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ENVIRONMENTAL HEALTH IN EGYPT: A SECTORAL ASSESSMENT AND RECOMMENDATIONS

WASH FIELD REPORT NO. 33

APRIL 1982

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WATER AND SANITATION
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ment Station.

April 19, 1982

Mr. Donald S. Brown
Mission Director
USAID
Cairo, Egypt

Attn: Dr. William D. Oldham, M.P.H., M.D.

Dear Mr. Brown:

On behalf of the WASH Project I am pleased to
provide you with two copies of a report en-
titled Environmental Health In Egypt: A sec-
toral Assessment and Recommendations. This
is the final report by myself and Mr. David
Donaldson resulting from our trip to Egypt in
October - November, 1981.

This report is the result of a request under-
taken by the WASH Project on October 6, 1982
by means of Order of Technical Direction No.
62 authorized by the USAID Office of Health
in Washington.

If you have any questions or comments regard-
ing the findings or recommendations contained
in this report, we will be happy to discuss
them. Additional copies of the report are being
pouched and should arrive shortly.

Sincerely,

Dennis B. Warner

Dennis B. Warner, Ph.D., P.E.
Director
WASH Project

cc: Mr. Victor W.R. Wehman, Jr.
S&T/HEA

WASH FIELD REPORT NO. 33

ARAB REPUBLIC OF EGYPT

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**ENVIRONMENTAL HEALTH IN EGYPT:
A SECTORAL ASSESSMENT AND RECOMMENDATIONS**

Prepared for USAID Mission to the Arab Republic of Egypt
under Order of Technical Direction No. 62

Prepared by:

Dennis B. Warner, Ph.D., P.E.
and
David Donaldson, P.E.

with the assistance of
Joseph Haratani

April 1982

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Washington, DC 20523



EGYPT FACES AN ENVIRONMENTAL HEALTH CRISIS

This young man has had to put down stepping stones through the pool of sewage that is semi-permanently at his front door. Unfortunately, such conditions are all too common and contribute to high infant and child mortality rates in Egypt. These appalling situations call for vigorous measures to upgrade the operational capacity of existing environmental health services, to improve basic sanitation measures (especially in the Governorates), and to strengthen the planning capacity of existing agencies so that minimum acceptable levels of health can be attained as quickly as possible.

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EXECUTIVE SUMMARY

Environmental health conditions in Egypt are poor and are deteriorating. Vigorous multidisciplinary and multiagency steps must be taken to strengthen operational activities, to improve basic sanitation efforts, and to upgrade the sector planning capabilities of the Government of Egypt (GOE) can expect to see conditions deteriorate even further. A few examples, drawn from Chapter 1, illustrate the current situation:

- Only 30 percent of dwellings have water taps in them (60 percent in urban areas and 4 percent in rural areas) and 25 percent of the population has no source of treated water.
- Only 22 percent of the total population (56 percent of the urban) are served by public sewerage or other sanitary waste disposal systems.
- Solid waste disposal is grossly inadequate, in spite of supplementation of scant public services by private entrepreneurs in urban areas.
- Industrial and agricultural chemicals are increasingly polluting the environment, causing deteriorating health conditions which will become more evident and more difficult to reverse as time goes by. (An example is the pollution of the Nile, which will continue to be the major source of drinking water.)

Such environmental health conditions are major factors in the complex pattern which keeps the health status of the Egyptian people at a level significantly lower than those found in other middle-income countries. Egypt's infant diarrheal and infant mortality rates, for example, are characteristic of countries with much lower economic status. The inability of environmental health institutions to cope with the current situation is due, in part, to a rapidly growing population, overloaded physical facilities, inadequate numbers of trained and experienced staff, and poor operation and maintenance of sanitation services.

To improve environmental health conditions in Egypt, it is imperative that the agencies responsible for the provision of

drinking water, excreta disposal, and solid waste collection services become aware that failure to operate and maintain facilities according to minimum standards is contributing directly to the environmental health crisis the country is currently facing.

If conditions are to be improved within a reasonable time all institutions in the environmental health sector (such as the Ministry of Health, the environmental health units at the governorate level, and the various operational organizations providing water supply and sewerage services) must be coordinated to focus on the common objective of achieving and maintaining minimum acceptable levels of environmental health for the general population in the shortest possible time. Once these basic levels are achieved and maintained, the institutions then should refocus their efforts upon their traditional roles. Thus, operational organizations can again give priority to customers willing to pay for desired services, and the Ministry of Health can resume its traditional role of setting standards and monitoring results.

The need for a coordinated approach is evident in the case of basic environmental health interventions. Widespread coverage by minimally acceptable but well-managed potable water supply and wastewater and solid waste disposal services would have major impacts on health status, particularly that of infants and young children who are the primary focus of both the GOE and USAID. In addition, such services would directly improve the quality of life for millions of other Egyptians. On the other hand the continued inadequacy of environmental health services negates many of the health benefits of improved medical services.

Chapter 2 shows that the basic environmental health infrastructure is understaffed, overloaded, and needs to reorient its resources. The existing legal framework is adequate for the immediate future, but it must be vigorously enforced.

In Chapter 3 the environmental health sub-sectors are reviewed. It is concluded that the GOE should give first priority to improving the areas of drinking water, excreta disposal, and solid wastes collection. Efforts also should be strengthened in the areas of housing, occupational health, pesticides, and food hygiene.

Chapter 4 explores institutions, their resources, and the existing laws. It also examines the current "pipeline" of environmental health-related projects in Egypt, which now totals US\$1,400 million in USAID activities and US\$580 million for projects by other donor countries.

Environmental health problems are surveyed in Chapter 5. In general, the present inadequate coverage of both safe drinking water and sanitary disposal of human excreta and solid wastes is attributable to:

- Inadequate coverage by properly operating facilities
- A multitude of organizations and agencies with little intrasectoral coordination
- Insufficient numbers of personnel experienced in public health measures
- Over-aged equipment and physical plants that are both difficult to operate and expensive to maintain
- A lack of basic data for planning purposes
- The absence of a central unit capable of providing leadership under the present crisis conditions

In the areas of occupational health, housing, pesticide use, and food hygiene, an inadequate understanding of the long-term impacts of many hazardous materials currently being introduced into Egypt is holding back development of effective environmental health controls.

The key environmental health problems are identified and further examined in Chapter 6 in order to establish the basis for future strategies in the sector.

Chapter 7 reviews the environmental health strategies currently used by the GOE and USAID. It also sets out a series of considerations for the development of future strategies. In Chapter Eight these concepts are explored as three strategy options:

- (1) No increase over current environmental health efforts.
- (2) The GOE alone expands environmental health efforts using its own funds.
- (3) USAID assists the GOE to strengthen a limited number of priority environmental health areas.

Chapter 9 recommends that USAID adopt a strategy of strengthening existing GOE institutions in the following areas:

- operational activities of existing urban water and sanitation facilities.
- basic sanitation efforts at the governorate level.
- planning capabilities within the operational organizations in the environmental health sector.

In order to assist future USAID efforts in the environmental health sector, Chapter 10 outlines a coordinated package of six programmatic proposals for USAID interventions within the strategy recommended in Chapter 9:

Strategy Element I: Strengthening of operational activities in urban water supply and sewerage facilities.

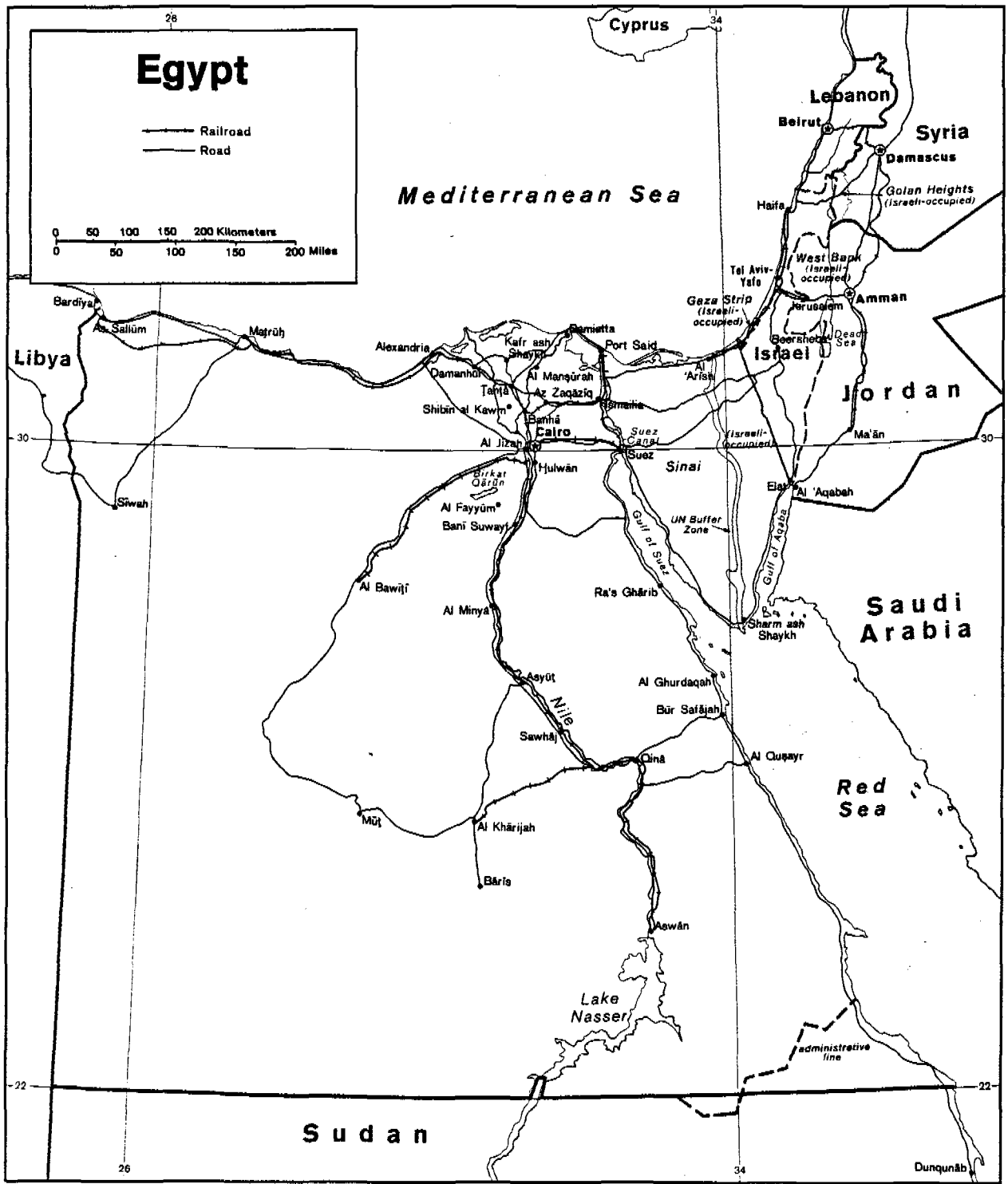
- Recommendation 1: Operational improvement of urban water and sewerage facilities.
- Recommendation 2: Improvement of environmental health operation personnel.

Strategy Element II: Strengthening of basic sanitation efforts at the governorate level.

- Recommendation 3: Environmental Health Priority Improvement Fund for governorates.
- Recommendation 4: Outreach Sanitarian Program.

Strategy Element III: Strengthening the planning capabilities within the Operational Organizations in the environmental health sector.

- Recommendation 5: Improvement of environmental health data base.
- Recommendation 6: Technological transfer of low-cost environmental health technologies.



Chapter 1

INTRODUCTION

For the majority of the population of Egypt environmental health conditions are poor and are deteriorating at an ever increasing rate. A rapidly growing population, overloaded physical facilities, inadequate numbers of trained and experienced staff, poor operation and maintenance as well as inappropriate infrastructures are hindering improvements in this area.

Currently, environmental services are insufficient in number or character to reasonably expect them to effect the changes that are needed to obtain and maintain even the most minimal levels of health over the long term.

To improve this situation, the Government of Egypt (GOE) is planning a series of projects. While the first focus of this effort has been in the drinking water and sewerage sectors, many tens of millions of dollars and many projects in the other environmental health areas will be required before Egypt will be able to develop a critical mass of interventions and human resources that will allow a self-sustaining long-term multidisciplinary environmental health program.

As part of its overall health strategy assessment, the USAID Mission in Egypt asked the WASH Project to review the current coverages, resources, activities and infrastructure as they relate to other health activities.

Based on interviews with numerous Egyptian health and public sector officials, extensive conversations with current and former USAID officials, field trips and a review of over 100 field reports and documents, the WASH Team Project Director, Dennis Warner, Ph.D., P.E. and Associate Director, David Donaldson, P.E. developed the report that follows. As it quickly became evident that many of the issues involved had implications that involved agencies outside the Ministry of Health (MOH) special efforts were made to visit those agencies that had operational functions in the environmental health area (such as the National Organization for Potable Water and Sanitary Drainage--NOPWASD, and General Organization for Greater Cairo Water Supply--GOGCWS) and supportive roles (such as WHO and UNICEF). In this manner, they were able to assess Egypt's efforts at developing an active, effective and integrated environmental health system that could set standards, operate facilities to meet them, evaluate results, and take corrective action.

Guidelines for the Team's effort were discussed with the USAID/Egypt Mission Director, Donald S. Brown and his staff.

Throughout the Team's field visit, efforts were coordinated with and supported by the Mission's Office of Health and Dr. William Oldham, its director. Many thanks go to him and his staff for the assistance and guidance they so freely provided.

The report that follows presents a summary of the environmental health data that were found and the strategies that are being followed and/or proposed. Based on these, a series of recommendations are made for the consideration of the USAID/Egypt Mission. The recommendations comprise an integrated package of interventions through which USAID could assist the GOE to strengthen its activities in the broad multidisciplinary area of environmental health.

Chapter 2

ENVIRONMENTAL HEALTH IN EGYPT

2.1 Overview

Environmental health activities are usually considered to be a series of interventions designed to prevent the deterioration of those places where people live and work. Traditionally these interventions have included potable water supply, wastewater and excreta disposal, solid waste disposal, industrial waste disposal, adequate housing, occupational health measures, food hygiene, and vector control.

As environmental health conditions in Egypt are highly dynamic, with new and often adverse impacts encountered at an ever increasing rate, the national desire to industrialize and improve the quality of life is sorely straining the limited resources of Egyptian institutions. It is increasingly clear that conventional solutions and strategies are inadequate to meet current and future problems.

In seeking to resolve environmental health problems in Egypt, a number of crucial factors must be considered:

- Population densities in urban and rural Egypt are among the highest in the world--up to 3,900 persons per square mile (5.40).*
- Trained manpower is insufficient and often is poorly located in regard to problem areas.
- Salary levels in government agencies are often so low that these institutions are unable to attract and hold experienced staff.
- The primary source of drinking water for Egypt will continue to be the Nile River with groundwater being a secondary source.
- Sewage and industrial wastes will continue to be disposed of in drainage canals for the foreseeable future.

Egyptian cities are growing at rates which exceed their ability to provide basic services. Because Egypt is becoming highly urbanized the country is unable to provide even the most basic services for much of its population. Rapidly expanding industrial and agrobusiness activities are affecting

* See Appendix E for references which are numbered and in parentheses in the text.

ever increasing numbers of people and their activities. In the villages there is a desperate need for effective, maintainable, low-cost interventions to improve conditions that now cause excessively high infant and maternal mortality rates. (2.3)

In examining environmental health problems and potential corrective actions in Egypt, it is evident that the traditional public works areas of drinking water and wastewater, excreta, and solid wastes disposal are of primary importance in reducing and controlling the most critical problems of infant mortality and child diarrhea.

This report examines various elements of current environmental health conditions in Egypt and presents overviews of each of the traditional environmental health areas. This is followed by a discussion of the needs of Egypt in the environmental health sector. Finally, the report presents recommendations for USAID interventions to assist the GOE in taking corrective actions. Before this, however, it will be necessary to look at several aspects of Egypt and its institutions which affect conditions in the health sector.

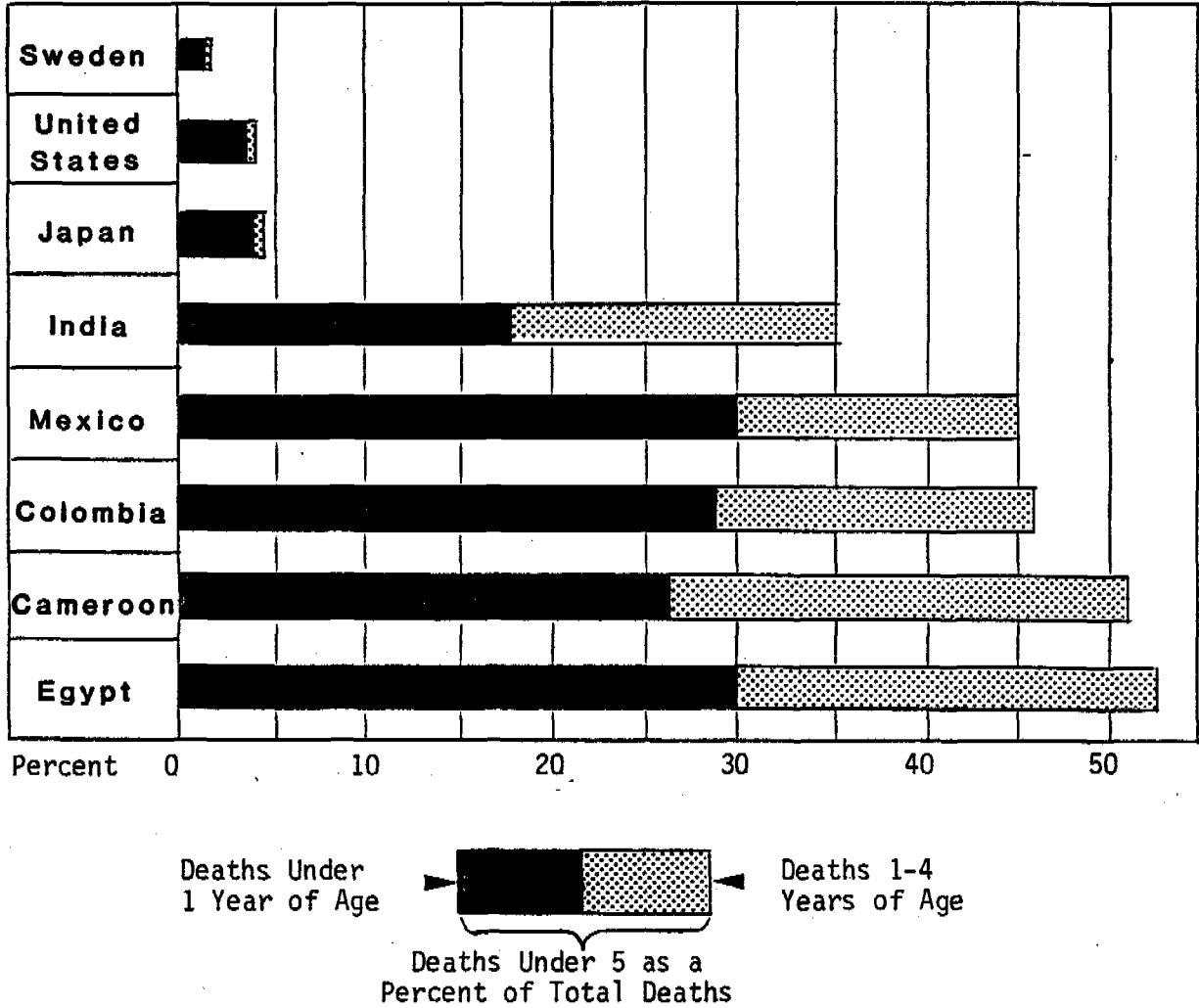
2.2 Health Status Indicators

Life expectancy at birth in Egypt is now about 55 years for females and 52 years for males (2.3). Approximately 43 percent of the population is under 15 years of age. Literacy is about 44 percent among the over 10 years age group. Mortality rates are slightly below the average for all North African countries (which, as a group, have a rate which is considerably higher than East Asia and most of Latin America), slightly lower than Southeast Asia, and much lower than the rest of Africa. Infant mortality is officially estimated to be about 116 per 1,000 live births. Infant deaths are generally believed to be underreported and the actual ratio is estimated to be as high as 180 per 1,000 live births in some areas (2.3). These rates are higher than would be expected, given the high level of health services found in Egypt compared to other countries. The high rates can be attributed mainly to the prevalence of gastrointestinal diseases resulting from poor sanitation conditions throughout the country. The deaths of children under five comprise about 50 percent of total deaths in the population, one of the highest proportions in the world, as shown in Figure 1 which, although dated, still reflects current conditions.

Maternal mortality is about one death per 1,000 births, roughly 15 times the rate in the United States (2.3). Infection and toxemia are reported to be among the three leading causes of maternal deaths. It should be noted that there are great statistical differences between urban and rural areas and between governorates. Life expectancies in

FIGURE 1

Deaths of Infants Under One Year of Age and of Children Under Five as a Percentage of Total Deaths



Source: Prepared by the Population Reference Bureau from data contained in the United Nations Demographic Yearbook, 1971 (New York, 1972), Population Bulletin, Vol. 29, No.1, 1974, p. 5. Permission for reproduction obtained from editor.

the urban governorates of Lower Egypt are almost identical. In rural Upper Egypt they average about 11 years less.

Recent dietary studies show that the average diet of low-income, nutritionally vulnerable groups, which include children under five and pregnant and lactating women, provided only about 76 percent of the recommended caloric allowances. In addition, the average amount of protein in these diets was below recommended allowances and only 11 percent of protein intake was from animal sources. Although vitamin deficiency syndromes are not commonly reported, about half of the rural farm laborers apparently suffer from secondary anemia because of heavy iron losses as the result of schistosomiasis and hookworm infections (2.3).

While reliable data are difficult to obtain, a recent study by the U.S. National Academy of Sciences summarized the situation regarding infectious diseases and their complications which are the major factors in infant and preschool mortality and one of the leading causes of illness in the adult population (see Appendix C). Diseases related to inadequate and unsafe water supply and poor sanitation are widespread in Egypt. More than half the reported infant deaths in poor or rural areas result from diarrhea. Typhoid, paratyphoid, and hepatitis are endemic. A serious water-related health problem in Egypt is schistosomiasis (bilharzia), which is estimated to afflict 30 to 50 percent of the population. Contact with canal or untreated Nile water is the primary source of infection. In addition, amebiasis is common throughout the country. Further, the lack of adequate water supplies has encouraged the use of unsafe sources of water for drinking, personal hygiene, and the washing of foodstuffs.

2.3 Impact of Disease

Reviews of Egyptian environmental health conditions and the principal diseases afflicting the population reveal the drain upon productivity and economic development wrought by diseases. This confirms the logic of the Egyptian health planners in giving priority to bringing the most debilitating diseases under control. Gastrointestinal diseases including intestinal parasites, diarrhea, and dysentery are endemic and have been only partially reduced by the best efforts of the Ministry of Health. Diseases of infancy and childhood, infantile diarrhea, mumps, whooping cough, chickenpox, and measles, also are endemic, and some of them appear in epidemics in various parts of the country. Typhoid has recently been reduced, but malaria, trachoma and tuberculosis remain widespread. Other bacterial and parasitic diseases are also widespread although not in endemic proportions. In common with industrial societies, the Egyptian populace is increasingly afflicted with the degenerative illnesses of cardiovascular diseases and cancer (2.3).

2.4 Population

Any review of the development needs of Egypt must consider the influence of population densities, growth rates, and available land. In 1978, the population of Egypt was 38.2 million, including an estimated 1.4 million living abroad at the time. The average annual growth rate for the period 1966-1976 was 2.3 percent. While this is slightly lower than the rate of growth for 1960 to 1966 (2.5 percent), it is still a very high figure (1.20). The population of Egypt is concentrated in the Nile valley and the Nile delta which together comprise less than four percent of the land area of the country. The average population density of this area is about 1,500 people per square kilometer, one of the highest in the world (5.40). Population densities rise even more dramatically in the cities; one area of Cairo (Ard-El Gameya) has 160,000 people per square kilometers.

In 1976, 44 percent of the population lived in the urban areas compared to 40.5 percent in 1966 and 37.5 percent in 1960. Thus, an ever-larger proportion of the growing Egyptian population lives in towns and cities. Compared to other countries at comparable stages of development and per capita income (US\$280 in 1978), Egypt is heavily urbanized.

Greater Cairo, which includes the Governorate of Cairo, the cities of Giza and Embaba in Giza Governorate, and the city of Shaubra El Kheima in the Qalyubia Governorate, now has about half the urban population of the country and is growing at a rate of about 4 percent per year. The overall population of Egypt is growing about 2.3 percent per year, but the urban areas are growing at a 3.6 percent annual rate. In 1977, the World Bank estimated that about 31 percent of the urban population (5.3 million persons) had incomes below the urban poverty threshold of 383 Egyptian Pounds (LE) (US \$547) per household per year (5.41).

