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Institutional Lessons Learned in
Environmental Health Programs

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CONTENTS

ABOUT THE AUTHORS	iii
ACKNOWLEDGMENTS	v
ACRONYMS	vii
EXECUTIVE SUMMARY	ix
1 INTRODUCTION	1
1.1 Background	1
1.2 Methodology	2
2 FRAMEWORK	3
2.1 Program Steps to Reach a Health Objective	3
2.2 Institutions	4
3 OVERVIEW OF CASES	7
3.1 Sanitation Program for Two Peri-Urban Communities in Montego Bay, Jamaica	7
3.2 Lead Exposure Reduction in Zlatna, Romania	9
3.3 Prevention of Diarrheal Disease through Environmental Health Interventions in Ecuador, Tunisia, Bolivia, and Benin	11
3.4 Egyptian Lead Exposure Abatement Plan	12
3.5 Reducing Dengue Fever in Guatemala	13
3.6 Developing a National Plan and Implementation Strategy for Sanitation in Peri-Urban and Rural Areas in Zambia	15
4 LESSONS LEARNED	17
Lesson 1: Sustainability of environmental health activities	17
Lesson 2: Institutional involvement in environmental health	18
Lesson 3: Coordination of multiple institutions for environmental health	19
Lesson 4: Roles and responsibilities in environmental health	21
Lesson 5: Using environmental health data	22
Lesson 6: Health expertise	23
Lesson 7: Limitations of institutional infrastructure	24
Lesson 8: Participation for environmental health sustainability	25

5	IMPLICATIONS FOR ACTION	27
5.1	Lessons Learned: In Review	27
5.2	Implications	28
5.2.1	Involving Appropriate Health Expertise	29
5.2.2	Involving Senior Health Professionals	29
5.2.3	Exploring and Disseminating the Most Effective Ways to Generate Cross-Sectoral Collaboration	29
5.2.4	Encouraging Cross-Sectoral Cooperation on the Donor Side	30
5.2.5	Reorienting Service Delivery Institutions toward Environmental Health	30
5.2.6	Formalizing and Enhancing Institutional Assessments	31
	BIBLIOGRAPHY	33
	TABLE	
	Summary of Case Studies	8

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ACRONYMS

CRDC	Construction Resource and Development Center (Jamaica)
CIMEP	Community Involvement in the Management of Environmental Pollution
DHF	dengue hemorrhagic fever
EHP	Environmental Health Project (USAID-sponsored project, Washington, D.C., 1994-1999)
HG	Housing Guaranty loans (USAID program)
INCAP	<i>Instituto de Nutricion de Centro America y Panama</i> (Nutritional Institute of Central America and Panama/PAHO)
KAP	knowledge, attitudes, and practices (survey)
LEAP	Lead Exposure Abatement Plan (Egypt)
MOH	Ministry of Health
MOU	Memorandum of Understanding
NGO	nongovernmental organization
OHS	occupational health and safety
RHUDO	Regional Housing and Urban Development Office (of USAID)
SSU	Sanitation Support Unit (Jamaica)
USAID	United States Agency for International Development
WASH	Water and Sanitation for Health Project (USAID-sponsored project, Washington, D.C., 1981-1994)
WGS	Working Group on Sanitation (Zambia)
WHO	World Health Organization



EXECUTIVE SUMMARY

During the last four years, the Environmental Health Project (EHP) has been engaged in a wide range of environmental health activities, many of which have had an institutional component. While some were specifically designated as institutional development activities, a number of them were focused primarily on health problems such as diarrheal disease, dengue fever, or lead poisoning. Activities which focus on health are also dependent on institutional conditions and call for attention to the institutional settings within which improvements in health can take place. In implementing those activities, EHP has acquired significant experience in recognizing or fostering the types of institutional relationships needed to address environmental health issues. This report summarizes six case studies; it also draws on evidence from a sample of environmental health efforts undertaken by other donor agencies. The purpose of this report is to identify lessons learned about institutional roles and responsibilities in environmental health when health improvement is the goal.

The lessons are drawn primarily from six activities implemented by EHP during the past four years:

- a sanitation program in two peri-urban communities in Montego Bay, Jamaica
- a program to reduce lead exposure in Zlatna, Romania
- prevention of diarrheal disease through environmental health interventions in Benin, Tunisia, and Bolivia
- development of the Lead Exposure Abatement Plan in Egypt
- social mobilization for the prevention and control of dengue in Guatemala
- development of a national plan for sanitation in peri-urban and rural areas in Zambia.

The report includes a framework to use as an organizing approach in reviewing the case studies and extracting institutional lessons. This framework has two components. The first includes six steps that are essential in achieving health outcomes:

- defining and quantifying the health problem through surveillance
- identifying the risk factors
- designing appropriate interventions
- implementing and monitoring the interventions
- continuing surveillance to determine the effectiveness of the interventions
- and expanding the effort, if it is shown to be effective.

The second component is identification of six types of institutions: regulatory, service delivery, public health, education and information, advocacy, and financing.

Eight lessons are drawn from the case study review; they focus on the institutional aspects of improving health in developing countries where environmental health is usually not a well-defined sector. The lessons have less to do with institutional development in the conventional sense and more to do with developing understanding

and collaboration among existing institutions, reorienting some institutions—such as service-delivery units—toward giving more attention to health outcomes, and establishing conditions in which health information and perspectives are brought to bear in a timely fashion on relevant institutional action.

The key lessons that emerged are as follows:

- Environmental health efforts will not be sustainable unless focused attention is paid to institutional issues. The most successful projects are those that pay explicit and early attention to the various institutional contexts for correcting the health problem, including identifying the roles and responsibilities of the various institutions.
- In addition to identifying the responsible and available institutions, project planners must devise ways to make sure those institutions are involved and support the process and its outcomes. The best involvement is meaningful rather than token and starts at the beginning rather than coming as an afterthought in program planning.
- Coordinating multiple institutions to address environmental health problems is a difficult task. Turf and technical jealousies, as well as inadequate understanding of each others' roles, make this challenge not only difficult but important to overcome. For the most part, the institutions that have the greatest stake in environmental health issues are those involved in environmental quality and those involved in public health. Barriers often hinder cross-sectoral collaboration. Open discussion and involvement of both major sets of institutions, from the highest levels to those involved in field operations, are crucial.
- In the implementation of environmental health projects, it is essential to make a systematic effort to determine which institutions are most appropriate to address which portion of the tasks needed to fulfill the desired health objective(s). An explicit data-gathering effort to assess the institutional landscape can be a key step in this process. Determining the most sensible allocation of roles and responsibilities for the initiative in question, furthermore, is best accomplished with the involvement of all stakeholders.
- If improvements in health conditions are to be quantified, measurements of health status at the baseline and as time passes are essential. These data are important not only to define the problem but also to mobilize the relevant stakeholders. In this regard, local data collected by local institutions are essential for local decision making. Institutional responsibilities for recording and disseminating such measurements into the future need to be determined in the planning stage.
- If serious consideration of health outcomes is expected, a significant level of health expertise must be employed from the outset. This is true for those involved from developing country institutions as well as those engaged on behalf of donor institutions.
- In environmental health, the existing institutional infrastructure is extremely limited, i.e., organizations with an explicit focus on environmental health. This circumstance makes cross-sectoral collaboration all the more important. And it also means that it may be fruitful to work with service providers (such as water and wastewater utilities) to help them focus more on environmental health as an important part of the overall effort.

- Locally initiated environmental health efforts will be sustainable and replicable only if supported at higher policymaking levels of government. Sustainability involves not just a continuing cash flow but a continuation of interest and sense of ownership. Projects that bypass national and regional governments are likely to remain dependent upon external assistance. Indeed, many environmental health problems are appropriately addressed at the level of national strategies and action plans formulated and agreed to by major stakeholders.

