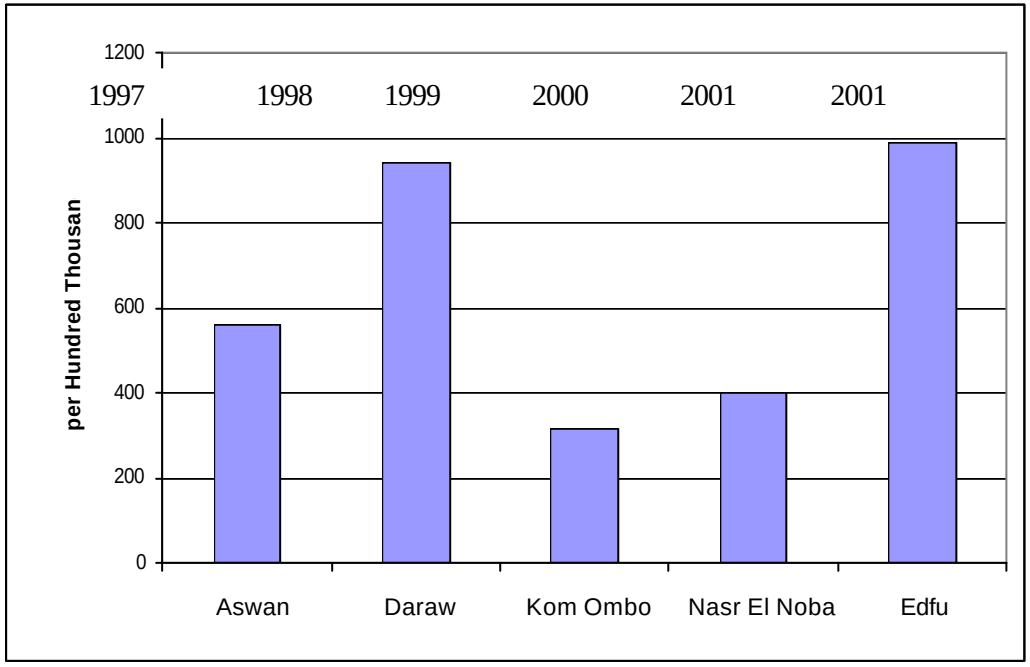
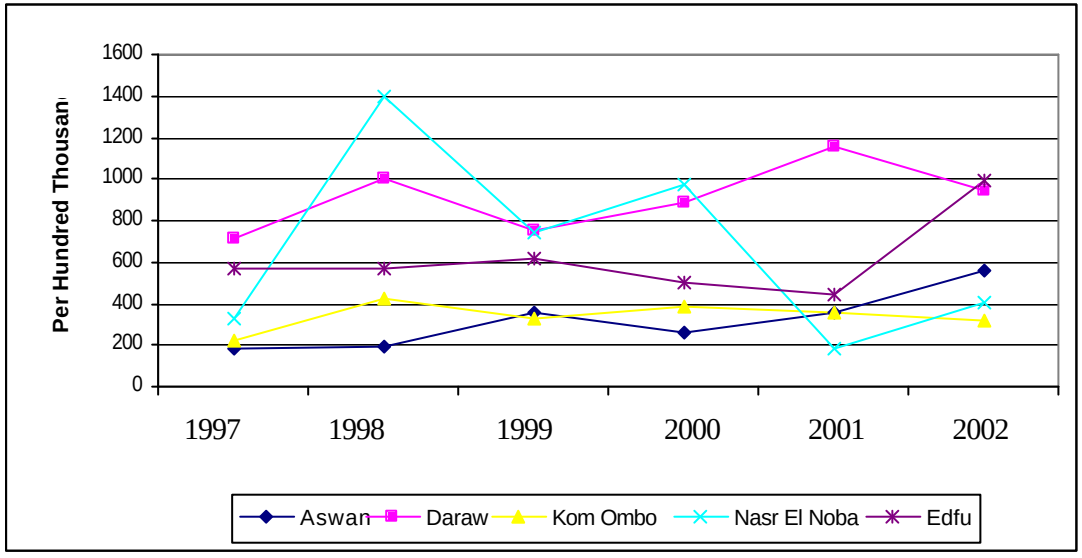


Figure 10.6 Records of cases of parasite infections in different markaz in Aswan Governorate 2002. Number of cases per 100,000.

Figure 10.7 Records of cases of parasite infections in different markaz in Aswan Governorate 1997-2002. Number of cases per 100,000.