2.5 Population and Labor Pressures

One of the most striking effects of rapid urban and rural population growth in Egypt is the growing pressure on the limited amounts of cultivatable lands. The population per square kilometer of cultivated land increased from about 500 in the early 1900's to around 1,400 in 1976. (Similar figures for other countries are 57 in Libya, 48 in Sudan, 75 in Tunisia, and 165 in Jordan.) At the same time, an increased use of technology in agriculture has reduced the demand for labor in the rural areas, thus contributing to an exodus from the villages to the cities. While most of the growth of the two largest cities (Cairo and Alexandria) has taken place on

non-agricultural lands, there are conflicts between the need to expand urban areas and the need to preserve cultivatable lands. The poor prospects for employment in agriculture are forcing a growing rural population to look largely to the urban industrial areas for jobs.

The population and agricultural problems are closely related to human resource development. Although the pressure of a rapidly growing labor force can be relieved by labor export in the short run, it is questionable whether other countries will continue to accept unlimited numbers of Egyptian workers.

2.6 Administrative Organization

Egypt is administratively divided into 26 governorates with the largest urban populations in Cairo, Giza, Alexandria, Port Said, Suez, and Ismailia Governorates. The Ministry of Local Government is responsible for developing and supervising the local government institutions. In 1979, Law No. 43/1979 increased the budgeting and financial powers of the governorates and allowed them to prepare their own economic plans. A governorate is headed by a Governor who holds the rank of minister and is appointed by the President of the Republic. Governors are directly accountable to the President. Each governorate has a locally elected council, and most are further organized into district, town, and village councils. The councils are subordinate to the Governor. While Cairo Governorate has no town or village councils, it has a local council and eleven district councils. The two other governorates of Greater Cairo (Giza and Qalyubia) have local, town, and village councils. Alexandria Governorate has a local council and four district councils. Asyut Governorate in Upper Egypt has local, town, and village councils.

The governorates control and supervise all local activities and also oversee central government organizations operating in their administrative area. Thus, planning, design and execution of urban development projects are governorate responsibilities. To fulfill these functions, each governorate has a number of technical departments, usually called directorates, which are the extension of the central government at the local level. (For example, there are environmental health units in each governorate and sanitarians in the health centers).

The governorates and the local government bodies look to the central government for technical support and back-up for their efforts. Often these requests are directed to the Ministry of Housing and Reconstruction (MHR) and the Ministry of Reconstruction and New Communities (MORNC). These Ministries are responsible for the provision of housing and most infrastructure services, as well as for the reconstruction effort following the recent wars. Up until the establishment of the Na-

tional Organization for Potable Water and Sanitary Drainage (NOPWASD) in 1981, MHR shared with the governorates the control over the general organizations, such as the General Organization of Potable Water (GOPW) and the General Organization for Sewerage and Sanitary Drainage (GOSSD). MORNC has overall responsibility for the General Organization for Physical Planning (GOPP), which is entrusted with drawing up regional development plans and assisting local governments in developing master plans, designing urban development projects, and establishing building codes.

Eight economic regions and regional planning councils were established in 1977. Their main purpose is to help set priorities for allocation of central and local government resources and to develop social and economic development policies at the regional level. As part of the devolution process, in January 1978, the governorates took full control over all local technical and administrative staff, including those appointed by the ministries.

2.7 Health Care Delivery Systems

The curative health delivery system of Egypt is defined by the Ministry of Health (MOH) as a pyramid that encompasses four levels of services: village health units (which provide both basic curative and preventive services), district health centers, general hospitals, and university hospitals. While in theory a referral system governs the passage from one level to the next, in actual practice, the referral concept tends to be rather ineffective.

The preventive health delivery system consists of the Environmental Health Department in the MOH. This unit develops standards and criteria for environmental health activities, monitors results, and works with the local authorities on corrective actions.

There are about 3,000 health units throughout the country with over 75 percent of them located in rural areas. This results in a coverage of approximately one health facility per 9,000 persons, or about one per 1.8 villages. Although utilization of health services has increased, it still remains below the level envisaged by the ministry. It is estimated, for example, that 80 percent of the births that take place in rural areas are not attended by a trained health worker. The overall health care network is characterized by a fragmentation of services, i.e., the user must visit several facilities to receive different services. In rural areas, the MOH is seeking to make services both more accessible and culturally acceptable. In urban localities, it is trying to establish health centers which will offer a full range of primary care and environmental health services.

In contrast to most developing countries, Egypt enjoys a favorable ratio of health professionals to population, with approximately one physician per 1,500 population on a national basis. There is, however, a marked concentration of physicians in the Cairo and Alexandria areas. The training of health personnel has undergone rapid expansion in recent years. More than 3,500 doctors were graduated in 1976, compared with 1,695 in 1970. The number of nursing graduates also doubled during the same period. In addition, increased numbers of sanitarians were produced. Enrollments for sanitary engineers, however, have not increased correspondingly.

In reviewing the health care delivery system in 1981, the World Bank questioned "why gains on the health front have not been more extensive, given the density of health facilities and supply of medical manpower" (1.20). They found that infant mortality still remained high, especially in Upper Egypt, and that gastroenteric diseases still exacted a heavy toll among all age groups. The Bank concluded that there was "some deficiency in the qualitative aspect that has resulted in underutilization of available health services" and that "insufficient attention has been given to the question of environmental sanitation."

2.8 Responsibility for Environmental Services

Until 1951, responsibility for sanitation services was lodged within the Ministry of Health (MOH). In 1951 a Ministry of Housing and Public Utility (MHPU) was created and given responsibility for housing, public works, sewerage works, and the licensing of ships and other forms of institutions which require inspection. Committees were established in the central administration and at the provincial level to coordinate this work between the Ministry of Health (MOH) and Ministry of Housing and Reconstruction (MHR).

As a result of this coordinated effort, there is now a division of labor between the two ministries. The MOH has the role of setting standards for water purity and sewerage effluents and providing technical guidance for sanitary facilities. The actual construction of improved housing, water works and sewerage disposal plants, however, is the responsibility of the MHR.

Chapter 3

ENVIRONMENTAL HEALTH SUB-SECTORS

3.1 Description of the Sector

In the following sections the current coverage and associated interventions within the environmental health sector are described. While the intent of these interventions is to improve and/or maintain a healthy living and working environment for people, some activities have more immediate impact than others. For this reason, potable water supplies and wastewater, and excreta disposal, as well as solid waste disposal, are considered areas of primary concern and will be discussed first. Next, the areas of housing, occupational health, pesticides, and food hygiene will be discussed as support areas.

3.2 Primary Areas

3.2.1 Drinking Water

Although it appears that drinking water supplies from the Nile River and from groundwater in the Delta are sufficient to support the current and future needs of Egypt (5.1), the provision of adequate quantities of safe drinking water is a goal yet to be reached in much of the country. The overriding factor in water supply is the extreme dependence of Egypt on the Nile (both its surface and underground flow). For this reason, the question of the future bacteriological and chemical quality of drinking waters is inexorably linked to actions that will be taken to control domestic, industrial, and agricultural wastewaters.

There are wide variations in levels of service and geographical coverage. Table 1 shows that over one-fourth of the population of Egypt does not have a source of treated water and that only 30 percent of the population have water piped inside the dwelling. Although few data are available on the reliability of the systems, the 1980 Binnie and Taylor study on provincial water supplies reported that "many consumers do not receive a full 24 hour supply" (1.29).

Table 2 shows that the distribution of water supplies is quite uneven. From this it can be estimated that Cairo and Alexandria, which comprise 26 percent of the total population, receive 65 percent of the total production. The remaining urban population accounts for only 25 percent of the treated water produced. On the other hand, the rural population, which makes up about 58 percent of the total, receives only 8 percent of the water produced. Studies show that about 40 percent of the water is lost before it reaches the consumer.

TABLE 1. ACCESS TO DRINKING WATER SUPPLY IN EGYPT (1976).

TYPE OF HOUSEHOLD ACCESS	URBAN	RURAL	OVERALL
1. Tap inside dwellings	60.6%	3.7%	30.2%
2. Tap in building but not in dwelling	8.6%	1.8%	4.9%
3. Source outside building	18.5%	58.2%	39.7%
4. No source of treated water	12.3%	36.3%	25.2%

Source: Reference 1.30

TABLE 2. WATER PRODUCTION AND NET WATER SUPPLY IN EGYPT (1976).

POPULATION	POPULATION (000)	WATER PRODUCTION (000) m ³ /d	NET SUPPLY (000) m ³ /d	L.C.D.*
Greater Cairo	7,500	1,750	1,050	140
Alexandria	2,500	625	375	150
Large cities	3,400	358	215	63
Towns	2,800	567	340	121
Rural	22,300	306	184	8
Total	38,500	3,606	2,164	56

*L.C.D. - Liters per capita per day

Source: Reference 1.30

From a health standpoint, it is clear that authorities should strive to provide "adequate quantities of safe water." Officials in Egypt have defined adequate quantities as being between 80-120 liters per capita per day (lpcd) for rural areas and 150-200 lpcd for urban areas (1.30). Table 2 shows that the per capita quantities provided in 1976 varied from 140 lpcd in the major cities to only 8 lpcd in the rural areas. It can be seen from these figures that there are wide variations between urban and rural systems and between provinces (see also Table 3).

An examination of the drinking water sector leads to the conclusion that the situation is improving in urban areas, but water facilities (1) are generally inadequate for the existing population, (2) are much better operated and have better coverage than rural systems but generally remain inadequate in quality, quantity, reliability, and accessibility, (3) provide intermittent supplies with high rates of unaccounted-for-water (20 to 40 percent), and (4) have inadequate distribution systems in some areas where new water treatment plants have been built.

In general, it can be estimated that 85 to 90 percent of the people in provincial Egypt live within areas served by some type of public or industrial water supply. At least 50 percent of this population obtain some or all of their water from rivers, canals, open wells, or handpumps, all of which are subject to pollution.

Outside the major cities one finds three basic types of public water supplies: road tankers, public standpipes, and individual household connections. Road tankers are widely used in the frontier governorates by both urban and rural consumers. Where public water supplies exist in rural areas public standposts are generally used as less than five percent of rural consumers have individual water supply connections. About half of all consumers in provincial areas rely on public standpipes or private sources, and half have individual water supply connections (1.29).

3.2.2 Wastewater and Excreta Disposal

At a national workshop on Development of Drinking Water Supply and Sanitation Programmes, held in Alexandria in February 1981, it was estimated (1.30) that only 19 out of more than 160 cities in Egypt are served by a sewage disposal system. Of the sewage collected (see Table 4), about one-fifth receives secondary treatment, another one-fifth receives only primary treatment, and the remaining three-fifths are disposed of in a raw state, making an overall efficiency of 25 percent. This means that only about 22 percent of the total population (56 percent of the urban) are served by public sewerage or other systems. There are 13 additional towns that have drainage

TABLE 3. DISTRIBUTION OF POPULATION HAVING HOUSE CONNECTIONS OR PUBLIC WATER STANDPOSTS IN FOUR SELECTED PROVINCES.

PROVINCE	WITH CONNECTION		NO. POP. PER WATER STANDPOST	
	Urban	Rural	Urban	Rural
Cairo	75%	N.A.	11,000	N.A.
Qalyubia	50%	20%	850	4,500
Damietta	72%	23%	2,000	1,400
Kena	55%	8%	4,500	2,000

Source: Reference 1.30

TABLE 4. EXISTING SEWAGE TREATMENT SYSTEMS AND POPULATION SERVED
(1976)

CITIES	NO. POPULATION (000'S)			TYPE OF RECIPIENT WATER COURSE
	Total	Served	% Served	
Greater Cairo	7,500	4,800	64	Drains, Farm
Alexandria	2,500	1,300	52	Sea, Lake
Port Said	300	195	65	Lake
Ismailia	170	85	50	Drain
Suez	150	75	50	Bay
Zagazig	190	57	30	Drain
Mansura	300	180	60	Drain
Damietta	100	30	30	Lake
Kafr El Sheikh	100	30	30	Drain
Mahalla	300	90	30	Drain
Tanta	350	105	30	Drain
Kafr El Ziat	100	30	30	Drain
Damanhour	200	150	75	Drain
Sh. el-Kom	100	30	30	Drain
Benha	100	30	30	Drain
Fayum	150	45	30	Drain
Beni Suef	120	18	15	Drain
Minia	150	45	30	Drain
Asyut	200	60	30	Drain
Total Urban	13,080	7,280	56	---

Source: Reference 1.30

systems that carry sewage but have no treatment. Conditions regarding industrial wastewater are still worse, as there is rarely any treatment of wastewater effluents before disposal.

Although Cairo and Alexandria are the best served cities (with systems nominally serving about two-thirds and one-half of their populations respectively), little data are available on the extent of alternative waste disposal systems, such as septic tanks, in these areas.

It is estimated that no more than five percent of the rural population have access to sanitary waste disposal facilities (latrines, sewer systems, etc.).

3.2.3 Solid Wastes

Limited field observations confirm that current practices for refuse collection and street sweeping do little to upgrade the public health environment of the community. In most urban areas public garbage collection and disposal services do, in fact, exist but are usually totally inadequate. Street sweeping and debris removal is the responsibility of the municipal authorities, who usually have limited amounts of funds, personnel, and equipment. This has resulted in a unique Egyptian institution. In Cairo and Alexandria, for example, house-to-house collection is left to private contractors, the Zabbaleen, who pay a fee to middlemen for the right to collect wastes from designated buildings. While the Zabbaleen of Cairo and Alexandria have been extensively studied, little is known of the organization and resources employed for solid wastes collection and disposal in other communities. Street cleaning is the responsibility of the municipality which often has large numbers of workers but limited numbers of trucks and carts. As a result, solid wastes collection is available for those who can pay, street sweeping is generally deficient, and overall solid wastes collection and disposal remains a public health problem.

In the rural villages, garbage and solid wastes collection is not as high a priority as water supply and excreta disposal because the Egyptian villager has traditionally produced few waste materials. An example of limited services in the village of Beni Adi in Asyut Governorate was reported by Metametrics in 1981 (5.2). Of 11 sweepers provided by the village council, five cleaned the major streets, three cleaned the village council building, one had responsibilities mainly for mosques, and two were assigned to clean up after the open market. The sweepers used several old donkey carts owned by the council. The collected garbage was dumped outside the city, generally along the sides of the main road, where it was periodically burned. There were no trash collectors for the six other villages served by the village council.

3.3 Environmental Health Support Areas

3.3.1 Housing

Urban health conditions in Egypt are deteriorating rapidly as the result of the generally uncontrolled urban growth process. The full impact of numerous new construction activities and the development of new cities is yet to be felt. While the situation is most acute in the major cities, there is an urgent need for expansion, as well as upgrading, of housing throughout Egypt.

3.3.2 Occupational Health

There are an estimated 9,500,000 persons in the Egyptian work force. Of these, 44 percent work in agriculture, 15 percent in service industries, 13 percent in manufacturing, 6 percent in commerce, 4 percent in transport, 3 percent in construction, 0.5 percent in public works, and 0.2 percent in mining and quarrying (2.3).

3.3.3 Pesticides

The annual consumption of pesticides has grown from 16,924 metric tons in 1966 to 30,000 metric tons in 1980. In 1980, the cost of pesticides amounted to about US\$100 million. According to reports, the incidence of acute pesticide poisoning generally increased every year until 1977 when many preventive measures were introduced (see Table 5).

The continuing seriousness of the pesticides problem was shown in a recent study (2.1) which reported that pesticide levels on food crops were many times higher than the maximum permissible level, as defined by the joint FAO/WHO food standard program, Codex Alimentarius Commission.

In its report on the Egyptian health sector, the U.S. National Academy of Sciences reported the following:

"A recent sample survey of agricultural workers indicated that almost all had some evidence of chronic pesticide poisoning. This is not surprising considering the wide use of pesticides and handling methods. Pesticides are purchased by the Ministry of Agriculture with minimal medical consultation. For several successive years, mass poisonings have occurred when a more toxic chemical has been introduced, examples being carbonate one year and organic phosphate another. The pesticides are applied by hand and few handling precautions are taken. Physicians assigned to rural health care receive no specific training in pesticide poisoning recognition or management. If recognized,

TABLE 5. INCIDENCE OF ACUTE PESTICIDE POISONING IN EGYPT
(1966-1980).

Year	No. of Reported Deaths	No. of Reported Deaths	Total	C.F.R.*
1966	1,091	44	1,135	4.0
1967	1,270	34	1,304	2.6
1968	1,608	35	1,643	2.2
1969	1,389	44	1,433	3.1
1971	741	21	762	2.8
1972	1,309	44	1,353	3.4
1973	493	2	495	0.4
1974	1,951	33	1,984	1.6
1975	967	4	971	0.4
1976	510	24	534	4.7
1977	2,671	69	2,740	2.6
1978	1,383	24	1,407	1.7
1979	1,062	30	1,092	2.9
1980	550	36	586	6.0

* Case Fatality Rate

Source: Reference 2.1

it rarely is reported. No routine surveillance of agricultural workers is carried out" (2.3).

3.3.4 Food

In general, the Egyptian population consumes adequate quantities of food, although differences exist between rural and urban areas. In 1979, the U.S. National Academy of Science summarized the nutritional levels as follows:

"[The] average per capita daily consumption is nearly 3,122 calories, 11.1 percent of which comes from proteins. Approximately 85 percent of the average daily protein consumption of 86.7 grams comes from plant sources. Actual food consumption patterns in Egypt are to a considerable extent determined by a family's location (rural or urban) and its income. Although food supplies are unequally distributed between urban and rural areas and among different income groups, limited surveys indicate that Egyptian adults are generally adequately fed, although many show some deficit in stature resulting from undernutrition in early childhood".

The report concluded that Egyptian children who obtain the bulk of their food from cereal grains "are unlikely to consume enough calories and protein for optimal growth" (2.3).

Chapter 4

ENVIRONMENTAL HEALTH RESOURCES

4.1 Sector Institutions

In general, the responsibility for the planning, design, construction, and financing of public utilities, including water and sanitation facilities, rests with the central government. Operations and maintenance, however, are the responsibility of the local authorities, which includes governorates, city councils, and village councils.

The main governmental organization in the development of water supply and sewerage systems is the Ministry of Housing and Reconstruction (MHR). Contained within it are the following agencies:

1. National Organization for Potable Water and Sanitary Drainage (NOPWASD) - responsible for the planning, design, and construction of water supply and sewerage facilities throughout Egypt with the exception of Cairo, Alexandria, and the Suez Canal cities. Operation and maintenance of systems are the responsibility of the local authorities.
2. General Organization for Greater Cairo Water Supply (GOGCWS) - responsible for the planning, design, construction, operation, and maintenance of water supply facilities in the Cairo metropolitan area.
3. General Organization for Sanitary Drainage in Cairo (GOSD/C) - responsible for the planning, design, construction, operation, and maintenance of sewerage facilities in metropolitan Cairo.
4. General Organization for Greater Alexandria Water Supply (GOGAWS) - similar to GOGCWS in Cairo.
5. General Organization for Sanitary Drainage in Alexandria (GOSD/A) - similar to GOSD/C in Cairo.
6. Suez Canal Authority (SCA) - responsible for the reconstruction, operation, and maintenance of most infrastructure facilities in the cities of Port Said, Ismailia, and Port Suez.

All of the above organizations are the result of a restructuring of the water and sewerage sub-sectors over the last two years. Prior to 1980, water supply responsibilities were divided between a single national organization and numerous local authorities plus separate organizations in Cairo, Alexandria, and the Suez Canal zone. Sewerage responsibilities, on

the other hand, were split between a single national organization and the local authorities. The reorganization of the sub-sector was caused by the need to strengthen the management and operational practices of the institutions delivering water and sewerage services and to make these institutions capable of handling the great increase in capital development that has occurred in the last three to four years. Because this reorganization is not yet completed, some of the institutions described above are not fully operational in terms of personnel, facilities, and defined areas of responsibilities. NOPWASD, for example, was established only in August 1981 and has not yet developed an organizational structure beyond a small headquarters staff.

The Ministry of Health (MOH) is the most important institution in Egypt in terms of defined environmental health responsibilities. By law, it is charged with setting water and wastewater standards, monitoring all water and sewerage facilities, collecting samples, performing laboratory analyses, and providing advisory services to the local authorities. The Ministry has almost no enforcement powers, however, and control of environmental health activities normally rests with the governorates.

Until 1951 responsibility for sanitation services was lodged with the Ministry of Health. In 1951, a Ministry of Housing and Public Utilities (later called Ministry of Housing and Reconstruction) was created and given responsibility for housing, public works, sewerage works, and the licensing of ships and other forms of institutions which require inspection. A committee was established in the central administration and at the provincial level to coordinate this work between the Ministry of Health (MOH) and Ministry of Housing and Reconstruction (MHR).

Although in theory the MOH sets environmental health standards, monitors associated conditions, and advises the operating agencies, a lack of motivated and trained staff, appropriate equipment, and timely financial resources makes it difficult for these regulatory functions to be properly carried out. Similarly shortages of trained personnel and equipment that can be maintained locally cause the operating agencies to have great difficulty in operating and maintaining existing water supply, wastewater and solid wastes collection systems. Thus, the balanced interministerial effort needed to protect and improve environmental health conditions does not occur except in the most minimal way.

Within the MOH, most environmental activities are carried out by the Department of Environmental Health which has Divisions of Water Quality Control, Wastewater Control, and General Sanitation. The Department provides overall advisory services to the governorates in the areas of water supplies, wastewater, solid wastes management, and food handling. A smaller Depart-

ment of Occupational and Industrial Hygiene and Air Pollution Control investigates occupational safety and air pollution problems, although most occupational health inspections are carried out by the Ministry of Manpower and Training. Other activities are carried out by the Department of Vector Control and the Department of Food Control and Nutrition.

Undergraduate training in engineering (but not public health or sanitary engineering) is given at universities in Cairo, Ayn Shams, and Asyut. While there are no technical colleges or institutes for technician training in water supplies and sanitation, there are some trade schools for the training of skilled workers (plumbers, mechanics, etc). In addition, there are five two-year schools run by the Ministry of Education which train about 500 sanitarians per year.

Research and training activities in environmental health are conducted by several institutions. The High Institute of Public Health in Alexandria offers post-graduate study in environmental sanitation. It is the only university in the Middle East, with the exception of the American University of Beirut, to offer graduate programs in public health. Contained within the High Institute of Public Health is the Industrial Waste Research Laboratory (IWRL), which carries out research investigations on domestic and industrial wastewaters and conducts occasional short training courses for engineers and chemists. Although the IWRL is funded by the U.S. Environmental Protection Agency, it is actively seeking support to expand its activities in Egypt.

Additional research in the area of wastewater is carried out in Cairo by the National Research Center, which is administered by the Ministry of Education. The bulk of research funding within Egypt is provided by the National Academy of Scientific Research and Technology, an organization similar to the National Science Foundation in the United States. In general, research is performed by specialized institutes, universities, private companies, and individuals.

A final group of institutions influencing environmental health in Egypt includes the multilateral and bilateral development organizations. Among the former are the WHO Eastern Mediterranean Regional Office in Alexandria and the UNDP and UNICEF Country Offices in Cairo. The World Bank also is very active in Egypt but has no permanent representative. Bilateral organizations include USAID, ODA (United Kingdom), Germany, Japan and France.

4.2 Environmental Health Laws

The legal framework for the environmental health sector consists of laws, decrees and regulations. Although most areas of environmental health are covered, general enforcement is er-

ratic. The following is a brief summary of the pertinent laws and regulations that govern environmental health activities in Egypt:

- Law No. 93/1962 provides the norms under which industrial waste effluents can be discharged into municipal sewers and agricultural drains. It regulates chemical substances in effluents and the conditions under which they can be discharged into drains and into the Nile River or its branches.
- Presidential Decree No. 2703/1966 and Law No. 93/1962 regulate environmental health measures concerning:
 1. Drinking water
 2. Discharging industrial wastes
 3. Protection of sea water and harbors from oil pollution
 4. Health problems
 5. Environmental health
 6. Industrial health and air pollution
 7. Ionized radiation
- Law No. 38/1967 concerns public hygiene and has 12 sections that cover various interventions and their applications.
- Law No. 134/1968 supports Presidential Law No. 38/1967 concerning public hygiene. Officially authorized by the Minister of Housing and Services, the law has four main chapters: definitions; garbage collection, transfer, and disposal; liquid waste disposal and discharging; and ruins and free spaces.
- Presidential Law No. 864/1969 established the High Committee for Prevention of Air Pollution, which is under the supervision of the Ministry of Health. The Committee is charged with the study of sources of air pollution, making recommendations, general policy planning for air pollution prevention, establishing norms and standards for air at different locations, and drafting regulations.
- Ministerial Decree No. 470/1971 regulates air pollution for industrial organizations, including the maximum concentrations of pollutants both inside and outside working environments. It has four sections: gases and vapors; dust and suspended poisonous liquid particles; suspended natural dust; and settled particles and dust.
- Water quality standards were approved by the High Committee for Water in 1975. These standards cover

physical properties of water, poisonous materials in water, materials having specific effects on general health, chemical materials affecting domestic use, water pollution indicators, and bacteriological specifications for potable water.

- Circular No. 3/1976 of the Ministry of Health regulates environmental conditions related to health. The regulations include the checking of health services throughout Egypt and the application of the different laws for public hygiene.
- Law No. 27/1978 regulates potable water resources for human use. It has 12 points defining the law and related conditions. It also covers the necessary steps to control and organize this environmental element.