These lessons provide a set of broad guidelines for USAID and others involved in designing and implementing environmental health programs. They also imply that it is important to involve appropriate health expertise, there is high value in using senior health professionals to engage ministries of health, work must continue in identification of best practices to achieve cross-sector collaboration, donors should approach environmental health efforts from a cross-sector perspective, service-delivery institutions should be reoriented to take health concerns into account when planning and implementing programs, and that institutional assessments are an essential component of all environmental health activities.

INTRODUCTION

1

1.1 Background

During the last four years, the Environmental Health Project (EHP) has been engaged in a wide range of activities, many of which have had an institutional component. While some of those were focused on institutional development, a number of them were focused primarily on health. They, too, were dependent on institutional conditions and called for attention to the institutional settings within which improvements in health could take place. In implementing these activities, EHP has acquired significant experience in recognizing the types of institutional relationships needed for effective environmental health programs. This report presents an analysis of a sample of EHP activities, as well as evidence drawn from a small set of environmental health efforts undertaken by other donor agencies, with attention to the institutional lessons that can be gleaned. The case studies are drawn directly from EHP work in Egypt, Jamaica, Guatemala, Benin, Bolivia, Ecuador, Tunisia, Zambia, and Romania. The report discusses institutional issues that must be addressed to achieve health outcomes. Even in relatively limited activities, with short-term health objectives uppermost, attention to longer-term institutional issues will contribute to building institutional capacity in the future. This point, indeed, is a major theme which emerged in the course of the assessment.

As a general rule, environmental health activities involve different governmental institutions, such as ministries of health, environment, local government, finance, and education; nongovernmental organizations (NGOs); and the private sector. For that reason, the examination considers institutions broadly, encompassing a large variety of types and levels of organizations.

The purpose of this report is to identify lessons learned about institutional roles and responsibilities in environmental health programs when health outcomes are the primary goal. The lessons themselves are drawn, directly and by inference, from the experiences in a number of different kinds of environmental health activities. The report is targeted at staff, particularly health and environment officers in USAID and other donor agencies, who are responsible for health, environment, and local government programs.

The next section describes the methodology used in the selection and analysis of the cases. Chapter 2 then introduces a framework for addressing environmental health issues and from which institutional lessons are later developed. Chapter 3 provides a summary of each case used in developing the lessons. Chapter 4 presents the lessons learned from the case studies regarding institutional roles. Chapter 5 then summarizes the lessons and provides implications for action.

The case studies are drawn directly from EHP work in Egypt, Jamaica, Guatemala, Benin, Bolivia, Ecuador, Tunisia, Zambia, and Romania.

A major theme is that even in relatively limited activities, attention to longer-term institutional issues will contribute to building institutional capacity in the future.

1.2 Methodology

Six environmental health activities were used as case studies. As mentioned above, they are summarized briefly in Chapter 3. Several criteria were used in selecting the cases:

- Each case had to have an explicit health objective.
- The array of cases needed to represent different environmental health problems. Those selected dealt with diarrheal diseases, dengue, and lead poisoning.
- The cases had to be geographically diverse. The case study locales were Latin America and the Caribbean, Africa, the Middle East, and Eastern Europe.
- The cases needed to illustrate institutions and decision-making at different levels of government.
- Urban, peri-urban, and rural settings needed to be represented.

All the case studies were reviewed by both authors. (One author was a member of the team which conducted the LEAP activity in Egypt.) For each case, the full written record was examined, both official final reports and other materials where present (reports to the file, memoranda to the file, relevant e-mail correspondence, and so forth). Discussion by telephone with one or more principals involved in each case supplemented the data examination. In addition, both authors met with the activity managers of almost all of the activities during a two-day period at EHP. In each of these sessions, the activity managers responded to a standard written questionnaire provided by the authors ahead of time, supplemented the written record with additional observations regarding the activity, and answered other questions. Some individuals contacted had been involved in more than one of the activities examined in this analysis; they were asked to compare the activities for inferences regarding institutional lessons learned.

The activities reviewed were all relatively short-term (one- to two-year period) and focused in scope. Because these activities ended only recently, health outcomes and sustainability in the long term could not be measured. Still, sufficient information was available to develop a valid set of lessons for these kinds of environmental health initiatives—lessons that can be used to improve project implementation in the future.

FRAMEWORK

2

To organize or systematize the review of the case studies, the authors developed a framework that has two components. The first describes the steps needed to achieve health outcomes in an environmental health program. The second identifies six types of institutions that cover the range often involved in environmental health programs.

2.1 Program Steps to Reach a Health Objective

Six steps are common in well-designed efforts to improve health outcomes. The steps presuppose that a health problem has been selected as a serious concern, demanding action on the part of donors or national policymakers.

The health problem must be defined and quantified through surveillance activities.

The main techniques that are used to define or quantify a health problem are carefully conducted surveys and, where available, mortality and morbidity records. Laboratory back-up of these activities is often necessary. (In such cases, there also needs to be an examination of the proficiency of the laboratory providing the service.) One of the case studies, which relates to lead emissions from a smelter in Romania, is a good example of how baseline information can be gathered in a manner that allows follow-up studies to monitor the success or failure of the intervention.

Program designers must examine the specific setting to see what risk factors exist.

Program planners need to ask themselves, “What sorts of factors contribute to a population’s being exposed to health risks?” It is easy for “outside experts” to use their own knowledge and experience, but participation by local people and institutions is necessary to identify risk factors to ensure that the site-specific nature of the problem is understood, and that local stakeholders are committed to addressing it.

Program planners identify or design interventions appropriate to the local situation.

The decision making process must involve those most directly impacted by the decisions (the local customers), but it is also important to draw in top leaders in government agencies. The process of “buying in” to a program often succeeds or fails in this phase. Involvement may range from being kept informed about an activity to providing financial assistance to engaging in hands-on participation in policy or implementation.

Baseline information should be gathered in a manner that allows follow-up studies to monitor the success or failure of the intervention.

A built-in evaluation system is essential. As far as possible, outcome rather than process measurements should be used to monitor interventions.

Carefully monitored interventions based on the above can then be undertaken. (This is the implementation phase.)

A built-in evaluation system is essential to make corrections and to determine if and when they are needed. To the extent possible, outcome rather than process measurements should be used to monitor interventions. Once collected, data should be analyzed and disseminated. (Because the EHP activities considered in this analysis had fairly short lifespans, e.g., one to two years, they do not provide any examples of this type of midcourse correction based on outcome measurements.)

Surveillance must continue, to determine the effectiveness of the interventions.

The activity plan should contain specific points where a determination of the effectiveness of the intervention is made. This is an extension of the concept of surveillance, which originally referred to defining the problem. In addition, surveillance of the outcome is the most useful manner in which to determine the feasibility of expansion. The surveillance of blood-lead levels in the smelter project in Romania demonstrated the effectiveness of the activity and helped support the idea of introducing similar interventions in other communities with smelters.

If the activity is shown to be effective, expansion of the cycle should be planned.

It is at this point that the early involvement of all relevant institutions should pay off. It is difficult to imagine any activity that does not have ramifications for several agencies. Expansion of activities has fiscal implications which spotlight the importance of involving all institutions that are likely to provide resources in the early planning stage.

2.2 Institutions

Six general types of institutions are involved in environmental health activities. Each type is represented at all levels of government: national, regional, and local. These institutions may not be easily identified, but they exist. In addition, each of the institutions may have a “shadow” in the donor and international agency community. The donor institutions often have greater power than their national counterparts, and the international agencies frequently set the determining factors in technical aspects of environmental health activities.

The six broad types are:

- **Regulatory institutions**—develop and enforce rules and regulations for compliance with environmental and public health standards
- **Service delivery institutions** (private and public)—responsible for providing environmental health-related services such as water, wastewater, vector control, and solid waste collection
- **Public health institutions**—provide services to prevent and treat environmental illnesses

Six types of institutions are identified.

