



ENVIRONMENTAL HEALTH PROJECT

ACTIVITY REPORT

No. 31

**INSTITUTIONAL ASSESSMENT FOR
LEAD EXPOSURE ABATEMENT
AND REDUCTION IN CAIRO**

December 1996

by
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Prepared for the USAID Mission to Egypt
under EHP Activity No. 255-CC

Environmental Health Project
Contract No. HRN-5994-C-00-3036-00, Project No. 936-5994
is sponsored by the Bureau for Global Programs, Field Support and Research
Office of Health and Nutrition
U.S. Agency for International Development
Washington, DC 20523

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ACKNOWLEDGMENTS

The institutional assessment team for LEAP acknowledges with gratitude the assistance of many individuals and institutions in cooperating with this work and providing useful insights. All participants in the start-up workshop for the activity and all institutional representatives interviewed for this work graciously offered time and information. Special thanks are due to the Technical Cooperation Office for the Environment of the Egyptian Environmental Affairs Agency, which assisted with data gathering and interpretation.

ACRONYMS

AEEC	Association of Enterprises for Environmental Conservation
CAIP	Cairo Air Improvement Project (sponsored by USAID)
CDC	United States Centers for Disease Control and Prevention
EEAA	Egyptian Environmental Affairs Agency
EETP	Environmental Education and Training Program
EGPC	Egyptian General Petroleum Company
EHP	Environmental Health Project
EIA	Environmental Impact Assessment
EMU	Environmental Management Unit (of governorates)
ENGO	Environmental Nongovernmental Organization
FEI	Federation of Egyptian Industries
FETP	Field Epidemiology and Training Program (USAID-sponsored project, implemented by CDC)
GOFI	General Organization for Industrialization
LE	Egyptian pounds; LE 3.40 = US \$1 (approximate exchange rate)
LEAP	Lead Exposure Abatement Plan
LSAP	Lead Smelters Action Plan (sponsored by USAID)
MOHP	Ministry of Health and Population
MTBE	methyl tertiary butyl ether
NEAP	National Environmental Action Plan
NGO	nongovernmental organization
NRC	National Research Center
PVC	polyvinyl chloride
RBO	Regional Branch Office (of EEAA)

TCOE Technical Cooperation Office for the Environment (of EEAA)
USAID United States Agency for International Development
WHO World Health Organization

EXECUTIVE SUMMARY

Lead has been identified as one of the top-priority environmental health threats in the greater Cairo area. Leaded gasoline and heavily-polluting smelters are recognized as main contributors to the lead problem. To reduce the health threat to the population, the U.S. Agency for International Development (USAID)/Cairo and the Egyptian Environmental Affairs Agency (EEAA) are working together, using a comprehensive approach to identify *the sources and pathways* of lead exposure, with the goal of reducing the threat to Cairo's population. The effort, called Lead Exposure Abatement Plan or LEAP, was developed at the request of the USAID/Cairo, in conjunction with the Technical Cooperation Office for the Environment (TCOE) of the EEAA. The TCOE will spearhead efforts to obtain stakeholder commitment to carrying out the key elements of the plan.

This report is an assessment of the institutions likely to play major roles in the development and implementation of a lead exposure abatement plan for greater Cairo. The investigation is undertaken as part of the data-gathering process for development of the plan. This report is to be used in conjunction with an environmental analysis being conducted simultaneously (EHP Activity Report No. 32, forthcoming). The aim of the institutional assessment is to identify key stakeholders, determine their potential roles in the lead exposure abatement plan, and begin to define the key policy and institutional issues that must be addressed to design an effective plan. The stakeholders assessed in this study include public institutions, nongovernmental organizations (NGOs), private businesses, and relevant networks and associations.

Institutional Assessment

The assessment focuses broadly on several types of institutions. Three types are central to the lead exposure issue in greater Cairo:

- # environmental institutions, especially EEAA
- # health institutions, especially the Ministry of Health and Population (MOHP) and the health care system
- # source and pathway institutions, i.e., organizations that generate lead use or emissions, incorporate it in their processes, or are linked to lead in its pathway from production and use to human contact.

EEAA has a broad mandate and is undergoing institutional and policy development, but the agency has limited capacity to implement a lead exposure abatement plan itself. The overall functions of EEAA require collaboration with other parts of the government and the emerging private sector. Such collaboration is especially pertinent with respect to the lead issue. EEAA efforts will likely include collaboration, facilitation, and informational tasks in conjunction with other key stakeholders. MOHP is a much larger and more well-established institution, and the health care delivery system is large and well developed. Several units within MOHP offer potential bridges for collaboration with EEAA. The EEAA-MOHP link is the most critical element for successful development and implementation of LEAP; successful collaboration between these institutions will likely require top-level commitments.

The source and pathway institutions of potential importance are multiple and varied. A plan has been adopted by the Ministry of Petroleum for eliminating leaded gasoline completely by the year 2000, and significant progress in reducing lead use in general has already been made. Efforts are underway to deal with the persistent problem of lead smelters/battery recyclers. This sector is difficult to address because of the number and dispersion of small smelters. The LEAP process is aimed, in particular, at institutions beyond gasoline and smelting, although some attention is given in this report to issues of secondary contamination resulting from those activities. The use of kohl, an eye cosmetic, presents a particularly difficult challenge: the cosmetic is almost completely composed of lead and is thus highly toxic, its users are many and dispersed, and its manufacturers and distributors are also decentralized. Lead-based paints are used by a variety of private manufacturers, many of them small, and this share of the market is increasing. Newspaper ink, supplied by one domestic producer, may present an exposure pathway via food. Ceramics for use as food containers are produced in small craft enterprises. The Cairo water supply and related systems currently present limited lead exposure, so intervention points within the water delivery system may not be needed. The system for producing and distributing food within greater Cairo contains several points of potential contamination by lead, and different institutions are involved at different stages. Occupational exposure may occur in several industries, and additional possible pathways include the production of cooking salt by one company, the recycling of dust collected from city streets, and contaminated compost in households. Each of these situations is characterized by unique institutional features.

Many additional types of institutions have potential roles in reducing lead exposure: educational, research, and informational institutions; community organizations, including women's associations and religious institutions; business associations, including institutions representing sectors of industry and those seeking to incorporate improved environmental practices within firms; several ministries, which share responsibility for

programs and jurisdictions with potential influence on lead; and the environmental management units in the governorates. Some of these various types of organizations might become involved in LEAP, but there are constraints. The most significant are financial constraints and disincentives, informational limitations, restricted institutional capacity, incomplete policy development, and jurisdictional diffusion within a centralized state system.

Cross-Institutional Issues

A well-conceived lead exposure abatement plan will have to deal with the challenge of stimulating cross-institutional collaboration in a setting where coordinated effort of this type is not customary. The need for cooperative effort between the EEAA and the MOHP is especially significant. Several points of potential linkage currently exist between the two structures. Joining these institutions for cooperative efforts on behalf of lead exposure reduction will require attention and commitment from the leadership of the both organizations. Links with other institutions on behalf of LEAP are also possible but must be forged. A high-level, interministerial steering group should be appointed for this purpose. And EEAA should begin to develop working relations with a number of these institutions, including private companies in lead-using industries, to begin the collaborative process. The Environmental Protection Fund could be used as a key tool in this effort.

Stakeholders and Targets

Priority stakeholders in several institutional locations could form an alliance on behalf of LEAP, but sustained support will not be forthcoming without leadership from EEAA. EEAA actions could take the form of information, education, technical assistance, and the targeted use of economic incentives. A preliminary list of targets for such interventions could be primary health care physicians, producers and consumers of kohl, the public ink manufacturer and private paint companies, bakeries, food distributors, occupational safety inspectors in the Ministry of Manpower and Migration, the Cairo Cleaning Authority, households

in greater Cairo, and industrial firms in which workers are exposed to lead.

Recommendations

Priority recommendations for the LEAP process itself include linking blood-lead level testing to ongoing environmental sampling to maximize the effectiveness of the interventions to be designed; establishing an advisory committee for the LEAP effort; providing more information to stakeholders about the LEAP process; involving MOHP more directly in LEAP efforts; and adding several more stakeholders to the LEAP process before it develops further.

Priority recommendations to be considered as possible elements of the plan include the following:

- # establish a high-level steering committee, representing several ministries and other key stakeholders, which would report to the executive chairman of EEAA for oversight and leadership in the implementation phase of LEAP
- # implement the EEAA's monitoring system
- # select lead exposure reduction as a priority use of the Environmental Protection Fund
- # design awareness, educational, and informational programs for several different audiences
- # develop and maintain a comprehensive lead database
- # improve the workplace inspection system
- # identify research priorities to address lead exposure issues more effectively
- # delineate specific actions to reduce lead exposure and improve the quality of information regarding several priority sources and pathways (petroleum; smelters; cosmetics; paints, inks, and dyes; and food)

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INTRODUCTION

1.1 Overview

Lead is one of the priority environmental health threats in greater Cairo. Average blood-lead levels in Cairo exceed guidelines established in the U.S. and those of the World Health Organization (WHO). USAID/Cairo and the Egyptian Environmental Affairs Agency (EEAA) are collaborating to identify the sources and pathways of lead exposure with the goal of reducing the threat to Cairo's population. This effort, called Lead Exposure Abatement Plan or LEAP, was developed at the request of USAID/Cairo, in conjunction with the Technical Cooperation Office for the Environment (TCOE) of EEAA. In 1996 USAID/Cairo requested the Environmental Health Project (EHP) to develop LEAP. EHP has divided LEAP into four related activities:

- # environmental analysis
- # institutional assessment
- # policy dialogue
- # intervention design

The environmental analysis, which involves the design and execution of a protocol for environmental lead sampling, was the first portion of LEAP to be initiated. It was undertaken from September through December 1996. That analysis is to be linked with the assessment of institutions, to identify public- and private-sector organizations that should be involved in efforts to reduce lead exposure. Institutional stakeholders will engage in a policy dialogue aimed at identifying priority policy options for LEAP. Those options will then be used in the intervention design. This report contains the results of the institutional assessment, conducted from September through December 1996. It is designed to provide essential information for the policy dialogue, currently underway and scheduled to continue until approximately May 1997. The intervention design phase will take place from May through August 1997.

To assist in these processes, three workshops involving stakeholder representatives have been planned as a part of LEAP. The first occurred in September 1996, the second is scheduled for May 1997, and the third is to occur in August 1997.

The purpose of the institutional assessment is to identify the key stakeholders, determine their potential roles in the lead exposure abatement plan, and begin to define the key policy and institutional issues that must be addressed to design an effective LEAP. The assessment included public institutions (several ministries and public companies), private businesses, NGOs, and community groups as well as any significant networks, task forces, associations, or organized clusters of such organizations. Institutions, in short, are treated here as organizations and linked groupings of organizations.

The institutional analysis is closely connected to the policy dialogue. Identifying key stakeholders and beginning the identification of key policy issues will help focus the policy dialogue on priority issues, stakeholders, and policy options. To emphasize this link and begin the process of policy dialogue, the latter activity began early in the course of the institutional assessment with the first LEAP policy workshop. The 3-person institutional assessment team participated in the start-up workshop (September 18 and 19) to explain the institutional portion of the LEAP effort and discuss its connection with the policy dialogue meetings planned in the future.

The fieldwork for the institutional assessment took place from September 15 to October 2 and December 4 to 9, 1996. Almost all of the work was conducted within the three governorates of greater Cairo. Interviews were also conducted with stakeholders in the research and university community in Alexandria. All three members of the EHP team participated in the September-October fieldwork; two of them were involved in additional interviews and assessment work in December. Most of the fieldwork consisted of interviews with representatives of stakeholder institutions and those knowledgeable about these institutions. The team

also examined conditions in Cairo, particularly regarding possible pathways of lead exposure.

1.2 Background

The Arab Republic of Egypt has a population of approximately 60 million. The head of state is the President, who appoints the government and its ministers. The government is assisted by the Peoples Assembly, an elected legislative body with five-year terms. The governing system is centralized, but subnational structures, the 26 governorates, serve as significant centers of administration and service. Greater Cairo, the capital and largest city, is home to approximately 12 to 15 million people and is served by three governorates: Cairo, Giza, and Kalyubia.

Cairo is a metropolis of high density and is a locus for large amounts of polluting industry and traffic. Its population is exposed to a variety of environmental threats, one of which is lead. Many studies have shown that average blood-lead levels in greater Cairo are much above guidelines established by the World Health Organization (WHO) and by the U.S. This situation poses serious health hazards for the population, particularly children and high-exposure groups within the population. The Cairo Comparative Risk Assessment, supported by USAID and completed in 1994, documented lead as a high-priority environmental health problem. Two sources of lead had already been identified as especially important: lead in gasoline emissions and emissions from secondary lead smelters. The Government of Egypt is now taking steps to deal with both of these. USAID, through the Cairo Air Improvement Project (CAIP) and the Lead Smelters Action Plan (LSAP), is assisting in these initiatives. However, several other sources and pathways for lead exposure have been suspected. Furthermore, since lead does not degrade and is likely to remain in the Cairo environment far into the future, it is important to control exposures as well as preventing introduction of new lead into the setting. The LEAP effort, therefore, is aimed at a comprehensive identification of exposure routes and development of a plan to target the highest-priority interventions to abate or reduce lead exposure.

The LEAP activity will involve stakeholders in the development of the program, under the

coordination of the Egyptian Environmental Affairs Agency, and will press for commitments to action on the part of the key stakeholders. It will be important to find and select feasible and implementable options during development of the plan. Key elements of a successful plan must include information about stakeholders, possible alliances among supportive institutions, and priority policy target points for potential interventions. This institutional assessment is designed to provide such information.