4.3 Environmental Health Institutions

4.3.1 Drinking Water

Responsibility for the provision and operation of public utilities is vested in local authorities, such as governorates, city councils, and village councils. Support from the central government is given by the Ministry of Housing and Reconstruction (MHR), the Ministry of Health (MOH), and the Ministry of Local Government (MLG).

Outside of Cairo, Alexandria, and the Suez Canal cities, Egyptian water supplies fall into three broad categories: (1) 11 regional systems that were built and operated by the General Organization for Potable Water (GOPW) to serve towns, villages and rural communities located mainly in the Nile Delta, (2) about 115 systems in the larger provincial towns operated by municipalities, and (3) about 1,250 rural supply systems. Some government institutions, principally the armed forces, operate their own systems. In addition, many industries often have their own private water supplies, and in some remote areas they also supply domestic water.

In Cairo and Alexandria, local organizations which started as private utility companies in the last century are now responsible for providing potable water. The Canal Zone cities of Port Said, Ismailia, and Suez are served by the Suez Canal Authority (SCA), which also began as a private company and is principally concerned with the operation of ancillary services for the canal.

Until mid-1981, Cairo, Alexandria, the Canal cities, and the regional systems were all operated by separate organizations. At that time, the government formed the National Organization

for Potable Water and Sanitary Drainage (NOPWASD) to serve as a coordinating and policy body for all these agencies.

4.3.2 Wastewater

Wastewater and excreta disposal responsibilities, including sewerage systems, latrines, and sludge disposal schemes are held by a number of different agencies and ministries. As indicated in Section 4.1, the MOH has the responsibility for monitoring the quality of both water and sewer services as well as promoting rural water and sanitation. The monitoring responsibilities include both urban domestic and industrial wastewaters. In domestic wastewater monitoring, their primary concern is cholera control. Due to limited staff and resources, the efforts of the MOH in the industrial sector are generally limited to responding to problems. In addition, the MOH is working with the General Organization for Sanitary Drainage in Cairo (GOSD/C) and the Ministry of Agriculture on a study of the use of domestic sewage sludge as soil conditioners for certain food crops.

In the urban and provincial sector, NOPWASD designs and constructs sewerage and drainage facilities in towns and cities. Separate entities, however, operate and maintain the Alexandria and Cairo sewerage systems. The governorates (or municipalities) operate and maintain the other sewerage and drainage systems but also can call upon the technical services of NOPWASD.

4.3.3 Solid Waste

As with many of the other municipal services, the collection and disposal of solid wastes varies with the type of service provided and the service area. Studies of sanitation services outside the major cities have found that municipal trash collection facilities are usually concentrated in the main city of a district. An example of existing sanitation services can be seen in the city of Asyut, where trash collection is carried out with four old trucks plus about 10 wooden donkey carts. These two modes of transport are housed in different centers. There are about 250 drivers and sweepers employed in garbage collection and street cleaning. Sweepers receive 30 piasters (US\$0.35) per day in salary. Their main duty is to clean the streets, which is usually done at dawn. There are reportedly two special hollows where city garbage is often dumped. In practice, however, garbage is often dumped along the side of a road or along a drainage canal on the outskirts of the city. Dead animals are collected and dumped along with the rest of the trash, which causes a substantial rat population to flourish in these areas. Periodically, the accumulations of wastes are set on fire.

Conditions similar to those in Asyut can be found in most provincial cities. Because of lower population densities and generally lower incomes, solid waste conditions are not as extreme in rural areas despite the fact that organized collection services are almost universally absent.

4.3.4 Housing

The Ministry of Housing and Reconstruction (MHR) is the principal institution in the housing sector. The health aspects of housing, however, are the responsibility of the MOH, which works through its Department of Environmental Health and through the Interministerial Committee on the Environment.

4.3.5 Occupational Health

Official responsibility for occupational health is fragmented among several ministries, which have been unable to coordinate their activities. In addition, existing laws and regulations are poorly enforced.

Within the MOH is the Department of Occupational and Industrial Health, which has three physicians and several allied health scientists. The Department investigates complaints regarding occupational health hazards, although it has no right of entry and no authority for enforcing compliance with laws or regulations. As a result, it is limited to making recommendations to other ministries. With the assistance of universities, the Department advises the Ministry of Manpower on occupational exposure threshold values in workplaces, collects reports of pesticide poisoning, and advises the Ministries of Housing and Industry on health guidelines for construction licensing.

The MOH is currently constructing and staffing a major research training and surveillance center for environmental and occupational health at Embaba near Cairo. U.S. support for the development of this center has been provided under the auspices of the Joint Working Group on Medical Cooperation. Technical planning advice has been provided by the U.S. Department of Health, Education, and Welfare through the National Institute of Environmental Health Sciences. USAID is assisting in the financing of equipment for the center.

The Department of Occupational and Industrial Health also has the responsibility for measuring air pollution. At present, this is done only in Cairo, but the MOH plans to extend this activity to other cities. The Department of Occupational and Industrial Health is operational only at the national level but is attempting to establish units at the governorate level.

Currently, they have advisory units in four of the 26 governorates.

The Health Insurance Organization, under the guidance of the MOH, is responsible for conducting periodic inspections of industries participating in insurance programs, identifying health hazards, and, more recently, performing medical investigations to determine disease prevalence in association with health hazards. It has no mandate or authority to enforce compliance to standards, although it is required to advise the industries of its findings and offer recommendations to them.

The Department of Occupational Safety and Health in the Ministry of Manpower has the right of entry into a plant for periodic evaluations of health hazards. Most of its 600 factory inspectors are chemists and engineers who are supposed to work closely with physicians trained in occupational medicine. However, only 30 out of 200 physician positions have been filled.

The Department of Industrial Productivity in the Ministry of Industry trains safety officers who collect accident information. Industries, by law, are supposed to report occupational diseases and accidents; in practice, little data are provided. The semi-autonomous National Institute of Occupational Safety and Health in the Ministry of Manpower was originally charged with training, research, and providing technical engineering advice to industry. However, it has a small staff, and although active, seems to be ineffective.

4.3.6 Pesticides

Responsibility for the control of pesticides is spread among various ministries and agencies. In its new Environmental Health Laboratory at Embaba, the MOH will be able to investigate the growing problem of pesticides in the environment. This group will work with the Ministry of Agriculture.

4.3.7 Food

The responsibility for inspection of food, restaurants, and food handlers lies with the environmental health unit in each of the governorates. These units are generally weak and understaffed.

4.4 Environmental Projects

Many agencies are funding projects that involve environmental health interventions and/or facilities. The following is an outline of the major projects.

4.4.1 USAID Projects

USAID projects that address environmental health problems fall into two categories: those whose main thrust is environmental health and those which are not mainly environmental health but which have significant environmental health components. The first category includes large capital investment projects for water supply and wastewater disposal in major urban centers. For the most part, the second category consists of projects designed to support the GOE decentralization efforts. The main purpose of these projects is to strengthen local institutions at the governorate, district, and village levels. However, they also comprise significant environmental health activities which respond to priorities set at the local levels. The target areas covered by these projects include both urban and rural population centers. They address a broad range of environmental health problems, including water supply, sewerage, garbage, solid wastes, markets, slaughterhouses, etc.

The total investment in the two categories of projects are \$1,365 million, of which USAID is providing \$737 million in loans and grants. Table 6 lists the current USAID projects having environmental health consequences (See Appendix D for details of each project).

4.4.2 Others

Among the other international donors funding major environmental health interventions are the following:

World Bank

- Alexandria Water Supply \$56 million
- Upper Egypt Drainage I & II (have small support element for bilharzia control program)
- Beheira Provincial Water Supply \$117 million

UNDP

- Master Plan for Water Resource Development and Use \$2.9 million

UNICEF

\$1.5 million

United Kingdom

- ODA (1st Phase Cairo Sewerage) \$100 million

TABLE 6. USAID PROJECTS IN THE ENVIRONMENTAL HEALTH SECTOR (1982)

PROJ. NO. Millions	PROJECT NAME	AUTHORIZATION DATE	COMPLETION DATE	FUNDING	
				IN US\$ USAID	Millions GOE
<u>Environmental Health Projects</u>					
0091	Cairo Sewerage Project	FY 78	Dec 85	\$129 (G)	\$168.5
0038	Cairo Water Supply	FY 77	Sept 85	\$61 (G/L)	\$54.3
0048	Canal Cities Water & Sewerage Project	FY 78	FY 82	\$96 (L)	\$71.4
0100	Alexandria Wastewater System Expansion Proj.	FY 79	FY 85	\$167 (G)	\$264
<u>Projects with Environmental Health Components</u>					
0153	Neighborhood Urban Services Project	FY 81	FY 86	\$89 (G)	\$13.9
----	Basic Village Services Project	FY 80	Dec 83	\$70 (G)	\$21
----	Provincial Cities Development Project	FY 81	Sept 86	\$75 (G)	\$25
----	Decentralized Support Fund	FY 80	Dec 85	\$50 (G)	\$10
				\$737	\$628.1
Grand Total=				\$1,365,100.	

Chapter 5

ENVIRONMENTAL HEALTH PROBLEMS

5.1 Current Conditions

Even a cursory review of the Egyptian health environment reveals the drain upon productivity and economic development wrought by the principal diseases. This review confirms the priority given by the Egyptian health planners to the control of the most debilitating sanitation-related diseases, such as intestinal parasites, diarrheas, and dysentery. In addition, many diseases of infancy and childhood, such as infantile diarrhea, mumps, whooping cough, chickenpox, and measles, are commonly found among the less protected groups within the population. Typhoid has recently been reduced, but malaria, trachoma, and tuberculosis continue to be problems. Furthermore, the Egyptian populace is increasingly afflicted with the degenerative problems of cardiovascular disease and cancer found in industrial societies (see Appendix C for details).

In general, environmental health conditions of Egypt are in need of overall upgrading. A lack of adequate financial resources, trained personnel, and equipment and supplies results in the following problems:

- Insufficient staff at the national level to develop policies and monitor their implementation.
- Insufficient staff at the governorate and local levels to properly operate and maintain local environmental health systems.
- Insufficient data on environmental health conditions and their interrelationships.
- Insufficient routine surveillance, resulting in problems that arise without sufficient warning.
- Persistence of heavy metal pollution (especially mercury).
- Air pollution levels that exceed the maximum allowable limits.
- High rates of typhoid and paratyphoid (110 per 100,000 in Alexandria in 1977).
- Drinking water and sewerage treatment plants that do not produce consistently safe outputs.
- Water distribution systems that have excessive losses (40 to 60 percent unaccounted for losses)

FIGURE 2

PUBLIC HEALTH PROBLEMS



Raw sewage from a major wastewater treatment plant being discharged to drainage channel adjacent to housing area.



- Solid wastes disposal systems that are unable to collect and dispose of domestic wastes in a sanitary manner.
- Pesticide levels on food stuffs that are 20 times the permissible levels.

The following is a discussion of the status of Egyptian environmental health services as they relate to attempts to improve the general health of the population.

5.2 Water Supplies

Although a substantial majority of the population is served with piped water, the supply is often erratic and its quality questionable. Many treatment plants fail to provide consistently potable water to the full extent of their design capability, and many wells and distribution systems are in poor operating condition. It has been estimated, for example, that less than 40 percent of the water produced in some of the major regional water treatment plants actually reaches the consumers (1.29). With few exceptions, existing water supply systems can be characterized as unreliable in providing adequate quantity and quality of water to their users.

The crucial factors of quality, quantity, reliability, and accessibility are all much worse in villages than in urban areas. From an operational point of view, systems tend to be old (and therefore difficult to maintain, as well as overloaded) and therefore unable to supply even the minimum water requirements. In addition, systems are often understaffed, poorly maintained, and limited in extent. The result is that many people are drawing water from unprotected and highly polluted sources. The contamination of existing public and private water sources in villages is one of the most urgent sanitation problems facing Egypt today.

Despite the above, treated water in Egypt, when available, is usually of high quality (less than 5 percent of the samples tested are unacceptable) and only 25 percent of the population does not have access to treated water supplies.

The reasons for the poor performance of existing water supply systems can be categorized into three general areas:

- (1) Poor maintenance of existing systems because of:
 - poor initial construction and faulty installation
 - lack of spare parts and poor stores management

FIGURE 3
WATER SUPPLY



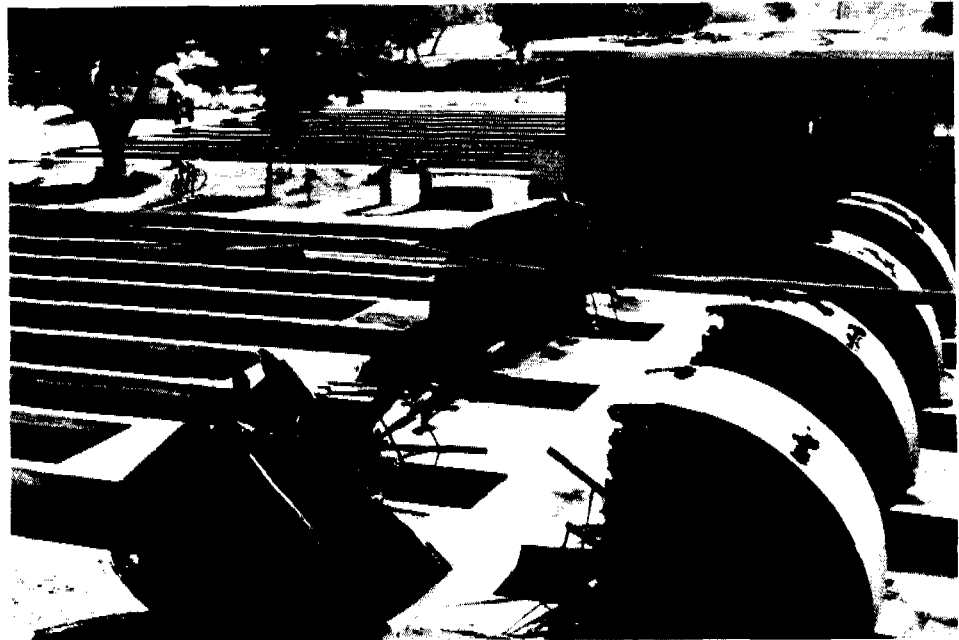
Inoperative Public
Standpost

Unsanitary conditions
at tank truck filling
station.



FIGURE 4

O&M PROBLEMS



Inoperative aeration equipment at wastewater treatment plant due to poor maintenance



Poor design for removal of material from grit chamber at major wastewater treatment plant

- lack of preventive or planned maintenance programs staff
 - shortage of mechanical and craft skills
 - over-centralized financial procedures
- (2) Poor quality control of water treatment resulting from:
- design faults on newly constructed works
 - lack of technical knowledge of the correct processes
 - shortage of chemicals
 - inadequate capacity causing some plants to be operated above the level at which they can produce safe water
- (3) Inadequate management and financial performance caused by:
- lack of staff with the requisite managerial and technical skills
 - fragmentation of the water supply sub-sector with a consequent diffusion of responsibilities
 - absence of financial objectives
 - failure to set water rates to reflect real costs
 - excessive regulation hampering managers
 - inadequate incentives to encourage good management

5.3 Wastewater and Excreta Disposal

The fundamental rule for regulating the present status of wastewater and excreta disposal conditions is given in both law (No. 93/1962) and tradition (no domestic sewage can be discharged directly into the Nile River). With the exception of some municipal sewerage systems, most discharges are made into drainage ditches which eventually flow back to the Nile.

In existing systems, the collection, pumping, and treatment facilities are generally old and in poor states of repair. The collection networks are overloaded, as present day discharges

FIGURE 5

EXCRETA AND SOLID WASTE DISPOSAL



Unsanitary collection and processing of solid wastes by Zabaleen

Workman standing in sewage while pumping out a household vault



Semipermanent pools of in new residential area

usually exceed design capacities. In addition, pumping stations are generally in varying states of disrepair. This problem is especially severe because extensive pumping of sewage is nearly always required over the flat terrain on which most Egyptian cities are situated. To make things worse, the conditions of the sewerage network are usually unknown because of poor record keeping.

Despite conditions favoring simple low-cost treatment methods, sewage treatment has developed along traditional lines, e.g., primary sedimentation, secondary treatment by trickling filters, and final sedimentation. Plants are often overloaded and invariably lack provisions for future extension. Modern low-cost methods, such as stabilization ponds and innovative biogas plants, have been investigated but have not been extensively introduced. Septic tanks, when used, often are too small and usually create problems with the high groundwater table.

Operation and maintenance deficiencies of sewage pumping and treatment plants pose serious problems. Insufficient staff and lack of spare parts result in many treatment plants not being operated effectively (particularly where the activated sludge process has been adopted). Treatment efficiency is further diminished because of frequent electric power outages.

In the rural areas, sanitary drainage and sullage disposal are major problems that result in highly unsanitary conditions in most villages. Existing facilities and services to handle human wastes often are inadequate, often inappropriately designed, and usually poorly maintained. Much needs to be done to increase local perception of the health consequences of contact with feces, flies, and other sources of infection. For excreta disposal, many houses have a cesspit or a sanitary vault with an unlined bottom. In many of the small villages and hamlets, however, stables are employed as places of defecation, and the resulting human and animal nightsoil is reused as agricultural fertilizer. This latter practice presents major public health problems to both the cultivators of the crops and the ultimate consumers of the foodstuffs.

In the past, the MOH was quite active in development of the rural sanitation subsector, but in recent years the responsibility for the construction of latrines and other basic sanitary installations has been turned over to the governorates and local authorities. Because of a lack of funds, experience, and motivation, further work in this area is occurring at a very slow pace.

In summary, the major sanitation problems in the rural areas are (1) inadequate drainage for public water systems and household sullage, (2) the lack of appropriate sanitary facilities for human excreta, (3) the unsanitary handling of animal manure, and (4) the lack of community services for the

collection and disposal of garbage, trash, and other solid wastes.

Most industrial wastewaters are discharged from plant premises without treatment. Since the nature of industrial wastes depends upon the industrial processes from which they originate, industrial wastewaters vary from relatively clean cooling water to waste effluents that contain highly poisonous, inflammable, or explosive substances. Except for the Cairo/Helwan and Alexandria areas, industrial wastewater problems are still poorly defined. A detailed water and air pollution study of the Helwan industrial area in April 1981 reported the following (3.6):

- "Helwan is one of the most dust polluted places in Egypt..."
- "Many factories in Helwan and Maadi dispose industrial waste directly into the Nile on Khashab irrigation canal."
- "No reliable data on the exact composition of factory discharges could be obtained."

Available data show that potential industrial wastewater problems exist in nearly every reach of the Nile River. The most polluting wastes in the Cairo reach, for example, are those discharged by the sugar, iron, steel, coke, and fertilizer factories in the El-Hawandia area (5.15).

Agriculture wastes are highly variable in both quantity and character. The most important of these are animal wastes, industrial wastes from the processing of raw food products, crop residues, inorganic salts and minerals, and pesticides. In particular, pesticides are a growing problem in surface drainage canals and in groundwater reservoirs which serve as sources for drinking water supplies.

5.4 Solid Waste

Solid wastes disposal systems suffer from a lack of heavy equipment and poor management techniques. In 1980, the City of Cairo was producing 4,000 tons a day of refuse (or 0.5 kg/day/per person which is about average for a developing country) (1.16) To transport these wastes, private refuse collectors used 5,200 uncovered animal-drawn carts to move 1,300 tons a day, while another 2,700 tons per day of street refuse were collected with motorized equipment. To serve a population of about 5.4 million, there were 16,000 workers, 10 mechanical sweepers, 38 sprinkling tracks 229 garbage trucks, and 5,000 refuse bins. Most of the materials collected were transported outside the inhabited areas and used to fill ponds and other low-lying areas. About 80 percent of the street

refuse was disposed of at Abul-Sood by open incineration or by covering. About 20 percent of the materials from one district was composted at the organic fertilizer factory in North Cairo (5.10). Less desirable situations exist in other areas. In Asyut district, for example, the authorities have four old run-down trucks, ten wooden donkey carts, and 250 sweepers and/or drivers (5.26).

Litter rather than garbage is the problem in villages. With the growing use of non-biodegradable plastics and pre-packaged products, this can be expected to get worse.

5.5 Housing

The rapid growth of urban population is resulting in the proliferation of uncontrolled squatter settlements which, with time, will turn into high density areas of extreme poverty. Due to the pressure of accelerating urbanization coupled with the rapid growth of population, the basic principles of zoning for different land uses are often neglected. This results in undersirable relationships between industrial and residential areas, recreational and industrial zones, and main traffic routes and residential plots. Inadequate transportation facilities and increasing traffic problems lead to further unbalanced urban growth patterns.

The U.S. National Academy of Science characterized the housing situation of Egypt as follows:

"Congestion and crowding characterize urban life in Egypt today. The housing shortage in urban areas is estimated to be about 1.5 million units. An average of 1.7 households occupies each existing unit" (2.3).

In spite of a rapid increase in urban populations, strict rent control laws have resulted in very low rates of construction. The average family size is five or more, and most families in Cairo and other cities live in three rooms or less. Most villages consist of rows of adjacent houses along narrow streets with few services. Less than 20 percent of rural households are supplied with electricity. These villages are clustered about a few central market areas. The concentration of dwellings in villages is the consequence of the use of all available land for farming and the limited access to potable water.

While there are shortages of housing at all income levels, the burden of the urban housing deficit falls most heavily on the poorer groups, which have resorted largely to constructing houses on unserviced public lands without building permits. About one half of all private housing construction in Egypt takes place in the informal sector, and consequently, a large and increasing portion of housing is "illegal". The World Bank

FIGURE 6

HOUSING



Lack of adequate solid waste disposal causes vector control problems.



High density housing complex serviced with electricity, piped water, and sewerage, but no solid waste collection.

FIGURE 7
FOOD HYGIENE



Tahina processing in Cairo back street
(Note lack of sanitary conditions)

reports that such informal housing is "generally of good quality and site layouts are efficient with adequate right-of-ways, in contrast to squatter areas in many other countries" (1.17). The lack of security of tenure and the absence of services are major problems for such households.

5.6 Occupational Health

The U.S. National Academy of Science found the following, populations at risk to occupational hazards; 6,000,00 for accidents, 3,000,000 for pesticide poisoning, 60,000 for mercury, chlorine, or alkali exposure, 400,000 for silicosis, 10,000 for byssionosis, and 1,500 for carbon disulfide exposure. In general, routine reporting of occupational diseases is limited and little hard data are available. A 1977 study of 250,000 industrial workers in Alexandria identified three cases of aniline poisoning, 600 of occupational deafness, eight of silicosis, 12 of byssinoisis, seven of lead poisoning, 45 of industrial eczema, 48 of mercury poisoning, seven of occupational cataracts, two of asbestosis, and 175 of chronic organic phosphate pesticide poisoning. According to the National Academy of Sciences, the reported national total of occupational accidents is roughly 45,000 yearly.

5.7 Pesticides

5.7.1 Effects on Individuals

A recent sample survey of agricultural workers indicated that almost all had some evidence of chronic pesticide poisoning (2.1). This is not surprising considering the wide use of pesticides the absence of effective controls over how they are handled. Pesticides are purchased by the Ministry of Agriculture with minimal consultation with health officials.

Egyptian agricultural practices are also a major source of chemical pollution in the form of pesticide residues on food and pesticide runoff into sources of drinking water supplies. Within the crowded cities and towns, large amounts of insecticides are also used to control insect vectors of disease.

Dr. A. El-Gamal of the MOH reported that the indiscriminate use of pesticides by untrained and unprotected agricultural workers has resulted in the chronic intoxication of over 60 percent of workers engaged in pesticide spraying from airplanes (2.1). In 1976, an increase in the accident rate of airplanes used in spraying was linked to decreased amounts of choline esterase enzyme in the bodies of the pilots. This denotes chronic intoxication and is manifested as headache and blurring of vision. There is every reason to suspect that many

Egyptians have varying degrees of chronic pesticides poisoning.

5.7.2 Effects on Disease Vectors

In his assessment of Egyptian pesticide use, Mr. A. Curley indicates that "with the rapid development and use of new organic insecticides in the last three decades, the overwhelming problem of resistance has become a serious and rapidly growing problem in Egypt" (2.5). The problem of pesticide tolerance is worldwide and is a well-demonstrated obstacle to raising agricultural crops. However, a more serious public health problem is the resistance shown by insect vectors of disease, e.g., the resistance of houseflies and mosquitos to DDT and its analogues, and the recorded rodent resistance to warfarin and other coumarin derivatives. Overall, the number of resistant insect pests increased from 14 species in 1948 to 364 species in 1976.

5.8 Food

Numerous examples of the contamination of water, soil, and edible food crops after the application of pesticides on cotton field were found in 1974-75. Subsequent basket studies have demonstrated the problem of contamination of edible foods.

In view of the proximity of cotton fields to those used for growing food crops, the large number and quantities of pesticides, and the lack of a central regulatory authority for food inspection, pesticide contamination must be considered a serious and growing problem.