- **Education and information institutions**—provide communication outlets and can convey accurate and understandable information on problems and solutions
- **Advocacy institutions**—promote policy innovations and social change
- **Financing institutions**—provide the resources for implementing interventions.

In addition to describing the steps and types of institution as tools of analysis, the authors used the following questions to determine the levels and types of institutional involvement and collaboration in the activities studied:

1. What are the legal or de facto responsibilities of the institutions involved?
2. What are the institutions' capabilities to meet those responsibilities?
 - Trained personnel
 - Technical capability
 - Financial resources
 - Internal priorities of the institution
3. What are the institutions' interactions, whether informal or official?
 - Written agreements
 - Formal meetings
 - Joint planning
 - Delegation of responsibility

It is against this framework that the case studies were reviewed. Collectively, the cases included the six steps used to achieve health outcomes as well as the six types of institutions. No one case addressed all elements in the framework. In each case, useful approaches, successes, challenges, and/or difficulties were identified. These elements served as the basis for the lessons reported in Chapter 4.



OVERVIEW OF CASES

3

This chapter provides a brief summary of the case studies used as background for developing the institutional lessons covered in Chapter 4. Each case summary describes the location and timing of the activity as well as the nature of the health problem addressed, an overview of the kinds of institutions involved, and a short statement regarding the results of the project, insofar as those results are known. Those cases which are not primarily EHP activities are so noted. Table 1 provides a summary of the six case studies. For more detailed information regarding each specific case, refer to the bibliography at the end of this report. It contains a list of activity-specific publications which provide more comprehensive information about the case studies reviewed in this analysis.

3.1 Sanitation Program for Two Peri-Urban Communities in Montego Bay, Jamaica

From 1994 to 1997, EHP provided technical assistance on behalf of USAID/RHUDO/Jamaica to assist two peri-urban communities (Norwood and Rosemont) on the outskirts of Montego Bay. Over the years, these two “informal” communities had undergone rapid development and eventually came to number several thousand residents each. In order to improve living conditions and to protect the coastal environment, USAID—through the provision of Housing Guaranty (HG) loans—and the Government of Jamaica began a concerted effort to upgrade the communities, including improving sanitation.

Using the HG funds provided by USAID, an urban sanitation program was designed, consisting of five main components. The project initiation phase included setting up the infrastructure—physical, as well as staffing—necessary to carry out the project. The training component ensured that all staff, and appropriate community members, had the necessary skills to undertake the project. The promotion component focused on making sure that key messages were developed and disseminated to the communities. The coordination component focused on ensuring that all key national and local authorities and institutions were brought into the process—when appropriate—and that information was exchanged throughout the project. Finally, the technology component ensured that all appropriate technological options were considered, and that appropriate choices were made for each community (including making sure that adequate attention was paid to operations and maintenance needs).

Wastewater disposal had become a particular concern, both because the provision of water services through the upgrading program was increasing household water use and because of potential threats posed to health and the vital tourist industry of Montego Bay by inadequate wastewater disposal. The lack of adequate water and sanitation systems is one of the root causes of diarrheal diseases and other gastrointestinal illnesses, through contact with pathogens found in contaminated water and human excreta. Studies have linked improved sanitation to improved health and

To improve living conditions and to protect the coastal environment, USAID and the Government of Jamaica began a concerted effort to upgrade the communities, including improved sanitation.

Water and sanitation-related health concerns coupled with concerns about the tourist industry, i.e., possible damage to the coral beds and Montego Bay by increased runoff, served as the impetus to move this activity forward.

Table 1
Summary of Case Studies

Case Study	Health Problem Addressed	Setting (Urban/Rural)	Types of Institutions Involved
Sanitation Program for Two Peri-Urban Communities in Montego Bay, Jamaica	Diarrheal Disease	Peri-Urban	National Level Community/Municipal Level Private Sector NGOs
Lead Exposure Reduction in Zlatna, Romania	Lead Exposure	Secondary City	National Level Community/Municipal Level NGOs
Use of CIMEP for prevention of diarrheal disease: A) Ecuador B) Tunisia C) Bolivia D) Benin	Diarrheal Disease (Bolivia and Benin) Cholera (Ecuador) Broad-based EH Problems (Tunisia)	Secondary City (except for Ecuador - Rural)	National Level Community/Municipal Level NGOs
Egyptian Lead Exposure Abatement Plan	Lead Exposure	Urban	National Level Private Sector
Reducing Dengue Fever in Guatemala	Dengue Fever	Urban	National Level Community/Municipal Level
Developing a National Plan and Implementation Strategy for Sanitation in Peri-Urban and Rural Areas in Zambia	Diarrheal Disease	Peri-Urban & Rural	National Level NGOs

nutrition, especially among children; the combination of improved access to potable water along with the provision of adequate wastewater disposal has been shown to have a positive beneficial impact on community health. Therefore, water and sanitation-related health concerns, coupled with concerns about the tourist industry because of the potential for increased damage to the coral beds and Montego Bay in general by increased runoff, served as the impetus to move this activity forward.

After initial assessments, which included an informal institutional review as well as a technical survey, appropriate on-site sanitation and graywater solutions were identified, a house-to-house survey was completed, and arrangements were developed to involve the community and establish an ongoing mechanism to upgrade household sanitation systems. The major institutional impediment to this activity was that several institutions had partial jurisdiction in the two communities for certain services, but no one entity was clearly authorized or obliged to provide service upgrading. The Jamaican Ministry of Construction (now known as the Ministry of Environment and Housing), the National Housing Corporation, the National Water Commission, the Caribbean Housing Finance Corporation, local banks and credit unions, the Ministry of Health and its public health inspectors, the Jamaica Public Service Corporation, the National Resources Conservation Authority, and the municipality of Montego Bay all had a potential role in upgrading services. In addition, private contractors were also involved, through their work in constructing and renovating homes.

In order to create some kind of workable institutional structure in the process, as well as to insure sustainability, all institutional parties agreed to turn the management of this activity over to a Jamaican NGO, the Construction Resource and Development Centre (CRDC). The CRDC's charge was to work with all collaborating partners to broker the design, information dissemination, financing, and official certification of sanitation upgrades to households for the construction of excreta disposal systems. These systems had to meet all environmental and public health standards, as well as be sensitive to each household's preferences.

Overall, the project has been successful in meeting its performance targets. It has improved the hygiene behaviors of households in the communities; it has contributed towards the reduction of sewage effluent discharged into Montego Bay; it has raised the environmental consciousness of community members; it has provided trained cadres of community health workers; and it has provided affordable technological solutions for the communities.

From an institutional standpoint, the final results of this solution, while clearly providing a workable institutional model, are somewhat mixed. CRDC created a new organization, the Sanitation Support Unit (SSU), located in the two Montego Bay communities, to deliver the brokerage and advisory services. The SSU has been effective. But, while considerable efforts were undertaken to move the SSU to long-term sustainability through a process of cost-recovery via fees, and while most of the SSU's budget was indeed covered in this fashion, this effort will be difficult to sustain and replicate elsewhere if the Jamaican private finance sector does not continue to make loans to households and if the HG-financed loans are not paid back by borrowers.

3.2 Lead Exposure Reduction in Zlatna, Romania

From 1994 to 1997, EHP provided technical assistance on behalf of USAID's Bureau for Europe and Newly Independent States (ENI) and USAID/Romania aimed at

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CRDC's charge was to work with all collaborating partners to broker the design, information dissemination, financing, and official certification of sanitation upgrades to households.

Preliminary data indicated that children in Zlatna were experiencing significant adverse health effects: reduced growth rate, higher blood pressure, higher prevalence of musculoskeletal problems, and high blood lead levels.