1.3 Scope of Work

The scope of work for this assessment called for identification of the range of key stakeholders who could have a role in developing and implementing the lead exposure abatement plan. The focus is greater Cairo, although results of the assessment and the eventual LEAP may, indeed, have national implications. The primary method for performing the task involved interviews with as many stakeholders as possible to determine levels of knowledge, experience, planning, and potential for involvement in reducing human lead exposure. The assessment was to identify stakeholder perspectives and potential obstacles to action. The EHP team was also asked to look at ways to enhance or encourage collaboration. It was instructed to develop a preliminary list of key policy targets for eventual use in combination with the results from the environmental analysis. The full scope of work is included as Appendix A of this report. Since lead exposure via petroleum and smelter operations is being addressed through the USAID-sponsored projects mentioned above, those industries received less attention during this assessment.

Since they are part of the overall lead Acommunity@in Cairo, however, and since the institutions involved in those sectors will have relevance for LEAP efforts at later stages, these sectors are included in Section 2.4, Source and Pathway Institutions.

This assessment broadly reviews the array of institutions now involved, or with potential to become involved, in the lead issue in greater Cairo. Since there are hundreds, if not thousands, of possibly relevant institutions, however, only a sampling has been contacted. The list of contacts developed during this activity reflects a balance

among the following criteria: centrality to the lead issue, breadth of institutional type that might be important for LEAP interventions, involvement in early LEAP activities (i.e., the first policy workshop), and interest in discussing LEAP-related institutional questions. A higher level of effort would have resulted in additional useful information. This assessment, nevertheless, contains much of the high-priority information on institutions that will be needed in following stages of LEAP.

1.4 Limitations

Scheduling difficulties and unexpected schedule changes precluded interviews with representatives of certain significant institutions, most notably the Ministries of Information and Waqfs (Religious Affairs) and the private paint manufacturing industry.

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INSTITUTIONS, ROLES, AND CAPABILITIES FOR LEAD EXPOSURE ABATEMENT

This chapter presents the core of the institutional assessment findings that pertain to an organization-by-organization review. Some of the institutional issues pertinent to the LEAP effort, nonetheless, are linked to existing or potential collaborative ties across organizations: interministerial, intergovernmental, public-private, and associational or federative alliances. These are the subject of Chapter 3.

Following an introductory section designed to explain the broad policy context currently operating in Egypt, the bulk of this chapter focuses on key institutions. The first two institutional types—environmental and health—must be involved in any lead exposure abatement effort, regardless of priorities assigned to targets and interventions. Likewise, the third type—source and pathway institutions—are central to any such efforts; these are the institutions through which the population is exposed to lead hazards. The remaining types of institutions—education and research, informational, community, labor and trade, as well as the important governmental institutions represented by other ministries and the three governorates in the Cairo area—can also be quite significant for specific aspects of an eventual plan. The chapter concludes with some observations about the institutional context in general and addresses issues around implementation.

2.1 Policy Background

The main policies now setting the context for LEAP can be reviewed briefly. The National Environmental Action Plan (NEAP) sets forth one of the few explicit official statements on environmental policy in Egypt. While heavy metals are mentioned in it in conjunction with land and water pollution, lead is mentioned specifically only in the air pollution chapter. That chapter begins with a brief overview of the air pollution situation

and then proceeds to spell out a few proposed actions to reduce pollution. Among these are:

- # The use of economic instruments to reduce gasoline consumption. This objective is to be attained by removing fuel subsidies and instituting fuel taxes by 1995. The former has been achieved for the most part, while the latter has yet to occur.
- # Lowering lead content in gasoline. This goal is to be achieved through the imposition of new standards of lead content in gasoline and an effort to force the refineries to comply. The plan proposes that the lead content be no more than 0.15 mg/l, and that higher-octane unleaded gasoline be produced and made available to consumers (i.e., gasoline stations in greater Cairo and Alexandria would be required to sell both leaded and unleaded gasoline). Differential pricing (favoring unleaded) could be introduced as an incentive to customers.

Some of these actions have been carried out. At the initiative of the Minister of Petroleum and the Egyptian General Petroleum Company (EGPC), the lead content in gasoline has been reduced dramatically. Moreover, the production of unleaded gasoline first began on a small scale and has recently expanded greatly. As of November 1996, approximately 80% of the gasoline sold in Egypt was unleaded. Further changes to solidify the production of unleaded gasoline are planned. The price, however, is significantly higher than its leaded counterpart.

Another of the main environmental policy tools is Law 4 of 1994, the law of environment. This legislation is the latest and most comprehensive of Egypt's environmental laws. It covers most aspects of the environment and spells out responsibilities of the various bodies concerned with environmental issues in Egypt. The law established the Egyptian Environmental Affairs Agency and defined its

authority. Law 4 clearly states that EEAA is primarily a coordinating body, despite the fact that the legislation grants the agency some limited executive powers.

The law, whose executive regulations were published in February 1995, grants a three-year grace period for the regulated parties to comply with its provisions. Among the unique features of this law are the following:

- # The Environmental Protection Fund, intended to provide financial resources to undertake environmental projects. Funding sources include but are not limited to fines for environmental violations, donor contributions, and allocations by the government. The fund is to be administered by a committee selected by the executive chairman of the EEAA.
- # Economic incentives, to be developed by the EEAA along with the Ministry of Finance, to reward those engaging in environmentally beneficial activities.
- # Environmental impact assessments (EIAs), required for projects deemed to have a negative environmental impact.
- # Environmental logbooks, required for establishments (like industrial plants) to record data on a periodic basis regarding the quality and quantity of discharges to the environment. This step is intended to facilitate monitoring considerably.
- # State of the Environment Report, an annual requirement.
- # Public participation, by reserving three seats on the EEAA board of directors for representatives of environmental NGOs. Moreover, the law grants NGOs and private citizens legal standing to sue environmental violators.

Workplace exposure issues are dealt with mainly through occupational safety laws, supplemented by some provisions of Law 4/1994. The laws set limits for workers' exposure to various pollutants and spell out precautionary measures and safety procedures. Occupational health and safety are primarily monitored by the Ministry of Manpower and Migration, which sends its inspectors to plants on a regular basis to enforce the law. Inspectors are authorized to issue citations and

impose fines. The Ministry of Health and Population (MOHP) collaborates with the Ministry of Manpower and Migration on occupational health issues.

In general, compliance with occupational health and safety regulations in Egypt is quite low, due in part to the low level of awareness among plant managers and workers. Weak enforcement is also a contributing factor.

The Egyptian business sector, for the most part, is divided into two main categories: public and private. Public companies are those owned directly by a government organization. As a result of nationalization efforts and subsequent expansions, the government currently owns approximately 340 major companies providing a wide range of products and services. The companies are organized under 17 holding companies. The heads of these companies report directly to the Minister of Public Enterprise Sector. A major privatization effort, currently underway, could result in the sale of most of the public firms to private investors. The private sector is composed of thousands of companies owned by private entities. For the most part, they fall under the same regulations as their public counterparts and are entitled to the same rights and privileges.

The MOHP is charged with several pollutant-monitoring functions. The Center for Environmental Monitoring has an ongoing Nile water and ambient air monitoring program, with lead one of the pollutants monitored in both media. Health inspectors routinely gather samples of food and drinking water for testing in the ministry's laboratories. The level of lead is one of the main subjects of analysis and reporting.

Registration of a new business enterprise is conditional upon compliance with several legal, financial, safety, and environmental regulations. As mentioned above, Law 4/1994 requires EIAs in some cases. An EIA is reviewed by both the EEAA and the local licensing authority, and plans are modified if necessary. Once the local licensing authority is satisfied, the license can be issued.

Regulations for solid waste management exist but are, in general, poorly enforced. Commingling of waste (that is, mixed dumping of hazardous and nonhazardous wastes) is common practice. The waste is then collected and transported to local open dumps. Much waste is recovered and sold for

recycling by scavengers. Battery scrap, for example, is sold to lead smelters by the scavengers.

2.2 Environmental Institutions

2.2.1 Egyptian Environmental Affairs Agency

EEAA is the main body responsible for managing environmental affairs in Egypt. It was established in 1981 as a ministerial committee and became an agency in 1982. EEAA is run by a board of directors headed by an executive chairman who reports to the Minister of the Public Enterprise Sector and Minister of State for Administrative Development and Environment. The main role of EEAA is to coordinate the various parties working in the field of environment. Thus, in the most general sense, its mandate is to protect and enhance Egypt's material resources through the formulation of policies and the preparation of plans for protection and promotion of the environment.

Since the issuance of Law 4/1994, EEAA has been granted wider powers (although many would agree that its powers are still inadequate), and a major restructuring of the agency. The approved structure (in Arabic) is included in this report as Appendix C. Although EEAA is primarily a coordinating body, it has gained some limited executive powers to undertake law enforcement activities on environmental matters. EEAA has been given direct authority in two matters: natural protectorates and contingency planning for environmental disasters. In all other subjects, EEAA remains largely a coordinating body, with the possible exception of authority to implement some pilot projects.

Article 5 of Law 4/1994 clearly sets out the roles and responsibilities of the agency. The key ones include

- # preparing draft legislation
- # preparing studies on the state of the environment
- # setting environmental standards
- # assuring compliance with pollution limits
- # establishing principles and measures for project EIAs

- # participating in the preparation and implementation of the national program for environmental monitoring and utilizing its data
- # preparing programs for environmental education of the public and cooperation in their implementation, and
- # preparing an annual report on the state of the environment for submission to the President of the Republic and the Cabinet.

Because lead is a pollutant that can be carried by various media and emanates from a multitude of sources, efforts in lead abatement will require collaboration among many agencies and departments within EEAA itself. A review of the EEAA structure suggests that the following sectors/departments are relevant to any lead-related effort: Environmental Awareness and Public Information, Water Quality, Air and Noise Quality, Land and Soil Quality, Environmental Health, Environmental Monitoring, Waste Management, and Hazardous Substances and Waste Management. The first five of these constitute the Environmental Quality Sector of the agency, and thus it would be logical to assume that the head of this sector should spearhead efforts of EEAA in lead abatement, under the guidance of the executive chairman.

2.2.2 Environmental NGOs (ENGOS)

Estimates of the number of existing ENGOS vary widely, from as few as 20 to as many as 100. This variation is due mainly to the difficulty of arriving at a precise definition of an ENGO. To coordinate their activities, the ENGOS have formed a 15-member steering committee, the ENGO Coordinating Committee. The committee acts both as a coordinating body and an advocate on issues of concern to ENGOS. The EEAA recognizes the steering committee as an official body and has asked it to nominate three individuals to represent the ENGOS on the newly formed EEAA board of directors (as mentioned above in Section 2.1). The incorporation of NGO representatives in the policymaking structure of an official government body is a major precedent in Egypt.

It has been reported, however, that the majority of NGOs are ineffective, primarily because of their lack of resources, low levels of organization, and

the virtual absence of support at the grassroots level.

There appear to be no lead-specific ENGOs. A few, however, have either worked on lead-related issues or expressed interest in doing so. Among these are the Coordinating Committee and the Association for the Protection of the Environment. ENGOs could potentially be used as vehicles for raising public awareness on lead exposure issues.

2.3 Health Institutions

2.3.1 Ministry of Health and Population

The Ministry of Health and Population (MOHP) is organized into three broad sectors: Curative Health Services, Basic and Preventive Health Services, and Family Planning. Each of the three units is coordinated by a First Undersecretary and organized into a number of administrative divisions. These subunits are coordinated by undersecretaries and structured in turn into additional subunits headed by directors. MOHP is one of the largest ministries within the Egyptian government. Its internal operations are hierarchically organized, with little work done cooperatively across sectors or subunits.

During the period of this assessment the following subdivisions were functioning:

- # *Curative Health Services:* Dentistry, Pharmaceutical, Research and Development, and Curative Medicine
- # *Basic and Preventive Health Services:* Endemic Diseases, Basic Health, Laboratories, and Preventive Affairs
- # *Family Planning:* Family Planning and Population

Health Directors serve at the governorate level; the broad administrative divisions at the central level are duplicated in the governorates to coordinate activities. District health officers are appointed at the local level. In addition to the governorate bureaucracy, an extensive local health care delivery system also operates.

Some 3,500 primary and maternal health centers are spread throughout Egypt to provide free services to the public. These are complemented by rural and district-level hospitals to provide acute

care and governorate-level hospitals to treat the more serious cases. Hospital services are also provided by teaching hospitals and medical schools affiliated with most of the universities. Three universities, Ain Shams, Cairo, and Helwan, operate in the greater Cairo area. Both Ain Shams and Cairo have teaching hospitals. Some private medical services are available at cost, and some health services are provided through the mosques.

Within the Basic and Preventive Health Sector, a new USAID-funded effort implemented by the U.S. Centers for Disease Control and Prevention has begun to train local physicians to do epidemiologic work. Called the Field Epidemiology and Training Program (FETP), this project was designed to provide assistance to research projects within MOHP and has recently received permission from the minister to conduct a blood-lead study of children under the age of six. This study will be the first comprehensive screening effort to identify children with elevated blood-lead levels and the risk factors for exposure to lead. The study is scheduled to begin in one district of Cairo in January 1997; data analysis is expected to continue through 1997. Once results of the study are available, MOHP will plan a more comprehensive effort to identify children with elevated blood-lead levels and to begin a preventive effort.

The Ministry of Health is the only central coordinating point for health services within greater Cairo. An effective lead exposure reduction plan will require numerous MOHP units to work closely with each other, including the Laboratories, Preventive Affairs, the primary and maternal health centers, and the hospital system. The various divisions within the central ministry, however, do not appear to communicate regularly across administrative lines. Heavy workloads have precluded close cooperation, and no mechanism appears to be in place for sharing information across subunits about work underway. As a result, it is often difficult for donors working with one division of the organization to get information about or disseminate information to the entire ministry or even to all of the appropriate subunits that might need to be included, as in a lead exposure reduction plan. A representative of MOHP sits on the EEAA board as a point of contact. Information about LEAP activity timetables, however, did not appear to have been

passed along to appropriate parties within the ministry. Communication and coordination across the various MOHP units will need to be improved to integrate the ministry fully into the LEAP process. Skill levels, interest, and commitment are quite high, nonetheless. Laboratory facilities reviewed for this assessment seem well equipped, well staffed, and well maintained. In this regard the ministry has ample capacity to do its regular work and expand if needed to take on additional responsibilities in the lead exposure abatement plan.