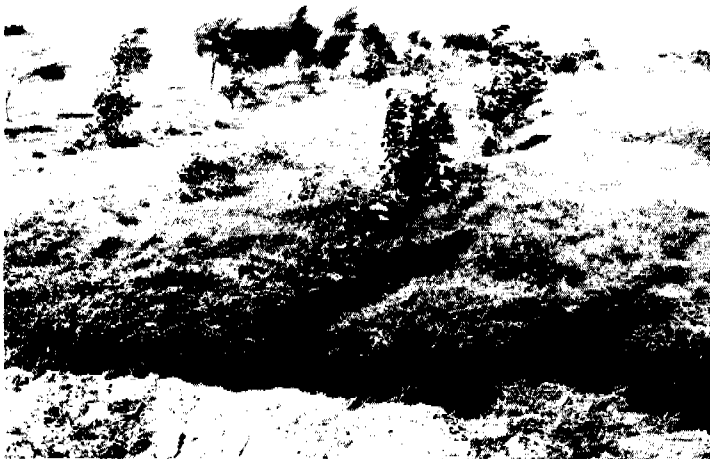
In addition, current attempts to develop irrigation schemes using effluent from wastewater treatment plants poses potential problems of food contamination. Figure 8 shows on-going experiments in reuse of wastewater.

FIGURE 8
REUSE OF SEWAGE



Sewage being used
for crop irrigation
experiment.

Foodstuffs grown on
sewage irrigated land.



Crops being irrigated
with sewage.

Chapter 6

KEY ENVIRONMENTAL HEALTH PROBLEMS

6.1 Problem Identification

Any review of environmental health problems in Egypt quickly comes up against the frustrating difficulties of poor data or, more commonly, no data. The health problems arising from the human environment appear everywhere to be evident, but little in the way of vigorous verification can be made with the conventional tools of health statistics, operational records, and controlled scientific investigations. For the most part, little sectoral or national information is available on the major environmental health issues. The data that do exist tend to be project-specific and are not normally referenced to national conditions.

Although time limitations ruled out any comprehensive assessment of any of the environmental health sub-sectors described in Chapter 5, visits were made to various GOE, United Nations', and local government offices, to sanitation facilities, and to both urban and rural communities. In the course of these visits, discussions were held with national and local officials, operational personnel, and international advisors.

These visits and discussions were conditioned by whatever documentary information was available at the time and by the following generally accepted (but not well documented) facts: the Egyptian population suffers from high rates of infant and child mortality, diarrheal diseases, and other infectious diseases related to poor water and sanitation. From an amalgam of the above tangible and intangible sources of information, direct impressions, and previous experience, the most crucial environmental health problems currently existing in Egypt were identified.

6.2 General Conclusions Regarding Environmental Health Conditions

Environmental conditions in Egypt have deteriorated to such an extent that current environmental health programs are unable to provide a minimum acceptable level of protection for the vast majority of the population. Much of the Egyptian population, and especially those living outside the major cities, lack basic environmental sanitation services, such as adequate quantities of safe drinking water delivered near the point of use, the sanitary disposal of excreta and wastewater, and the final disposal of household solid wastes in a non-harmful manner. Conditions in other areas, most notably housing, occupational health, pesticides, and food hygiene, also appear to

be grim, although not as widespread as in the water supply and waste disposal sub-sectors. Many of the problems causing these conditions are the result of inadequate operational resources, insufficient trained staff, and the general paucity of both planning and operational data.

From the previous discussions of the environmental health sector, its resources, and current conditions, the following general conclusions can be drawn:

- An environmental health crisis exists in Egypt, especially in the major population centers. This is primarily the result of extremely poor sanitation conditions and the increasing complexity of environmental health problems associated with rapid population growth and high population densities.
- Environmental health problems are especially severe in the areas of drinking water, wastewater and excreta disposal, and solid wastes collection.
- A shortage of trained experienced staff in key positions is adversely affecting the efforts of the GOE to respond to the above crisis.
- The basic institutional infrastructure to deal with environmental health problems exists in the GOE, but it is poorly equipped, insufficiently funded, inadequately staffed, and often poorly located.

6.3 Key Problem Areas

There are a number of environmental health conditions and their associated problems which are critical for both the immediate and long-term health of the Egyptian population. USAID and the GOE should give their primary attention to the following key areas:

1. Existing water supply and sewerage facilities in Egypt are not being properly operated and maintained. Urban facilities, in particular, do not perform as designed and fail to maintain acceptable levels of quality control. There is no indication that the new water and sewerage facilities currently being developed with USAID assistance will be operated and maintained in such a way as to bring about essential health benefits. On the contrary, the chances are very great that such facilities will quickly deteriorate to sub-standard levels of performance and eventually become inoperative. This possibility endangers the large program of capital investments being made by USAID in water supply and sewerage.

2. There is an acute shortage of trained operational personnel in the water supply and sanitation organizations. In general, there are personnel problems in all sub-sectors of environmental health, but they are particularly severe in the cadres operating water supply and sewerage facilities. Professional staff are generally inexperienced and lacking in professional motivation, while technician personnel have almost no opportunities for formal training. As a result, water and sewerage facilities tend to be badly managed and improperly operated.
3. Existing water supply, excreta disposal, and solid wastes collection systems in the governorates are greatly deficient in both standards of operation and area of coverage. Much of the population, especially in the rural areas, have little access to such systems, and even in the urban service areas the basic health benefits are not widely realized. Because the problems of facilities, equipment, and personnel in the medium and small towns are the responsibilities of governorates, national attention is rarely focussed upon the poor environmental health conditions that exist in the provincial areas.
4. Sanitation services in the rural towns and villages are very poor, and conditions are deteriorating as populations increase. The main official channel for advice and guidance on improving water supplies, excreta disposal, solid wastes disposal, food protection, housing, and other sanitation measures is through sanitarians in the environmental health departments of the governorates. However, there are insufficient numbers of trained and adequately equipped sanitarians. In addition, the broad range of responsibilities required of sanitarians and their limited resources prevents them from bringing about significant and sustained improvements in sanitation in the rural areas.
5. There is a severe shortage of data on environmental health conditions in Egypt. This shortage generally extends to all areas of information, including demographic statistics, hydrologic and climatic data, mortality and morbidity data, facility operations records, and monitoring and quality control information. In many cases, data are being collected, but there is no effective process for making the information available to planners concerned with long-term environmental health problems. The greatest problems arise from an inadequate environmental health data base and an extremely weak information collection, storage, and retrieval system.
6. Little is known about the applicability of low-cost environmental health solutions used in other countries to conditions found in Egypt. Problems of urbanization and

industrialization have common elements, and potentially common solutions, throughout the world. Without adaptation to local conditions, however, technologies transferred from one country to another often are inappropriate and costly, as can be seen in many of the water and sewerage facilities currently in use in Egypt. Insufficient attention is being given to research by Egyptian institutions into low-cost environmental health technologies suitable to local social, technical, and financial conditions.

6.4 Classification of Environmental Health Needs

In summary, the key environmental health needs involve immediate action to address the operational problems in the water supply and sewerage facilities, long-term efforts to respond to the growing problems of urbanization and industrialization, coordinated programs at the governorate level, and strengthened information management systems. All of these needs are rooted in institutions and their capability to carry out their assigned functions.

Thus, the fundamental need in the environmental health sector is basically for a strengthening of existing institutions. Little in the way of new institutional formation is required; the basic organizational infrastructure already exists but is not properly meeting its responsibilities. The urge to create new institutions to channel resources to specific problems should be resisted. In the long-run, it will be less costly and more effective to strengthen the existing environmental health institutions already in place in Egypt.

The basic environmental health needs in Egypt, therefore, are three-fold:

1. Immediate operational improvements in water supply and sewerage facilities in urban areas.
2. Better delivery of sanitation services at the governorate level.
3. Strengthening of existing institutions in the environmental health sector

Chapter 7

EXISTING ENVIRONMENTAL HEALTH STRATEGIES

7.1 Current Environmental Health Strategies of the GOE

In 1977, the Government of Egypt adopted a five-year economic and social development plan for the period 1978-1982. In the Health and Medicine Annex of that document, the GOE presented policies for the health sector in order to "use its human and material sources with the maximum possible efficiency at the highest possible level of effectiveness for the largest number of citizens." Six general objectives were established for the health sector. The first of which was termed "Concentrating on preventative and basic health measures."

In the area of environmental health, the Five Year Plan called for the Ministry of Health to "attempt to take the lead in sensitizing the entire society to the need for raising the general level of cleanliness." The Ministry has attempted to respond to this mandate by working with other relevant agencies through numerous interministerial committees. In addition, the plan directed the MOH to "increase its capacity for monitoring pollution in the environment as it affects both the workers and people living in the vicinity of sources of pollution". And finally, the plan called for the MOH to decentralize and delegate authority for the administration and management of health services to the governorate level.

During 1980-81, the general strategy of the MOH in the health sector included the following specific preventive activities (1.10):

1. Early discovery of infectious diseases and monitoring national epidemic;
2. Augmenting health quarantine capabilities in the Republic's ports-of-entry;
3. Securing required vaccines and sera;
4. Establishing general administration of food monitoring (Safety and Inspection)... This has necessitated the development of Central Laboratories for monitoring food;
5. Controlling disease transporting insects and rodents;

6. Speedy discovery of infectious diseases, their control by epidemic eradication, early discovery and national followup; and
7. Formation of new Technical Committees (for environmental health)... The opening of Imbaba Environmental Research Center... This center will be the National Research Center.

Future strategies call for the MOH to give greater emphasis to primary health care, rural health services, immunization, health education, and family planning. To do this, the MOH will shift to preventive and curative health care and health promotion. It will make diarrhea a primary focus of attention.

7.2 Current Environmental Health Strategies of USAID

The USAID effort to assist the GOE to improve environmental health was accelerated in 1976 with approval of the Strengthening Rural Health Delivery Project. The thrust of this effort has been broadened as can be seen from the statement in the USAID 1982 Country Development Strategy Statement (CDSS) for Egypt:

"In health we plan a three-part approach to reduction of infant mortality. First, we plan to continue efforts to improve the institutional framework for the delivery of health services both in rural and urban areas. Infant care will be a prominent part of this effort. Secondly, we also will continue with measures to improve sanitation by expanding the upgrading of water and sewerage facilities from the primary cities to provincial and rural areas by the end of the five-year period. These efforts will be strengthened by information activities aimed at better sanitation practices. Third, we plan a frontal attack on the root cause of infant mortality, diarrheal diseases, through a widespread program of oral rehydration throughout Egypt."

While the above statement does not specifically mention all of the traditional environmental health areas, it does stress the importance of a strengthened institutional framework, improved sanitation facilities, and a reduction of infant diarrheas. Discussions at all levels of the USAID Mission have also indicated that USAID seeks a balanced approach which will result in improved health conditions for all in the places where they live and work. As there is growing acknowledgement that as the "medical" elements of better health can be addressed through various projects, it is now appropriate to consider how attention to the broad environmental elements of water, sanitation, solid wastes, occupational health, pesticides, and food hygiene can be focussed to support the overall health delivery system.

7.3 Water Supply and Sewerage Strategies of the GOE

Provision of safe drinking water and adequate sanitation is a primary strategy of the GOE. It has been formulated by the GOE for both the long-term (to the year 2000) and mid-range (1981-1985) period. In the long term, the general objectives are to overcome existing deficits in the production of drinking water and the capacity of sewerage systems, to meet maintenance requirements and emergency situations, and to develop sufficient water and sewerage utilities to attract foreign investment in other sectors. The importance of attracting foreign capital will be emphasized by giving priority to water and sewerage projects in industrial zones. Health consequences are not always an explicit component of long-term strategy in the water and sewerage sector.

Long-term objectives for drinking water include the following:

1. To increase production in order to serve the growing population and to achieve the following per capita consumption rates:

Table 7

Per Capita Water Consumption (liters/day)

Region	1980	1985	1990	2000
Cairo	255	295	330	400
Alexandria	170	200	220	370
Other Cities	65	100	110	240
Rural Areas	55	70	77	150

2. To increase the efficiency of water utilities.
3. To prevent pipe bursts in the distribution system.
4. To reduce the number of people unserved with drinking water in the rural areas from 4.5 million in 1979 to 3.0 million in 1985 and to serve all with adequate supplies by the year 2000.

Long-term objectives for sewerage include the following:

1. To increase sewage flows in proportion to water consumption and to achieve the following per capita flows in sewered cities:

Table 8

Per Capita Sewage Flow (liters/day)

Region	1980	1985	1990	2000
Cairo	206	265	290	380
Alexandria	100	170	190	350
Other Cities	90	120	130	190

2. To increase the efficiency of sewerage utilities and prevent sewage flooding.
3. To provide sewerage in all cities by the year 2000.
4. To provide sewerage in all inhabited areas of cities.
5. To reduce the number of people in the cities unserved with sewerage from 6.2 million in 1979 to 5.0 million in 1985 and to serve all with sewerage by the year 2000.

The capital investments necessary to fulfill the above long-term strategy are as follows:

Table 9

**Proposed Investments in Drinking Water and
Sanitary Drainage Projects
(in million Egyptian pounds)**

	1980	1980/1985	1985/1990	1990/2000
Drinking Water	150	800	1,000	2,000
Sanitary Drainage	168	800	1,000	2,000

Based upon figures developed by the World Bank, the total investment in 1980 prices required for urban water supply and sewerage by the year 2000 is estimated to be 7,061 million Egyptian pounds, of which 2,905 million will be needed for water and 4,156 million for sewerage.

Although Egypt has not yet developed a formal plan for the International Drinking Water Supply and Sanitation Decade (1981-1990) a National Action Committee (composed of representatives of various government ministries), has been set up to coordinate sector investments and a technical support team (comprised of representatives of international organizations) has been established to assist the Committee in coordinating multilateral assistance.

7.4 Other Sectors

No long-term comprehensive strategies have been developed for the areas of solid waste, occupational health, food and pesticides. Existing studies on these environmental health aspects have been limited to a few cities and relatively small development zones. Once it is operational, the proposed Environmental Center at Embaba can serve as the focal point for developing such plans. In addition, the ORDEV center for the Basic Village Service Project (See Appendix D and reference 1.7) could serve as a focal point for EH activities in the villages.

7.5 Considerations for Future Environmental Health Strategies

As the above mentioned strategies were considered it became increasingly clear that any future interventions in this sector must be considered within the context of the entire USAID program in order that a balanced plan can be formulated. Any USAID strategy can be considered as realistic only to the extent it accurately assesses the role environmental health activities can play in USAID's overall development strategy. This role is influenced by a number of major factors.

First, the level of assistance provided by USAID defines the overall extent, if not the type, of activities that can be planned. USAID is currently providing about \$1 billion of development assistance to Egypt annually. Of this, approximately \$200 million per year is for direct planning, construction, and/or rehabilitation of water supply and sewerage facilities with another \$100 million per year for other activities that closely affect environmental health. It is assumed that the overall level of USAID assistance will continue indefinitely at the present level as will the proportional level of investment in the area of environmental sanitation. The primary need is to insure that these investments are mutually supportive and purposefully lead to the achievement of USAID objectives.

A second factor is the health orientation of USAID development goals in Egypt. USAID has a basic mandate from Congress to address basic human needs in its worldwide efforts. In Egypt, two of the key health needs are reductions in infant mortality and child diarrhea. It is assumed that activities improving

environmental health are among the most effective means of addressing these health needs.

The third factor influencing the formulation of an environmental health strategy is the future status of current capital programs in USAID. As was shown earlier, existing USAID programs for water supply and sewerage in Egypt exceed \$700 million, although less than 10 percent of the proposed capital works have actually been constructed to date. Given the large commitment USAID has made to this program of capital development, it is assumed that the various water supply and sewerage projects will continue as planned and that no significant changes in either levels of funding or implementation scheduling will occur.

Chapter 8

CURRENT ENVIRONMENTAL HEALTH STRATEGY OPTIONS

8.1 General

The current ability of the GOE to develop the multidisciplinary, multiagency and multiphased responses necessary to ensure the development, implementation, and long-term operation of its environmental health programs is conditioned by the following factors:

- USAID and the GOE have "under way" about US \$1,365 millions of environmental health projects in the development pipeline. Of this total, about 75 percent is for drinking water and sewerage projects in Cairo, Alexandria, and the Canal cities. (See Table 6)
- Other agencies (i.e., World Bank, UNDP, ODA of the United Kingdom, KFW of Germany, etc.) have committed an additional US \$482 million for drinking water and sanitation projects (see Table 6).
- Activities and programs in other environmental health areas (i.e., solid waste, pesticides, food, and environmental aspects of housing, etc.) are mostly embryonic, understaffed, and poorly financed.

8.2 Environmental Health Goals of the GOE and USAID

There are few established environmental health goals in Egypt today. The health sector strategy now being formulated for the USAID provides the Mission with an opportunity to assist the GOE in articulating relevant goals for the country. It remains true, however, that no plan developed by a foreign donor can fully substitute for one conceived, developed, and implemented by Egyptians themselves. To be successful, the USAID health sector strategy therefore, must contribute not only to mandated U.S. goals as outlined in Chapter 7, but also to a variety of needs perceived by Egypt. In environmental health, the basic operational strategy for USAID should be to reach agreement with the GOE on the most essential needs and then to work within the constraints of the USAID program to satisfy them.

One major step would be for USAID and the GOE to mutually adopt the goals of the International Drinking Water Supply and

Sanitation Decade. USAID should agree to assist Egypt in achieving acceptable levels of potable drinking water and sanitation for all Egyptians by the year 1990. The current high level of activity in water supply and sewerage, especially that sponsored by USAID, provides an excellent base for expanding related projects to all areas of the country. Initial efforts should be devoted to developing a comprehensive needs assessment and a corresponding implementation plan for the period 1982-1990.

In general, USAID goals in environmental health should reflect the following characteristics:

1. Environmental health problems and the associated needs should be viewed from a national standpoint rather than being limited to a site-specific project standpoint.
2. Environmental health interventions should promote interministerial coordination of efforts.
3. The strengthening of existing institutions should be emphasized over the creation of new ones.
4. Personnel skills should be upgraded at both the professional and technical levels.
5. Existing facilities should be rehabilitated to perform as they were intended, and investments in new capital works must be designed to protect against deterioration of performance.
6. Improved information systems should be established to provide necessary technical data and sector conditions to environmental health professionals.
7. GOE organizations having environmental health responsibilities should be strengthened to carry out their work properly.

8.3 Strategy Options

In examining its strategy options, USAID/Egypt must consider the supportive nature of its efforts. For example, in spite of the hundreds of millions of dollars that USAID and others are devoting to new facilities and infrastructure improvements, ultimate responsibility for operation and maintenance of these systems resides with the GOE. To ensure this is done at reasonable cost, the GOE has the obligation to (1) set public health standards that realistically reflect existing human, financial and technical levels, (2) develop affordable design and operating criteria, and (3) propose enforceable standards for all environmental health programs.

The proper design of strategy involves complex and highly dynamic problems which are often interlocked in strange ways. For example, sewerage and solid waste disposal are closely related in many Egyptian cities, although this may not be obvious at first glance. Because there are no adequate solid waste disposal mechanisms, residents often remove manhole covers and throw their wastes into the sewers. This results in sewer blockages and subsequent pools of sewage in the streets, which in turn result in high disease rates. In addition, piles of uncollected garbage in the streets result in widespread vector (i.e., flies and rats) problems. Therefore, oftentimes, the sewerage problems cannot be solved without extensive solid waste disposal measures.

Similar linkages between various problem areas can be found between other environmental health sub-sectors. To address these problems, multidisciplinary, multiphased, and multiagency solutions must be the rule rather than the exception. Although these solutions may have the goal of improving both economic and social benefits for all in the shortest possible time, resources are always limited and, thus, priorities must be set for both USAID and GOE actions. It must be realized, however, that the priorities of the GOE and USAID are quite different, as they arise from different goals: USAID seeks to support GOE activities, whereas the GOE must set standards and operate facilities.

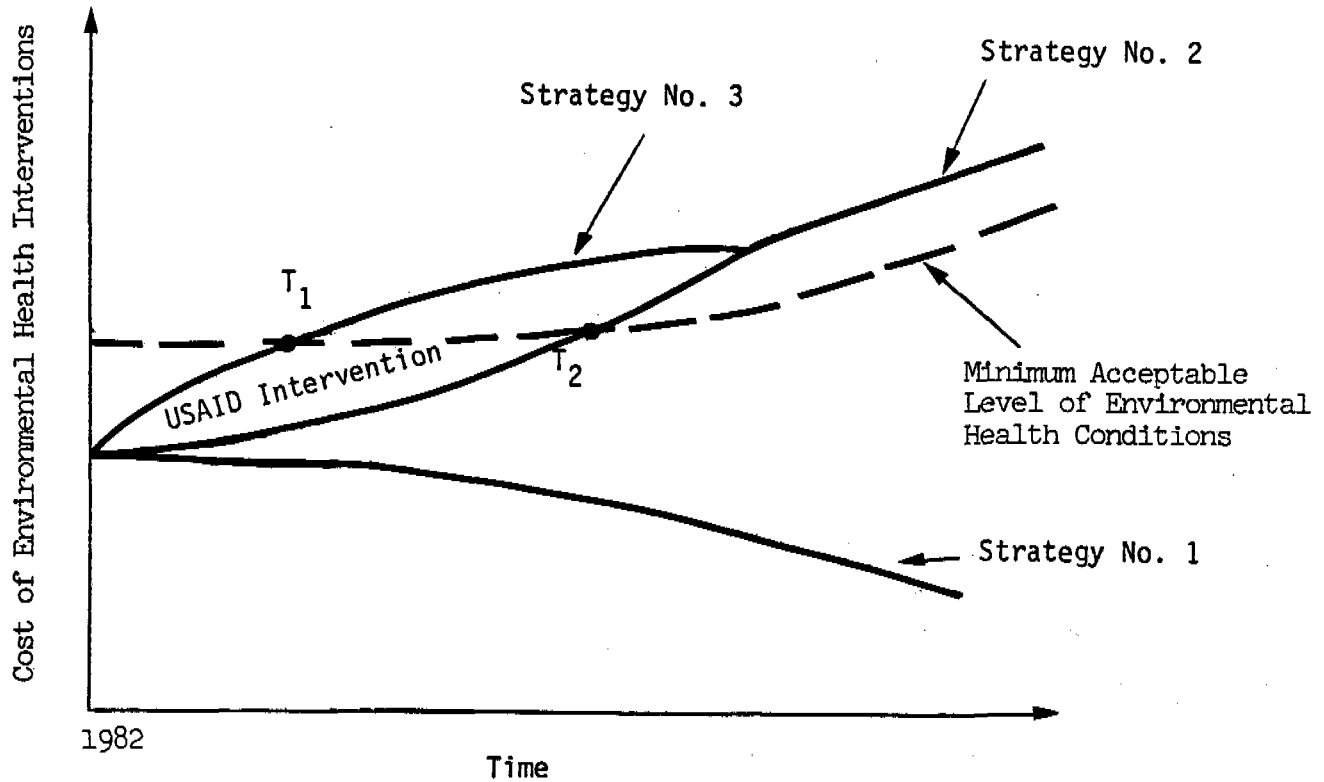
In light of the above discussion, three basic strategy options are possible. These are illustrated in Figure 9 and described below.

8.3.1 Strategy No. 1: No Increase Over Current Environmental Health Efforts

If the funding levels of the GOE and USAID for environmental health were to remain constant, there would occur an accelerating deterioration of environmental health services as new facilities came "on-line". The new facilities would place overwhelming burdens on an already overloaded infrastructure. Furthermore, because of the interlocking (i.e. multidisciplinary and multiagency) nature of most environmental health problems, unresolved issues in one area over time would affect other areas and together they would reduce the overall availability of needed resources. (For example, unless the problem of pesticide runoff is controlled, it will eventually become a limiting factor in the availability of drinking water supplies.) A strategy of no increase in environmental health funding, therefore, will lead to an ever increasing deterioration of health conditions in Egypt in the years to come.

FIGURE 9

Relationships Between Choice of Strategy and Attainment of Minimum Acceptable Level of Environmental Health Conditions.



Strategy No. 1.= No increase in current funding levels.

Strategy No. 2.=Increased GOE funding; constant USAID funding.

Strategy No. 3.=Increased GOE and USAID funding.

T_1 = Time to attain minimum acceptable level under strategy No. 3.

T_2 = Time to attain minimum acceptable level under strategy No. 2.

8.3.2 Strategy Number 2: The Expansion of the GOE Environmental Health Efforts Using its Own Funds

This option assumes a steady increase in GOE funding in the environmental health sector over the coming years. Current environmental health conditions in much of Egypt, however, are so far below minimum acceptable levels that an excessive length of time would probably be needed to upgrade conditions to the desired minimum level. Unfortunately, the longer solutions are delayed, the more rapidly will environmental conditions deteriorate. Moreover, because of the synergistic effects of many of these problems, the delay will often cause exponential increases in the costs of the solution eventually adopted.

It is axiomatic that the cost of preventing pollution is much cheaper than trying to eliminate it once it occurs. Thus, while Strategy No. 2 is a possible alternative, it does not appear to be an acceptable one because of the lengthy delay in attaining minimum health conditions (see Strategy curve No. 2 of Figure 9.)

8.3.3 Strategy Number 3: USAID Assists the GOE to Strengthen a Limited Number of Priority Environmental Health Areas

Under this option, USAID would fund for a limited time a carefully selected and coordinated set of projects described in Chapter 10 in order to more quickly bring environmental health conditions up to minimum levels. USAID could maximize its influence by assisting the GOE in the following areas: (1) improving operational activities at urban water and sewerage facilities; (2) strengthening sanitation services at the Governorate level; and; (3) developing operational planning capabilities in Egyptian institutions. Thus, at any given time, USAID's contribution would represent a supplement to the GOE's much larger funding level.