EHP developed a strategy which involved four specific types of assistance: 1) technical assistance/training, 2) cross-sector team development, 3) procurement of equipment, and 4) technical support for Romanian institutions and the Zlatna community.

addressing environmental health problems associated with exposure to emissions from a copper smelter located in Zlatna, Romania. Zlatna is a one industry town with approximately 2,800 people employed by the copper smelter. The Zlatna area has a population of 10,000 and includes agricultural and mining activities. Zlatna is approximately 30 km from Alba Iulia, the capital city of Alba Judet. The smelter was identified as a major source of atmospheric pollution in the area surrounding Zlatna, especially sulfur dioxide (SO₂) and lead emissions. Preliminary data, prior to the interventions undertaken by EHP, indicated that children in Zlatna were experiencing significant adverse health effects, likely as a result of their exposure to lead. Specific conditions identified included reduced growth rate, higher blood pressure, higher prevalence of musculoskeletal problems, and high blood lead levels. In addition to addressing the issue of high blood lead levels in children—and the resulting negative health effects suffered by them—the activity was also designed to address the poor health and safety conditions for workers at the copper smelter, as well as the issue of inadequate monitoring of ambient air quality. The overall goals of the technical assistance were, therefore, to reduce exposure of young children to lead, to improve occupational health and safety at the smelter, and to improve air quality monitoring capacity and data management.

In collaboration with all of the stakeholders, EHP developed a strategy for achieving each goal. This strategy involved providing four specific types of assistance: 1) technical assistance/training, 2) cross-sector team development, 3) procurement of equipment, and 4) technical support for Romanian institutions and the Zlatna community in implementing action plans developed during the project. The project was successful, and concluded with all initial goals being met, and even exceeded in some cases. Results for the goal of reducing the exposure of young children (ages 0-6) to lead included a 25% decrease in blood lead levels (from an average of 40 to 28 g/dL), changes in knowledge, attitude, and practices, and a collaborative effort by the community to improve hygiene conditions at the Zlatna kindergarten. Results for the goal of improving occupational health and safety (OHS) included increased awareness and focus on OHS issues by workers at the smelter, reductions in blood lead levels, improvements in knowledge and practices of workers, and increased access to (by procuring needed items), use of, and maintenance of OHS equipment. Results for the goal of improving air monitoring and data management included the installation, operation, and maintenance of an updated air quality monitoring system, and a vastly increased capacity to manage and analyze air quality data.

From an institutional standpoint, it is important to understand that, as noted earlier, a four-pronged strategy was employed to accomplish the goals of this activity. This involved undertaking a preliminary, informal institutional assessment, along with a technical appraisal. This approach led to:

- the establishment of cross-sectoral working groups, including a multidisciplinary Lead Working Group with local teachers, physicians, the municipality, Judet-level (county-level) Sanitary Police and Health Education Laboratory personnel, environmental health specialists from the regional Institute of Public Health, and EcoZlatna (an environmental NGO);
- procurement and delivery of equipment needed for blood-lead testing;
- technical training;

- collection and analysis of baseline and follow-up environmental and blood-lead data, as well as data on knowledge, attitudes, and practices in the community; and
- development of health education, community awareness, and family lead awareness counseling programs.

As the project evolved, additional working groups were established and the involvement of others, including parents, employees at the smelter, and a Peace Corps volunteer, contributed to its success.

The activities in Zlatna continued past the end of the EHP activity. Working Groups have been established for lead exposure, air quality monitoring, and occupational health and safety issues. Other sources of support were identified during the activity and have been providing funds and expertise. In addition, in a follow-on activity EHP used the cross-sectoral model to address lead exposure in Copsa Mica and Baia Mare, two other cities in Transylvania with a lead exposure problem.

3.3 Prevention of Diarrheal Disease through Environmental Health Interventions in Ecuador, Tunisia, Bolivia, and Benin

Since 1994, EHP has implemented a number of interventions around the world employing a methodology known as Community Involvement in the Management of Environmental Pollution, or CIMEP. The philosophy underpinning the CIMEP methodology is to create effective partnerships between community representatives, municipal/public sector staff, and local NGOs as they attempt to address environmental health issues, especially in underserved peri-urban communities. Thus far, CIMEP has been applied in the following countries: 1) Ecuador (1994-1995) to promote better water storage practices and hygiene education, aimed at reducing the number of cholera cases in indigenous (Indian) communities; 2) Tunisia (1995-1996) to address broad-based environmental health problems through the extension of municipal services to underserved peri-urban communities; 3) Bolivia (1997-present) to create community and departmental teams to develop behavior-based solutions—at the household and community levels—to address diarrheal diseases; and 4) Benin (1997-present) to initiate environmental health interventions aimed at reducing high-risk behaviors associated with diarrheal disease transmission.

Technically, these activities are separate cases, either because of their design and/or execution, or as a result of the type and extent of institutions involved. For example, the CIMEP activities in Tunisia did not specifically target diarrheal disease as the others did. Activities in Ecuador focused on cholera in two states (Chimborazo and Cotopaxi). In Tunisia, the effort focused on six neighborhoods in two very different secondary cities (Sousse and Kasserine). In Benin, work is being performed in nine pilot neighborhoods in Parakou, Bembereke and Banikoara, in the Department of Borgou. In Bolivia, the focus has been on municipalities in the State of Santa Cruz. Nonetheless, the many similarities of these activities allow them to be described and reviewed together.

In brief, CIMEP is a two-year process that includes the following components: a baseline study, a series of skill-building workshops, policymaker roundtables, community microprojects, training of trainers, and scale-up. Municipal team members who work for the local government in some capacity learn to work with community

The philosophy underpinning the CIMEP methodology is to create effective partnerships between community representatives, municipal/public sector staff, and local NGOs.

CIMEP seeks to encourage interaction between communities and officials at the local level.

members to identify environmental health risk factors, conduct community mapping to identify high-risk transmission routes, and develop and implement community-level interventions, such as latrines and hygiene education activities (commonly referred to as microprojects) funded by USAID. In some cases, such as Tunisia and Benin, the intent has also been to scale up the activity to the national level.

The CIMEP strategy has been to address environmental health problems in secondary cities, where the attention to health outcomes has been particularly emphasized. The CIMEP approach focuses on health improvements achieved through community behavioral change and by developing the capacity of municipal staff to work in partnership with communities.

In several of the CIMEP cases, involvement of a very broad range of institutions has been sought. For example, in Benin CIMEP has evolved into a close collaboration between the Ministry of Health and the Department of Borgou, USAID, and EHP. Extensive participation by community-based NGOs is also an objective. In addition, other donors, other USAID projects, and traditional authorities have been involved in the process.

In all cases, CIMEP seeks to encourage interaction between communities and officials at the local level. The approach is designed to encourage horizontal, cross-institutional problem-solving with attention to the agenda and problems developed and framed at the community level. In each of the CIMEP activities, there has been extensive community involvement in identifying risk routes and developing microprojects. The activities have elicited cooperation among officials from different sectors. Periodic department-level policy roundtables have brought together representatives from diverse ministerial institutions to review and assess progress. Community microprojects include contractual provisions requiring demonstrated behavioral change as a condition of continuing support for additional community microprojects. These contractual provisions become a form of ongoing monitoring and evaluation for the municipal teams and the local communities.

There has been extensive community involvement in identifying risk routes and developing microprojects. In addition, the activities have elicited cooperation among officials from different sectors.

In Bolivia and Benin, EHP has conducted health baseline studies to determine if diarrheal disease rates were reduced. In Bolivia, the interventions have been completed and the baseline survey repeated. The results show that diarrheal disease rates were reduced by 38% in Samaipata, the largest community, and by over 75% in a small adjacent rural community. In Benin, the baseline survey will be repeated in May 1999; thus, as of this writing, no health outcome or behavior change data are available.