The assessment team was unable to visit any primary health care facilities, but they have been described as easily accessible to any Egyptian citizen. In addition, some facilities concentrate on providing services to mothers and young children. Each is staffed by a general practitioner, at least one sanitarian, and nursing personnel. Sanitarians visit homes as well as inspect food facilities and waste storage facilities. Officials consider sanitarians an ideal group to receive additional training in environmental health as part of the LEAP activity. They have the capacity to do direct health education targeted at families with young children.

2.3.2 Health NGOs

Numerous NGOs are concerned with health. A reliable estimate of the exact number is not available, but the assessment team met with several individuals affiliated with such organizations. Several are worth highlighting.

The Association for the Protection of the Environment, actually an ENGO, has organized a pilot study to reduce lead exposure in women who collect and sort garbage and who prepare compost. These women have been trained to sort metal separately from food within the garbage. The pilot effort was accomplished through a door-to-door educational campaign accompanied by distribution of containers for sorting the garbage. The garbage sorters' lead levels were measured before and after the intervention and found to be lower following initiation of the new practices. In addition, compost prepared from the newly sorted garbage contained less lead. Organizers expect this change to result in lower levels of lead in food grown with the composted material. This pilot is planned for replication on a larger scale.

A Medical Women's Association has played a strong advocacy role for improvements in health. The organization seems to have potential for appealing directly to the physician community concerning the importance of lead in greater Cairo.

The Maternity and Childcare Higher Council Advisory Committee, chaired by the wife of the Egyptian President, is now launching a plan for helping children with learning disabilities. The emphasis on learning disabilities could be tied to lead poisoning as an antecedent factor. An individual within EEAA now works full time as a point of contact with this group.

2.4 Source and Pathway Institutions

Among the key stakeholders in any lead exposure abatement effort are the source and pathway institutions, i.e., any organizations that produce lead as a commercial product or a waste by-product as emissions, those that incorporate lead in their processes, and those that may be linked to lead in its pathway from production and use to health impact on humans. Thus, the umbrella includes lead generators and institutions using lead in their production processes as well as institutions potentially part of the Apathway@ of lead exposure: those involved in the distribution of food found to be contaminated by lead, for instance.

The assessment team's search for source and pathway institutions in greater Cairo began by identifying documented users of lead. Institutions along additional routes of exposure were identified and assessed based upon known exposure routes in other countries. The review was expanded as well by inquiring about reported lead uses in Cairo. Interviews and an examination of documents assisted in expanding the breadth of coverage. The original list was increased to encompass as many source and pathway institutions as possible within the time available, while also paying particular attention to the preliminary results of the LEAP environmental analysis to ensure that exposure possibilities identified by the sampling results were included. The full list of persons (and organizations) contacted is included as Appendix B to this report.

Three limitations should be kept in mind in using the results of this institutional assessment:

- # In an ideal assessment process, institutions should be identified after an environmental analysis is completed. In reality, the environmental analysis was conducted at the same time as the institutional assessment. Consequently, the findings and recommendations in this report should be viewed as somewhat preliminary.
- # Time constraints and the limited availability of some institutional representatives meant that interviews were not possible for all sources and pathways directly involved in lead use. In these cases, information was obtained from other individuals with extensive knowledge of the industry or pathway in question.
- # Certain types of source or pathways are quite dispersed and decentralized (e.g., paint manufacturers in the private sector). In such instances, it was obviously not possible to interview representatives of each organization. The assessment provided here is based on information drawn from one or more knowledgeable representatives from the sector; interviews in these cases included discussion of the structure of the sector overall and the practices and perspectives of businesses or organizations. In a couple of cases, since sources of lead exposure are sufficiently decentralized, it is difficult to refer to sources or pathways as institutions.

Given the methods used and the limited time, it is possible that highly unusual, unknown, or isolated source and pathway institutions have been omitted in this review. It is clear, however, that those included constitute the bulk of the source and pathway actors in greater Cairo. For each type of source and pathway institution, information is included on current levels of knowledge, actions taken or planned, and the perspective of institutional representatives.

2.4.1 Petroleum

Leaded gasoline has constituted a major source of lead exposure in greater Cairo. The principal source institutions have been the gasoline refineries—public companies—and the Ministry of Petroleum. The ministry controls the refineries. No private sources of petroleum are available in Egypt. The source of

leaded gasoline, therefore, is highly concentrated in the key institutions, and decisions are made by the ministry.

The pathway of exposure, of course, involves huge numbers of transport vehicles, including those used in public transport and also private vehicle assembly and use. Automotive assembly is currently performed in Egypt, and many vehicles are imported as well. Institutions supplying new vehicles, whether assembled or imported, pose no constraint for a shift to unleaded gasoline.

Little public information is available regarding the current operations or plans of the Ministry of Petroleum regarding lead. The ministry is aware of lead hazards, has taken steps toward exposure reduction, and has developed specific plans for the total elimination of lead in Egyptian gasoline. Official specifications for lead in gasoline now call for a maximum of 0.65 grams per liter, down from a maximum of 0.8 a few years ago. By 1996, the Cairo-area refinery had first reduced lead concentrations to approximately 0.3 (for verification via sampling results in Cairo, see Memorandum from Saad Abdalla to Fredrich Guymont et al., August 15, 1996, *Real Values of Lead Content in Locally Marketed Gasoline*). Later in 1996, thanks to an order issued to the Egyptian General Petroleum Company (EGPC) by the Minister of Petroleum, methyl tertiary butyl ether (MTBE) began to be imported for use at the Cairo refinery, which accounts for 60% of the nation's gasoline. The use of lead has now ceased at this refinery. The Alexandria and Suez refineries also produce no leaded gas. Of all refineries in Egypt, only those at Assiut and Tanta are now producing leaded gasoline, and they account for only 20% of the national supply.

Currently, the key limiting factor in completing the transition to totally lead-free gasoline production is the availability of appropriate refinery equipment. The Ministry of Petroleum has developed a plan for the phase-out of lead by the year 2000. The plan includes installation of a reformer unit at the refinery located in Assiut, along with the phased opening of two isomerization units—one at the refinery in Alexandria, the other six months later at the Cairo unit. Once these projects are completed, MTBE importation will no longer be necessary. Refinery-level specifications have not yet been developed. The schedule is gradual, due to limited

governmental funds. But recent developments involving MTBE suggest an acceleration of the ministry's announced phaseout projections as shown in Table 1.

In the meantime, the government has begun to emphasize the use of compressed natural gas as a vehicle fuel. The Ministry of Transit and Communication is currently encouraging bus and taxi fleets in Cairo to convert to this option, and the Cairo Air Improvement Project of USAID and EEAA also includes a component supporting this move. Egypt possesses large natural gas supplies.

During the transition to a lead-free transportation system, additional issues will have to be dealt with, for example, the pricing policy for unleaded gasoline; unleaded fuel is currently much more expensive than the leaded alternative. Pricing decisions take place in the Cabinet of Ministers.

Table 1
Planned Phase-out of Leaded Gasoline
(in grams of lead per liter)

Year	Cairo	Egypt
1995/96	0.35	0.28
1996/97- 1998/99	0.26	0.2
1999/2000- 2000/2001	No lead	no lead

SOURCE: Presentation by Dr. Hassan Mohamed, Egyptian General Petroleum Corp., Start-up Workshop for Lead Exposure Abatement Plan, Cairo, September 18, 1996.

2.4.2 Battery Manufacturing and Smelting

An extensive network of battery-manufacturing and -recycling plants, private and public, operates in greater Cairo. A recent report of lead smelting activities in Egypt commissioned by EEAA references 14 battery manufacturers, 7 of which lie within greater Cairo (TCOE 1996). In addition, battery recycling activities take place in at least one public and numerous private plants within greater Cairo. Lead is continuously cycled from scrap collectors who deliver old batteries to secondary smelting facilities which in turn extract the metal from the old batteries, remelt it, and deliver lead to battery manufacturing plants for reuse.

Lead from secondary smelters is also used to produce shields for X-ray devices, seals for use in locking doors, water pipes, solder, and cable sheathing. Secondary smelters produce red lead oxide for use in paint. The vast majority of the lead, however, makes its way into batteries.

A member of the assessment team visited one of the publicly owned plants to observe conditions. This facility evidenced a complete lack of engineering controls and worker protection. Activities were conducted in large buildings with open doors; fumes were vented to the outside. The rotary furnace was not sealed. The kettles used for alloying the molten lead were open to the air inside a building with doors open to the outside. Neither respiratory protection nor protective clothing was worn by employees, nor were shower facilities provided. Workers seemed unaware of hazards. Many open containers of red lead oxide were visible in a building open to the outside. A thin coating of red lead oxide was evident on every flat surface, including floors. This plant was located in a district adjacent to residences. The management indicated that new equipment was scheduled for installation soon.

In addition to formal manufacturing and smelting plants, Cairo is home to numerous remelting facilities, which are small and informally run. Many of these shops are also situated in residential neighborhoods and are not subject to the same system of workplace inspections as the larger plants. One such facility located on a major street near the Khan el-Khalili market was observed. Several men were working in an open storefront

with no barrier separating them from passersby. Workers were using open flame torches to heat the metal. No eye protection, protective clothing, or respiratory equipment was used. Residences occupied the second floor of the building; no special ventilation equipment was available to divert fumes.

Workplace inspection is the responsibility of the Ministry of Manpower and Migration. In addition, the Occupation and Industry Division within the Preventive Health Sector of the MOHP can send inspectors to facilities in response to complaints lodged by workers or from neighboring communities. Workers in formal manufacturing and smelting facilities are insured by the Insurance Division of the Ministry of Social Affairs, receive monitoring examinations, and are eligible for workers' compensation. Neither inspections nor monitoring appear to be done routinely, nonetheless.

If a worker's blood-lead level reaches 80 micrograms per deciliter, he is supposed to be removed from the workplace for at least a six-month period. Average blood-lead levels of 90 micrograms per deciliter, however, have been reported among workers at one secondary smelting facility (TCOE 1996). If these figures are accurate, the inspection and worker removal system does not appear to be functioning as intended.

It is widely believed that these smelting facilities pose hazards only to the workers. There is little understanding of the role that emissions from such plants, along with related soil and ambient air contamination, play in the health of neighborhood residents. Furthermore, the detrimental effect of take-home dust in elevating the blood-lead levels of workers' families was not appreciated, even within the health care sector. A recent study commissioned by the Ministry of Petroleum found high concentrations of lead in ambient air (well above standards set by WHO) near smelting facilities in greater Cairo (Institute of Graduate Studies and Research, University of Alexandria 1996).

Lead exposure from this industry could be greatly reduced by instituting a system of engineering controls, technological improvements, and hazard communication. The Lead Smelters Action Plan (LSAP), referenced in Chapter 1, is being designed to address this issue for larger facilities but will not affect smaller plants and the informal sector. A plan for addressing this portion

of the industry may have to involve the Ministries of Health, Labor, and Social Affairs as well as the Ministry of Environment and Public Enterprise.

2.4.3 Cosmetics

The eye cosmetic *Akohl* has been reported in the scientific literature as a source of lead. Samples of this substance were purchased at the Khan el-Khalili bazaar by a member of the environmental assessment team. The material was prepared on site by grinding a powder with a mortar and pestle to make the quantity needed for the transaction. When the sample was analyzed, it was found to be nearly pure lead.

This material is applied to the conjunctival surface of the eye. It is widely used by women (with implications for lead transmission to unborn children) and is applied to newborns of both sexes. Estimates of the use of this product by women ranged from 10% of the population to universal. Since this product is manufactured informally, regulation of either preparation or sale would be difficult. This set of circumstances would seem to be ideal for a public education campaign discouraging product use on young children or women of childbearing age.

2.4.4 Paints, Inks, and Dyes

Paints used in greater Cairo are manufactured by an industry dominated in the past by one public company, Paints and Chemical Industries, which currently serves approximately 60% of the domestic paint market. The growth of the private sector has now resulted in a set of at least 45 private manufacturers (approximately 14 companies, the rest small and/or informal operations). There is also one military paint manufacturer. Some of the private firms currently supply paint for export markets as well. As one recent report on the industry, published in a business monthly, put the matter, "The growth in the paint industry, according to [a managing director of an investment firm], is attributable to the rapid expansion of the construction/housing sector, increased industrialization, the higher demand for inks, the overall increase in the population and the increased sensitivity to polluting industries in advanced countries which is creating opportunities for such

industries to be set up in and export from developing nations (Powers 1996: 16).

The demand for paint can be divided into industrial and residential uses. Paints and Chemical Industries uses some lead for its industrial paint, which constitutes 10% of the company's overall paint production (such as red paint for protecting construction steel and shipyards from corrosion). The remaining 90%, manufactured for residences, is water-based paint without lead. (The public firm switched from lead-based residential paint in 1985, at the insistence of a collaborating company in the United Kingdom.) Private manufacturers, however, do use lead paint for the residential market. One use is in the primary coat on wood in residences; repainting generally involves replacing the outer coat but not removing the primary layer. Paint manufacturers, at least those in the formal sector, generally are aware of concerns about lead. Contractors readily purchase leaded paint for their work, and the issue of lead is rarely raised. The lead-based residential paint enjoys a price advantage over the lead-free alternative, and the lead-free market share is declining.

Ink is also manufactured by Paints and Chemical Industries. It appears that lead is being used in newspaper ink manufactured by the company. Since the firm supplies all domestic production of newspaper ink and pigments, and since newspaper is sometimes used as a food wrapper in Cairo, this pathway may be a source of lead exposure. Paints and Chemical Industries, the sole sizable source of domestic production, holds a 70% market share for ink. The bulk of the remainder is supplied through imports. No information was available regarding the sources or composition of imported ink.