As shown in Figure 9, strategy No. 3 assists Egypt to achieve minimum acceptable levels of environmental health conditions sooner (T_1 is less than T_2) and at a lower cost than either of the other two options. Under this strategy option, USAID/Egypt's assistance would be decreased with time, and eventually terminated, as GOE institutions became fully mature.

In light of the urgency of environmental health problems in Egypt, the limited availability of trained human resources, and the large number of projects currently in the pipeline, strategy three is the only viable alternative at this time. The time lag inherent in strategy two and the deterioration in both existing and new facilities to be expected under strategy one makes these two options inconsistent with current USA goals.

Chapter 9

RECOMMENDED ENVIRONMENTAL HEALTH STRATEGIES FOR USAID

9.1 General Considerations

The primary purpose of future USAID interventions in environmental health in Egypt should be to strengthen existing GOE activities in this sub-sector. This is justified by the large amount of capital investment currently taking place and by the existence of a relatively well-designed, though overloaded, infrastructure in Egypt for delivering environmental health services. There is a growing need for a drastic improvement in the operation and maintenance of facilities, both in existing systems and those expected to come on-line in the near future.

Foreign investment, including USAID assistance, is concentrated on capital development, leaving the running of systems to overloaded GOE organizations which are increasingly incapable of maintaining standards of operation and maintenance necessary to protect public health. These organizations must be strengthened at both national and local levels to perform their basic functions. There is no other way to assure that the massive capital investments currently being made by USAID in water supply and sewerage facilities will contribute to overall development goals. Unless associated GOE institutions are strengthened, the water and sewerage investments, at best, will have little effect on national development and, at worst, will result in facilities with a very short operational life.

By strengthening GOE institutions in the environmental health sub-sector, USAID will be able to provide indirect, but essential support to its current portfolio of sanitation-related projects. This will benefit the USAID program in two major ways. First, stronger GOE institutions will be better able to operate and maintain the water supply and sewerage facilities currently being developed. Given the poor record of operation and maintenance of such facilities this will serve to protect the major capital investments of USAID. Secondly, the development of institutional support programs will provide USAID with direct linkages to the major GOE organizations having environmental health responsibilities. Such linkages would serve as channels of communication between USAID and the GOE and provide USAID with a means of influencing and supporting the continued formulation of environmental health policy within the GOE.

A strategy of institutional strengthening also would result in major beneficial consequences within the GOE. In the first place, it would emphasize the importance of health considera-

tions, especially among those institutions which normally view their functions solely in technical or public utility terms. As was shown earlier, there are a wide variety of organizations in the areas of environmental health, but only a few are actively concerned with the health consequences of their activities. And secondly, the greater awareness of environmental health responsibilities should help foster interministerial coordination on common problems. Some of the interministerial groups which USAID could directly support are the National Action Committee for the International Drinking Water Supply and Sanitation Decade and the National Committee on the Environment.

9.2 Constraints Upon USAID Strategies

Any strategy adopted by USAID will be limited by physical, financial, and political constraints. In some cases, these constraints are inherent in environmental health planning, but often they are associated with the overall USAID program in Egypt. The Primary constraints and limiting conditions are as follows:

1. Because of the crises in environmental health in Egypt today, USAID should concentrate its limited resources on those efforts that will result in a strengthening of programs with immediate impact on the largest number of people. The initial effort, therefore, should be to strengthen activities in drinking water, wastewater treatment, excreta disposal, and solid wastes collection in the areas of large population concentrations. Additional efforts involving basic sanitation measures should be emphasized in the villages. Further action in the areas of housing, occupational health, pesticides, and food should be considered once minimum levels of environmental health conditions have been established in the primary sanitation activities.
2. Because many different development activities have health consequences, some believe that it is difficult to carry out long-term comprehensive planning in environmental health. As a result, environmental health planning within both the GOE and USAID has tended to be short-term, narrow in scope, and reactive to major capital works projects. Unless both parties act together, USAID promotion of environmental health planning by itself will not bring about immediate significant improvement within the GOE.
3. U.S. development policy in Egypt is based upon a bilateral approach, and this policy is expected to be continued for the foreseeable future. Multilateral cooperation among external donors is not actively promoted by USAID. Future USAID interventions in environmental health, therefore, will probably be largely bilateral in nature.

4. Future levels of USAID funding are uncertain. For the immediate future (two to three years), current funding levels are expected to be maintained. Mid and long-term projections, however, cannot be made at this time.
5. Because of the large USAID development program in Egypt, Mission staff are heavily burdened with the administrative and technical details of several extremely large projects. Recommendations for the strengthening of GOE institutions in the sanitation sub-sector could impose even heavier administrative burdens on the Mission staff, yet staff levels will not be allowed to increase. There is need, therefore, to formulate USAID interventions in the area of environmental health which add a minimum of additional management responsibilities to existing Mission staff.

9.3 Recommended USAID Strategy

Based upon the above review of the environmental health sector, its institutions, resources, and problems, the goals of the GOE and USAID, and the strategy options possible at this time, it is recommended that USAID adopt a general strategy of institutional support having the following three key elements:

1. Strengthening of operational activities in urban water supply and sewerage facilities.
2. Strengthening of basic sanitation efforts at the Governorate Level.
3. Strengthening the planning capabilities of the operational organizations in the environmental health sector.

Further discussion and details regarding the above elements of the recommended strategy are given in the next section. Programmatic recommendations for specific USAID interventions are given in Chapter 10.

9.4 Key Issues in Each Strategy Element

9.4.1 Strengthening of Operational Activities in Urban Water Supply and Sewerage Facilities

In strengthening operational activities, the following issues are important.

1. USAID and others are currently investing huge sums in the water supply and sewerage systems of Cairo, Alexandria, and the Suez Canal cities. One of the basic assumptions regarding these efforts is that they will help to improve public health conditions. However, an inspection of existing plants and systems in these cities shows that current operation and maintenance procedures are not resulting in the desired public health benefits. In order to realize the health benefits of existing systems, and to protect the investments being made in new systems, it will be necessary to strengthen the institutions having operational responsibilities in water supply and sewerage. Because of their higher population concentrations, the highest priority should be given to bringing about a rapid improvement in the operation of these facilities in urban areas.
2. The human resources available to the environmental health sector in Egypt are generally characterized by an abundance of inexperienced professionals and a critical shortage of qualified technicians. In addition, there is a poor distribution of trained personnel among the numerous ministries, organizations, and institutions that have a role in the environmental health sector. This distribution is further distorted by a concentration of professionals in major cities with relatively few working in rural areas. The reasons professionals give for not working in the rural areas include difficulties in obtaining housing, fewer career opportunities, and low pay.
3. The policy of the GOE to guarantee a job for each university graduate has resulted in a serious overstaffing of inexperienced professionals in the operational institutions. The low salaries paid to public sector employees and the lack of a professional esprit de corps within the environmental health institutions has resulted in a constant drain of experienced personnel to the private sector in overseas positions. Overstaffing with inexperienced professionals often causes individuals to be assigned to positions for which they are neither interested nor fully qualified. Furthermore, a shortage of competent middle-level management support has resulted in overloading the few available experienced persons. Because of these problems, many routine situations are currently managed as crises.
4. At the technician level, the lack of formal training programs forces system and plant operators, inspectors, and sanitarians to rely upon in-service or on-the-job training from fellow workers. More often than not, this has resulted in poor practices being passed along from worker to worker and little opportunity to

introduce new ideas and/or improved techniques. No certification schemes or other methods exist for recognizing advancing levels of complexity and responsibility in water supply or sewerage treatment plants. The consequences include the absence of defined programs of job advancement and the perpetuation of poor work practices.

9.4.2 Strengthening of Basic Sanitation Efforts at the Governorate Level

In strengthening the basic sanitation efforts of the GOE at the governorate level, the following issues should be considered:

1. Existing drinking water, excreta disposal, and solid wastes disposal systems in the governorates are so deficient in coverage and operation that for much of the population, especially in the rural areas, they are unable to provide the user with even the basic health benefits that are inherent in such systems. And unless current management practices and manpower levels can be substantially improved, the improvements that are currently being financed will not be able to deliver the desired health benefits.
2. The sanitarians in the environmental health departments of the various governorates are the key elements for upgrading sanitation services in the existing rural towns and villages. At present, sanitarians have many different responsibilities with few readily available resources to make small-scale, on-the-spot improvements to demonstrate the benefits of improved sanitation.

9.4.3 Strengthening the Planning Capabilities of the Operational Organizations in the Environmental Health Sector

In strengthening the planning capabilities of the operational organizations, the following issues should be addressed:

1. Inadequate data on environmental health conditions throughout the country are crippling current attempts to develop realistic plans and programs for environmental health interventions. The lack of statistical data, in particular, prevents the GOE from addressing the long-term environmental health problems of industrialization and urbanization that are growing in extent and severity at the present time.

2. Although environmental health conditions in Egypt are rapidly deteriorating, little is known about the applicability of many of the standard and/or low-cost environmental health solutions to Egyptian climatic, social and technical, and management conditions. As a result many high technology solutions currently are being proposed. If adopted, they could lead to costly solutions that cannot or will not be operated and maintained once donor financing is withdrawn.

CHAPTER 10

RECOMMENDATIONS FOR USAID ASSISTANCE

10.1 The Need To Coordinate Interventions

Previous chapters have shown that the major environmental health problems in Egypt today are due primarily to institutional weaknesses in terms of personnel, management, and operational resources. If USAID is to optimize its assistance to the GOE, the response must be a coordinated set of clearly focused actions that can be implemented as quickly as possible.

This chapter outlines six specific recommendations for programmatic interventions by USAID in the environmental health sector. These recommendations arise from the three key elements found in the USAID strategy proposed in Chapter 9. The strategy elements and their associated recommendations are as follows:

Strategy Element I: Strengthening of Operational Activities In Urban Water Supply and Sewerage Facilities

- Recommendation 1: Operational Improvement of Urban Water and Sewerage Facilities
- Recommendation 2: Improvement of Environmental Health Operational Personnel

Strategy Element II: Strengthening of Basic Sanitation Efforts at the Governorate Level

- Recommendation 3: Environmental Health Priority Improvement Fund for Governorates
- Recommendation 4: Outreach Sanitarian Program

Strategy Element III: Strengthening of Planning Capabilities within the Operational Organizations in the Environmental Health Sector.

- Recommendation 5: Improvement of Environmental Health Data Base
- Recommendation 6: Technological Transfer of Low-Cost Environmental Health Technologies

Since the existing problems in the environmental health sector are interrelated, permanent improvement in sector conditions will not be possible unless all three of the strategy elements and their associated recommendations are addressed as a coordinated whole. Piecemeal interventions on one or more issues may bring about some localized improvement but will have little effect in helping the country to attain a minimum acceptable level of environmental health conditions.

Therefore, the above list of recommendations for USAID interventions is presented as a package of key actions needed to effectively combat the environmental health crisis facing Egypt at the present time. These recommendations should be viewed as essential components of a single integrated program rather than a "shopping list" of independent interventions. It is recommended that USAID consider supporting all of the recommendations, or some related variant of them. If this is not possible, priority should be given to immediately strengthening the operational activities at existing urban water supply and sewerage facilities.

10.2 Strategy Element I: Strengthening of Operational Activities in Urban Water Supply and Sewerage Facilities

The immediate need in the environmental health sector is to improve the operation of existing water supply. And sewerage schemes. In order for USAID to maximize its impact on the environmental health sector and to protect its considerable capital investment, it should provide direct support to the organizations operating such facilities. This support should involve technical assistance to at least the following national level organizations:

National Organization for Potable Water and Sanitary Drainage (NOPWASD)

General Organization for Greater Cairo Water Supply (GOGCWS)

General Organization for Greater Alexandria Water Supply (GOGAWS)

General Organization for Sanitary Drainage in Cairo (GOSD/C)

General Organization for Sanitary Drainage in Alexandria (GOSD/A)

Ministry of Health, Department of Environmental Health (MOH)

10.2.1 Recommendation 1: Operational Improvement of Urban Water and Sewerage Facilities

In the foregoing discussion, the first five organizations have responsibilities for the operation of facilities, while the Ministry of Health is responsible for monitoring the facilities and for compliance with health standards. To achieve the desired operational standards, it is recommended that at least one senior technical advisor be assigned to each of the above six institutions.

For the organizations with operational duties, the advisor should be an experienced facility operator who can provide operational guidance, troubleshooting advice, and on-the-job training for Egyptian facility operators. Such advisors should be familiar with all aspects of plant operation, maintenance, quality control, and management. Their immediate responsibility should be to see that minor problems and local bottlenecks hampering the performance of treatment plants are overcome as quickly as possible.

For the Ministry of Health, the advisor should be a sanitary engineer responsible for advising the Department of Environmental Health on monitoring, sampling, testing, and compliance aspects of water supply and sewerage facilities.

Within all institutions, there should be a small operational support fund available to the advisors to assist them in overcoming minor equipment, supplies, and transport problems. These funds should be used at the discretion of the advisors, but with the approval of the relevant institution. The funds should be made available to each institution on an annual basis. It is recommended that the allocation of funds be made contingent upon the preparation of an approved action plan for the year. Overall assistance should be programmed for at least a five-year period and the annual Operational Support Fund should be established for high priority, public health-related operational improvements in facility operations. The fund should be large enough to provide incentives to each organization to develop a yearly action plan.

The proposed cost of this recommendation is:

Technical Assistance (advisors):

One advisor for each of six institutions
(6 advisors for 5 yrs. @ \$120,000/yr.) = \$3,600,000

Operational Support Fund:

Separate fund for each of six institutions
6 institutions for 5 yrs. @ \$200,000/yr.) = \$6,000,000

5 - year total = \$9,600,000

- Recommendation: USAID should establish a program of direct assistance to the operation of urban water supply and sewerage facilities.
- GOE Institutions Affected: NOPWASD
GOGCWS
GOGAWS
GOSD/C
GOSD/A
MOH
- Major Components: Technical assistance and an Operational Support Fund.
- Estimated Costs: \$2,000,000/yr. over five years.

10.2.2 Recommendation 2: Improvement of Environmental Health Operational Personnel

The shortage of qualified personnel and the absence of training programs are recognized by officials of the water and sanitation organizations as serious problems. Some efforts at developing manpower training schemes are currently under way. NOPWSD, for example, is establishing an overall strategy for Cairo, Alexandria, and the Canal cities in order to coordinate their water needs with the proposed training activities of the Beheira provincial water supply system. These activities will be part of the training center being developed in Beheira Governorate by the Organization of Reconstruction and Development of Egyptian Villages (ORDEV).

Other environmental health sub-sectors, such as solid wastes, occupational health, vector control, etc., need to develop training strategies suited to their own needs. In addition, Ministry of Health staff at the national and governorate levels should be trained to evaluate and monitor the new water and sewerage facilities that are currently under consideration.

To integrate these various elements and strategies, the new Environmental Health Center at Embaba should take leadership in training the trainers of operational personnel for environmental sanitation facilities. The various sector institutions also should examine the manpower needs and existing career paths for technicians in the environmental health systems. Serious consideration should be given to the certification of technicians, especially operators at water supply and sewerage facilities, through a series of modular type courses and examinations. Such a process would allow the development of appropriate numbers and types of skilled persons while providing system managers a tool to reward better qualified workers.

The development of required courses will require the formation of a working group of representatives of the various operational organizations and institutions in the environmental health sector. The Department of Environmental Health in the Ministry of Health should be considered as one of the key participants in this working group. This effort will require the assistance of short-term foreign consultants in the design and initial phases of training courses. It is believed that direct technical assistance can be used effectively in Egypt, but strenuous efforts should be made to limit the use of expatriate personnel to the first two to three years of the project. Funding requirements are expected to be on the order of \$3 to \$4 million dollars annually for a period of four years.

- Recommendation: USAID should assist in the development of modular training courses leading to certification of both trainers and operational personnel in water and sewerage facilities and other environmental health disciplines.
- GOE Institutions Affected:
 - MOH (Department of Environmental Health)
 - NOPWASD
 - GOGCWS
 - GOGAWS
 - GOSD/C
 - GOSD/A
- Major Components: Training Support Fund
- Estimated Costs: \$3,000,000 to \$4,000,000/yr. over 4 years

10.3 Strategy Element II: Strengthening of Basic Sanitation Efforts at the Governorate Level

The current environmental health crisis in Egypt requires that public health authorities in the governorates establish a minimum acceptable level of health conditions as quickly as possible. From a public health standpoint, the services of water supply, excreta disposal, and solid wastes collection are the most cost-effective interventions for obtaining long-term benefits. As basic health levels are attained, however, environmental health authorities also must recognize that these systems also assume important social and commercial roles, that is to say, the continuing operation of sanitation activities services becomes basically a routine municipal service. Under these conditions, the responsibilities of the governorate-level institutions shift from the establishment of environmental health levels to monitoring of operations to see that basic health conditions are maintained for all populations being served.

10.3.1 Recommendation 3: Environmental Health Priority Improvement Fund for Governorates

To establish acceptable health conditions at the governorate level, the operational agencies in the environmental health sector must improve the performance of their systems to at least minimum acceptable levels. It will be especially necessary for the operational organizations within the governorates to (1) improve their management techniques so that users will derive the greatest possible health benefits from the combination of water supply, excreta disposal, and solid wastes collection, (2) work closely with environmental health authorities to define realistic and sustainable minimum health levels, (3) improve the quality and quantity of manpower, and (4) work closely with environmental health authorities in order to continually associate operational procedures with subsequent health conditions.

An Environmental Health Priority Improvement Fund (EHPIF) should be established to finance activities at the governorate level among the operational agencies providing water supply, excreta disposal, and solid wastes collection services. The purpose of the fund should be to support coordinated efforts among the institutions providing these three environmental health services and to link their activities more closely to public health requirements.

Proposals for financial assistance should be sent from the various operational organizations to a joint GOE/USAID working group headed by a representative of the Department of Environmental Health in the Ministry of Health. Upon certification by the working group that the proposed action addresses a basic health need in a pre-determined priority area, funds should be made available for the proposed operational improvement. Activities in the medium-to-small-size cities and towns should be given priority.

It is estimated that between \$10 to \$20 million a year would be required over a five-year period to finance such program elements as (1) promotion of institutional development, (2) rehabilitating critical system elements that would allow subsequent rapid expansion of system coverage, (3) equipping work crews with essential tools to repair and maintain key system elements, (4) upgrading operational units at governorate and municipal levels, and (5) strengthening the Department of Environmental Health in the Ministry of Health to effectively carry out its proposed leadership role.

- Recommendation: USAID should assist in the financing of coordinated environmental health activities at the governorate level.

- GOE Institutions Affected:

MOH, Department of Environmental Health
Governorate-Level environmental health
institutions

- Major Components: Environmental Health Priority Improvement (EHPI) Fund
- Estimated Costs: \$10,000,000 to \$20,000,000/yr over 5 years

10.3.2 Recommendation 4: Outreach Sanitarian Program

The efforts of specially trained sanitarians should be directed to assist environmental health authorities at the governorate level to carry out sanitation improvement campaigns in selected villages. In these "outreach" programs, sanitarians should be directly responsible for (1) identifying villages with the most critical sanitation conditions, (2) identifying the community leaders, (3) identifying actions with the potential for a dramatic impact on environmental health problems, (4) discussing the proposed actions with the community, (5) providing the necessary materials for construction, (6) directly supervising the implementation of the improvements, (7) supervising the training of personnel for the long-term operation and maintenance of the interventions, and (8) evaluating the results. Villages warranting immediate attention include those with the worst infant mortality rates and the poorest potable water and sanitation coverage.

In order to have maximum impact upon communities, the number of interventions undertaken by "Outreach Sanitarians" should be limited and carried out on a demonstration basis. The work must also be carefully coordinated with the efforts of sanitarians in other villages and integrated into ongoing environmental health efforts in the district. This effort should be limited to three or four governorates until the outreach approach is fully developed and proven.

Under this program, USAID should assist the governorate authorities to (1) select priority areas, (2) identify and train "Outreach Sanitarians," (3) supervise the procurement and shipment of supplies and equipment to "Outreach Sanitarians" in the field, and (4) develop a program that will be replicable in other governorates. The program should make maximum possible use of existing sanitarians and should seek to establish the "outreach" concept as an option in the training of future sanitarians. The Department of Environmental Health in the Ministry of Health should be used as the overall coordinating and planning institution for the program.

It is estimated that between \$4 to \$8 million per year for five years will be required to (1) purchase needed materials from national and international suppliers, (2) equip the "Outreach Sanitarians", and (3) develop a long-term training scheme to ensure appropriate numbers of such sanitarians. The work of the "Outreach Sanitarians" should be coordinated with the activities and priorities financed by the Environmental Health Priority Improvement Fund (EHPIF).

- Recommendation: USAID should assist in the financing of an Outreach Sanitarian Program in three or four governorates.
- GOE Institutions Affected:
MOH, Department of Environmental Health
Governorate-level environmental sanitation
institutions
- Major Components: Outreach Sanitarian (OS) Fund.
- Estimated Costs: \$4,000,000 to \$8,000,000/yr. over 5 years

10.4 Strategy Element III: Strengthening the Planning Capabilities within the Operational Organizations in the Environmental Health Sector.

There are two high priority problems in this strategy element. Firstly, inadequate data on environmental health conditions throughout the country are crippling current attempts to develop realistic plans and programs for environmental health interventions. The lack of statistical data, in particular, prevents the GOE from addressing the long-term environmental health problems of industrialization and urbanization that are growing in both extent and severity.

And secondly, little is known about the adaptability of low-cost technologies used in other countries to the environmental health conditions and problems found in Egypt. This lack of knowledge has led to the overdesign of many sanitation facilities and to a level of operational sophistication that cannot be maintained with local resources.

10.4.1 Recommendation 5: Improvement of Environmental Health Data Base

Given the current environmental health crisis in Egypt, data collection systems must be practical, simple, and action oriented. Planners must be able to develop broad action plans with a minimum of data and then adjust them as additional data become available.

The improvement of a data base must be related to the capabilities of institutions to respond to immediate short-term environmental health problems. As immediate needs are addressed and eventually overcome, the nature of the high priority problems will change from the short-term to that of medium and long-term needs. The short-term problems will require a high degree of cooperation between institutions operating water and sanitation systems, those collecting data, and those setting standards. The long-term problems will require the establishment of research and data collection projects in the following areas: (1) revised drinking water and wastewater treatment standards that realistically reflect national operational capabilities rather than expressions of ideal levels, (2) research on low-cost excreta disposal systems that can eventually tie into sewerage systems, (3) research into the effects of high levels of pesticides and industrial pollutants on minimum acceptable levels of health, (4) studies for improving the quantity and accessibility of drinking water in water short areas such as Sinai and the frontier governorates, and (5) sub-sector assessments of provincial sanitation, solid wastes, and national water quality management.

Funding for the planning and assessment efforts should be coordinated with projects from the Environmental Health Priority Improvement Fund (EHPIF) described in Recommendation 3. Funding for the research and basic data collection projects should be considered under a separate funding mechanism. Although external technical assistance may be needed to initiate some of the activities included in this recommendation, the long-term goal should be to develop the capabilities of Egyptian institutions and agencies to be self-sufficient in routine data collection, special assessments, and research investigations.

Financial assistance will also be needed to establish an Interministerial Action Group to coordinate the activities and administer the program. Additional funds should be provided to help the operational agencies integrate their planning and data collection systems into the overall operation of this effort. Approximately \$3 to \$5 million per year will be required for the initial three-year stage.

- Recommendation: USAID should support the improvement of the environmental health data base by providing funds for improved data collection sub-sector assessments, and research investigations.
- GOE Institutions Affected:
 - Interministerial Action Group
 - National-level environmental health institutions
- Major Components: Financial assistance.

- Estimated Costs: \$3,000,000 to \$5,000,000/yr. over 3 years

10.4.2 Recommendation 6: Technological Transfer of Low-Cost Environmental Health Technologies

Research into ways of adapting low-cost environmental health technologies to Egyptian conditions should be encouraged at Egyptian institutions. Particular consideration for research support should be given to the Environmental Health Center at Embaba, the High Institute of Public Health in Alexandria, and the national universities.

Problem areas that should be looked at, but not be limited to, include the following:

- Controlling pesticide pollution in drinking water sources.
- Low-cost excreta disposal schemes for cities and villages.
- Solid wastes removal and disposal schemes that use a minimum of mechanical equipment.
- Low-cost methods of providing basic amounts of drinking water to water-scarce areas.
- Control of algae in drinking water supplies.
- Low-cost simple techniques for removing iron and magnesium from village water systems.
- Use of sewage flows, latrine waste, and/or solid wastes in desert reclamation schemes.

Funding requirements for this activity will depend on the number and type of problems examined, but should be no less than \$2 to \$4 million a year for a period of five years.

- Recommendation: USAID should support research into low-cost environmental health technologies at Egyptian institutions.

- GOE Institutions Affected:

High Institute of Public Health (Alexandria)
Environmental Health Center (Embaba) national universities

- Major Components: Financial assistance

- Estimated Costs: \$2,000,000 to \$4,000,000/yr. for 5 years

10.5 Summary of Recommended USAID Interventions

The funding levels, duration of projects, and types of resources required are summarized in Table 7. The total cost of the package of recommendations outlined above ranges from US\$24 to US \$41 million per year over the first three years with slightly lower totals over years four and five. Over the entire five year period, the recommended interventions will cost between US \$110 and US \$200 million.