10.2 Diseases on Respiratory system

A high percentage of children less than five years old visiting doctors and hospitals have some sort of respiratory disease (28 % for the governorate as a whole). The highest percentages are encountered in Edfu and Kom Ombo, where 55 % and 42 5% of the visits are due to respiratory diseases respectively.

It should be further studied whether the high percentages of respiratory diseases in these markazes are related to the air pollution problems in Edfu and Kom Ombo cities. The percentages of respiratory diseases have increased in recent years (Figure 10.9). The cause of this increase should be studied further. I.e. is it a real increase or due to reporting?

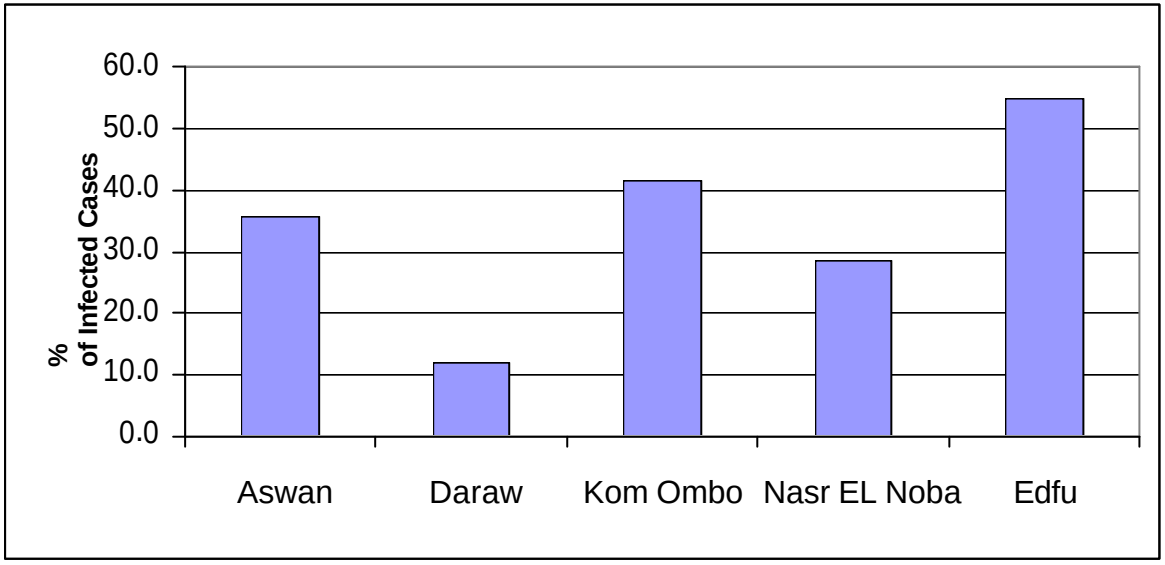


Figure 10.8 Registered cases of respiratory diseases for children less than five years 2002 in different markaz in Aswan Governorate. Percentage of visitors to doctors having respiratory diseases.

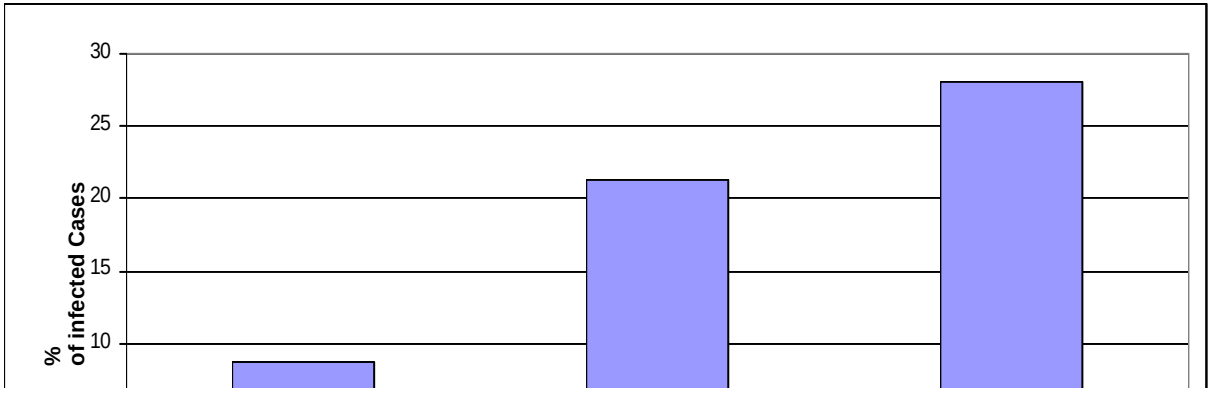


Figure 10.9 Registered cases of respiratory diseases for children less than five years in 2000-2002 in Aswan Governorate. Percentage of visitors to doctors having respiratory diseases.