The manufacture of dyes constitutes a separate industry with a separate set of producers. Preliminary information provided by a representative of the General Organization for Industrialization (GOFI) of the Ministry of Industry suggests that some dyes used in Cairo may contain lead. GOFI is a locus of knowledge regarding many of the source and pathway institutions outlined earlier. The organization reviews new industrial enterprises before they begin production, licenses them, offers technical advice, and now participates in EIAs. The dye industry consists mainly of small manufacturers (roughly 50% public and 50%

private); approximately one quarter of the latter group may be using lead.

2.4.5 Pipes, Plumbing, Water, and Water Storage

Water can sometimes be a pathway of exposure to lead, via ingestion, although preliminary results from the LEAP environmental assessment indicate that this route is not currently a pervasive problem in greater Cairo. Still, it would be helpful to review the Cairo water system and its associated institutions; some individuals are concerned about gradual plumbing erosion that may be occurring in homes within Old Cairo, for example, and a general sketch of the organization of the water system would provide background information should any water-related intervention be considered in the future.

The water system can be considered in terms of the public water supply system, household plumbing, the water supply itself, and institutions associated with water monitoring and management. One company, the Cairo Water Authority, is responsible for providing pipes and connections for the city's water supply. Pipes and plumbing within residences are supplied or contracted for by the homeowner, usually from small firms or informally. The pipes being supplied for the Cairo system are generally galvanized iron, covered with zinc. Lead is used as solder in some portion of these pipes.

Inside homes in Cairo, lead is generally used in plumbing, but most of the lead is installed on the output side of the water and sewage system—the portion removing water and sewage from the house. Some substitution of polyvinyl chloride (PVC), manufactured domestically and available more cheaply, is currently occurring. The one exception is for flexible pipe connecting the water main to the residential meters. Lead is universally used at this point in the system, which is installed generally by the Cairo Water Authority. The authority prefers to use lead here because of its flexibility. In older homes, this portion of pipe gets coated with minerals deposited on the inner surface, thus reducing dangers of lead exposure to those using water in the house. The remainder of indoor plumbing on the water supply side of the household system is generally made of tin. Three or four private companies and one public firm manufacture

plumbing fittings. This number is manageable for policy intervention.

Large-scale municipal water storage tanks are made of concrete. Household tanks, however, are almost universally constructed of metal, although some newer fiberglass tanks are now available. The sheet-metal tanks are primarily constructed by small workshops.

The Cairo Water Authority is responsible for the greater Cairo water supply itself. Among the national authorities overseeing water supply are the Ministry of Housing and Public Utilities and the Ministry of Local Administration. The water authority has indicated that its data show low lead content as water enters the distribution system (PRIDE 1994), and some previous studies of water from the tap in household samples show significantly higher and quite varied levels of lead. On the other hand, the Central Laboratory at the Ministry of Health and Population tests water at various points in the system, including household taps, as part of the ministry's monitoring program. The results are generally well below the 0.05 mg/l regulatory standard. Low levels were also found in the set of water samples taken for analysis as part of the LEAP environmental assessment.

Regarding institutional involvement, it can safely be said that the water authority and plumbing/contracting firms do not consider lead exposure to be a significant issue at present, and these institutions are not now engaged in initiatives aimed at reducing lead exposure.

2.4.6 Food

Lead exposure via food potentially includes issues of food production, transport, distribution, storage, and processing. The information reported here is based on interviews at the Ministry of Agriculture as well as other ministries and with ministry consultants, discussions with representatives from the NGO community, and a review of published scientific literature.

Food production, transport, and sale fall within the purview of the Ministry of Agriculture. The ministry also conducts some laboratory analyses of exported and locally consumed foods, primarily for pesticide residues but sometimes for other contaminants, like heavy metals, as well. Food vending establishments are inspected by the

MOHP, which also conducts analyses of food for microbial contamination. MOHP has authority to remove products from markets; the Ministry of Supply and Ministry of Interior have this authority as well.

Pesticide registration is a complex process coordinated through a committee at the Central Agricultural Pesticides Laboratory. Although no pesticides containing lead are now approved for use, it appears that the responsible committee does not explicitly consider the risks of lead contamination in its deliberations.

Typically, food is grown in areas surrounding greater Cairo and transported, often in open conveyances, into the city for sale and consumption. When motorized vehicles are used for transport, these may be fueled with leaded gasoline. The transportation process provides potential for deposit of lead particles on food. The food transport industry is decentralized; transporters of agricultural products are not organized into a trade association. Plans underway to phase out lead in gasoline, described in Section 2.4.1, should have a tremendous impact in reducing lead deposition during the food transport process.

Bread is a potentially important pathway of lead exposure. It is carried throughout the streets by vendors using large uncovered platters. On virtually any public sidewalk in central Cairo, vendors sell bread in open containers. A public service campaign using a popular local actor has already been developed to publicize the contamination of bread with lead. In addition, USAID has been working with local bakeries to change the type of fuel they use. Some bakeries utilized recycled motor oil in ovens where the heat source is in direct contact with the baking bread, thus causing contamination.

Studies performed in neighboring countries have shown that flour can be contaminated with lead during the grinding process. Mills used for grinding flour can be soldered with lead to stabilize parts, but this lead makes its way into the flour in the form of small particles which break off during the grinding process. This pathway has been traced to outbreaks of lead poisoning on the West Bank in Palestine. Flour contamination is one source now being considered in an outbreak of lead poisoning in Aswan.

Some food (and some water) is stored in pottery which is glazed, and the use of ceramic

vessels is common in cooking. These vessels are manufactured in informal cottage industries and sold in small shops and on roadsides. The LEAP environmental analysis sampling effort underway (as of this writing) should be able to determine if the containers are a potential source of lead contamination.

MOHP, which has the capacity to test food for lead, has recently had an impact on lead exposure through food. The ministry's environmental laboratory performs routine monitoring of drinking water, soil, and air and has been doing so for several years. The laboratory also initiates tests of lead in food when deemed appropriate. In December 1995, as a result of testing canned food samples, the MOHP ordered the canning industry to stop using lead solders. It was reported to the team that this directive has been implemented and that lead solder is no longer used in canning processes in Egypt. (Canned foods are being sampled by the LEAP environmental team to verify this.) The MOHP central laboratory is currently expanding, and its capacity to test for lead is increasing. As this report was being prepared, personnel from the MOHP laboratory were visiting CDC in the United States for additional training in analytical techniques.

Given the development in canning and the phase-out of leaded gasoline, some of the most important sources of lead contamination in food are being or have been greatly reduced. In addition, USAID is working with bakeries to assist them in converting to natural gas as a source of clean fuel. This shift will potentially reduce lead contamination in bread. Flour samples are being taken as a part of the environmental analysis being performed in the LEAP process. If flour is found to be contaminated, MOHP's Health Education office and the State Information Service (through the local information centers) could get involved in a public information campaign regarding the dangers of using lead-contaminated flour.

2.4.7 Other Exposure Rates

Some additional exposure routes are reviewed briefly below. These fall into two general categories: (1) occupational exposure and (2) previously unexpected possible exposure pathways.

It is clear that many workers involved in the industries covered in earlier subsections are exposed to lead on their jobs. Some, for instance at the smelters, are probably among the most severely lead-poisoned of the Cairo population. Thus, any comprehensive lead exposure reduction effort would have to deal with the issues of occupational exposure. The Lead Smelters Action Plan, currently under development by USAID and TCOE, may include a component to deal with this issue for smelters in the formal sector. Workplace exposure extends beyond this single industry, however.

Several additional industries not mentioned in earlier sections probably expose workers to lead. These sectors pose low dangers to populations beyond the workplace (and workers-homes) but should be mentioned in a survey of source and pathway institutions. The principal additional institutions using lead in Egypt are several:

- # Lead-sheathed cables are used in Egypt. The sole manufacturer of this variety is reported to be Egyptian Electric Cables Company in Mostorod, in the Cairo area (TCOE 1996).
- # A significant industry producing glass and crystal (for instance, for chandeliers) is active in Cairo. One public and one private company are responsible for most of the production; lead is used in the process.
- # The bulk of glazed ceramics is produced for floors and walls rather than food containers, but the workplace exposure issue may be significant for this sector. Most of these ceramic products are manufactured by about six companies—a mix of public and private.
- # Work with silver (primarily in the Khan el-Khalili) as well as silver extraction and silver plating—a business involving many small companies—can also be considered.

Other lead uses include ammunition, primarily for the military, containers for the disposal of radioactive waste, and printing type.

These sectors as well as those covered earlier are structured in various forms, but one common characteristic can be mentioned regarding the workplace lead-exposure issue: low levels of awareness among workers. In general, industrial workers in Cairo, in both the formal and the informal economy, are not well protected from

hazards, are not well informed about the risks they face, lack protective equipment, and are not aggressive about ensuring their own protection when the issue is raised. Managers in some of the sectors are aware of the hazards of lead exposure, but protection is not emphasized and is often neglected completely.

Beyond workplace exposure and the sources and pathways covered earlier, three additional possible routes of exposure were identified during the fieldwork. Verification of exposure is beyond the scope of this institutional analysis, but a brief depiction of these possible pathways may be useful.

First, the manufacture of cooking salt may inadvertently involve some lead contamination. Salt is produced from waters of Lake Marriute near Alexandria, at the site of a major industrial area. Lead is deposited in the lake and enters the salt crystals. If not purified, the salt will retain this lead. Cooking salt in Egypt is made by one major company, El Nasr Salines Company, which uses the Lake Marriute site. Some smaller companies, counterfeiting the larger firm's label for their product, have recently been the target of a governmental crackdown.

Second, recycled dust may also be an exposure route in the greater Cairo area. Streets are cleaned regularly by the Cairo Cleaning Authority, and the collected dust is combined with garbage, taken to subsidiary dumps and thence to the main dumping site. Given the lack of rainfall and the likely accumulation of lead in the city's dust, those handling the cleaning operations and those living near dumping sites may be exposed to lead as the dust gradually migrates.

Finally, garbage from households may pose another inadvertent pathway of exposure through indirect ingestion, as explained above in Section 2.3.2.

2.5 Education/Research/ Information Institutions

2.5.1 Universities

There are 14 institutions of higher education in Egypt. Three of them, Cairo University, Helwan University, and Ain Shams University, are located within and serve greater Cairo. Cairo and Ain Shams Universities are affiliated with teaching hospitals which provide health care services to the population of greater Cairo. Both universities offer graduate and undergraduate programs, including training in health and environmental disciplines. Although these are public institutions, each university operates fairly independently of the Ministry of Education. They have considerable administrative leeway and discretion in determining research and academic priorities.

Some research activities on lead poisoning and/or lead exposure have been conducted at Ain Shams and Cairo Universities. (The team requested bibliographies of the relevant research efforts.) There appears to be a network of 40-50 individuals at these institutions who have been involved in lead-related research. In addition, some work on lead exposure in Cairo has been conducted by researchers at Alexandria University. (Bibliographies of this work were also requested.)

Policy-related research, including environmental-health and lead-policy analysis, does not occupy a high priority in universities within Egypt. Furthermore, the system of higher education seems to maintain a very traditional focus on environment as a conservation, rather than a health-related, discipline. Environmental health does not appear to be recognized as a discipline of study. There is little coordination between environmental studies and health studies. Individuals within the same institution may be unaware of related work being done by colleagues.

Still, some promising programs have been identified. A new course of study on occupational nursing has been initiated at Ain Shams University. This program holds promise for encouraging a focus on workplace exposure to environmental toxins such as lead. In addition, teams of researchers at Ain Shams have had some success in implementing blood-drawing activities on a

community-wide basis, despite a widespread taboo about drawing blood.

There is also interest at Ain Shams in land use and city planning as one way of addressing source industrial institutions. Relocating hazardous industries outside of Cairo has been a subject of considerable recent discussion among some stakeholders in Egypt. Furthermore, as companies shift from public to private ownership, environmental impact assessments are often performed. Unfortunately, the health effects of exposure to hazardous materials receive little attention in these assessments. Industrial siting decisions and incorporation of human health exposures into EIAs could be included in the lead exposure reduction effort.

Researchers at the Institute of Public Health at Alexandria University have performed cooperative studies linking health outcomes to environmental exposure in battery plants. In addition, several blood-lead studies involving adults and children have been done over the years under the auspices of the institute. English translations were requested by the team.

Despite the relative lack of cooperative cross-institutional research, the team identified two relevant organizations, the Society of Occupational Medicine and Environment and the Society of Community Medicine, memberships for which are drawn from multiple academic institutions. These organizations may have potential for encouraging broader dialogue among individuals engaged in lead-related research.

2.5.2 Other Research Institutions

The National Research Center (NRC) conducts investigations on behalf of ministries and also undertakes privately funded research. The NRC receives some funding from the government but is responsible for seeking additional outside support to supplement its budget. Some research activities on lead exposure in air have been performed under NRC auspices.

2.5.3 Primary and Secondary Schools

An extensive, publicly funded system of instruction for children operates within greater Cairo. Some private education is also available. Primary and secondary education falls under the jurisdiction of the Ministry of Education. Classroom size in the publicly funded schools is reportedly quite large, with some classes containing more than 60 pupils. Certain schools operate on a shift basis. As many as three such shifts can be scheduled daily to maximize the use of overcrowded facilities.

Many schoolchildren, especially those of lower socioeconomic status, drop out of school before receiving a diploma. Many of these children enter the workforce to supplement family income. Some are employed in occupations where they are exposed to occupational hazards, including lead. Child labor laws do not appear to be enforced.

In recent years attempts have been made to incorporate environmental education in the primary and secondary curricula. Examples include educational materials on conservation prepared by EEAA for incorporation into the primary curriculum and water conservation clubs initiated by a donor-funded Water Conservation Project.

The Ministry of Education has undertaken several initiatives in this field, as well, including a number of modules on aspects of environmental and health education. Written materials, videotapes, and teleconferencing are among the multimedia elements of these efforts. Currently, 6 videoconferencing centers operate throughout the country during the day and/or in the evening, with a total of 27 such centers foreseen. Additional modules focusing on environment and health are planned for the future. Televisions are available in many schools, facilitating the use of such educational efforts, and many schools also have a physician and a nurse assigned, thus increasing the possibilities for emphasis on environmental health issues. Interministerial attention is given to education for the environment, health, and population through a high-level committee made up of representatives from WHO, UNICEF, USAID, MOHP, EEAA, as well as the Ministry of Education. The group seeks involvement of students, parents, teachers, principals, and governorate officials.