Table 10: Funding Requirements for Proposed USAID Environmental Health Package

No.	Recommendation Title	GOE Institutions Affected	Major Components			Funding Level		Total (US\$ Millions)
			Tech Support	Support Funding	Financial Assistance	Cost/yr. (US\$ Millions)	Duration	
1	Operational Improvement of Urban Water and Sewerage Facilities	NOPWASD, GOGCWS, GOGAWS, GOSD/C, GOSD/A, MOH	X	X	--	2	5 yrs.	10
2	Improvement of Environmental Health Operational Personnel	MOH (Div. of EH), NOPWASD, GOGCWS, GOGAWS, GOSD/C, GOSD/A	--	X (Training)	--	3 to 4	4 yrs.	12 to 16
3	Environmental Health Priority Improvement Fund for Governorates	MOH (Div. of EH), Governorate level EH institutions	-- --	X (EHPI)	-- --	10 to 20	5 yrs.	50 to 100
4	Outreach Sanitarian Program	MOH (Div. of EH), Governorate level Sanitation institutions	--	X	--	4 to 8	5 yrs.	20 to 40
5	Improvement of Environmental Health Data Base	Interministerial Action Group, National level EH institutions	--	--	X	3 to 5	3 yrs.	9 to 15
6	Technological Transfer of Low-Cost Environmental Health Technologies	EH Center (Embaba), High Institute of Health at Alexandria, National universities	--	--	X	2 to 4	5 yrs.	10 to 20

APPENDIX A


MEMORANDUM

1861 2 100

WATER AND SANITATION FOR HEALTH (WASH) PROJECT
ORDER OF TECHNICAL DIRECTION (OTD) NUMBER 2
Camp, Dresser & McKee, Inc.

October 6, 1981

TO: Dr. Dennis Warner, Ph.D., P.E.
WASH Project Director

FROM: Mr. Victor W.R. Wehman, Jr., P.E., R.S.
AID WASH Project Manager 

SUBJECT: Provision of Technical Assistance Under WASH Project Scope of Work
for USAID/Egypt

REFS: A) CAIRO 22119
B) STATE 244355
C) Egypt Health Sector Assessment: Environmental Health Working
Paper (Scope of Work and Terms of Reference)-NE/TECH
D) Health Sector Assessment 8/16/81-P. Johnson

1. WASH contractor requested to provide technical assistance to USAID/Egypt as per Ref. C., and Ref. A para. 3. Scope of Work. Contractor to provide two (2) internationally recognized sanitary/environmental engineers as per most recent discussions with NE/TECH and mission for period of 3-4 weeks each as necessary and appropriate, starting o/a 18 October in Cairo. Both consultants do not necessarily need to be in country at the same time.
2. WASH contractor/sub-contractor/consultants authorized to expend up to seventy (70) person days effort over a three (3) month period to accomplish this technical assistance effort.
3. Contractor to provide draft final report according to Ref. C., a debriefing according to Ref. C. and a final report within 30 days of their return from the field.
4. Contractor to coordinate directly with USAID/Egypt (Dr. W. Oldham), NE/TECH representative in Egypt on TDY (Mr. J. Haratani), USAID environmental officer, capital development and engineering officers, and various ministries as appropriate.
5. Contractor should ensure that NE/TECH (B. Turner), NE/PD/ENGR officer and Egypt desk officer receive copies of OTD and are coordinated with and informed on ETA's, purpose of TA, etc. as appropriate.
6. Sixty (60) person days of international and domestic per diem is hereby authorized.
7. Two round trip airfares from Washington, D.C. to Egypt and return to Washington, D.C. are authorized.

8. Local in-country travel is authorized as necessary to accomplish scope of work. Effort should be made to utilize USAID/Egypt transportation, secretarial and interpreter/liaison services to maximum extent possible. If this proves to jeopardize effort in team leader's opinion, consultants authorized rental of local vehicles and conveyances, rental of interpreter services and procurement of typing services as necessary NTE \$3,500 without request and approval by AID Project Manager.
9. Seven day work week is authorized if deemed necessary by team leader.
10. Miscellaneous expenses authorized NTE \$2,000.
11. Local graphics/photography, reproduction and typing expenses authorized NTE \$800.
12. WASH consultant requested to take 35 mm camera and film to take representative group of 35 mm slides to adequately portray environmental health situation in Egypt for purposes of debriefing and educating other WASH CIC and consultant staffs.
13. Mission and consultant should be contacted immediately and technical assistance initiated as soon as possible or convenient to USAID/Egypt. WASH CIC should ensure backstopping of consultants.
14. Appreciate your prompt attention to this matter. Good luck.

VWw:ja

CAIRO

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ACTION AID-35

ACTION OFFICE NETO-04
INFO RFPD-04 NEDY-02 NEEL-03 APOST-01 SIME-01 STIN-04 HNS-00
RELO-01 NAST-01 /030 A2 X17

INFO OCT-01 /036 W
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E.O. 12065: P/A
SUBJECT: HEALTH SECTOR ASSESSMENT.

1. PASS TO BARBARA TURNER, NE/TECH/RPN AND JOE HARATANI USAID/UNIS.
2. CONCUR ON PROPOSAL TO RECRUIT CENTRALLY FUNDED WASH CONSULTANT TO WORK WITH HARATANI ON ENVIRONMENTAL HEALTH BACKGROUND/ISSUES PAPER.
3. MINISTER OF HEALTH HAS REQUESTED THAT USAID DELAY START OF ASSESSMENT UNTIL NOVEMBER 1. CITES UNAVAILABILITY OF SENIOR MOH PERSONNEL TO ASSIST IN PHASE I OF ASSESSMENT DUE TO INVOLVEMENT MOH PERSONNEL IN CHOLERA QUARANTINE PROGRAM FOR CARRIERS FROM JORDAN & IRAQ. ALSO A NUMBER OF SENIOR STAFF HAVE BEEN SENT TO SAUDI ARABIA TO PROVIDE MEDICAL CARE TO PILGRIMS TO MECCA. MINISTER HOWEVER HAS AGREED TO USAID PROCEEDING WITH DATA COLLECTION IN OCTOBER IF NO REQUIREMENTS PLACED ON MOH PERSONNEL. ENVIRONMENTAL ASSESSMENT WILL BE BASED PRIMARILY ON INFORMATION FROM OTHER SOURCES, BELIEVE OCTOBER CONSULTATION FEASIBLE. HARATANI CAN WRAP UP MOH INPUT IN EARLY NOVEMBER. UNDERSTAND HARATANI IS WRITING SCOPE OF WORK FOR WASH CONSULTANT.

4. USAID PROPOSES FOLLOWING SCHEDULE OF ACTIONS:

- (A) RECRUITMENT OF RESEARCH ASSISTANT FOR DATA BASE COLLECTION. SEVERAL LOCAL CANDIDATES BEING CONSIDERED.
- (B) BRINGING ROBERT EMERY OUT ON APHA CONTRACT DURING OCTOBER TO WRITE SCOPES OF WORK FOR BACKGROUND/ISSUE PAPERS AND TO INITIATE RECRUITMENT OF REQUIRED LOCAL CONSULTANTS FOR PHASE I.
- (C) EMPLOYMENT OF HANAL NADIM TO WRITE SOCIAL ASSESSMENT PAPER AS SOON AS FUNDS AVAILABLE.
- (D) CONSULTATION BY COP JOHN ALDEN NOV. 1 FOR 2-3 WEEKS PERIOD TO ESTABLISH FINAL TERMS OF REFERENCE OF ASSESSMENT, ESTABLISH WORKING RELATIONSHIP WITH MOH, AND COMPLETE RECRUITMENT OF LOCAL CONSULTANTS AND PHASE I SUPPORT STAFF (WITH USAID ASSISTANCE AS REQUIRED). AS PHASE I MANAGER, HE WILL BE CHARGED WITH SUPERVISION AND ASSISTANCE TO THE PHASE I TEAM WHICH WILL:
 - (1) COLLECT AND SUMMARIZE EXISTING DATA
 - (2) ASSESS AND IDENTIFY IMPORTANT GAPS IN EXISTING DATA
 - (3) PURSUE RAPID FIELD ASSESSMENTS WHERE APPROPRIATE
 - (4) IDENTIFY AND DISCUSS CHANGES AND TRENDS
 - (5) HIGHLIGHT MAJOR FINDINGS, ISSUES AND QUESTIONS FOR DISCUSSION
 - (6) IDENTIFY IMPORTANT ACTORS AND INSTITUTIONS FOR POSSIBLE CONTACT AND INVOLVEMENT IN PHASE TWO.

SUBJECT AREAS I.P. BACKGROUND/ISSUES PAPERS ARE DESCRIBED IN "HEALTH SECTOR ASSESSMENT PAPER" WRITTEN BY PAH JOHNSON 8/15/81 AND ACCEPTED BY THE MISSION AS THE BASIC DESIGN FOR THE ASSESSMENT. "INFECTIOUS AND ZOO-NON-TRANSMISSIBLE DISEASES" HAS BEEN ADDED AS AN AREA FOR ASSESSMENT.

(E) DEPLOYMENT OF PHASE II TEAM ON FEB. 1 FOR ONE MONTH. CHIEF OF PARTY (JOHN ALDEN) ALREADY SELECTED. OTHER TEAM MEMBERS PROPOSED ARE HEALTH ADMINISTRATION SPECIALIST (BARBARA TURNER), HEALTH ECONOMIST (CARL STEVENS), MEDICAL ANTHROPOLOGIST (PAMELA JOHNSON), AND TWO OR MORE DISTINGUISHED INTERNATIONAL HEALTH AUTHORITIES. ONE SHOULD HAVE WIDE EXPERIENCE IN PUBLIC AND ENVIRONMENTAL HEALTH AND THE OTHER IN INFECTIOUS DISEASES AND CLINICAL SYSTEMS. USAID IS CERTAINLY OPEN TO SUGGESTIONS FROM AID/W CONCERNING TEAM COMPOSITION.

5. PLEASE ADVISE. ATHONTON

Handwritten notes and signatures:
- [Signature]
- [Signature]
- [Signature] → U.S.
- [Signature] → J.P.

Department of State

→ J.F.
T.P.OUTGOING
TELEGRAMPAGE 01 STATE 244355 → U.W. 5833 072241 AID8662
ORIGIN: AID-35-----
ORIGIN OFFICE NPTC-04
INFO NEPD-04 NEEI-03 AAST-01 CMGT-02 CTR-02 SIHE-01 ENGR-02
RELO-01 IC-00 /020 A0-----
INFO OCT-00 /035 RDRAFTED BY AID/NE/TECH/HPN: B. TURNER/J. HARATANI: L
APPROVED BY AID/NE/TECH/HPN: BARBARA TURNER
AID/NE/RI: B. PORTER (PHONE)
AID/S T/HEA: V. WEHMAN (PHONE)

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FM SECSTATE WASHDC
TO AMEMBASSY CAIRO

UNCLAS STATE 244355

AIDAC

E. O. 12065: N/A

TAGS:

SUBJECT: HEALTH SECTOR ASSESSMENT

REF: CAIRO 21083

1. HARATANI AVAILABLE UP TO SIX WEEKS TO ASSIST USAID AS REQUESTED REFTEL; HOWEVER, WE FEEL TWO TASKS IDENTIFIED, I. E., CAIRO SEWERAGE AND HEALTH SECTOR ASSESSMENT WILL REQUIRE GREATER EFFORT THAN POSSIBLE IN SIX-WEEK TIMEFRAME. SUGGEST ENVIRONMENTAL HEALTH ISSUES PAPER FOR HEALTH SECTOR ASSESSMENT SHOULD BE UNDERTAKEN BY A SEPARATE CONSULTANT. NEXTECH IS WORKING THROUGH THE CENTRALLY-FUNDED W. A. S. H. CONTRACT TO IDENTIFY QUALIFIED CONSULTANT (AT NO COST TO USAID). PROPOSE HARATANI WOULD SPEND UP TO ONE DAY PER WEEK WITH CONSULTANT BUT THAT CONSULTANT WOULD HAVE PRIME RESPONSIBILITY FOR DEVELOPING ISSUES PAPER. THIS WOULD ASSURE SUFFICIENT TIME AVAILABLE FOR BOTH TASKS.

2. HARATANI AND TURNER HAVE INTERVIEWED ONE EXCELLENT CANDIDATE WHO WOULD BE AVAILABLE FOR MONTH OF OCTOBER. (CV HANDCARRIED TO OLDHAM.) PLAN REVIEW OTHER CANDIDATES WITH W. A. S. H. BEFORE NOMINATION.

3. REQUEST USAID COMMENTS/CONCURRENCE TO NOMINATE CANDIDATES THRU W. A. S. H. CLARK

UNCLASSIFIED

EGYPT HEALTH SECTOR ASSESSMENT: ENVIRONMENTAL HEALTH WORKING PAPER

Terms of Reference

Contractor will provide a Sanitary/Environmental Engineer consultants to travel to and work in Egypt for a period of approximately ^{three to} four weeks *each* beginning o/a October 4, 1981. The consultants will travel to Washington, D. C. to confer with A.I.D. and other pertinent officials prior to departure to Egypt.

A.I.D. will provide the consultants with available reference documents for review and assist in arranging meetings with the proper officials. A.I.D. will also provide office space and telephone service in Washington, D. C. A.I.D. will also assist the contractor in obtaining the necessary visas.

In Egypt, USAID/Cairo shall provide the normal office and logistical support services rendered to contractors. Consultant will be responsible to arrange for lodging, meals and transportation services needed in carrying out the contract.

Prior to departure from Egypt, the consultants shall submit a draft report as described below. The consultants will present a debriefing for pertinent USAID staff prior to departure from Egypt.

Upon return to the U.S.A. consultants will visit AID/W for one day to submit a copy of his draft report and present a debriefing for pertinent AID/W staff.

Contractors will submit a final report to NE/TECH/HPN with 30 days of the debriefing of his return to the U.S. no later than December 15, 1981.

Consultants Qualifications

Consultants shall be ~~a~~ graduate ^{or} Sanitary or Environmental Engineers with at least 10 years experience. The consultants should have significant professional experience overseas in developing countries, preferably in Egypt or the Near East region. Arabic language ability is desirable but not necessary.

Scope of Work

The major determinants of health status in Egypt are linked to the environment. The need for clean water and sanitary waste disposal, industrial pollution and occupational hazards in rural and urban areas are among the factors which contribute to Egypt's pattern of disease and illness. As part of the planned health sector assessment, the consultants will assess: 1) the environmental determinants of health status in Egypt. 2) the interrelationship of health with other sectors of A.I.D. assistance: Water, sanitation, agriculture, industry and housing.

The purpose of this assessment is to lay the groundwork for how A.I.D.'s strategy for continued involvement in the health sector should address environmental health issues.

The consultants will prepare a working paper which :

1. Reviews and summarizes existing data on environmental determinants of health status in Egypt
2. Identifies important gaps in existing data.
3. Based on data review and interviews with appropriate officials and authorities, identifies and discusses priority problems, changes and trends.

HEALTH SECTOR ASSESSMENT

A. Existing AID Strategy

USAID Cairo initiated its health/population sector support to the GOE in 1976 with approval of the Strengthening Rural Health Delivery Project. The strategy has resulted in the set of projects now underway or in development focuses on the improvement of the delivery of basic health and family planning services to the community with concentration in the public sector (in accord with GOE policies) but with some limited experimentation with private and traditional channels.

The Mission health strategy was articulated succinctly in the 1982 County Development Strategy Statement:

"In health we plan a three-part approach to reduction of infant mortality. First, we plan to continue efforts to improve the institutional framework for the delivery of health services both in rural and urban areas. Infant care will be a prominent part of this effort. Secondly, we also will continue with measures to improve sanitation by expanding the upgrading of water and sewage facilities from the primary cities to provincial and rural areas by the end of the five-year period. These efforts will be strengthened by information activities aimed at better sanitation practices. Third, we plan a frontal attack on the root cause of infant mortality, diarrheal diseases, through a widespread program of oral rehydration throughout Egypt."

This statement does not reflect USAID's support of other activities in health such as family planning, medical education, research and commodities.

B. Need for an Assessment

A number of factors suggest that it is now time to reflect upon our first five years of experience and to lay plans for the next period of AID assistance. To date, AID has developed several successful projects in health. In keeping with GOE and Mission policy, AID assistance laid the groundwork for the improvement of service delivery through MOH facilities. While these projects are achieving many of their objectives, has their impact been limited by their relatively narrow focus?

Our five years of involvement has generated a broader understanding of Egypt's health sector and a growing appreciation of its dynamic and heterogeneous nature. There are many indications that this is a period of critical transition during which the roles and relationships of the major actors in the health sector are changing. We see a growing importance of the private sector in service delivery, new administrative decentralization, experimentation with new means of financing health care

and impetus for change in medical and paramedical education and training. Those are challenges to innovative programming as well as opportunities to help shape and support new directions.

Our experience in the sector has also lead us to realize that, despite a wide range of studies and data collection efforts, the lack of certain fundamental kinds of information handicaps efforts in effective health planning and evaluation. For example, while it has grown in importance, there appears to be little information on the private and non-formal health system and how they relate to the public delivery system (does it supplement? replace? what income groups are served?). There are significant gaps in our understanding of how these sectors operate and how interventions could be constructive. Similarly, we lack a map of the health sector from the bottom up, as it appears to its users. A few studies document extremely low utilization rates of MOH facilities (10% in SRHD Survey,) and high use of private sources of care. A better understanding of factors in utilization is needed to design activities which are responsive to the needs of all strata of society, especially high-priority target groups. Ways to make health services available to indigent populations under such innovations as insurance and pay-as-you-go plans need to be explored. Resource flow data are needed on expenditures in the public and private sectors.

The SRHD experience in particular has led us to realize that there is a need to understand better the fundamental determinants of health status in Egypt. Within that project the toll in infant mortality from diarrhea and tetanus was documented in limited geographical areas. However, there is a long list of important Egyptian health problems about which little is known: the etiology of respiratory disease, causes of maternal mortality, the prevalence of low birth weight, tuberculosis and zoonotic diseases, and the effects of agricultural and industrial pollution. To target health programs, as well as to measure improvements in health status, existing data - especially that in Arabic - needs to be compiled and important gaps filled in.

In addition, now that the "medical" elements of better health are being addressed through the current portfolio, it is time to consider addressing the determinants of health which lie outside of the health delivery system. It is an appropriate time to consider environmental and other factors which affect people's risk of acquiring disease and possibly develop activities which complement our substantial capital investments in water, sewage, housing, basic education, and agriculture.

Finally, five years into the program, we have a clearer perspective on what sources AID can bring to bear to assist Egypt in improving its health system and consequently, its people, operating within the Congressional mandate's health status. Plans for the next phase of American assistance to the sector should reflect the realities of the assistance program: the extensive demands on a relatively small USAID health staff, the need to obligate and disburse funds, the need to achieve results that are at once visible, measurable, and lasting, and

the need to use technical assistance as efficiently as possible. It would be unwise to develop a strategy dependent upon markedly higher staff of technical assistance levels. Equally, it would be unwise to focus either on short-or long-term impacts to the exclusion of the other.

C. Terms of Reference

The Health Sector Assessment has two objectives:

- 1) To establish guidelines, assess options and recommend a strategy for AID's continued involvement in the health sector and to lay out the data base underlying these recommendations.
- 2) To initiate a health planning and evaluation process which establishes benchmarks and develops the effective use of data to monitor and evaluate improvements in the health system and ultimately, health status.

This is clearly a continuing process. Initially, two phases are planned, a phase to collect data and define issues and a second phase to formulate strategy options. It is important that, while this will be incorporated in an AID strategy, the team must set that strategy in the context of the plans and policies of the Government of Egypt, and take into account the activities of the other donors and actors in the sector. This assessment will build on the Population Sector Assessment currently underway as it relates to health.

The assessment will consider several questions:

What are AID's Goals in the Health Sector?

AID's ultimate strategy in the health sector is to contribute to improvements in Egyptian health status, improvements which will lead to longer and more fulfilling lives for Egypt's citizens, greater productivity, less human wastage and the more effective nurturing of future generations. AID recognizes that many intermediate goals contribute to this overall objective. Expanded access to effective health services, availability and use of safe water, routine neo-natal examinations and more comprehensive vaccination coverage are only a few examples.

Within this overall framework, the AID strategy in health should establish operational goals in three different time horizons. Identifying short-, medium- and long-term objectives will permit AID to be more responsive to needs in a changing sectoral environment. In addition, time-linked goals will allow for planning to achieve visible impacts in the near term as well as to progress toward improvements in the health status in the longer term.

The assessment will need to consider a wide range of options with respect to both target population and program. To date, AID has taken young children and mothers as its principle target population. Given Agency guidelines and our current understanding of Egypt's health

problems, it is likely that this will continue. The assessment should consider if these are the only appropriate target populations for achieving health objectives at favorable cost.

Programmatically, support to the health sector may seek to achieve several goals, including improved access, increased efficiency, greater effectiveness and maximization of cost effectiveness.

What are the key constraints in reaching Health Sector goals

In a period of rapid transition, it is appropriate to ask if the present structure of the sector - in financial and institutional terms - is congruent with health sector goals. Does the institutional framework of the sector and the allocation of resources within it flaw in some fundamental way current efforts to improve health status or service delivery?

Relatively high per capita expenditures and per capita/health personnel ratios suggest that the major problems may lie in the allocation of resources and structural or institutional limitations. Nevertheless the question of overall resource levels - financial, human and infrastructure - should be considered both from the point of view of basic insufficiencies as well as changes required to achieve greater cost-effectiveness.

Other possible constraints should be considered. In Egypt, because of the numbers of health facilities and medical personnel, access is generally not seen as a problem. However, since there is evidence that utilization is not necessarily related to ease of physical access, there needs to be a careful review of other qualitative factors - economic, educational, and social - which may affect access. In addition, as the sector changes and the role of the private sector grows, supported, perhaps, by health insurance, access will be increasingly important as an issue, particularly, for indigent groups.

System efficiency has been identified as a considerable constraint in MOH facilities in the SRHD project areas. Over-staffing, low salaries, under-equipment and lack of adequate training, supervision and management contribute to overall inefficiency in health care delivery. There is a growing suspicion on the part of AID that elements of the private sector are markedly more efficient and should be used. The Diarrheal Disease Control Project, for example, expects to utilize the network of pharmacies for distribution of and education about CRS. The assessment team needs to consider to what extent AID should try to increase efficiency in problem areas of the sector and to what extent we should seek to build on efficient elements without overloading them.

A third goal is to increase the effectiveness of the health system in improving the health status of the Egyptian people. In attempting this goal, one is immediately aware of the need for improved data on the determinants of health status and the expanded use of such data in the planning, monitoring and evaluation of health programs. This is, of course, an important function of the MOH's new planning unit and of Egyptian universities. AID should consider how best to support the impetus to expand the use of performance-related research and health and management information systems. This, together with measures of cost effectiveness, are essential pre-conditions for more effective allocation of sectoral resources.

What are AID's options?

As AID prepares for its next period of assistance to the health sector, a number of options for expansion need to be considered.

The existing portfolio offers opportunities for expansion. In geographic terms, AID's current program in health is quite restricted. The projects have certain elements which could be expanded to other governorates, (example: - Rural Health Project: vehicles, commodity package, renovation to RHU's nationwide). The projects' lives could also be extended, especially where a three to five year period has proven to be too short for the kinds of changes being attempted.

The transition occurring in the health sector and our increasing awareness of the importance of the private sector offers, perhaps, the widest scope for the expansion of AID assistance in innovative and effective ways. Consideration should be given to such options as: the support of new initiatives in health insurance; support and expansion of PVO activities in health; innovative ways to extend access to good physician care - private and public - to rural and indigent populations (loan programs, basic equipment, continuing education); the support of the MOH in its plans to recognize trained traditional birth attendants; and continuing education for physicians, particularly in preventive medicine, family planning and clinic management.

An additional opportunity for expansion lies in the interaction between health and other sectors which AID is supporting. Recognizing that the major determinants of health status in Egypt are linked to environmental issues, the time seems appropriate to take a broader look at health and to assess how health interrelates with other sectors: water, sanitation, agriculture, industry, education and population. The development of health initiatives which parallel and complement AID investments in those other sectors should result in synergistic effects on health status.

Short-term options: In the shortest time frame, one to three years, the health system and its personnel must be taken as a given. Nonetheless, ways direct and indirect, may be identified to support and improve selected portions of the health system. It is important in considering short-term assistance options to look at the total health sector, public and private, and at systems which support service delivery as well as at

the direct contacts between consumers and health care personnel. This approach requires that AID have a comprehensive understanding of the health sector including service delivery (public and private), education, training, supply and logistics systems. There may be ways to support and upgrade existing programs and institutions in ways that are effective (E.g. upgrading equipment in health facilities; upgrading the equipment in use in the formal and informal sector, of young rural physicians, dayas, and midwives; supplying key medical equipment in short supply such as syringes; or supporting community or PVO health projects).

Medium-Term options: The possibility of significantly increased funding levels is most likely in the medium term. The Team should assess sectoral or budget support in areas where it may substantially contribute to a more effective alignment of goals and institutions. The assessment should also consider what kinds of objectives can, realistically, be met in the medium term.