3.4 Egyptian Lead Exposure Abatement Plan

Between 1996 and 1997, EHP provided technical assistance to USAID/Egypt and the Government of Egypt in the development of a Lead Exposure Abatement Plan (LEAP). Cairo is a locus for large amounts of polluting industry and traffic. Lead had been identified as a major environmental health risk, particularly in the greater Cairo area. Many studies have shown that average blood lead levels in greater Cairo are above internationally established safe guidelines, such as those prepared by the World Health Organization. This situation poses serious health hazards for the population, particularly children and high-exposure groups within the population. The LEAP effort, therefore, was aimed at creating a comprehensive national strategy to identify exposure routes and to design interventions to abate or reduce lead exposure for the general population of Egypt, especially children. LEAP was developed by the

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Ministry of State for Environmental Affairs, formerly known as the Egyptian Environmental Affairs Agency, acting in concert with the Ministry of Health and Population and other national agencies, with technical support from USAID/Egypt.

In order to ensure continued institutional support for the process, three workshops were convened during the life of the project. Participants included representatives from many institutions in Egypt, including government ministries, some governorates, selected NGOs, businesses or business associations, and medical and research centers. The goal of the first workshop was to provide basic information on lead exposure and the LEAP effort. The goal of the second workshop was to inform stakeholder representatives of the results of data-gathering and to begin to design interventions to reduce lead exposure associated with the most important sources. The goal of the third workshop was to discuss the draft Plan, and to begin the process of gaining approval for it.

Early on in the process, as well, a Working Group—with representatives from the environmental and health ministries, along with USAID/Egypt and EHP—was established to share information and discuss activities. As a part of the preparatory work, institutional and environmental assessments, as well as a limited behavioral assessment, were conducted. The environmental effort sought to characterize the distribution of lead in various environmental media throughout Cairo and to identify the most important routes of lead exposure for Cairo's residents. A children's blood-lead testing activity, supported by the U.S. Centers for Disease Control and Prevention and conducted in greater Cairo through the Field Epidemiological Training Program, was also intended to be a key part of the data-gathering. That effort proceeded at a slower pace, although some data were available by the conclusion of the planning process.

The Plan targeted lead exposures associated with food, kohl (an eye cosmetic), ceramics, and paint. It also included a wide range of interventions and a set of educational, awareness, data-gathering, and monitoring interventions. The Plan called for the involvement of institutions from public, private, and nongovernmental sectors; at national and governorate levels; and across many agencies of government. The environmental and health ministries were designated as having the lead roles in seeking approval for the Plan throughout government and for jointly initiating its implementation.

The final draft Plan was adopted by the Minister of State for Environmental Affairs and is being considered for adoption by the Government of Egypt. The support the Plan has received can be attributed in large measure to the close attention paid to involving all of the appropriate stakeholders, at the appropriate time.

3.5 Reducing Dengue Fever in Guatemala

From 1996 to 1998, EHP provided technical assistance to USAID/Guatemala and the Guatemalan Ministry of Health (MOH) in the area of dengue control. Classic dengue, and its more fatal manifestation, dengue hemorrhagic fever (DHF) reappeared in Latin America in the 1960s. Classic dengue is a self-limiting viral disease with symptoms quite similar to those of a bad case of the flu and to which little importance is generally attributed. DHF, on the other hand, is a serious syndrome requiring hospitalization in an intensive care unit, and it exhibits a very high mortality rate. Between June 1996 and January 1997, 18 cases of DHF were reported in the Department of Escuintla in Guatemala. It was feared that these 18

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The general objective of the public information and vector-control action plan was to prevent a new outbreak of dengue/DHF through community participation and social mobilization.

cases represented the tip of the iceberg, i.e., a much larger outbreak of classic dengue. In September 1998, the MOH, USAID/Guatemala, and the Nutrition Institute of Central America and Panama (INCAP) proposed a public information and vector-control action plan. The general objective of the plan was to prevent a new outbreak of dengue/DHF through community participation and social mobilization aimed at achieving a sustainable response, with no dependence on inputs with high economic or ecological costs (i.e., using no pesticides). Priority would be given to the most affected areas, and the plan would be expanded to other areas at a later date, once the immediate critical situation had been dealt with.

EHP became involved in this effort starting in 1996, when the MOH requested USAID support. The MOH desired funding to conduct a control program based on a traditional vector control approach. EHP provided short-term consultation to the USAID mission, and it was determined that the large-scale vector control option was impractical. A program of community education and information was viewed as potentially more effective. Funds were made available for a focused effort in five municipalities in the Department of Escuintla, and an Information and Communication Unit (ICU) within the MOH was established to develop materials to assist communities in locally implemented source reduction. It is important to note here that the vector mosquito for dengue (*Aedes aegypti*) breeds in containers that hold water around urban dwellings, and community clean-up has been demonstrated to be the best method of dengue prevention. Working in concert with various expatriate and local experts, the community conducted a KAP survey, completed a baseline assessment, and created a surveillance and monitoring system, starting in late 1996. All three of these tools contributed towards the creation of an action plan that effectively contained the anticipated epidemic, and actually reduced the numbers of cases recorded in 1997 (by approximately 40%). This reduction is particularly notable because the surveillance and recording system was vastly improved from 1996 to 1997. Thus, a more complete picture of actual cases was provided in 1997 compared to 1996.

This activity involved close coordination and cooperation among national government institutions, community members, local community health sector representatives, and PAHO, all of whom provided members to a project management committee.

Of significance from an institutional standpoint, this activity involved close coordination and cooperation among national government institutions (the MOH and the Guatemalan Social Security Institute), community members, local community health sector representatives (Escuintla Health Area Headquarters), and PAHO (INCAP), all of whom provided members to a project management committee that was established to oversee activities. Decisions were made in a collaborative manner, and communication was facilitated by regular meetings. Upgrades in the form of better equipment (e.g., computers to create and maintain databases) were also provided.

EHP's role in this activity continues. EHP is providing copies of the (Spanish-language) training materials prepared and used by the Guatemalan partners to other USAID missions in Latin America for adaptation to other country contexts, in the hope that the organizational and institutional lessons learned in Guatemala can be broadly applied in the region. EHP also hopes to foster inter-institutional cooperation in the regional efforts to prevent and control dengue.

3.6 Developing a National Plan and Implementation Strategy for Sanitation in Peri-Urban and Rural Areas in Zambia

In 1995, UNICEF/Zambia initiated a Water, Sanitation, and Health Education Program (WASHE). As of 1997, it was operating at the national, district, and village levels in the 10 most severely drought affected areas of the country. WASHE was designed to support two distinct efforts: 1) institutional capacity-building for sector reforms and 2) a “community” WASHE Project. Since its inception, WASHE has been working in partnership with other donor-sponsored activities in the water and sanitation sector in Zambia to strengthen the capacity of the government of Zambia to plan and implement beneficial programs. The special focus of these programs is on water and sanitation in peri-urban and rural areas. All of these efforts fall under the umbrella of the National Water Policy, which was initiated in 1994 and which also includes sanitation in its scope. Other donors have been involved in various parts of this effort. In 1998, EHP—on behalf of USAID—was asked by UNICEF to assist in the development of the action plan and the monitoring and evaluation component, which it did. UNICEF, however, has retained the lead role in all technical assistance efforts undertaken to date.

The National Water Policy institutionalized support for sanitation, but it did not specify either a strategic approach or guidelines that would lead to improvements in sanitation. To support the implementation of the policy, the institutional partners agreed that a Working Group on Sanitation (WGS) was needed. The WGS would be charged with reforming the water and sanitation sector, and would be responsible for developing a 5-year action plan and strategy. A series of workshops was organized by the WGS; four national workshops were convened by the WGS, and a series of consultants has been employed to assist with the development and refinement of a draft National Sanitation Strategy for Peri-Urban and Rural Areas in Zambia and a National Action Plan for the years 1999-2003. The latter includes a draft Implementation Programme as well.