Incorporating materials about the dangers of lead exposure into school curricula is an option with potential. Water conservation and other environmental issues are precedents. The Ministry of Education has a subunit that designs, tests, and evaluates curricular materials. The Danish donor agency, Danida, has made contact with this division and has reviewed its work favorably. MOHP also has a division that focuses on curriculum materials. It has had successful experience in developing health messages for children.

EEAA has generated some materials on environmental education. The agency, however, has not coordinated much of its work with the Ministry of Education. There may be potential for collaboration with the MOHP to prepare, test, and evaluate materials aimed at schoolchildren.

2.5.4 Community-based Organizations

Within the time constraints of this assessment, it was not possible to perform a comprehensive review of efforts by NGOs in environmental or health education. There may be a number of NGOs, however, working with children and/or experienced in developing educational materials for children. Possibly some of these could be mobilized on the lead issue.

One current environmental education effort with a community emphasis is the Environmental Education and Training Program (EETP), a Danish-funded project. EETP staff have developed lessons for household/family education on environmental matters and might be able to assist in the design of educational initiatives on lead exposure reduction.

2.5.5 Informational Organizations

Mass information campaigns on an environmental issue such as lead exposure could be important in Egypt. Since a substantial portion of the population is illiterate, particularly women, and since television is a popular medium for information dissemination, most high-visibility campaigns involve the use of television. Often along with other media. Television is run by the state; the Ministry of Information is the key institution determining access to the

airwaves. Other ministries have produced informational campaigns and worked with the Ministry of Information for broadcasting. Issues deemed of high priority by high-ranking officials can be a focus of mass media campaigns at substantially reduced cost. The Ministry of Information has a certain amount of discretion in assigning financial charges for such efforts.

Within the EEAA, the Central Department for Environmental Information and Public Awareness is responsible for coordinating such campaigns and programs on behalf of the agency. Thus far, however, the department has not developed regular ties or cooperative efforts with the Ministries of Information or Education (see Section 2.5.3). Within TCOE, one individual in particular, a public awareness expert, has considerable expertise regarding procedures, approaches, and contact points for media-based campaigns. This individual or position could be used as a coordination point for a lead-focused awareness campaign.

The print media would also be useful in mass informational campaigns. A number of journalists have become interested in environmental issues and would likely give some attention to lead exposure issues. An institution with a potential role in informational campaigns is the Environment Writers' Association, an Egyptian organization seeking to develop a network of environmental journalists in the Middle East.

2.6 Community Organizations

Certain other community-based institutions beyond environmental or health-oriented NGOs could be possible avenues of information. Among these are women's organizations and religious groups.

2.6.1 Women's Organizations

NGOs focused on women's issues are significant in greater Cairo. The International Conference on Women, convened in Beijing a couple of years ago, stimulated a resurgence of interest in gender issues within the country. In many respects, women's NGOs are currently more prominent in Egypt than are environmental groups, and networking among women's groups has been occurring.

Most women's organizations currently target issues such as women's rights, illiteracy, and

reproductive health. The level of knowledge about lead issues is low in most of these organizations. Some organizations are neighborhood-based and could potentially become involved in community educational and cleaning efforts aimed at lead exposure reduction.

One organization that may be considered for a possible role in LEAP is the Medical Women's Association (see Section 2.3.2, above).

2.6.2 Religious Organizations

Religiously-based institutions are a very significant component of associational life in greater Cairo. One estimate is that approximately 35% of Egyptian NGOs have religious ties. Governmental liaison with the religious communities is administered through the Ministry of Waqfs (Religious Affairs).

Religious organizations could provide a potent link to a large portion of the population. Furthermore, both Islamic and Christian institutions have been involved in some health and environmental information and education efforts in recent years; one example is the National Community Water Conservation Project, which involved six or seven mosques and some churches in an organized effort. Messages encouraging personal hygiene, which appear in the Koran, could be used to bolster health messages aimed at reducing lead exposure in young children.

A possible limitation in using this institutional channel is that contact with religious organizations will need to be made via individual mosques and churches, rather than through central or national headquarters. The Local Information Centers of the State Information Service could be involved in such an effort. There is, additionally, a growing interest in the Ministry of Waqfs in promoting educational activities involving mosques and churches.

2.7 Labor/Trade Associations

Labor organizations are quite weak in greater Cairo and in Egypt in general. They are not labor unions, in the Western sense of the term. The Egyptian labor institutions are government-controlled and cannot serve as a source of independent advocacy for action on the lead issue or on questions of occupational health and safety. They might be

useful, however, in officially organized educational/informational initiatives.

Business associations operate in greater Cairo and may be increasingly important in efforts to deal with environmental issues, including lead. The Federation of Egyptian Industries (FEI) currently represents 18,000 public and private companies. The federation is organized by business sector and also has a representative for environmental matters. The FEI has been working with EEAA in efforts to broker some agreement on issues pertinent to certain industrial fields, and EEAA/TCOE plans further efforts of this type. For instance, the agency plans to develop an understanding with an association of investors representing the Sixth of October City, a new community in the area.

The FEI does have information about companies on a sector basis and is willing to provide it and to help convene a forum for discussions regarding environmental matters. At this point, EEAA does not have information regarding the full range of businesses, public and private, with which it must deal in inducing environmental improvements. After the 1998 grace period for implementation of the Environmental Law ends, the agency will need such information. Currently it is working with the FEI and others to develop consensual mechanisms.

An additional institution with potential to serve as a bridge between EEAA and the business sector is a relatively new NGO, the Association of Enterprises for Environmental Conservation (AEEC). The members of this organization are companies, represented in the AEEC by their chairs; the association is governed by a board of approximately 17 individuals. Several board members are also active leaders in the FEI. The focus of AEEC is twofold: to educate business people about environmental issues and to advocate for them on legislative and regulatory environmental issues. Some of these channels for discussions could probably be used as part of the lead abatement effort. In addition, there are two planned AEEC activities which might be considered as part of informational and awareness efforts: a training program organized by the association for media personnel, into which lead issues could be incorporated; and a monthly magazine, which could provide some information regarding lead and LEAP to Egyptian industry.

In addition, a number of smaller, industry-specific associations operate in a number of fields. These may be useful as channels of information and consensus building in designing and implementing specific, targeted interventions to reduce lead exposure.

Nonetheless, a significant segment of the Egyptian economy is informal. For some of the sources and pathways covered earlier, business associations reach only a portion of the producers or suppliers. For certain sources, like suppliers of kohl as a cosmetic, virtually the entire industry is organized as a craft and consists of small producers and sellers.

2.8 Additional Ministries

The treatment of institutions thus far has included some coverage of 9 of the 32 current members of the Council of Ministers. Some of the ministries in this array are obviously more important than others in the LEAP process. In particular, EEAA and MOHP would have central roles in LEAP, no matter which priority interventions are eventually chosen. The Ministry of the Public Enterprise Sector could be important for certain targeted public companies. If the petroleum ministry is able to keep to its established schedule for the phase-out of lead in gasoline, it and the Ministry of Transport will assume much less important roles in the LEAP process. (It is likely, nonetheless, that their involvement in some form can be useful even under these conditions—to maintain liaison regarding information and possibly to offer evidence of progress and information to other sectors about how to circumvent obstacles to success.) Involvement of the other institutional actors in this list is likely to be contingent on the findings of the environmental analysis and the selection of priority interventions and targets. Other ministries may possibly be involved. Specifically, Insurance and Social Affairs could be involved in workplace exposure reduction efforts; and the roles of Information, Education, and/or Religious Affairs are likely to be key in education and awareness campaigns. Which ministries would play which roles will depend on the ministries' level of interest, the possibilities for collaboration with EEAA and others, the design of the campaign(s), and the nature of the target group(s).

The following additional ministries could play roles in LEAP and its implementation:

- # Ministry of Finance. As the ministry responsible for formulating the government's budget, this institution would obviously be a key stakeholder for elements of LEAP requiring public expenditures for program implementation, including use of the Environment Protection Fund. In addition, this ministry is charged with regulating all imports, including hazardous materials. Finance would be a major stakeholder in any effort to control scrap lead imports.
- # Ministry of Industry. This institution houses one unit of potential significance for LEAP: the General Organization for Industrialization, or GOFI. In coordination with EEAA, GOFI could offer assistance in identifying specific targets for reduction in lead exposure, assisting those organizations in source reduction or conversion to alternative technologies, and reviewing progress.
- # Ministry of Manpower and Migration. Workplace inspections for occupational safety and health are handled by a department of this ministry. Efforts to deal with workplace exposure to lead, therefore, may need to be coordinated with the current inspection program. Since workplace inspections are generally regarded as ineffective, however, some revision in the existing routines would likely be involved.
- # Ministry of Local Administration. This unit provides the link between national government and administration in the governorates. Its role would likely be in assisting the coordination of any LEAP efforts introduced at the governorate level.
- # Ministry of Agriculture. This ministry is responsible for issues related to crop production. Lead uptake in fruits and vegetables, of concern to some health officials, would fall in its province. In addition, the ministry handles the registration of pesticides. An informational/awareness effort aimed at the ministry's registration committee is a possible low-key intervention option.
- # Ministry of Planning. The role of this entity is peripheral to the LEAP initiative per se.

However, any significant elements of LEAP that would require inclusion in the government's five-year plan would have to be reviewed by this ministry before inclusion.

This set of ministries obviously constitutes a sizable list. Not all of them would be involved in LEAP, and several of them might play roles limited to one or a few elements. Current levels of knowledge and orientation toward a LEAP effort vary. High degrees of awareness are evident among managers in Petroleum, those portions of Public Enterprise responsible for smelters, and parts of EEAA. Some units within MOHP and the Ministry of Transit and Communications are also aware of the lead issue and inclined to be supportive of the abatement effort, if not knowledgeable regarding the full range of sources and pathways that may be important in Cairo. Knowledge and concern are also evident within GOFI. Many of the other stakeholders currently have low levels of information and are occupied with other issues. Understanding among the stakeholders about the interrelationships within the USAID-sponsored projects—the CAIP, LSAP, and LEAP—is generally quite low, even for those who participated in the start-up workshop for LEAP.

Even among the fairly knowledgeable and interested stakeholders listed above, it is expected that concerted effort will be needed to induce collaboration across institutional lines for development and implementation of LEAP. The key question of cross-institutional collaboration is addressed in Chapter 3.

2.9 Governorates

An Environmental Management Unit (EMU) has been created in each of Egypt's 26 governorates. The unit, which is attached to the governor's office, is charged with undertaking various liaison functions related to environmental protection. The EMU is expected to sensitize the governorate departments to environmental needs and encourage them to incorporate environmental criteria in their work. Each EMU also liaises with outside agencies (including EEAA) on environmental issues. It acts as an advocate on behalf of environmental issues and concerns in the governorates and as an advisor and facilitator to those undertaking environmental work. As an example, the EMU can require the submission of an EIA for a proposed project. It can also act as facilitator and information provider to environmental project implementers.

In general, the level of knowledge and competence in most EMUs is quite low. This is due both to the relative novelty of the concept and to the fact that few of the EMU staff members are adequately qualified.

In a recent restructuring, the EEAA has established eight Regional Branch Offices (RBOs) throughout the country. The relatively new RBOs are expected to enjoy a more executive character than the EMUs, which act primarily as coordinators for issues and activities within a governorate.

Action on environmental issues, however, is not restricted to EMUs. Several governors are known to have taken active steps toward resolving environmental problems. The Governor of Cairo, for example, has issued several decrees to move environmentally polluting activities from the urban center. A major produce market and the main slaughterhouse have already been moved. Efforts are underway to move tanneries and lead smelters outside city limits.

2.10 General Institutional Observations

It is clear that a very large number of institutions, public and private, have some stake in the LEAP effort and its eventual implementation. The stakes vary, as do the capacities of the institutions involved. This section looks at the capacity of institutions in greater Cairo to proceed through the planning process itself and execute a lead exposure abatement plan.

Many institutions and individuals have general concerns about lead exposure and the health of the Cairo population. There are, of course, few institutions opposed in principle to lead exposure reduction. The significant limitations that are likely to affect implementation of such a plan are the following:

- # financial constraints and incentives
- # informational limitations
- # constrained institutional capacity
- # constrained policy development, and
- # jurisdictional diffusion within a centralized state system.

Governmental institutions in greater Cairo have few unencumbered resources to devote to new programs. This is particularly true while the government is seeking to develop a private sector and protect its residents against the socioeconomic dislocations of the market. Some elements of a lead exposure abatement plan could be accomplished with few resources. But financial constraints are real and circumscribe the limits of the possible, assuming no new donor commitments. A significant exception to this generalization is the Environmental Protection Fund, projected to begin functioning very soon with an initial pool of LE 30 million. By-laws for the operation of the fund are nearing completion, and the oversight committee, to be appointed by the EEAA executive chairman, will be able to allocate support for environmental projects across a range of priority uses. Lead exposure reduction could be identified as one of these. The fund, with several sources of income including donor contributions, offers considerable flexibility.

Interest on the part of the scientific and environmental communities in lead exposure constitutes a significant resource that could be

tapped during LEAP development and implementation. However, a constraining feature is also important: the quality of existing information on lead as shared by institutions in greater Cairo is low. Multiple studies of lead concentrations and blood levels have been conducted, but their value is limited because they are not collected in any one source or database and by legitimate questions raised by many stakeholders about the reliability of the findings. The extent of research cooperation across institutions in Egypt is very limited. And, as indicated earlier, there is little ongoing monitoring. Reliable, verifiable, and widely shared information about lead-focused research and monitoring is not available.