Some portions of the sector might be particularly responsive to medium-term support; other areas may require the kind of support that comes from sustained institutional linkages or long term technical assistance. The bulk of AID's current projects seek to improve health system effectiveness and efficiency as a means to improve health status in a time frame of up to five years. While the projects have been successful to date in achieving limited objectives, the SRHD evaluation observes that system-wide changes have proven more elusive. Some aspects of the current portfolio may need to be expanded or extended into longer-term commitments.

Long-Term options: As we reflect on our last year's experience, it is clear that certain problems will demand assistance sustained over a period which exceeds the traditional life span of a project. This realization, together with growing interest in the development of sectoral grants, requires the serious attention of the team. There will need to be an assessment and ranking of assistance priorities so that resources are not dissipated in a series of unrelated activities. Further, one will need to look at which Egyptian institutions are best able to absorb substantial support in an effective way. In addition, one needs to assess the interest and ability of U.S. institutions, such as universities to commit their resources over time to develop linkages with Egyptian institutions. Finally, such long-term support requires the development of effective health and management information systems which can chart a course of resource allocation and help to monitor and evaluate progress.

D. Work Plan

PHASE ONE: Data Gathering

During a three-month period, a team will prepare background material for the Health Sector Assessment in the following areas:

- 1) Profile of health status in Egypt: health problems/data needs.
- 2) Directions and trends in MOH policy, Planning and Service Delivery.
- 3) An overview of donor activities.
- 4) The user perspective: Social science research on health services.
- 5) The private sector: PWO's, Private practices, and other service sources.
- 6) Health manpower assessment: Needs in medical and paramedical education, training, and continuing education.
- 7) Environmental health.
- 8) Health Services and decentralization.
- 9) Health Education: Media and the schools.
- 10) Equipment needs in the health sector.

In these areas the team will:

- 1) Collect and summarize existing data
- 2) Assess and identify important gaps in existing data
- 3) Pursue rapid field assessments where appropriate
- 4) Identify and discuss changes and trends
- 5) Highlight major findings, issues and questions for discussion
- 6) Identify important actors and institutions for possible contact and involvement in Phase Two

Phase one will be carried out under two contracts. Assessment Support will be supplied by a local contract with an Egyptian research group. The following personnel and services will be supplied under this contract: Phase One Director (part time), Research associate/coordinator; Research assistant (to summarize Arabic documents); secretary; other translation services as needed part-time local consulting services, including health planning; environmental health; health information systems; office space and reproduction services.

Expatriate Consultant Services in Phase One and for the assessment team itself will be supplied under a contract with an I.Q.C. or small or disadvantaged business. It is expected that services in a number of health-related fields will be required, including: health economics, environmental health, medical anthropology or sociology, public health planning, and medical education. Individual scopes of work will be drawn up for each consultant required an estimated 10 expatriate consultants working an average of 25 days each will be required under this contract during the two phases.

PHASE TWO:

Week One: The first week of the second phase will consist of a series of open discussions with the team, MOH officials, USAID staff and other invited health and donor officials. The participants will review the issued papers and thoroughly air questions, issues and concerns.

Sunday: A.M. - Health Status of Egypt
 (Disease prevalence, priorities, trends, determinates of health status)
 P.M. - The Users' Perspective: Trends and Characteristics

Monday: The Health Services in Transition
 A.M. - The Public Sector
 P.M. - The Private Sector

Tuesday: Supporting the Health Sector
 A.M. - Financing the Health Sector
 P.M. - Health Planning and Information Systems

Wednesday: A.M. - Health Manpower
 P.M. - Health Manpower Training

Thursday: A.M. - Health of the Next Generation: Family Planning and Education
 P.M. - Health and Environment: Water, Sanitation, Housing and Industry

Saturday: A.M. - AID's Future Role: Program Office

Week Two:

Discussions with Egyptian counterparts and other experts. Further discussion with USAID staff.

Week Three:

Team consideration of options and formulation of recommendations. Preparation of draft report.

Week Four:

Wrap-up meetings, report revisions.

HEALTH SECTOR ASSESSMENTPHASE ONE

Week: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18 / 19 / 20 /

<u>ACTIVITY:</u>	DOCUMENT GATHERING	DATA TEAM	1) Issues Papers 2) Rapid Field Assessments (as needed)	ASSESSMENT TEAM
<u>PERSONNEL:</u>	1 Research Associate 1 Research Assistant	Research associate/ coordinator Research Asst. Secretary	Local Consultants (5-6) Research Associate (p.t.) Project Director (p.t.) Secretary	Secretary
<u>EXPATRIATE</u>	Assessment team - 2 day meeting - D.C. to define data needs	1-2 expatriate consultants	3-4 expatriate consultants	5-6 consultants

COMPLEMENTARY ACTIVITIES
 POPULATION SECTOR ASSESSMENT
 UNIVERSITY OF MICHIGAN STUDY OF RESOURCE FLOWS AND INFRASTRUCTURE
 FUTURES GROUP STUDY OF PHARMACY SECTOR

Reporting RequirementsPhase One:

- 1) A series of 10-12 issues papers will be prepared on topics agreed upon by USAID and the local research group. The purpose of these papers is to provide background material, present issues and stimulate a discussion of problems and issues during Phase Two. Five-Six papers will be prepared under each of the two contracts, each paper by an appropriate consultant acceptable to USAID.
- 2) An annotated bibliography of pertinent English and Arabic documents (reports, articles, theses, manuscripts, and miscellaneous published material) will be prepared by the local contractor. Annotations of Arabic documents will be detailed and evaluative. One copy of each document cited will be available to the assessment team and will be turned over to HRDC/H at the completion of the assessment.

Phase Two:

The assessment Team will prepare a detailed report which establishes guidelines; assesses alternatives and recommends strategy options for A.I.D.'s continued involvement in the Health Sector. The report will lay out the data base underlying its recommendations and, where appropriate, identify where additional information is required for programming purposes.

The report will be submitted to USAID in draft at the end of the third week in-country. Discussion of the report and needed revisions will be carried out in the final week.

APPENDIX B

Agencies and Individuals Visited

1. USAID

Address: Cairo Center
Garden City, Cairo Tel: 28211 - 28219

1.1 Office of the Director

Mr. Donald S. Brown Mission Director
Mr. Richard Dangler Asst. Mission Director
Mr. Michael T. Kingery Deputy Asst. Mission Director

1.2 Office of Health

Dr. William Oldham Director Office of Health
(ex. 466/467)

Ms. Constance Collins
Ms. Emily Leonard
Mrs. Fawiza Tadros

1.3 Office of Infrastructure Development & Program Support

Mr. Walter H. McAleer
Mr. Frederick Guymont Ex. 273/315
Mr. Mohamed Gamel el Din
Mr. Nabil Saba

1.4 Office of Local Administration and Development

Mr. John E. Roberts Director, Office of Local
Admin. and Development
(ex: 333/358)
Mr. Ernest Kuhn Project Officer for Basic
Village Services
(ex: 333/398)
Mr. Peter Amato (ex: 214)

1.5 Office of Development Resources and Program Support

Mr. Richard Dangler Director, Office of Development
Resource and Program Support
Mr. Michael I. Kingery

1.6 Near East Bureau/Washington

Mr. Steven F. Lintner NE/TECH
Mr. Joseph Haritani NE/TECH

2. Ministry of Health

Dr. Amin El Gamal Under-Secretary for Environ-
mental Health and Occupational
Medicines

2.1 Department of Environmental Health

Dr. Ezzad M. Helwa Acting Director Tel. 26719
28166
25827

2.1 continued

Dr. Sara Atlala	Director Water Quality Control
Dr. Ahmed Aly Abdo Ameu	Director for Sanitary Affairs
Dr. Hosny Shehata	Asst. Director for Water Quality
Mr. Sobhy Ahmed Abdel Magid	Chief Sanitarian

2.2 Department of Occupational Health

Dr. Zenab A. Youssef	Acting Director (tel: 29617)
Chemist Saleh El Mallah	

2.3 Others

Dr. Helmy El Bermawy	Director General of Health Planning (Tel: 906806/29489)
Dr. M. Safwat Moliaje El Den	Director General Central Health Laboratory
Dr. Maheu Hanna Danial	Chief Chemist and Director Water Department at Central Laboratory
Mr. Youssef Shafik Youssef	Chemist, Environmental Health Ctr.
Dr. Abdelaziz A. El Shafie	Chief Toxicologist, Environmental Health Center
Mr. Hassan El Fiqui	Chemist, Abu Pawash Wastewater
Mr. Abdallah Kaouel	Chief Chemist, Zenein Wastewater Treatment Plant
Mr. Seleman Fitian	Director of Agricultural Research at Abu Rawash Wastewater Treat- ment Plant

3. Ministry of Housing and Reconstruction

M. Abdel Moneim Ashmawy	Chairman, National Organization of potable Water & Sanitary Design, Mogamau Building, Midan El Tahrir Cairo Tel: 779293 29894
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Eng. Youssef Hanna	General Manager Research and Training Department General Organization for Potable Water (GOPW) Cairo Tel: 33752
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Eng. Farouk Kassen	Director of Planning and Design General Organization for Sewerage and Sanitary Drainage Mogamau Building, Midan El Tahrir Cairo Tel. 29873 29874
--------------------	---

3.1 General Organization for Greater Cairo Water Supply

Mr. Ezzat Abbas Mohamed
Director of Research
El Roda Water Treatment Plant
General Organization for
Greater Cairo Water Supply
Cairo
Tel. 840526

Mr. Mohamed Ragaie
General Director of Laboratories
and Research
General Organization for Greater
Cairo Water Supply
Ministry of Housing and Recon-
struction
Cairo
Tel: 746415

4. Fayoum Governorate

Dr. Mohamed Asem
General Director of Public
Health
Fayoum Public Health
Fayoum Governorate

Dr. Fakhry Hakim Farag
Deputy General Director for
Preventive Medicine
Fayoum Public Health
Fayoum Governorate

Eng. Abdel Rahman Abdullah
Director of Fayoum Water Works
Fayoum Governorate

5. Giza Governorate

Dr. Ezzat Abbas Mohamed
Under Secretary for Health
Giza Governorate

Dr. Hamdy Ali Hamt
Director Omkhenan Health Center

6. Cairo

Dr. Gamal El Din Nagr
Deputy of the General Manager
South Zone Health Center
Cairo

Dr. Fathy M. Al. Damanhamy
Director for Medical Center
of Abon El-Sanad
Cairo

7. World Health Organization

Dr. F. Parteau
Acting Regional Director
Director, Disease Prevention
and Control Division
World Health Organization,
Alexandria, Tel. 30090

World Health Organization, continued

Dr. M.I. Sheikh, Ph.D. Regional Advisor, Coordination
in Environmental Health
World Health Organization
Alexandria
Tel: 30090 (ex. 217)

Dr. K.S. Rao Director, Environmental Health
and Coordination
Administrative Assistant
Coordination with U.N. Bodies
World Health Organization
Alexandria
Tel: 30090

8. High Institute for Public Health
(Alexandria)

Dr. Ahmed Hamza, Ph.D. Director, Industrial Waste
Research Center
High Institute of Public Health
Alexandria
Tel: 75575/75576

Dr. Fahmy M El Sharkawi Professor of Sanitary Engineering
Department of Environmental
Health
Alexandria
Tel: 75575

Dr. Hassan Mitwally Head, Department of Environmental
Health
High Institute of Public Health
Alexandria
Tel: 75575

9. UNICEF

Mr. Vladimin Panick Senior Project Officer
Water Supply
5, Hindawi Street
Dokki, Cairo
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701766

Dr. Bozidar Kojicie Advisor, Drinking Water Programmes
UNICEF
New York
Tel: (212) 754-3272

Terje Thodesen Project Officer
5, Hindawi Street
Dokki, Cairo
Tel: 700144, 700815, 701766

10. UNDP

Mrs. Soheir Habib
Programme Officer
UNDP
29 Taha Hussein
Cairo
Tel: 651387, 651385

11. Misc. Contacts

Mr. Sherif M. El-Hakim
Sherif M. El-Hakim Associates
11 Dr. Mammoud El-Hefny Street
Garden City, Cairo
Tel: 23905

/ Dr. James A. Listorti
Consultant, Stanley Consultants
Cairo

✓ Mr. Robert Emery
Consultant
USAID, Near East Bureau
Cairo

Mr. P.A. Moody (BSC, MSC, MICE, MIWES) Senior Engineer
Water Supply Projects for the
Arab Republic of Egypt
Binnie & Partners and John Taylor
& Sons (Consulting Engineers)
19 Teba Street
Dobbi, Cairo
Tel: 704244, 704373

Mr. William H. Rappold
Training Officer
Canal Cities Consultants
76, Abdel Hamid Badawy Street
Heliopolis, Egypt
Tel: 862072

✓ Mr. Leo St. Michael
c/o AMBRIC/Cairo Wastewater
Project
P.O. Box No. 2265
Ataba Square
Cairo
Tel: 749417, 749636

Dr. L.V. Gutierrez, Jr.
Assistant Project Director
AMBRIC/Cairo Wastewater Project
P.O. Box No. 2265
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Tel: 749419, 749636

Bacterial Diseases

The estimated annual incidence of typhoid and paratyphoid fevers is 50 per 100,000 population; in Alexandria the incidence is estimated to be 150 per 100,000.^{22/} The diseases are believed to be more frequent in the city than in rural areas. These Salmonella infections seem to occur throughout the year, but there apparently is a large seasonal rise in summer (May to November). The disease is much more frequent in children, particularly those in the 5 to 15 year age group. A unique feature of Salmonella infections in Egypt is occurrence of urinary infection, especially S. Typhi, as

*Dr. Salah el Din Madkour of the Epidemic Control Department of the Ministry of Health and Dr. Mohamed Helmy Wahdan, Professor of Epidemiology in the High Institute of Public Health, Alexandria University were especially helpful.

a complication of urinary tract involvement with Schistosoma hematobium.^{23/} It is estimated that about 75 percent of reported cases are S. Typhi, 20 percent are paratyphoid A, with the remaining five percent made up of many other types. Acute typhoid fever appears to respond better to chloramphenicol than to amoxicillin, although those with urinary tract complications are treated with amoxicillin. The JWG Subcommittee for Biomedical Research has suggested that a careful epidemiological study be done which could be used as a basis for field trials with a polysaccharide vaccine being prepared from typhoid bacilli in the United States.^{24/} The fatality rate in treated typhoid fever apparently ranges around 1 percent.

The incidence of cerebrospinal fever is estimated to be about 3 per 100,000 population yearly.^{25/} Type A meningococcal meningitis is the most frequent, but some other types also have been identified. The disease is most prevalent between January and May. In recent years, children five to fifteen years of age have been the chief victims, with case fatality rates apparently ranging around 15 percent. Most cases of cerebrospinal meningitis are treated with sulfadiazine, but recent studies in Cairo show the combination of trimethoprim and sulfamethoxazole to be effective. While most cases of acute meningitis are undoubtedly caused by N. meningitidis, diagnostic facilities are so limited that many cases caused by pneumococci, H. influenzae, and perhaps other organisms are probably diagnosed and treated as meningococcal infections.

Streptococcal disease and rheumatic fever occur with an apparent frequency of five to six cases per 1,000 children yearly between the ages of 6 to 15 years,^{26/} which is about three times the rate for the same age group in England and Europe. Because of an increased awareness of this problem in Egypt, a program was begun in January 1977 to examine all schoolchildren, aged 6 to 15 years for rheumatic valvular heart disease. There are four million schoolchildren in this age group, but there may be as many as two million other children, especially from rural areas, who do not attend school and will not be involved in the program. Examinations were expected to be completed during 1978. The study team consists of 115 primary care physicians who had a special training course for detection of valvular heart diseases. Children identified as having a disease were further examined by one of four heart specialists assigned to the study. Preliminary findings had confirmed a high incidence of rheumatic valvular heart disease. Diagnosed cases were enrolled in a penicillin prophylaxis program. In addition, almost as many cases of congenital heart disease were found, a number far in excess of that expected. The results of this study should provide an extremely valuable foundation and point the way for planning future surveillance and intervention programs for rheumatic valvular heart disease.

Tuberculosis is a major problem in Egypt. There is a reported mortality rate of between 7 and 8 per 100,000 population, a prevalence of positive lung x-ray findings of 2 per 1,000 in several studies, positive skin test reactions of about 20 percent of children in the 10 to 14 age group reported in a 1974 survey, and frequent occurrence of meningeal and osseous forms of the disease.^{27/} BCG was given by traveling teams for several years to school age

children. A wet vaccine prepared in Egypt was used, but it lost potency in the hot weather. Currently, a Japanese dry vaccine is being given at age three months along with the smallpox vaccine, and then again at age six and at age twelve to those entering and graduating from primary school. The BCG vaccine is given without a prior tuberculin test: if a reaction occurs, it is considered indicative of tuberculosis infection and a diagnostic study is made. The evidence for the success of the BCG vaccination is limited, but definitive. Coverage of schoolchildren is estimated to be about 80 percent, with about 90 percent of the vaccinations considered successful. Adult disease is detected when patients with pulmonary symptoms suggestive of tuberculosis present themselves to the health care system: if the chest x-ray is suspicious, examination of a stained smear and culture of sputum are completed. The Ministry of Health has an extensive detection and treatment network: 72 mass mobile roentgenography units; 25 mobile BCG inoculation units; 15 laboratories for culturing and sensitivity testing; and 10,000 beds in speciality chest disease hospitals, sanatoria and special sections in general hospitals. Because ambulatory treatment has been emphasized for the past several years, many of the hospital beds designated for tuberculosis apparently are empty or filled with patients with other diseases. In summary, increased use of BCG, availability of antimicrobial therapy, and strengthened case finding efforts have brought about a slowly improving situation with respect to tuberculosis.^{28/} However, a nationwide health problem of great magnitude remains.

Leprosy has been known in Egypt for several thousand years. It is estimated to affect more than two persons per thousand population, or over 70,000 persons for the nation as a whole.^{29/} The disease is most common in the crowded Nile Delta, but there are significant foci in Luxor and Aswan, in Middle and Upper Egypt, respectively. Leprosy is more common in males than in females. Four percent of the cases are among children less than 15 years of age. There are two voluntary leprosaria near Cairo and Alexandria which serve as centers for diagnosis, early treatment, physiotherapy and plastic surgery, rehabilitation, and research on leprosy chemotherapy. When patients are discharged from leprosaria, they are followed in one of sixteen outpatient facilities scattered over the country, by a leprosy relief association which is found in each governorate, and by physicians in the Ministry of Health ambulatory care system. Dapsone is used as treatment in 90 percent of the cases. Lamprene (B 663), a red phenazine dye, is used in cases where severe erythema nodosum develops as a consequence of the dapsone treatment. Experimental work also is being carried on with phenylthiourea (CIBA 306, antithyroid agent), which is relatively toxic, but quite inexpensive. Recently, studies have been started with rifampicin, directed to early reversal of infectiousness, hoping to shorten the initial period of hospitalization. About one-sixth of patients with leprosy in Egypt are lepromatous.

Viral Diseases

All types of hepatitis — A, B, non-A non-B — are reported to be present. The total annual occurrence is estimated to be much greater than

150 cases per 100,000 population.^{30/} Hepatitis occurs in urban and rural areas, is endemic all year, and often epidemic in summer. The fatality rate is estimated to be about 1 in every 100 cases. A recent development is the detection of hepatitis B antigens in many cases of schistosomiasis with liver involvement. Although this is considered to be an unfavorable prognostic finding, the problem has not yet been studied adequately. Hepatitis in Egypt, as in most developing nations, is a major unsolved health problem. Consideration should be given to conducting clinical field trials of hepatitis A and B vaccines in Egypt if clinical studies now underway in the United States show them to be safe and effective.

Rabies is an important problem in Egypt. There are an estimated 2,000 cases per year in the country, all of which are fatal.^{31/} The disease comes from wolves in the desert through camels and dogs. Almost all of the human disease in Egypt comes from the numerous stray dogs that are present throughout the nation. It is estimated that about 1 in 100 dogs is infected and that an unprovoked attack by a dog carries a 20 to 30 percent risk of exposure to rabies infection. About 50,000 courses of antirabies vaccine are dispensed each year. The vaccine is made at the Agousa Virus Center and is produced from goat-brain. It is highly antigenic and associated with three or four cases of encephalitis each year. The Virus Center plans to change to a tissue-culture vaccine to be obtained from the United States or France. Although the current vaccine is considered effective, it was learned during the Institute of Medicine study group visit to Abassia Hospital that 14 of 15 patients with rabies had received the vaccine, 10 of them the full 20 doses. Rabies hyperimmune serum is not available.

Trachoma and acute eye infections have left major visual disability in nearly five percent of the inhabitants of rural villages and between one and two percent of those in urban areas, according to a recent study.^{32/} The disease originates in early infancy when trachoma and secondary bacterial conjunctivitis combine to cause fibrosis of the eyelid and ultimately scarring and corneal opacity. The acute process of the disease subsides at about age nine, leaving a scarred residue to progress to reduced visual acuity. Haemophilus species, pneumococci, Moraxella species, and an organism fulfilling the usual diagnostic criteria for N. gonorrhoeae are the principal causes of complicating eye infection. Acute ophthalmia is most frequent at the beginning of summer and in fall when conditions of high temperature and high humidity favor the breeding of flies in manure that is piled in or near the houses. It is believed that cleanliness and simple eye care measures, such as flushing the eye with zinc drops, will minimize ophthalmia. Antimicrobial drugs are effective treatment when it occurs. Major constraints are principally the long-term problems of improving personal hygiene in houses and persuading families to bring children with eye disease to the clinic for treatment. Although there are almost 3,000 hospital beds for eye disease, which in 1974 were occupied by 37,520 patients, most eye disease is cared for in outpatient facilities. The Outpatient Department of the Cairo Eye Hospital has 250 patients on a winter day and more than 700 daily during the summer. In all of Egypt during 1974, there were 4.5 million outpatient visits to eye facilities.^{33/}

Despite the fact that vaccination against poliomyelitis has been compulsory since 1969, the disease has continued to be a serious problem. Undoubtedly, Egypt is going through a sanitation transition wherein gradually improving sanitation in some areas lessens the early life exposure to fecal contaminants among certain more protected population groups, such as breast fed infants and upper socioeconomic families. Consequently, some of them fail to develop the usual active immunity and paradoxically suffer greater risk from certain diseases. The high incidence of poliomyelitis may be partly a manifestation of this phenomenon. Between 1971 and 1976, there were about 1,700 cases of paralytic polio per year in Egypt.^{34/} Oral vaccine was administered by dropper after having been stabilized with magnesium chloride, which has a bitter taste. Many children attempt to expectorate the vaccine and are reluctant to take the second and third doses. A study in early 1976 revealed that nearly one-half of paralytic polio patients had received no vaccine, an additional one-third had received only one or two doses, and only twelve percent had received all three doses.^{35/} A major campaign against polio was started in the summer of 1976, when slightly more than six million children were given three doses of the vaccine. A 50 percent sucrose solution that increases the palatability of the vaccine was used as the stabilizing agent. Perhaps as a result of that campaign, there were only 790 cases of polio reported during 1977. Most polio is Type 1, but some Type 2 is seen. The government plans to carry on an intensive compulsory program of polio immunization in the future, hoping to see a virtual disappearance of the disease in Egypt. In Egypt, as elsewhere in hot climate countries, accumulating evidence suggests that immunity is not reliably established with the oral live virus vaccine, even after multiple doses. The reasons are not clear, but it is believed by some investigators that there are unknown intestinal tract inhibitors that may be related to the presence of other competing viruses. Thus, although current planning in Egypt contemplates use of the oral live virus vaccine, a pilot study will be conducted with the assistance of the Netherlands to compare the efficacy of parenterally-administered killed virus vaccines (not requiring refrigeration) with the oral live virus vaccine.

In the fall of 1977, an epidemic of Rift Valley Fever occurred in the south-east section of the Nile Delta.^{36/} Although an uncomplicated febrile illness was typical, encephalitic, ocular, and fatal hemorrhagic complications also were recorded. Concomitantly, an epizootic occurred among domestic animals, with abortions and heavy mortality reported in sheep and cattle. The disease was diagnosed with the help of the United States Naval Medical Research Unit 3 and the Yale Arbovirus Research Unit. The epidemic is believed to have been one of the largest human outbreaks ever of Rift Valley Fever and the first reported in North Africa. It apparently was carried into Egypt by a camel train from the Sudan. Estimates of the number of human infections range from 18,000 to over 200,000. The fatal cases were estimated to range from 60 to over 600. Although reported after the discovery of human disease, the epizootic in animals was occurring concomitantly and resulted in mortality of up to 60 percent of some sheep herds and abortion of up to 100 percent of pregnant ewes, along with reported infections in cattle, water buffalo and other domestic animals. It has been determined that the virus

survived the 1977-78 winter and there is concern that it may become endemic or enzootic in the country.^{37/}

Smallpox vaccination is still given as a compulsory immunization at three-months of age in Egypt, and vaccination against smallpox is still required for visitors. However, the disease has not been seen in the country since well before 1970.