Among the institutions participating in the development and refinement of the strategy and supporting materials have been the Ministry of Health, the Ministry of Energy and Water, the Ministry of Local Government and Housing, the Central Board of Health, the Community Management and Monitoring Unit, the National Water, Sanitation and Health Education Program Coordination and Training Team, a number of NGOs active in the water and sanitation sector, as well as various donor representatives. Perhaps most importantly for the ongoing success and sustainability of this initiative, high-level central ministry officials have participated in the workshops. Decisions are being made on a consensual basis, and coordination and communication appears to be going well, due in part to the regular workshops that are held.

Agreement has been reached on the written products (i.e., the Strategy and the Action Plan), although some key issues regarding jurisdiction appear not to have been resolved yet. It is hard to predict how effective this program will be in addressing the health-related impacts of inadequate water and sanitation. The answer will lie in the future.

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LESSONS LEARNED

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Lesson 1: Sustainability of environmental health activities

Environmental health efforts will not be sustainable unless explicit attention is paid to institutional issues.

All the cases reviewed for this analysis make clear that technical issues are important, but for programs to be sustainable, specific and direct attention must be paid to institutional issues. Institutional issues vary from setting to setting, so it is impossible to know in advance which ones are uppermost in a particular setting. Institutional assessments can be particularly helpful in this regard, even if they are conducted quickly, and the results should be documented in free-standing reports or memoranda available to teams working on other environmental health efforts in the same setting at a later date. The institutional assessment which was part of the Egyptian LEAP case stands as a good example in this regard.

In all of the cases examined in this analysis, institutional issues were important to the project teams. And it is clear that institutional development for sustainability of environmental health improvements is a goal that can be supported and advanced in significant ways on projects of many types and durations. In the Egyptian LEAP effort, dealing with institutional issues was an explicit and primary component of the activity, and a formal institutional assessment was planned and executed as one of the deliverables. The assessment identified a range of short-term and longer-range institutional issues that received explicit attention during the project. Those institutional issues also shaped the design of interventions and the assignment of responsibilities in the lead exposure abatement plan. In Zlatna, Romania, a review of institutions and institutional issues was conducted somewhat belatedly once the project was initiated, when it became clear that it was crucial to identify key positions, individuals, and institutional issues prior to designing and implementing any interventions. In these and other cases, when the activities were completed, host-country decision makers emphasized how centrally important this explicit attention to institutional issues had been.

The Egyptian LEAP and Jamaican cases in particular show that a work plan for institutional development is as important as a work plan for environmental and health activities. In both instances, the explicit coordination of both institutional and technical work plans forced a consideration of the full range of issues and led to adjustments that improved project performance. For example, in the Jamaican case, after identifying organizational and management issues in the implementing NGO which were slowing up progress, the work teams which conducted household reviews were reconfigured.

In the Egyptian case, and in Zlatna as well, attention to institutional issues increased the likelihood that the environmental health efforts would be sustained. Institutional issues were attended to in these cases by reminding stakeholders of some of the key issues and the importance of building effective and responsive core

Technical issues are important, but for programs to be sustainable, specific and direct attention must be paid to institutional issues as well.

In several cases, when the USAID-funded activities were completed, host-country decision makers emphasized how centrally important explicit attention to institutional issues had been.

A work plan for institutional development is as important as a work plan for environment and health activities.

institutions; convening working groups representing key stakeholder institutions to help grapple with key issues; devoting attention to clarifying and defining roles and responsibilities so as to maximize the likelihood of effective performance; and considering explicitly the interaction of financial and institutional demands for long-term sustainability. In Jamaica as well, a great deal of attention was devoted to the development of institutional capacity and financial sustainability for the SSU to be able to implement sanitation activities in other communities; gaps, weaknesses, and shortfalls were addressed as the activity evolved. The result was an organization with potential to address sanitation issues in other communities.

Lesson 2: Institutional involvement in environmental health

It is important to involve relevant institutions, including the important stakeholders and authorities from the health sector. The best involvement is substantive rather than token and starts at the beginning rather than coming as an afterthought in program planning.

Environmental health often calls for involvement by a disparate array of institutions and authorities, some with little history of cooperating with each other.

Early and meaningful involvement of the appropriate stakeholders is key to successful environmental health initiatives. Many aspects of environmental health call for involvement by a disparate array of institutions and authorities, some of which may have little history of cooperating with each other. Thus, the sooner the right stakeholders become involved and begin to develop joint solutions to shared problems, the more likely a successful outcome will occur.

There is no general “one best answer” to the question of which stakeholders should be involved. Relevant participants vary from issue to issue and country to country. In developing a national plan and implementation strategy for sanitation in Zambia, for example, an analysis of the setting showed that along with the more obvious agencies—national health and water and sanitation institutions—it was crucial to include the ministries for energy, environment, local government and housing and representatives of several local organizations. Extensive efforts were made at the outset to involve all these institutions in collaborative discussions, the review of analytical materials, and problem-solving. The ultimate success of the plans developed will be significantly enhanced by this meaningful and early involvement of a broad array of partners. In the Zambian case, not all institutional issues were resolved by broad institutional involvement; in fact, as of this writing (December 1998), some key decisions about allocation of roles and responsibilities have yet to be made. But thanks to the participatory process, those issues were identified and have been explicitly discussed and analyzed by the full range of stakeholders.

The project team in Zlatna made extensive efforts to maximize the chances for collaboration and joint problem-solving by involving an array of stakeholders who either had jurisdiction over relevant parts of the problem—e.g., Health Inspectorate and the regional Institute of Public Health—or were clearly disposed to addressing the environmental problem-solving—the local environmental NGO, parents of young children, and the U.S. Peace Corps. The decision to work toward early and repeated involvement of such stakeholders was guided by a pragmatic openness to maximize the institutional contributions and leverage available for problem solving. A broadly representative Lead Working Group was established early on to maintain focus on the multi-jurisdictional environmental health issue, rather than letting the issue be defined as one relating only to health, environment, or other partial perspectives.

When the right kinds of institutions are involved in project development and implementation, as in the Zlatna instance, environmental health benefits beyond the immediate setting or short-term goals are encouraged. For example, in Romania, by involving relevant stakeholders from other regions of the country with similar environmental health issues, successful activities were expanded or replicated. The Guatemala case, though modest in scope, was less successful in informing and involving certain stakeholders—key representatives within national ministries, for instance. It was also less successful in scaling-up once the local dengue control effort was developed.

The CIMEP activities, by definition, constitute the most obvious examples of early and substantive institutional involvement, at least with regard to local institutions. These cases were framed around a bottom-up organizing effort without any preconceptions about which stakeholders would eventually be most crucial. The animating idea was that the community itself had the capacity to identify issues and needs; delineating the local environmental health issues and determining which institutions must be involved would emerge during the process itself. In the CIMEP activities reviewed, a wide variety of stakeholders was eventually identified and involved. For those institutions operating beyond the community level, regular meetings about the community activity have brought them into contact with each other and with community groups. A shared decision-making process greatly increases the chance that broad stakeholder involvement will be accepted by the community.

Lesson 3: Coordination of multiple institutions for environmental health

In environmental health efforts, multiple institutions typically drawn from different sectors—i.e., health and environment sectors—need to be involved and their efforts coordinated to achieve common objectives. It is crucial to identify the right institutions and to secure their willing collaboration.

This lesson is central to all of the projects reviewed. Securing willing and collaborative participation of the right institutions is often very difficult. This point is illustrated in the LEAP project in Egypt. Jealousies, turf issues, misunderstandings, and different priorities among different institutions across the sectors were all part of the start-up process. The fact that the project was successful is due to a large extent to identification of these challenges in the early review of the institutional landscape. The time and effort spent in a systematic identification and description of the various players (or “institutional assessment”) allowed project planners and the stakeholders themselves to anticipate the difficulties and prepare to address them. As the project developed, significant attention was devoted to the challenge of maintaining institutional support across the sectors.