One advantage for the LEAP initiative is the number of stakeholders with a real interest in addressing the lead issue in a thoroughgoing fashion. A disadvantage is the limited institutional capacity of many of these organizations. Successful implementation requires trained and motivated staff, soundly-structured and well-supported agencies and ministries, and some clarity in the allocation of responsibilities across jurisdictional lines. A number of the institutions reviewed here have dedicated staff, and some units have well-established structures that serve priority purposes well. But important parts of the overall system are not yet in place. EEAA itself has not fully established its structure, and the agency has sought to build capacity during the grace period before application of the Environmental Law and Executive Regulations. The structure and its processes are untested. The branch system planned for assisting EEAA in reaching into the field is not yet functioning. And routines for dealing with important stakeholders (like several other ministries and the private business sector) are just beginning to develop. Other institutions, including the EMUs in the governorates, currently exhibit limited institutional capacity. And potentially important programs, like the workplace inspections by the Ministry of Manpower and Migration, are generally judged to be ineffective.

Further, policy and program development on issues close to the core of the LEAP effort are currently limited. The EEAA example is perhaps the most central. The monitoring system on which environmental surveillance must be based does not yet function. The agency has a mandate to deal with

environmental issues, but it has no direct authority to regulate without first coordinating with other ministries in whose jurisdiction environmentally damaging behavior may be occurring. EEAA has no enforcement unit, nor is one planned. The grace period relieves EEAA of the burden of acting immediately, but there is as yet no experience in attempting to seek compliance with environmental standards. Financial instruments are endorsed in principle but as yet are not developed. The Environmental Fund is coming into existence but has not yet been used to address environmental problems. And collaborative approaches for dealing with target groups are under development but thus far not established.

The Ministry of Health and Population seems well positioned in terms of human resources and technical capacity to play an important role in LEAP (see Section 3.1 below). In light of the limited environmental health capability within EEAA, EEAA should consider asking MOHP to join as a full partner, rather than as an additional stakeholder. Environment and health are equally important perspectives for developing lead poisoning prevention efforts. A full partnership of EEAA and MOHP may be the only practical way of assuring direct coordination across the various subunits of health and the appropriate divisional areas within EEAA. Despite the presence of a representative from MOHP on the EEAA board of directors and some joint participation on interministerial committees, communication between the two agencies appears incomplete. A partnership might facilitate the direct coordination that appears to be needed to launch a more effective planning process.

This analysis leads to the conclusion that, at least in the short to medium term, regulatory instruments will need to be subordinated to collaborative, consensual, informational, and educational instruments, perhaps supplemented by the selective use of financial instruments aimed at carefully selected target groups. Leveraging effort by tapping the capacities of additional institutions with experience and credibility in selected sectors is probably also a necessity. The specifics of these instruments and collaborative alliances can be developed once the environmental analysis is completed and the stakeholders begin work developing options for priority interventions.

In this relatively uncharted territory, there will be opportunities to build institutional bridges for many environmental efforts, but much of the institutional work remains. Lead exposure reduction is an example of an important issue around which some of this institution-building can take place. It has the advantage that interest and concern about lead exposure come from many quarters, and far beyond EEAA. An additional feature of the institutional setting is the cross-institutional nature of Egyptian environmental implementation generally, and lead exposure reduction in particular. Various parts of this policy issue are in the domain of many different institutions, and a successful LEAP is contingent on addressing the cross-institutional questions.

3

CROSS-INSTITUTIONAL ISSUES

The overall purpose of the Egyptian Environmental Affairs Agency is to improve environmental quality by inducing collaborative efforts on the part of the relevant ministries and other stakeholders—including those outside the government itself. EEAA, therefore, must rely on consensual efforts in virtually all of its programs. The issue of lead exposure abatement, if anything, requires even more collaboration. The review provided in Chapter 2 demonstrates that those with a stake in this issue are many and varied. Fostering cross-institutional cooperation will call for particular attention.

No structure, task force, committee, or set of organizational routines currently operate to bridge all or most of the important stakeholders for lead exposure reduction. Any systematic collaboration on the issue, therefore, will require workable cross-institutional links built in the development and implementation of the plan.

In general, three strategies for cross-institutional coordination are possible: the use of authority, common interest (different institutions concerting their actions because all are highly committed to a successful result), and exchange (institutions offering something of value to each other to induce coordinated effort on a common enterprise). Practically speaking, no common source of authority operates among the key stakeholders for lead exposure abatement in greater Cairo. Even for the central government ministries and agencies at the core of the issue, different units operate under authority for parts of the overall issue of lead exposure, and jurisdiction for the policy problem is divided.

The discussion in Chapter 2 shows that many stakeholders in greater Cairo have an interest in lead exposure reduction. In fact, the only overt opposition to reducing lead exposure is likely to come from source and pathway institutions and individuals, who had to bear direct costs of substituting another substance in place of lead in their production processes or who had to change their behavior to protect themselves or their families. And, with appropriate information and in

certain cases technical assistance, a number of these interested parties might become allies in the cause. But the level of importance currently attached to lead exposure abatement varies among institutions and is not now sufficiently high overall to induce spontaneous efforts. (This situation is partially explained by the lack of detailed information in the hands of many of the stakeholders; provision of specific data regarding the environmental analysis and blood-lead findings could alter the status quo.) This point holds in particular because all stakeholders would have to divert resources from other pressing programs and issues if they were to focus sustained attention on lead. This shift in attention, particularly since it would also require devoting scarce resources to potentially time-consuming cross-institutional collaboration, cannot be expected to happen automatically in the short run.

Rather, EEAA as the primary institution developing LEAP, would have to rely on developing shared information and building exchange relations among stakeholders, as well as fostering the evolution of some trust among key stakeholders, to encourage coordinated action to reduce lead exposure.

This chapter covers the current state of affairs regarding cross-institutional linkages among some of the key stakeholders. Because of its centrality to the lead exposure abatement question, the ties between the EEAA and the MOHP receive particular attention. Other cross-institutional developments are also addressed.

3.1 Environmental and Health Linkages and Collaboration

Knowledgeable officials in the EEAA and MOHP all understand that some cross-institutional ties will have to develop for execution of a well-coordinated plan. Prior to the LEAP effort, however, few links have been developed between these two structures. This circumstance is due in part to the relative newness of the EEAA and its efforts to develop

internal capacity before addressing priorities for external collaboration.

One formal agreement currently operates between the two institutions for information exchange; MOHP has agreed to provide monitoring data to EEAA. Some cooperation has been attempted, as well, regarding hazardous substances and waste. Efforts are also underway by EEAA to develop a protocol with MOHP on information exchange regarding lead: EEAA would provide environmental sampling results in exchange for blood-lead findings. Even at the level of information sharing, other connections between these two units have yet to develop. No programs currently operate jointly between the institutions.

Nevertheless, interest has been expressed at high levels within the MOHP to work cooperatively with EEAA on a priority issue like lead exposure reduction. A review of the structures and institutional needs of each unit, furthermore, shows a number of functions for which mutual assistance might be possible. Related functions include such matters as inspections, enforcement, monitoring, technical assistance, education and awareness, and legislative development.

Structurally, it appears that the two institutions have points of potential ties for ongoing or routine efforts, some of which could influence LEAP. For EEAA, the Environmental Quality and Environmental Management sectors could liaise with MOHP for monitoring and execution of lead reduction efforts. The central department for Environmental Awareness and Public Information could potentially bridge with the Health Education unit in the MOHP on educational and awareness efforts to reduce lead exposure. The department of Environmental Health within EEAA could work collaboratively with the similarly titled department in MOHP. And the Environmental Protection Fund might be able to liaise with the MOHP in identifying priority targets for lead and other joint concerns. Such possibilities could assist in encouraging the sharing of information, building trust, coordinating organizational routines, and providing opportunities for mutually beneficial exchange.

On the side of the health ministry, the key units available for potential links, beyond those just mentioned, are the Central Laboratory, the Environmental Laboratory, Preventive Medicine

generally, Maternal and Children's Health, and the Occupational Health Department. A further possible bridge between the two institutions is links in the field: between the branches of EEAA now being opened and the extensive health care delivery system.

Joint information sharing, joint workshops, and some joint operations are also possible; and there is interest in many offices in seeing such efforts develop on the lead exposure reduction issue. A key point, nonetheless, is that these links have not yet been developed. And collaborative efforts between the organizations are dependent on continuing top-level commitment. Initiating and developing this commitment at the highest level of EEAA and MOHP is a prerequisite for any of the bridging efforts that might emerge through the more extended structure.

3.2 Linkages and Collaboration Involving Additional Institutions

In the current institutional setting, the most striking feature is the lack of regular connections among the interested parties. Researchers at several universities and research centers perform relevant studies but generally do not collaborate. Most industries and firms, public and private, have had little contact thus far with EEAA. The private sector, in particular, has not yet been linked to EEAA. The agency plans to work with business-oriented associations to develop understandings on selected issues. And the agency's joint efforts with GOFI to assist businesses in improving their processes represent an early and potentially promising route to consensus building and technical assistance on environmental matters.

EEAA is now considering a range of potential links with other institutions to leverage support for such tasks as inspections, enforcement, monitoring, education, technical assistance, and legislative development. Some of these functions could bear on the lead exposure reduction efforts. And the development of EEAA branches creates the possibility for coordination with the health district system and environmental management units of the governorates.

In other cross-institutional relations, as with the Ministry of Health and Population, EEAA has

sound reasons to build links and, in some cases, plans to do so. In general, however, these relations have yet to be forged. Most stakeholders point to a lack of integration among the institutions that might play a role in developing and implementing LEAP.

Some key stakeholders in the lead issue, including some ministries, sit on EEAA's management board. The board also includes representatives from universities and research centers, the public enterprise sector, and NGOs. This board establishes an initial set of connections among a variety of stakeholders and is a possible venue for discussing collaborative aspects of the LEAP initiative.

Currently, the most common mechanism used in Egypt to induce collaborative effort on a high-priority issue is an interministerial advisory council, chaired by or reporting directly to a top-ranking official and representing key stakeholders. There is precedent in several fields of policy for this sort of institutional bridge. One recent successful example in the environmental field is a group developed around the issue of ozone depletion. Advisory councils, typically supported by funds providing transportation incentives for the participating representatives, have often resulted in increased understanding of wide-ranging issues, greater commitment on the part of multiple stakeholders, and support from several quarters for sustained implementation of agreements.

And once again, the Environmental Protection Fund offers a concrete instrument that can be used to induce collaborative effort across key institutions.

In short, the current context in greater Cairo displays relatively low cross-institutional development but also offers some prospects and possibilities for the establishment of links among several stakeholders. EEAA in particular, as an agency with a mandate for collaboration and with a lead role for coordinating the development of LEAP, has some options available for encouraging further collaborative effort.

4 RECOMMENDATIONS

4.1 Priority Stakeholders and Likely Allies

There is virtually no overt opposition to lead exposure reduction in greater Cairo. Resistance could arise due to the cost of change on the part of source and pathway institutions, as well as the difficulties of changed behavior at the household and individual level. Certain priority stakeholders and likely allies in a lead exposure reduction plan can, nonetheless, be identified. The following list is subject to change due to the findings of the environmental analysis and further blood-lead testing. At present, however, these seem to be the most significant priority stakeholders and likely allies in LEAP:

- # EEAA, including top officials and certain offices identified earlier. EEAA's jurisdiction is centrally related to lead exposure reduction.
- # MOHP, including top officials and certain offices identified earlier and the field structure for primary health care. As explained above, environmental and health authorities constitute a necessary partnership in LEAP.
- # Certain NGOs, including the ENGO Coordinating Committee and possibly the Association for the Protection of the Environment and the Medical Women's Association. As mentioned in Section 2.2.2, the committee serves as a steering group for the ENGOs, is to be represented on the board of directors for EEAA, and has expressed interest in lead exposure reduction. The Association for the Protection of the Environment has already completed a lead exposure reduction pilot project and has experience in conducting a door-to-door educational campaign. The Medical Women's Association might be involved in informational and educational efforts.
- # Specialists in lead research in several universities and the National Research Center (NRC). These individuals and institutions have developed valuable information about lead; could be involved in further research efforts aimed at clarifying sources, pathways, and exposures; and can help to disseminate information.
- # Some religious institutions (specific mosques and churches yet to be identified). These could be involved in educational and informational initiatives.
- # Several business associations, such as the Federation of Egyptian Industries and the Association of Enterprises for Environmental Conservation, with an interest in enhancing collaboration with business on environmental concerns. These could play a role in helping to coordinate collaboration, informational exchange, or technical assistance between the core LEAP institutions and firms in business sectors that are targeted for LEAP interventions.
- # The Ministry of Education. This institution is experienced in developing curricular materials for a variety of educational interventions, including programs on environmental issues.
- # The Ministry of Information. This unit would likely play a central role in informational campaigns, particularly any conducted through television.
- # The Ministry of Agriculture and Land Reclamation. Depending on the results of the environmental analysis, the agriculture ministry might be involved in providing information and assisting with interventions at early parts of the food exposure pathway.
- # The Ministry of Public Enterprise Sector. This institution is central for any efforts to change behavior in one or more public firms.
- # The Ministry of Finance. Finance has a role in the government budgeting process and, in particular, is directly involved in the operations of the Environmental Protection Fund, the largest plausible source of potential financing for lead exposure reduction under Egyptian governmental control. The ministry would also

be involved in any efforts to restrict scrap lead imports.

- # The Ministry of Industry. This unit could be a focal point for setting standards regarding relevant pesticides and could offer assistance through GOFI to targeted source or pathway organizations.
- # The Ministry of Manpower and Migration. Attempts to focus workplace inspections on lead exposure reduction would need to involve this organization.
- # Paint manufacturers, perhaps especially those interested in export markets. These firms currently use lead and would need to alter production operations if paint is shown to be a significant route of exposure. Export-oriented companies might be particularly interested in information showing export-marketing advantages to lead-free products.

Further, the Ministry of Petroleum might be considered a priority stakeholder now supportive of lead exposure reduction. Whether the ministry is included in the list above depends on how its program for shifting to unleaded fuel is viewed as an accomplished fact or a general direction still requiring discussion and oversight within LEAP.