Measles is still a major contributor to infant and preschool mortality in Egypt. It has been identified as a cause in nearly two-thirds of deaths reported to be due to infectious and parasitic diseases in the one-to-four age group.^{38/} In some areas of Cairo, over half of the two-year olds have already had measles.^{39/} In 1977, immunization against measles became mandatory. In late 1977, a nationwide survey for measles was begun with the cooperation of the United States Center for Disease Control in Atlanta. Blood from every fifth child from six months to six years of age in each of the 25 governorates was obtained to measure hemoglobin concentration and measles antibody titers. Analysis of data is not yet completed. Both the immunization campaign against measles and the oral polio vaccine campaign require an improved cold-chain in Egypt if the programs are to be successful.

There were no reported cases of cholera in Egypt in 1977.

Parasitic Diseases

There is little question that schistosomiasis (bilharziasis) is the most important parasitosis in Egypt, a view shared by Ministry of Health officials and most health scientists and clinicians. Although overall prevalence rates are declining, there are increasing numbers of Egyptians infected because of Egypt's population growth rate. Schistosomiasis has been present in Egypt since the days of the Pharaohs. In 1851, Theodore Bilharz identified Schistosoma haematobium, the causative trematode for urinary schistosomiasis. In 1915, Leiper, also in Egypt, found the cause of intestinal schistosomiasis to be Schistosoma mansoni. Since these discoveries, literally thousands of studies and publications have addressed the problems of schistosomiasis in Egypt, but there are still many questions that remain to be answered before effective methods of prevention, cure or control can be realized.

Prevalence. There are striking geographic variations in prevalence of S. mansoni and S. haematobium infections in the Nile Delta, with S. haematobium found only in the Nile Valley in Middle and Upper Egypt, south of Cairo.^{40/} Three nationwide surveys have been conducted. In 1937, about 47 percent of the population were found to be infected. In Middle and Upper Egypt, only S. haematobium was found, with a prevalence rate of 60 percent in perennial irrigation areas and 5 percent in basin irrigation areas. In the Nile Delta, prevalence rates went as high as 83 percent of various population groupings, and in some areas 60 percent of the population were infected with both S. mansoni and S. haematobium. In 1955, the 1937 survey was replicated. The overall prevalence of S. haematobium had fallen from about 48 percent to 38

percent, and of S. mansoni from about 32 percent to 9 percent. A sample survey in 1976, which has not been completely analyzed and published, suggests on the basis of preliminary analyses that overall prevalence has dropped to about 21 percent of the population, with a range from 5 percent to 40 percent in various areas. It should be noted that some indepth studies of limited areas have shown a higher prevalence of S. haematobium than would be suggested by the nationwide surveys. It is reported that 80 percent of primary schoolchildren in some areas in Luxor are infected.^{41/} In some villages in the Nile Delta, S. mansoni prevalence rates of up to 55 percent recently have been reported, an unexpected finding.^{42/}

However, additional evidence of a continuing decrease in overall prevalence comes from studies of delayed peak onset of infection, from aggregated patient data of rural health units, and from studies which show a decreasing prevalence of the bulinus snail vector for S. haematobium.^{43/} Prevalence is generally higher in males than in females, peaking for both in early adolescence and plateauing by the mid-20s, followed by a gradual fall that probably reflects acquired immunity. Several longitudinal studies currently underway, including for example, the cooperative Ministry of Health/NAMRU-3 project in Luxor, will help determine whether the apparent declining prevalence holds for communities not subject to interventions, and whether or not the decline of the snail vector is reflected in reduced transmission of schistosomiasis.

Morbidity. There are no reliable population-based morbidity data for schistosomiasis in Egypt. Therefore, it is not possible to state with any degree of confidence the proportion of the infected who are slightly, moderately or severely ill, or who die as a consequence of schistosomiasis. It is clear from experience in Egypt and elsewhere that most of those infected do not develop overwhelming infections.^{44/} Indeed, in most endemic areas of the world, one can detect relatively few deaths due solely to Schistosoma infection. Quantitative egg count, which correlates well with intensity of infection or worm burden in most cases, is the best available (albeit incomplete) predictor of disease. In other countries where morbidity studies have been made, modest worm burdens — less than 100 eggs per gram of feces — rarely have overt illness symptoms. In Qalyub in the Nile Delta, the geometric mean titer of S. haematobium has been measured to be 9.7 eggs for each 10 cc of urine, and of S. mansoni, 12.8 eggs per gram of feces.^{45/} These limited results suggest that a large proportion of the infected population in Egypt may have relatively low-level infections.

The only overall "morbidity" data available reflect the number of patients seen in medical care facilities who are diagnosed as infected. However, the data fail to distinguish between those who are ill and those who are infected. Nearly half of all patients admitted to medical or surgical wards of seven university and government hospitals visited by the Institute of Medicine study group were hospitalized for management of schistosomiasis or its complications. The mortality rate due to schistosomiasis is estimated to be somewhere between 0.1 and 1 percent of those infected.^{46/} It should be emphasized that many of the complications of schistosomiasis that are listed as the immediate cause for death, such as chronic renal failure,

bladder cancer, and portal hypertension, carry an extremely poor prognosis even with the most modern therapy. No available medical or surgical treatment will reverse existing disease complications, with a few specific exceptions such as the medical management of intestinal polyposis. At best, curative medicine yields palliation or prevents further progression of the disease from continued egg production.

Control. Eradication of schistosomiasis in Egypt does not seem possible with available technologies. Effective preventive measures, such as immunization (which is under active investigation) or massive behavioral change accompanied by widespread availability of potable water and systems for the sanitary disposal of excreta, seem relatively far in the future.^{47/} Snail control and drug therapy to reduce transmission are the principal available control measures, used singly or in combination. Most snail control projects have used chemical molluscicides, although currently there are several experimental efforts using various plants and animal control mechanisms.^{48/} Egypt was the first country in the world to apply molluscicides to schistosomiasis control. Although mollusciciding seemed to produce favorable results early on, the prevailing view now is that it must be used in combination with therapeutic agents in order to effectively reduce prevalence.^{49/} Neither has treatment alone been considered effective in Egypt in the past. The available therapies, such as tartar emetic and Astiban, were sufficiently unpleasant to render completed courses of treatment unlikely, and that has been the empirical experience. However, trials of treatment alone have not been undertaken with recently developed, more effective and easily administered therapies, such as metrifonate for S. haematobium. Also, no studies have been done to compare suppressive rather than curative therapy, although mass treatment targeted on population groups with heavy egg counts might be adequate for reduction in overall transmission and morbidity.^{50/} Finally, there has been no effective non-toxic therapy available for S. mansoni until very recently; oxamniquine is now available and praziquantal is in the final stage of clinical testing.

The most successful projects to date have combined mollusciciding and mass therapeutic treatment, with the best known being the Al Fayyum Bilharzia Control project.^{51/} In that project area, S. haematobium prevalence has fallen from about 7 percent in 1969 to 6 percent in 1976. The program involves mollusciciding every four months, repeated case detection surveys, and drug therapy, initially with ambilhar and tartar emetic, and more recently with metrifonate. It should be noted that the Al Fayyum oasis area is supplied fresh water by a single feeder canal from the Nile, thus facilitating the use of the mollusciciding agent. The only similar situation that exists in Egypt is the Suez Canal zone, which also is supplied fresh water through a single feeder canal from the Nile. Inspired by the success of the Fayyum project, the World Bank is now assisting the Egyptian government in a project to control schistosomiasis in Middle and Upper Egypt, covering a population of over 8 million people.^{52/} The project was started in 1975, and is scheduled for completion in 1982. At this point, the requirements for continued mollusciciding, special case finding, and treatment programs beyond 1982 are not

known.*

Because all areas are not amenable to effective mollusciciding, because currently available effective molluscicides kill other aquatic life, and because mollusciciding has never eradicated the vector snails -- thus necessitating repeated costly applications -- studies comparing other control measures have begun. A Ministry of Health study in Qalyub, assisted by the United States Center for Disease Control, for example, plans to compare mass chemotherapy and tunnel drainage for snail control singly and in combination. Baseline data have been obtained, but the initiation of the experimental control phase awaits the availability of a safe and inexpensive chemotherapeutic agent for S. mansoni.

Research. As might be expected, there is much ongoing research in schistosomiasis on diagnosis, pathogenesis, immunology, therapy, and prophylaxis beyond the epidemiological and control studies already mentioned.^{53/} This research is being conducted at most of the research institutes in Egypt, as well as at the university hospitals. A new Bilharzia Institute, being developed with the assistance of the West German government, was scheduled to open in 1978. In the spring of 1978, it was decided that the new institute would fall under the jurisdiction of the Ministry of Health. This institute could well serve as a major resource laboratory and a coordinating focal point for research on schistosomiasis in Egypt.

There are a number of parasitic diseases other than schistosomiasis that are endemic in Egypt. Amebiasis has a prevalence rate of 20 percent to 90 percent, with the higher rate characteristic in the poor urban and rural areas.^{54/} Despite its high prevalence, morbidity -- primarily dysentery or liver abscess -- apparently is remarkably low. Giardia lamblia is the only other common protozoal intestinal infection in Egypt, with a prevalence estimated at about 15 percent. Only two intestinal helminths, ascaris and hookworm, are considered potentially important pathogens in Egypt. Overall, ascaris prevalence is estimated to be about 26 percent, but in some rural areas 70 percent of schoolchildren are reported to be infected. Despite this high prevalence, obstruction of the viscera due to ascaris apparently is relatively rare in Egypt. Hookworm infection is surprisingly uncommon, even in rural areas, with an overall prevalence estimated at 6 percent. Morbidity in the form of hookworm anemia apparently is light in most of the population, but NAMRU-3 researchers have demonstrated severe iron losses in heavily infected individuals, and they consider hookworm infection to be the most important cause of iron deficiency anemia among Egyptian farmers. Although there have been several small epidemics of trichinosis in Cairo and Alexandria in recent years, none of the parasites acquired through ingestion of specific foods seems to pose a significant public health problem in Egypt.

* Present annual per capita cost is estimated to be slightly more than \$1, with 80 percent of the cost being for the molluscicide. The annual per capita operating expenditure for health is about \$4.15, making the control program relatively expensive.

Control of malaria is relatively good in Egypt at the present time. Although the disease was endemic, with several major epidemics, prior to 1972, only 960 cases were reported during 1977.^{55/} Case fatality rates are reported to be very low. Malaria in Egypt is caused primarily by Plasmodium vivax transmitted by Anopheles pharoensis, although Plasmodium falciparum (malignant malaria) transmitted by A. sergentii is found in Al Fayyum. A. gambiae, a much better vector for malignant malaria, is not now in Egypt, but the development of Lake Nassar has led to concerns that it will be introduced from the Sudan. Malaria control is based on a combination of case detection and larvicide and insecticide operations. Case detection is primarily passive through the Ministry of Health rural health units, centers and hospitals, where blood films are obtained from febrile persons who have no other obvious diagnosis. Identified cases are treated with a 4-aminoquinoline and primaquine therapeutic regime. In some areas, mass drug administration has been carried out when an increased incidence was detected. Larvicides including DDT in fuel oil, DDT wettable powder in water, and malathion emulsion (57 percent) are used in various spraying programs. There appears to be little coordination between the vector control and endemic disease health care programs in the Ministry of Health with regard to vector sensitivity, choice of pesticide, or duration or frequency of application.

Filariasis (Wucheria bancrofti), transmitted by Culex pipiens, is considered by some officials of the Ministry of Health to be the second most important parasitic disease in Egypt. Although overall prevalence and its geographic distribution have been declining since the days of Napoleon without specific control measures, there remain five important focal endemic areas. The highest current prevalence is about 3 percent in Qalyub. Population-based morbidity data are unavailable. Improvement in current control is hampered by possible increasing resistance of the vector, coupled with the need to treat for ten days to eradicate the infection. Treatment with diethyl carbamazine is said to be without significant side effects, which is surprising in view of the usually reported high incidence of allergic complications elsewhere.



CAIRO, EGYPT

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

September 23, 1981

Dear Mr. Minister:

The problem of child mortality is one of the great issues of Egyptian development programs. A serious effort at reducing currently high levels of child mortality would have a fundamental impact on all public health services and on the basic quality of life of the Egyptian people, urban and rural.

In the attached letter to the Minister of Health, I have sought to point out a wide range of AID projects which affect the availability of potable water and effective sanitation systems - and the impact that these programs, in conjunction with other health and educational efforts, could have on reducing child mortality.

The range of projects described in the letter to the Minister of Health have evolved from a variety of interests - concern with urban development, interest in the decentralization process, a desire to deal with health services. Despite the diversity of their origins, they do provide the basis for a framework of a national campaign significantly to reduce child mortality.

I know of your own deep interest in the whole issue of meeting basic human needs. I would like to suggest that improved understanding and coordination of a number of the activities which are currently underway could have an even more dramatic impact on basic human needs than if each of the activities is dealt with in isolation.

His Excellency

Dr. Abdel Razzak Abdel Meguid


Deputy Prime Minister

Economic & Financial Affairs

Cairo

I would be happy to discuss these matters at your convenience. I would hope that such a discussion could be helpful in better directing the purposes to which future AID resources might be devoted in a manner which gets even more fundamentally at some of Egypt's critical development needs.

Sincerely yours,



Donald S. Brown
Director



CAIRO, EGYPT

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

September 23, 1981

Dear Mr. Minister:

I thank you very much for your letter of September 3, 1981 regarding the proposed project for the Control of Diarrheal Diseases. The project paper for this proposed new project has been approved by A.I.D./W and as you know we now plan to sign the necessary agreement on September 27 to get the program underway.

I agree fully with your belief that this program can have an important impact on inhibiting the effects of diarrhea, particularly among children. We all believe that if an effective national program can be mounted, there should be a significant reduction in child mortality and an eventual reduction in fertility. Such a reduction is well worth the costs which have been projected for the program.

While we share an enthusiastic interest in the potential of this program, I think we are also all aware that the program will be dealing more with the symptoms than the cause of diarrhea itself. The causes of such wide spread prevalence of child diarrhea are manifold. Their resolution will undoubtedly take many years. Indeed, it is because of the difficulty of getting at the root causes that the Diarrhea Control Project is of such importance in lessening child mortality rates now. Nevertheless, in spite of the much more fundamental difficulty of overcoming the underlying causes of diarrhea, I am sure you would agree we must also initiate ways of dealing with them as well as treating the consequences.

His Excellency
Dr. Mamdouh Gabr
Minister of Health
Cairo

Dr. Mamdouh Gabr -

In our opinion the problems of safe water and sanitation, in both urban and rural areas, are the critical factors in the present wide prevalence of diarrhea. It is certainly not the only factor, but improved sanitation practices and knowledge can have, in our view, a significant impact on the problem.

In this connection, I thought you should be aware of a wide range of A.I.D.-supported programs which are being carried out which we believe can have an important impact on safe water and sanitation issues. Not all of these activities were designed with the specific intention of meeting sanitation issues, yet the resources available through many of them could be more heavily directed towards sanitation. Other activities have a more direct focus on safe water and sanitation. I am thinking particularly of urban water and sewage projects. But major urban water and sewage projects can be enormously expensive. In order to have the broadest possible impact on public health and child mortality, we must constantly strive to find more cost-effective methods for dealing with urban water and sewage problems.

I am listing in an attachment to this letter the various activities currently underway or about to be initiated by your Government with A.I.D. support which do have the potential for reducing water and sanitation problems. The descriptions in the attached listing are necessarily brief but we can at any time provide you and your staff with more detailed information about any of these activities.

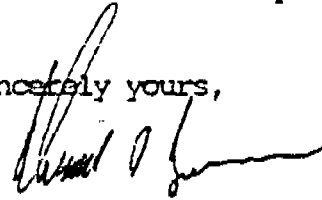
I bring this list of activities to your attention, despite the fact that the Ministry of Health is not directly involved in them, because I think their success in dealing with water and sanitation issues can have a critical effect on public health concerns and can contribute significantly to the education of child mortality. To the extent that the services of the Ministry of Health can be supportive of the work being carried out by various rural and urban governorates in these activities to assure that they are planned, organized and implemented in the most cost effective way possible - then the basic interests of your Ministry will be served. To the extent the educational services of the Ministry can be organized in a manner which is supportive of the specific location of certain of these activities, then there can be mutual reinforcement between these programs, the public's perception of the need for them, and your own efforts to improve sanitation knowledge and practice.

Dr. Mamdouh Gabr -

I hope you will find the attached materials of interest. It is my impression that the range of activities described in the attachments, taken in conjunction with other health and educational programs already underway as well as the planned Diarrhea Control Project, could form the framework for a national effort at major reduction in child mortality. If such a coordinated effort could be directed to specific reductions in child mortality over the coming decade, this could become one of the world's most important public health achievements.

I would be most interested in any further discussions we might be able to hold with you and other representatives of the Ministry of Health on how we can use our various programs for mutually reinforcing purposes.

Sincerely yours,



Donald S. Brown
Director

ATTACHMENT

PROJECTS DIRECTLY DEALING WITH WATER AND SANITATION ISSUES

A. Rehabilitation of Water and Sewage Systems in the Suez Canal Area

Estimated AID Life of Project Contributions: \$96 Million
Amount of AID Commitments to date : \$96 Million

This project, initiated in FY 1978, provides financing for rehabilitation and upgrading of water and sewage systems in the three Canal Governorates. Work on improvement of water systems is carried out in cooperation with the Suez Canal Authority and the three Governorates. Work on sewage system improvements is carried out in cooperation with the General Organization for Sewage and Sanitary Drainage (GOSSD) - now being reorganized as a national water and sewage organization. A consortium of American consulting firms, Canal Cities Consultants, has been engaged to assist GOSSD and SCA in the design and supervision of works to be undertaken

Procurement of major equipment to be utilized for this rehabilitation and modernization program is just underway at the present time.

B. Cairo Water

Estimated AID Life of Project Contributions: \$61 Million
Amount of AID Commitments through FY 1981 : \$61 Million

This project, initiated in FY 1977, will finance the modernization and expansion of the Rod El Farag Water Treatment Plant. Capacity of this plant will be increased from 200,000 CM³ per day to 650,000 CM³ per day and all related facilities of the plant will be upgraded. Six kilometers of new transmission mains related to the Water Treatment plant will be installed. In negotiations for an amendment to the project which was recently signed, it has been recognized that there exist serious problems of leakage and wastage in the Cairo Water system. Plans are therefore being developed for a major campaign to lessen the impact of wastage and leakage as a supplement to upgrading of this major water treatment plant.

C. Cairo Sewage

Estimated AID Life of Project Contributions: \$175 Million
Amount of AID Commitments through FY 1981 : \$ 24.1 Million

Initiated in FY 1978, major new resources are being provided for this project in the current fiscal year. This is a joint effort of the British and American Governments working with GOSSD (and the new implementation organization now being established in Cairo Governorate). The combined UK-US efforts will be aimed both at rehabilitation of the existing systems and at expansion and modernization of the entire system. The initial emphasis in AID-financed activities centers on rehabilitation, including improved sewer cleaning operations, development of programs for overcoming present sewage overflows and upgrading of the existing system. The combined efforts of the Egyptian, UK and American Governments over the coming decade, however, are expected to have a major impact on the totality of the sewage system of Cairo, Gize and Qalubiya Governorates.

D. Water and Sewage in Poor Neighborhoods of Cairo

Not yet designed, this project would be an effort at experimenting with new and cost effective means for providing adequate water and sewage in poor neighborhoods which are now inadequately served and which probably cannot afford for many years to achieve the full range of household-level water and sewage services. There has been general agreement with the Governorate and the appropriate services to move towards design of the experimental activity as soon as possible. The results of the experiment would then be available to build back into longer-term major water and sewage development plans.

E. Alexandria Sewage

Estimated AID Life of Project Contributions: \$132 Million
Amount of AID Commitments to Date : \$102.3 Million

As with the Cairo Sewage project, this activity involves both short-term system rehabilitation and basic modernization and expansion, and is covered under two separate projects which are being implemented as one. Work underway on a series of top priority projects involves sewer cleaning, replacement of pumps and other rehabilitation actions plus placing of a new sewer system in the Ras el Soda area. Longer term overall system development plans are now being developed by the consulting group CH2M and Metcalf and Eddy.

The Alexandria and Cairo Sewage projects represents two of the most ambitious sewage rehabilitation and expansion programs anywhere in the world.

F. Alexandria Water

Not an A.I.D. project, this World Bank Venture will have a major impact on improving potable water availability in Alexandria.

G. Beheira Water

Also a World Bank project, this activity will be upgrading potable water supplies on a governorate wide-basis in Beheira.

PROJECTS AIMED AT OTHER OBJECTIVES BUT WHICH HAVE
A MAJOR POTENTIAL FOR MEETING SANITATION NEEDS

A. Basic Village Services

Estimated U.S. Life of Project Contributions: \$145 Million
U.S. Government Commitments to Date : \$115 Million

The purpose of this project is primarily to strengthen local government by making available to Village Councils resources need for local infrastructure improvement. Initiated in three governorates, it is now functioning in nine rural governorates. Funds are being made available to village councils for those activities which, at the local level, are determined to be of high priority needs to village residents. At the present time, some 1,000 village level sub-projects are underway or completed.

Village Councils have identified potable water as a high priority, and probably the largest single category of projects being requested at the local level deals with potable water. Sanitation projects are also involved but Village Councils have generally given these a much lower priority.

It is our belief that if Health officials were to work more carefully with governorate and village leadership in the nine governorates concerned to impress upon them the importance of sanitation projects - and if governorate health staff could work with village councils in the identification and planning of sanitation projects - a substantial level of resources could be devoted to such activities.

B. Decentralization Support Fund

Estimated AID Life of Project Contribution: \$100 Million
AID Commitments to Date : \$ 50 Million

Initiated in 1980, this project is also intended to strengthen local government planning and implementation capacity. The project provides all rural governorates with funding with which to procure capital equipment which can have broad usefulness in meeting governorate development needs.

Already, several governorates have identified trash and sewage collection equipment as being of high priority. Others are procuring earth moving and related equipment to be used, among other things, to deal with sanitary fills, control of stagnant water and the like.

The prospect for health officials to work with governorate leadership, both in identifying appropriate equipment and then in planning in the utilization of such equipment as is procured, could have an important impact on directing much of this equipment to meeting local sanitary problems.

C. Provincial Cities Development

Estimated AID Life of Project Contribution: \$75 Million
AID Commitments through FY 1981 : \$20 Million

This project has been designed to provide rural city managers with resources for improvement of city infrastructure. Funds will be provided to Fayoum, Beni Suef and Minia for urban infrastructure improvements. All three governorates have already identified water and sewage as being of highest priority. The project, started in September, 1981, will be far more effective and reach the largest possible number of people, if it can involve cost-effective methods of providing potable water and sewage treatment facilities for these three cities. An effort to mount effective public health sanitation campaigns in conjunction with infrastructure development could have a significant effect on the overall impact of the program.

D. Urban Neighborhood Services

Estimated AID Life of Project Contribution: \$89 Million
AID Commitments through FY 1981 : \$20 Million

This project, just signed in August, 1981, will provide funds for local government organizations as well as voluntary organizations in Cairo and Alexandria to undertake local community improvement projects. Like the Basic Village Service program, this project will look to local government

bodies to identify their own community improvement needs and to plan and implement projects to meet those needs. It is expected that communities will, among other things, identify neighborhood cleanup, garbage and trash removal and local level water and sewage improvements as being of high priority. If effectively mobilized, these neighborhood level interventions should mesh well with the broader city-wide water and sewage projects already underway. Collaboration of health officials in sanitation campaigns and in helping communities to design and implement projects to meet sanitation needs could be a most important contribution to having this activity meet basic public health needs.

E. Helwan Housing Project

Estimated AID Life of Project Contributions: \$80 Million
AID Commitments through FY 1981 ; \$80 Million

This project has two parts: construction of a new community in Helwan, initially to provide 7,000 housing units but capable of expansion to 30,000 units; and work in upgrading of six "informal settlements," mostly in the Helwan area and involving a population of approximately 150,000.

The new community element will provide all basic infrastructure (water, sewage, electricity, schools, health clinics, etc.) for the community, plus a range of low-cost housing solutions based on "core housing" concepts.

Because community facilities, including school and health facilities, are being developed as an integral part of this community, there are broad opportunities for collaboration over health and sanitation matters.

The six upgrading areas will provide existing communities with new infrastructure - primarily improved water and sewage - and with needed community facilities, including health facilities. Again, the opportunity for collaboration, educational programs and the like, to obtain the maximum improvement in sanitation knowledge and practice, could be of great public health value.



CAIRO, EGYPT

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

September 23, 1981

HRDC

Dear Hamdi:

I know how very concerned you are with the development of Fayoum Governorate. I am well aware of your specific concerns with issues of public health, population and particularly with the existing high levels of child mortality.

Because of your interest, I am enclosing herewith a letter which I have just sent to the Minister of Health. I am also sending a copy of this to the Deputy Prime Minister for Economic and Financial Affairs. I am hoping that making my views known on these issues to senior Egyptian officials could be helpful in further galvanizing efforts at dealing with the grave problems of high child mortality.

I would be pleased to discuss any aspects of these letters with you at your convenience.

My best wishes to you.

Sincerely yours,

Donald S. Brown
Director

Enclosure:
Letter to Minister of Health

His Excellency
Hamdi Hakim
Governor of Fayoum

1. Priority EH Areas (Drinking Water,
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