Sublesson 3a: Obtaining willing involvement is easier when each institution is convinced of the importance of the overall health goal and when their responsibilities in the activity are both politically and technically important.

Project managers must be prepared with a variety of methods for identifying health problems and solving problems so that the most appropriate approach can be used to achieve the goals. In Zambia, the approach involved a series of skillfully facilitated

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workshops. The Egyptian LEAP case incorporated a variety of methods: periodic workshops were supplemented by and integrated with the formal institutional review, the environmental sampling and data analysis, and findings from individual discussions with numerous stakeholder representatives. An active working group represented the main authoritative institutions in each of the two sectors—environment and health. The Romania and Jamaica cases also involved multiple methods. In Zlatna, the provision of strongly desired technical equipment to local institutions gave project managers an opportunity, based on the interest triggered by this transfer of hardware, to focus attention on project goals. In Jamaica, the establishment of a system of animators with the involvement of key community leaders was a distinctive approach, a method helpful in maintaining understanding and commitment within the community to the overall project goal. Still other approaches were useful in one or more of the cases reviewed: using formal agreements between institutions such as Memoranda of Understanding (MOUs), building on existing collaborative links across institutions, using common data or reporting channels, and assisting each other as appropriate during implementation. Over the long term, a key to institutional collaboration is the development of trust. This last point was crucial in several cases, including Zambia, Romania, and the Egyptian LEAP, according to participants.

Sublesson 3b: In securing intersectoral collaboration, it is best to designate one institution—with appropriate jurisdiction and the required coordinating skills—in the lead role.

Designating the lead organization is perhaps the most difficult task and is best accomplished by enlisting an authority higher than the institutions involved. Sometimes, despite the advantage of having a single lead institution, intersectoral complications preclude it. In the Egyptian LEAP case, both environmental and health institutions were identified as having leading roles. For most of the specific LEAP interventions, one (or both) was designated as the lead. Even so, the plan called for establishment of an Interministerial Steering Committee to provide overall direction. That body was designed to coordinate, and lend legitimacy, among a wide group of ministries and other institutions whose participation during implementation was deemed crucial.

Sublesson 3c: Intersectoral collaboration for health outcomes can be greatly enhanced if top leaders are informed of the activity early on and are convinced of its importance.

In the Zambian and the Egyptian activities, support from important leaders opened up the intersectoral communication lines below top levels and reduced bureaucratic infighting.

Sublesson 3d: For some environmental health problems, involvement of different levels—national, regional, and/or local—of certain institutions may be the most appropriate response.

Collaborative involvement may require institutional participation between various levels as well as across sectors. In Guatemala the national health institution provided technical guidance, the local municipality implemented it, and funding was provided by

Collaborative involvement may require institutional participation between various levels as well as across sectors.

an international agency. Involvement of the last-mentioned is intended to result in expansion of the dengue control program in the Central American region.

In Zlatna, involvement of community schools, the community health authority, the regional laboratories, and the national government increases the prospects for success not only in the project area, but in other smelter communities as well.

Lesson 4: Roles and responsibilities in environmental health

Program planners must make a systematic effort to determine which institutions can most appropriately address which tasks to meet the desired health objective(s).

This lesson, derived from the full set of cases examined, also follows logically from Lesson 2—it is not possible to involve the relevant institutions unless they are first identified; and it is not possible to involve them in meaningful ways unless it is determined which institution is best qualified to handle which portion of the tasks.

In all the cases reviewed, program planners attempted to allocate tasks to the most appropriate institutions. In the Egyptian LEAP activity, EHP served as broker between organizations. In addition, collective deliberations during a series of workshops included representatives of many of the institutions to be involved in the activity. One key issue which frequently arises in environmental health activities is how to allocate responsibilities between health and environmental authorities; this question was one of the institutional issues at the core of the LEAP initiative. In that case, efforts were made to apply a division of responsibilities often seen in other countries. Fortunately, this allocation was widely accepted as appropriate in the Egyptian case. Health departments or ministries have as their most central task the area of disease prevention. The health authority may also have responsibility for delivery of health care, as is the case in Egypt. Disease surveillance and information systems are essential responsibilities for the governmental health authority. Environmental surveillance, on the other hand, is typically in the hands of the environmental authorities; this is the case in Egypt. The environmental agency is responsible for identifying high-risk environmental exposure sources and populations in any sampling efforts to be implemented jointly with health authorities; conducting monitoring, regulatory, licensing, and enforcement activities to reduce emissions and other exposure risks; and ensuring that regulatory programs reflect an integrated approach to reducing exposure hazards. In the Egyptian LEAP activity, the distinction as stated above was used explicitly and successfully to allocate primary responsibility for some interventions to the Ministry of Health and Population and its associated field health apparatus, and for others, to the Ministry of State for Environmental Affairs. Many of the specific interventions designed for that plan were feasible only by clear specification of responsibilities between these two main authorities.

In some of the cases studied, NGOs had crucial informational and brokering roles. This can be seen in efforts to deal with lead exposure problems in Zlatna, Romania, and in the sanitation program in peri-urban neighborhoods in Jamaica. In both cases, program designers determined early on that to achieve health outcomes, key NGOs needed to be involved in a carefully structured and limited way. The Zlatna NGO remained in the background and was not involved in early briefings and decision making among key stakeholders, but it did provide program planners with crucial

A key issue which frequently arises in environmental health activities is how to allocate responsibilities between health and environmental authorities.

In Jamaica, CRDC acted as a broker and was the key intermediary organization, but it refrained from entering the turf of other key institutions. The NGO was able, through a careful definition of its role, to coordinate local action without limiting or intruding on the responsibility of other organizations.

Involving the institutions should include a self-assessment of institutional responsibilities, strengths, and weaknesses.

The cases reviewed show the need to institutionalize data collection and analysis. Local data collected by local institutions are essential for local decision making.

information about the institutional terrain and the feasibility of certain options. In Jamaica, CRDC acted as a broker and was the key intermediary organization, but it refrained from entering the turf of other key institutions, such as construction work performed by local artisans and private firms under contract with homeowners or inspections of household systems conducted by the public health authorities. Given the conspicuous absence of governmental agencies in the Jamaican peri-urban communities, the NGO was able, through a careful definition of its role, to coordinate local action without limiting or intruding on the responsibility of other organizations. In environmental health efforts, which often span sectors and often lack key brokering or coordinating institutions, NGOs can play this role successfully.

The Zambian planning offers another instance in which a great deal of initiative has gone into the determination of appropriate institutional roles and responsibilities. Particularly noteworthy is that the project did not stop with general plans, but has carried this focus on allocation of roles into development of consensus on a fairly detailed implementation strategy. Analysts of development activities point out that it is on these details that projects often falter. The allocation of institutional roles in the Zambian activity is fairly complex because of the multilayered and multi-institutional nature of the issues involved. Attention to these institutional complexities bodes well for execution.

Involving the institutions should include a self-assessment of institutional responsibilities, strengths, and weaknesses. This point is illustrated by the successful efforts in the four cases discussed above. In addition, the CIMEP efforts have been marked by heavy involvement of community members. As relevant institutions have been identified in community discussions as important for specific environmental health issues, they have become engaged as well. CIMEP provides different ways of linking institutions into community-level discussions and of allocating roles among those institutions as a part of the regular dialogue.

Lesson 5: Using environmental health data

If improvements in health conditions are to be quantified (i.e., the health outcome), measurement of health status before the start of the program and subsequently is essential. These data are important not only to define the problem but also to mobilize the relevant stakeholders into action. Institutional responsibilities for recording and disseminating such measurements into the future need to be determined in the planning stage.