Other priority stakeholders are either not themselves organized into institutional form or are important participants but not necessarily allies in the LEAP effort. The former group includes, first and foremost, the children of greater Cairo, since children suffer greater and more permanent damage from a given level of lead exposure; consumers of contaminated food; those working in and living near the city's smelters; workers subject to occupational exposure in several other industries; users of the eye cosmetic kohl; and possibly those living in residences with lead paint.

The source and pathway institutions of most importance are also priority stakeholders and would need to be consulted and considered in any plan to reduce exposure to lead. These bodies, discussed in the following section, are not natural allies in lead exposure reduction. But some policy interventions might be designed that could induce their acquiescence or even support.

4.2 Preliminary Identification of Policy Targets

As of this writing (December 1996), identification of policy targets, and especially any effort to begin the design of policy interventions to reduce lead exposure, is preliminary. The results of the environmental sampling are not yet available, and key stakeholders have not had an opportunity to review them and consider priority targets, appropriate intervention points, and alternative instruments for dealing with lead exposure. These tasks are designed into the overall LEAP effort. Still, this institutional analysis, particularly when considered in the current context of greater Cairo, suggests some tentative conclusions about policy targets and intervention strategies. These conclusions should be reviewed when the results of the environmental analysis are available.

A preliminary list of policy targets, if one omits the petroleum and smelters issues, includes the following:

- # district health offices/primary care physicians
- # producers and consumers of kohl (particularly women of child-bearing age)
- # Paint and Chemical Industries, a public company
- # private paint manufacturers
- # Ministry of Agriculture and Land Reclamation
- # bakeries using recycled motor oil as a fuel
- # food distributors
- # Ministry of Manpower and Migration's occupational safety inspectors
- # Cairo Cleaning Authority
- # households in greater Cairo, especially those growing food and using compost and those with children
- # industries exposing workers to lead, including the several sectors identified in this report.

The Ministry of Petroleum and the smelting sector, formal and informal, also should be considered priority targets if there is any slippage in current activities to address these sources directly through other plans and interventions.

The kinds of interventions to be considered for these priority targets have yet to be designed. But it seems clear that top-down regulatory approaches, while appropriate for a variety of purposes, are unlikely to be effective in greater Cairo in the immediate future. The grace period for enforcing the Environmental Law is likely to be extended to the year 2000 is one reason. Another, equally important, is the mandate of EEAA itself, which emphasizes collaborative efforts and requires the agency to cooperate with major official stakeholders in many sectors. Still, some quasi-regulatory reforms, like enhanced workplace inspections combined with education and technical assistance, should be targeted for consideration.

The kinds of instruments likely to be most useful and most easily implemented are training (for instance, for primary health care workers, as discussed in the next section), awareness-raising and educational campaigns targeted toward several of groups (see below), technical assistance (especially for some source and pathway institutions), and selective economic instruments (again, referenced in the next section). As of this writing, the environmental analysis shows relatively significant baseline levels of lead in the greater Cairo environment. Since lead does not degrade or wash away, LEAP will need to consider mass campaigns aimed at the broad population to provide information about how to reduce the risk of exposure from residual lead contamination, particularly for children.

Beyond interventions designed to reduce exposure, capacity-building instruments should be considered as a part of the LEAP process to enhance prospects of sustainability and inter-institutional collaboration into the future. These issues too are addressed below.

4.3 Policies and Interventions

This section contains recommendations of two types: suggestions to consider for the LEAP process itself and proposals for specific interventions. The final section gives special attention to options for

enhancing collaboration among the key stakeholders during and after LEAP development.

4.3.1 Recommendations for Upcoming Phases of the LEAP Process

The six priority recommendations for the LEAP process itself are as follows:

1. Since the blood-lead testing planned for greater Cairo by the Field Epidemiology and Training Program (FETP) is now scheduled for completion by the end of March 1997, the most important immediate recommendation is for USAID, in Cairo and/or in Washington, and TCOE to contact the CDC and/or the MOHP to coordinate the blood-lead testing with the LEAP schedule. USAID and/or TCOE should offer assistance to the MOHP to increase the prospects of close coordination.

2. A free flow of information to key stakeholders throughout the LEAP activity is a prerequisite for the plan's eventual success. Accordingly, TCOE should consider appointment of a respected, small advisory committee for the remainder of the LEAP process. Such a group could consist of approximately three persons drawn from the reporting committee used during the start-up workshop in September 1996 and/or the principal institutions involved in the LEAP effort (TCOE, MOHP, USAID/Cairo). This committee could begin functioning immediately and could perform several tasks, including organizing the start of a lead information base, providing succinct information to workshop participants and interested others regarding the reasons for emphasizing lead as a high priority in greater Cairo, contacting participants in the recent start-up workshop to provide information about steps already completed and upcoming schedules for further actions, initiating formal contact with newly identified stakeholders for inclusion in the remainder of the LEAP process, identifying other promising NGOs with interest or experience in lead exposure reduction, and gathering information for transmittal to TCOE regarding pertinent ideas and developments as reported by stakeholders. The committee could also offer advice about the design of the upcoming workshops. Such a committee

should have a specific point of liaison within TCOE and should also keep USAID/Cairo and EHP regularly informed about its efforts and relevant developments. It is unlikely that the project timetable will be met without oversight by some designated entity. A regular schedule of communications, such as a monthly conference call among TCOE, USAID/Cairo, and EHP, should take place. (Note: parts of this recommendation, provided in draft form in October 1996, were acted upon by TCOE, i.e., the establishment of a LEAP Working Group in December 1996.)

3. Since interviews with stakeholders revealed that many, including several workshop participants, do not have a clear idea about the relationships among the three projects—CCAIP, LSAP, and LEAP—USAID/Cairo should provide more information about how these projects interrelate and why LEAP is an essential component of the overall effort. As pointed out in this report, many stakeholders were aware of the lead issue and believe it is associated largely if not entirely with gasoline and smelters. They are uncertain how and why another initiative is useful. Information dissemination could be done in collaboration with TCOE, possibly by using the advisory committee mentioned above as a channel for dissemination.

4. If the current schedule for LEAP is maintained, a small meeting for data discussion and interpretation and workshop planning should take place in Cairo before the second workshop, now scheduled for May 1997. Participants would be members of the EHP institutional assessment and environmental analysis teams, officials from TCOE and USAID/Cairo, and members of the advisory committee. At this meeting, important results of the analyses could be discussed and their implications for LEAP considered. Detailed planning for the second workshop could be built on these discussions. One possible option would be to have this pre-workshop meeting scheduled in December, with the second workshop in March. (Note: this recommendation, provided in draft form in October 1996, was acted upon by TCOE, USAID, and EHP. The recommended pre-workshop meeting was held in Cairo in December 1996.)

5. The role of MOHP is crucial for a successful program, and there is interest in the ministry in cooperating in the development of LEAP. Such high-level support is critical in

promoting and activating cross-institutional collaboration within the Egyptian government. For these reasons, TCOE should make concerted efforts, with the assistance of USAID/Cairo as appropriate, to involve MOHP more intimately and at higher levels in the LEAP process. These efforts could include inviting the Minister for Health and Population, who is interested in environmental health issues, to open the second workshop along with the EEAA executive chairman; informing the Minister regularly and directly about LEAP; using the Adviser to the Minister for External Affairs, who has had experience dealing with both EEAA and MOHP, as a key link in the liaison process; and working with the Preventive Care Sector of MOHP in developing intervention options. Many of these channels could also be used to enhance coordination during LEAP implementation.

6. The TCOE, possibly working with the lead exposure reduction advisory committee, should contact additional priority stakeholders to encourage their involvement in the LEAP process. The additional participants could include: the Ministries of Finance, Education, Information, Agriculture, and Manpower; selected NGOs not contacted thus far (such as the Association for the Protection of the Environment along with the Association of Enterprises for Environmental Conservation); the Environment Writers Organization; a representative from the Council on Maternal and Child Care, chaired by the wife of the President; and representatives from the private sector, particularly the targeted sources and pathways for lead exposure (paint manufacturers, food distributors, bakeries, and kohl manufacturers). The environmental analysis may also identify additional stakeholders for inclusion. Particular effort should be made to increase participation by representatives with decision-making authority within their institutions.

Other recommendations for the LEAP process are:

7. Since the CAIP, LSAP, and LEAP activities have overlapping components, USAID/Cairo in collaboration with TCOE should encourage those conducting these separate but related efforts to communicate with one another, inform each other of project developments, and coordinate initiatives to reduce chances for inconsistency or unnecessary

duplication of effort. A joint set of project meetings, regular mailings or reports, and/or broadened distribution lists are some ways of enhancing such coordination.

8. Economic justifications for policy initiatives (such as cost/benefit analyses) are not typically developed within Egyptian government agencies, but they can be very influential in making decisions about allocating resources. Officials at top levels of EEAA are interested in cost-benefit justifications for LEAP-identified interventions. Thus, EHP should develop some estimates of the rate of return on LEAP-targeted policy interventions, especially those that require expenditure of new resources. These estimates should be consistent with the funds EHP has for this component. If not, it could be supported separately by USAID and/or TCOE.

9. As a part of the second LEAP workshop, it might be helpful to include reports and discussion of success stories involving cross-institutional collaboration. These examples could be from Egypt (for non-lead cases, such as ozone depletion) or from other countries (for collaborative efforts focused on lead exposure reduction). Such examples could be developed by EHP, USAID/Cairo, and TCOE.

10. Resources permitting, TCOE and EHP should consider holding the upcoming workshops outside Cairo, to increase attention to the issues and attendance throughout the day.

4.3.2. Recommendations for Consideration as a Part of the LEAP Product

The following recommendations for the LEAP product itself are addressed at TCOE and stakeholder institutions. Although TCOE can perform a coordinating function, much of the actual effort to reduce lead exposure in greater Cairo must come from other institutions. With this contextual point as background, the following recommendations are put forth:

11. Given the cross-institutional nature of environmental health issues in Egypt and in particular the jurisdictional breadth of the lead issue, a focal point of LEAP implementation needs to be identified during the planning process. Candidates would include a specially-appointed lead exposure reduction advocate within EEAA who reports to the

executive chairman, possibly in collaboration with the advisor for External Affairs to the Minister for Health and Population; and a high-level steering committee, representing the range of ministerial stakeholders and other principal stakeholder institutions including NGOs, governorates, and affected public and private companies, with such a committee reporting to the executive chairman of EEAA. The committee, at a minimum, would need to be adopted as a part of the formal, recognized plan; and it should have authority to review LEAP progress, require reports from the relevant stakeholders, and recommend actions to speed implementation. The committee should be required to report at regular intervals to the executive chairman of EEAA on LEAP implementation. The group could also circulate a newsletter to relevant ministries to update personnel on LEAP's progress. Nominations for committee membership should be made by top officials in the stakeholder institutions. (Note: a preliminary version of this recommendation for a high-level coordinating committee, presented in draft form in October 1996, was acted on favorably by TCOE in December 1996.)

12. Continuing efforts to deal with lead in greater Cairo, and elsewhere in Egypt, will require that the EEAA establish and implement its environmental monitoring system as a matter of high priority.

13. If lead exposure abatement is identified as a priority issue by those managing the Environmental Protection Fund, financial support from the fund could be available for initiatives to be identified and designed for LEAP.

14. As reported at the start-up workshop for LEAP, development and maintenance of a comprehensive database on lead is considered a high priority item. To this end, a centralized information center on lead exposure should be developed and managed, either by EEAA alone or in combination with MOHP. Data should be made available to interested researchers, stakeholders, and the population at large. Pertinent information might include

- # copies of scientific publications,
- # statistical information on the magnitude of the problem,

- # descriptions of interventions designed to reduce exposure, and
- # contacts with individuals having relevant technical expertise.

15. EEAA and MOHP should consider developing and conducting periodic conferences on lead exposure so that personnel in relevant ministries can educate themselves about the problem and share information with colleagues in other disciplines.

16. Many stakeholders have some awareness of the lead issue but lack information about how to take practical action to reduce exposure. In addition, it is likely that those living and working in greater Cairo will be subject to some exposure from residual lead contamination for quite a long time into the future. For these reasons, awareness, educational, and training efforts should be considered during the planning process. Some specific interventions might start with the following areas:

- # Training for primary care physicians in the national system, either as part of preservice training or through continuing education. MOHP could collaborate with EEAA in developing these efforts, aimed at helping health-care practitioners identify, treat, and prevent lead exposure.
- # Strengthening workplace inspections by training and upgrading staff in the Ministry of Manpower and Migration and MOHP. Particular attention should be given to lead exposure, risks to families of workers, and practical steps to reduce exposure.
- # Limited-scale training and awareness efforts to alert the pesticides registration committee of the Central Agricultural Pesticides Laboratory to the problems caused by lead exposure.
- # Educational programs on reducing lead exposure, to be administered through the primary school system. This intervention could be developed by EEAA and MOHP, with the assistance of the Ministry of Education. It might involve use of multimedia modules and other innovative channels of environmental health education under development at the Ministry of Education.

- # Mass media campaigns, with an emphasis on television as well as other channels of dissemination, aimed at informing the public about how to reduce exposure at the household level and providing information about exposure through cosmetics, paint, and food. In regard to food as a pathway, a campaign could be mounted to discourage use of inked paper or plastic food wrappers, as well as potential dangers of leaving food uncovered out of doors. Such a campaign could also encourage washing fruits and vegetables before ingestion. Different campaigns might be directed specifically toward young children.

EEAA and the awareness expert within TCOE could work with the Ministry of Information in developing mass campaigns. Several other stakeholder groups, mentioned earlier in this report, have experience with environmentally-oriented media campaigns and could offer assistance. The National Community Water Conservation Project is an example. Efforts by Danida, the Danish development organization, to support environmental education and awareness can also provide examples and support. And the Healthy Mother/Healthy Child initiative of USAID's Maternal and Child Health Program has been developing links with the Ministry of Information for media efforts. Attention to this issue from top levels of EEAA could result in support from the Ministry of Information, which would reduce the direct costs for such a campaign. Mosques and churches, as well as selected NGOs, could also provide important assistance in these efforts. The U.S. company, Children's Television Workshop (Sesame Street), has produced a program focusing on lead exposure reduction which could be adapted for Egyptian television. MOHP and Ministry of Information are obvious collaborators in such efforts. And the print media, perhaps through the Environmental Writers Association, could be mobilized as well.