10.3 Occupational health and safety

The Industrial Safety Department must hold records of labourers' health with regards to; occupation related diseases, light work injuries, heavy work injuries and chronic and ordinary diseases records. With respect hereto information on the occupation diseases has been provided for 3 existing establishments El Naser Mining, Kima Egyptian Chemical Industry and Arab Contractor in Aswan covering the period from 1/1 1996 till 31/12 2001. The number of occupational diseases is nearly nill for Arab Contractor, noticeable for El Naser Mining and highly noticeable for Kima Egyptian Chemical Industry. Particular due to the fact that the reported figures for the last documented year 2001 is as high as 423 for the period 1/1 till 30/6. If it can be assumed that the work force in 2001 was the same as for 2003 the percentage of occupational diseases is as high as 17 %.

Important issues to be improved

The ISD is of the opinion that the following measures should be taken to improve the situation:

1. The penalties given with respect to violation of laws is too weak, both in terms of fine and in the enforcement
2. That Law no 137/year 1981 has many short comings but that these will hopefully soon be compensated for through a new Law of unified labours.
3. In order for the ISD to deal more effectively and train on the issue of hazardous materials and waste management the ISD staff themselves need training.

11. NATURE AND NATURE CONSERVATION

The nature in Aswan Governorate is very beautiful and supports a rich diversity of flora and fauna. The River Nile with its gorgeous rocky cataract Islands, the Nile Valley with its green agricultural land and Lake Nasser are the most significant features of the landscape. The landscape east of the Nile is undulating and rather mountainous desert. In contrast, the desert west of the river is completely flat sand desert with scattered oases such as Kurkur and Dungul.

In Aswan Governorate there is a wide range of different nature types, each with a characteristic flora and fauna. The most significant nature types are: The River Nile, Nile Banks and Nile Islands, The Aswan Reservoir, Lake Nasser, Farmland in the Nile Valley, Gardens, The Desert areas, Wadis of the eastern desert and Oases of the western desert.

There are two protected areas in the Governorate, The Saluga and Ghazal Protected Area and the Wadi al-Allaqi Protected Area. In addition, the Kurkur and Dunqul oases have been proposed as Protected Areas. The existing and proposed protected areas.

12. OTHER ENVIRONMENTAL ISSUES

12.1 Pesticides

As mentioned in section 7.4.3 pesticides may seriously pollute surface and groundwater. Some of the markaz workshops in 2002 mentioned the use of pesticides as a hazard to farm workers. Termites are reported to be a problem in some areas after the use of insecticides was banned.

12.2 Tree planting

Tree planting was repeatedly mentioned as an important issue at the series of markaz workshops. The inhabited parts of Aswan Governorate are quite “green”, but the importance of trees as providers of shade in this climate cannot be underestimated. According to the Environment Law, Article 27, nurseries must be established in each district and in each village. The Aswan EMU has been involved in a number of tree planting schemes. In connection with the Environment Day 2001 18,000 trees were planted, donated by the Ministry of Irrigation, but unfortunately 15,000 of these died within a short time due to lack of care.

12.3 Noise

Noise can also be a severe environmental problem. The major sources of noise are road traffic, manufacturing and handicraft activities, construction work, general neighbourhood noise and social-, cultural- and leisure activities. Noise was mentioned at many of the markaz workshops as a problem , mainly due to very loud music in connection with wedding parties and noise from workshops and small industries.

Noise can be a serious threat to human welfare, due to irritation and stress. Regular exposure to sudden, loud noises during night that disturb the sleep may cause long-term physiological damage, including heart and circulatory disorders. Long term exposure to noise may cause severe damage of hearing.

12.4 Animal waste

The problem of animal manure in streets and unplanned settlements has also been raised at some of the mentioned workshops.

12.5 Problem related to groundwater levels

Since the construction of the High Dam, water level fluctuations in the River Nile has almost ceased to exist. In addition year-round irrigation has resulted in the water table being constantly high and that salts are no longer flushed away. This has resulted in deterioration in crop yield due to water logging and salinity in some areas, and difficulties with disposal of wastewater in others.

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