17. Efforts could be initiated to encourage, assist, and influence source or pathway businesses to alter their practices to reduce lead exposure. EEAA would have a lead role here, could be assisted by GOFI, the Ministry of Manpower and

Migration, MOHP, and appropriate business associations and NGOs, as identified earlier. Such efforts might include the following:

- # Work with business associations and NGOs to identify full lists of firms using lead in their processes; use these associations to begin discussions with the firms about the lead issue and ways of solving it. An example might be the paint, ink, and dye industry. Efforts could be made to encourage manufacturers of household paint to discontinue use of lead, and to encourage ink and dye manufacturers to develop a substitute for lead. Communication about on-the-job hazards could also be developed for workers exposed to lead via paints, inks, and dyes.
- # Incorporate lead issues explicitly in the registration of new companies by GOFI.
- # Consider lead carefully in any environmental impact assessments. (EIAs are conducted by many institutions; with the privatization processes underway, this recommendation can reach very dispersed organizations.)
- # Disseminate information on cleaner technologies, during LEAP development and afterwards, with coordination by EEAA and assistance from GOFI, business associations, and NGOs.
- # Alert firms in export-sensitive industries to the advantages of switching from lead components, and inform lead-using businesses of possible substitutes for the material (examples: paint manufacturers, bakeries).
- # Work with EHP and the Ministry of Finance to design economic instruments to encourage firms and government agencies to shift from lead use. (Pricing and narrowly-targeted subsidy mechanisms for particular industries are possibilities.)

18. The LEAP effort addresses lead exposure issues broadly; it is not primarily focused on exposure arising from petroleum and smelting, which have been the subject of other efforts. Nevertheless, it is sensible for EEAA to encourage implementation of lead exposure reduction efforts already underway. Two specific steps are recommended:

- # For petroleum: support efforts by the Ministry of Petroleum to phase out lead in gasoline; disseminate information on a recent ministry-supported study outlining air-lead concentrations near industrial facilities; develop a clear description of the lead pathway related to soil and dust; and develop clear guidelines for households to reduce lead exposure from soil and dust.
- # For smelters: coordinate efforts to inspect worksites with MOHP and Ministry of Manpower (see recommendation 20, below), develop a system of communication about hazards; retrieve worker blood-lead sampling information from the Ministry of Social Affairs; and develop an effective enforcement mechanism for removal of workers when blood-lead levels exceed the threshold.

19. A potential role for EEAA is to help establish and coordinate laboratory proficiency programs. There is little access to standards for calibrating lead analytic instruments in Egyptian laboratories. Nor is there a proficiency program through which blind samples are sent to laboratories to compare their performance. This kind of effort would improve the country's ability to measure environmental and/or blood-lead samples and draw conclusions about sources, pathways, and exposure for the population.

20. Joint workplace inspections involving the relevant units of EEAA, MOHP, and the Ministry of Manpower and Migration could be initiated for lead-using industries. Such combined inspections would be worth the extra expense in that they would likely increase the effectiveness of the inspections themselves, be more likely to offer specific advice and information to the firms involved, and would result in increased training and awareness on the part of the inspectors. This mechanism would also help to coordinate the work of these governmental units on lead-related matters.

21. Researchers and research institutions also have a contributing role to play; several are represented in the LEAP effort. Research institutions could coordinate investigations and direct them at the highest priority, most practically relevant lead issues remaining to be investigated. Reliable studies of lead exposure are important, as are studies focusing on policies, policy

implementation, the relative impact of alternative policy instruments, and the economic costs and benefits of policy interventions. (These policy and economic types of investigations are not now typically conducted within the Egyptian research community.)

4.4 Ways of Enhancing Collaboration

Additional recommendations have to do with building institutional capacity for addressing a cross-cutting issue like lead exposure. This final section covers this topic.

To encourage cross-institutional collaboration to reduce lead exposure, a steering committee of the type outlined above is a necessity. Some of the other recommendations sketched thus far can also help to encourage collaboration. In addition, EEAA should consider the following possibilities:

22. Encourage the formation of an advocacy group for lead exposure reduction. Interested NGOs, business associations, and others could participate. Such a group could monitor progress toward announced targets, suggest feasible options for reducing exposure further, and provide information to the relevant ministries to assist in their task of implementation.

23. Disseminate information to LEAP stakeholders on other successful collaborative efforts, including those involving multiple organizations, industries, and agencies working on behalf of lead exposure reduction in developing countries.

24. Look for ways to provide useful information and services to relevant stakeholders, particularly key ones like MOHP, as an approach to building the collaborative potential of LEAP. Monitor results, laboratory services, reports, technical assistance, and other forms of cooperation.

25. Coordinate EEAA's branch structure and activities, as they develop, with the field structures of other relevant ministerial stakeholders, especially MOHP, and the Environmental Management Units of the governorates.

26. Encourage the appointment of environmental liaisons in all other ministries, since environment is a cross-cutting issue and action requires links across governmental institutions

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Appendix A: Scope of Work

Egypt: LEAP Institutional Analysis

Background

The Environmental Health Project (EHP) will be working with USAID/Cairo and the Egyptian Environmental Affairs Agency (EEAA) to develop the Lead Exposure Abatement Plan (LEAP) between July 1996 and April 1997. The overall purpose of LEAP is to develop a plan to reduce lead exposure to the Egyptian population, especially in Cairo. Average blood lead levels in Cairo exceed guidelines established in the U.S. and by WHO. EHP has organized its effort into four substantive activities: Environmental Analysis, Institutional Analysis, Policy Dialogue, and Intervention Design. The entire LEAP program will contribute to a Results Implementation Package to be developed under Management Activity. The initial trip for the Environmental Analysis will take place August 8-19, 1996. This team will focus on designing a protocol for the environmental lead sampling including an assessment of the capacity of several Cairo laboratories to conduct the environmental lead sampling analyses. This scope of work describes the institutional analysis activity.

The overall purpose of the institutional analysis is to identify the key stakeholders, determine their potential roles in the lead exposure abatement action plan, and define the key policy and institutional analysis that must be addressed. The list of stakeholders includes both public and private sector institutions as well as NGOs and community groups. The primary counterpart for EHP is the EEAA. Other public agencies include those concerned with public health, petroleum, transport, water and wastewater, industries, research, and education. Private stakeholders include companies responsible for lead smelting, petroleum refining, plumbing, paint manufacturing, makers of lead water pipe and water storage tanks, batteries, and food canning. Institutional groups representing communities include NGOs and community associations.

The institutional analysis is closely linked to the policy analysis. The identification of the key stakeholders and the policy issues that must be addressed is a basic building block in the policy component of LEAP. Knowing where the key stakeholders stand on various issues, what role they might eventually play, and what will be required to mobilize the key stakeholders is critical to making progress in the policy component of LEAP. Knowing where the key stakeholders stand on various issues, what role they might eventually play, and what will be required to mobilize the key stakeholders is critical to making progress in the policy component. For this reason, the institutional analysis is taking place early in the development of LEAP. The first policy workshop will take place during the first week of the institutional analysis.

Tasks

1. Participate in a team planning meeting at EHP prior to traveling to Egypt.
2. Identify the key stakeholders that have a role to play in implementing LEAP. These stakeholders should fall into the following categories:
 - \$ regulatory institutions (e.g., EEAA, Ministry of Petroleum)
 - \$ private sector companies (e.g. lead smelters, auto repair shops, battery manufacturers, lead pipe manufacturers, etc.)
 - \$ advocacy organizations (NGOs)
 - \$ mass education and information institutions (e.g., press and television)
 - \$ academic and research institutions.
3. Interview the key stakeholders around the following concerns:
 - \$ ascertain their level of awareness of the problem

- \$ find out what actions these institutions have already taken or are planning to take to reduce human exposure to lead
 - \$ determine the role these institutions might play in the development and implementation of LEAP
 - \$ identify the key policy issues affecting them and their perspective on the policy issues
 - \$ identify the most important obstacles to future action
4. Assess the potential for collaboration among the stakeholders and what the most appropriate mechanisms might be to foster collaboration.
 5. Determine which stakeholders are likely to be the most important ones for the development and implementation of LEAP and which ones are likely to be allies in this effort. This determination should be based on which ones have the greatest promise in dealing effectively with the key issues, which ones have the most influence and reputation for getting things done, and which ones are the most willing partners.
 6. Based on the interviews with the stakeholders, develop a preliminary list of the key policy targets that LEAP might address. The choice of policy targets will be determined in large measure by the results of the environmental analysis. However, the interviews are likely to result in the identification of possible policy targets. Examples of policy targets include the licensing and operation of industrial enterprises, consumer protection regulations, occupational health and safety regulations, and enforcement of existing regulations.
 7. Participate in the first policy workshop. The Lead Policy Analyst should be prepared to make a presentation at the workshop in September on the U.S. experience in reducing exposure to lead. The team leader should be prepared to design a session that will result in gathering information relevant to the institutional analysis.
 8. Write a report which summarizes the results of this activity. The report should include a brief description of the key stakeholders and their potential role in LEAP, an analysis of the institutional issues that need to be addressed, and preliminary identification of policy targets.
 9. Provide a debriefing for EEAA and USAID/Cairo prior to departure from Egypt.

Expected Results

- # identification of key stakeholders and description of their roles
- # analysis of key institutions including possible mechanisms for collaboration
- # preliminary identification of policy targets that the LEAP might address

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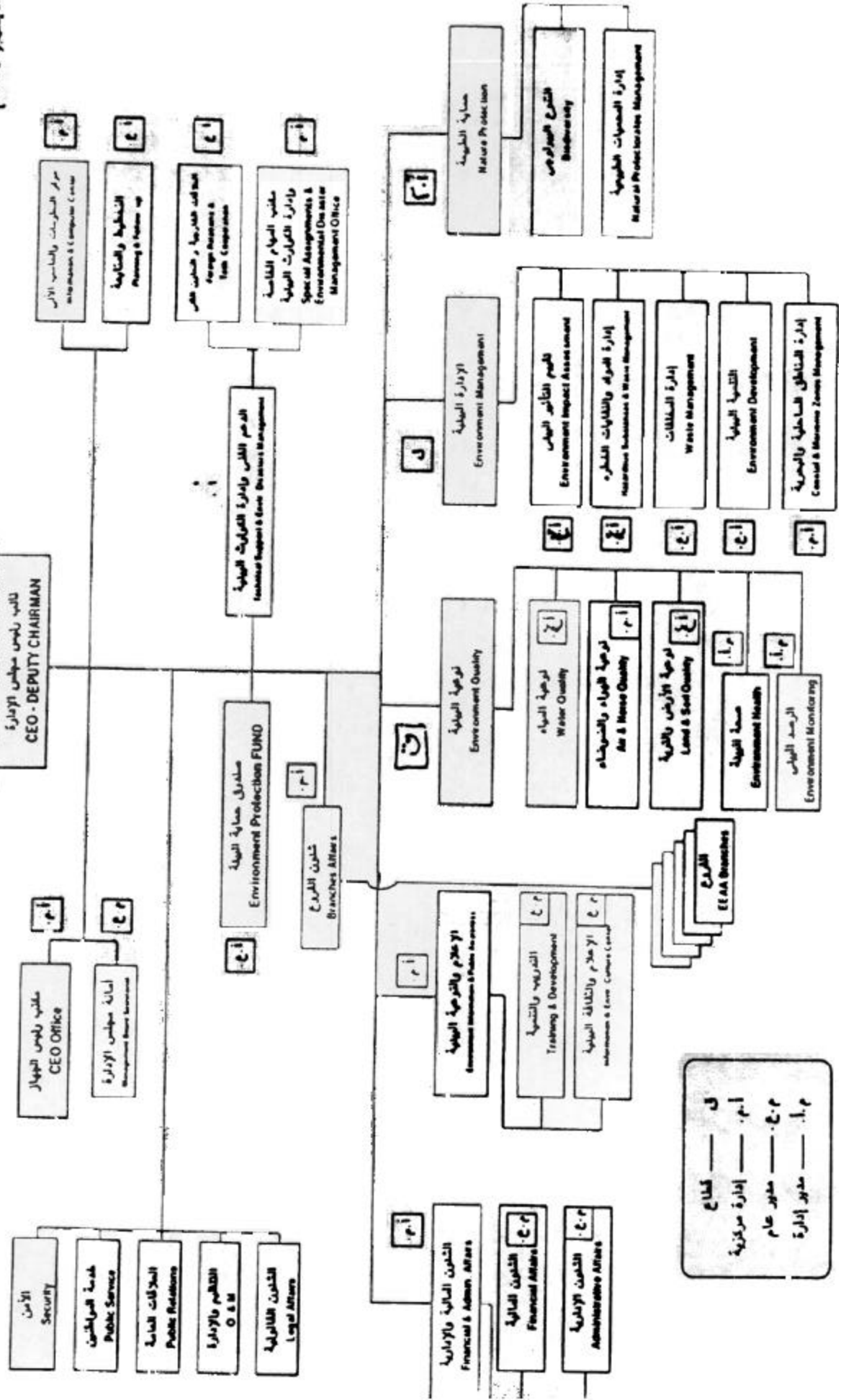
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**Appendix C: Organization Structure Adopted
for Egyptian Environmental Affairs Agency
current as of 1996**

Diagram 1

Cabinet Presidency
Environment Affairs Agency (EEAA)
Master Organization Chart
Approved by CAO. (OR)
(December 1994)

... له رقم []
... مجلس الوزراء
... شؤون البيئة
... الهيكل التنظيمي الرئيسي
... من المجلس المركزي للتعليم والإدارة [تنظيمها]



ك قطاع
أ.م إدارة مركزية
ع.م مدير عام
أ.م مدير إدارة