The cases reviewed show the need to institutionalize data collection and analysis. They also reinforce the point that local data collected by local institutions are essential for local decision making. General data do not necessarily trigger action. Policymakers, for instance, do not like to make decisions based on global data. They are tempted to say, "But my country [district, city] is different." It is important therefore to have available local, current information upon which to make decisions and design interventions.

A number of the cases show that environmental data are of great importance in identifying risk factors as well as points of effective intervention. Most environmental health problems that arise in developing countries have been seen before in other locales and have identified risk factors. Expert bodies such as the United Nations

Environmental Program, US EPA, the International Labor Organization, and the World Health Organization have already developed programs and standards that can be useful in analyzing and framing responses to new health problems, but it is important to be cautious, as conventional wisdom can be misleading.

The value of local data is well documented in the CIMEP projects. In those efforts, the keys to success have been institutionalizing responsibility in local authorities and involving local people early in the project planning to develop the database upon which to bring about change in environmental conditions. In those projects the data were drawn not solely from the usual environmental hazard assessment (at the ministry level) but included the beliefs and attitudes of people in the communities. In dealing with relatively small communities, it was important to have behavioral data, since any change in health status might not be discernible until the project was completed. (Examples of behavioral data include handwashing, latrine use, water storage, and food hygiene.) Accomplishing this objective required the intensive training of local personnel, an effort which brought the appropriate and sometimes disparate institutions into contact.

The maxim that “conventional wisdom” can indeed be misleading was demonstrated in activities around the Lead Exposure Abatement Plan in Egypt. It was widely believed that the primary lead exposure source was automobile exhaust from leaded gasoline (and to some degree from smelters), since visible air pollution was concentrated in urban areas with high numbers of motor vehicles. As a result of good data collection, flour, pottery, and cosmetics (kohl) were identified as major contributors to the lead burden. The availability of recent Egyptian-specific data helped to galvanize the institutions and assisted them in reaching consensus on interventions to reduce lead exposure.

Lesson 6: Health expertise

If serious consideration of health outcomes is expected, a significant level of health expertise must be employed from the outset.

Achieving health outcomes requires the involvement of health experts from the beginning of an activity. This expertise can take many forms including the engagement of an epidemiologist to conduct a health baseline survey, a health educator to design an educational program, or a public health expert to identify risk factors. Whatever the details of the activity, the key point is to involve experts who think like public health workers and focus on the health and welfare of the community as a whole. Often these health inputs are lacking at the start of a program because of the inability of health and environment agencies to work together effectively. Some of the cases analyzed for this review demonstrate that it is important to bridge this gap for the benefit of the public and to establish mutual understanding and respect between the two disciplines.

In Guatemala, the spread of dengue threatened to reach epidemic proportions. The local populace and local authorities believed that spraying was the best way to control the mosquito population. The project provided technical assistance that involved dengue control health workers who demonstrated to local authorities that spraying was only a temporary measure and that source reduction (elimination of breeding sites) by community and household action would be more effective in controlling the disease in the long run.

The key point is to involve experts who think like public health workers and focus on the health and welfare of the community as a whole. Often these health inputs are lacking because of the inability of health and environment agencies to work together effectively.

In Romania, health workers led by project consultants were faced with evidence of lead intoxication of children in Zlatna due to the emissions of a smelter. Those responsible for the initiative demonstrated that a major source of lead for children was the dirt in play areas as well as unwashed foods. This finding resulted in the development of an education program that emphasized handwashing and washing of all foods. The regional public health laboratory conducted blood lead surveys before and after the educational program and demonstrated that the program was effective. Although the ultimate solution will be source reduction (emission control), the environmental and health personnel were able to jointly design a program that protects the health of children and allows time for resources to be found to modernize the smelter.

In Zambia a series of workshops was conducted which brought the health and environmental forces together before embarking on a large-scale sanitation improvement program. Developing mutual trust and respect among these organizations will be very beneficial for successful implementation of the program.

The planners involved in the Jamaica activity ensured that an evaluation of health benefits was built into the community sanitation program. A community-based health attitude survey was conducted early on in the activity; its findings provided guidance for steps in implementing the project.

These examples illustrate the benefits of involving qualified health personnel early in tackling environmental health problems.

Lesson 7: Limitations of institutional infrastructure

In environmental health, the existing institutional infrastructure is extremely limited, i.e., organizations with an explicit focus on environmental health are rare, which means that intersectoral collaboration is all the more crucial if the purpose of the activity is to improve health.

The cases reviewed present a kind of “feast or famine” institutional picture for environmental health. On the one hand, a number of the cases—most especially Zambia, Romania, and Egypt in the LEAP activity—show what might appear to be institutionally rich settings. Many institutions, and quite a variety of institutional types, are relevant to the environmental health problems addressed in those activities. On the other hand, the quantity and quality of institutional infrastructure for environmental health *per se* are often extremely limited. Institutions may be weak, and their ability to coordinate among each other lacking. Many institutions offer pieces of the puzzle, but no single institution may be ideally positioned to coordinate the intersection of environmental and health efforts.

The Zlatna lead exposure case offers a good example of this point. The health agency involved was focused primarily on curative care, the environmental agency on air pollution, and the municipality (and firm) on jobs. These institutional interests are unlikely to change in the near future, and this case illustrates why intersectoral collaboration is so important. A collaborative approach, of course, was the primary strategy adopted in the case.

Similar situations prevailed in all the other cases. For example, in Egypt, both the health and environment ministries had set up “environmental health” units, but they were weak, drastically understaffed, and not used to dealing with their counterpart

The quantity and quality of institutional infrastructure for environmental health per se are often extremely limited. In addition, many institutions may offer pieces of the puzzle, but no single institution may be well positioned to coordinate the intersection of environmental and health efforts.

sector or institution. These offices had not had any contact with each other when the project commenced.

Health ministries are usually not responsible for improving environmental conditions that affect health. They are usually poorly staffed for extensive work in environmental health. Their activities are best utilized in surveillance, epidemiology, survey design and analysis, and outcome measurement. These techniques are needed by the environmental ministries to determine where their best efforts should be directed. If a health ministry has any interest in environmental health, it is typically a specialized laboratory. Environmental ministries, like those involved in the cases reviewed, are primarily focused on the “green” environment and its protection; they are mindful of creating an environmental jurisdiction that is distinctive, rather than one that might be under the primary authority of another ministry. Other institutions, such as utilities and municipalities, are usually focused on service provision, and not on achieving health outcomes.

The absence of explicit environmental health institutions has two major implications. One is the importance of institutional collaboration, illustrated in many of these cases, to address environmental health. And the second is the need to work with service-provider institutions, like utilities and municipalities, to help them focus more on environmental health. If reshaping the institutional landscape is not feasible in the short term, as is the case in most settings, a reorientation of existing key institutions is the most sensible option. That tactic was used quite specifically in several of the cases, most obviously in Zlatna (with the municipality and the educational system), throughout the LEAP activity (involvement and collaboration by governorates, utilities, NGOs, and others), and in Guatemala (through the municipality).

In the absence of a specific institution with responsibility for the environment, the infrastructure of an existing institution can be used to assume some of the responsibilities of an environmental unit. The Guatemala activity is a case in point. There the health ministry was able to assume roles and responsibilities for environmental issues, as well as its more traditional health jurisdiction, to develop a successful approach to the dengue problem.

Lesson 8: Participation for environmental health sustainability

Locally initiated environmental health efforts will be sustainable and replicable only if supported at higher levels of government.

Involving local stakeholders from the beginning, in substantial ways and with appropriate assistance to help them work together effectively, can enhance efforts to achieve health outcomes. It also is important to establish linkages between the local activities and the national level (e.g., ministries of health and environment) to obtain the needed policy support, delegation of responsibility, and financial resources. The leaders in national-level institutions can also be crucial in acquiring external technical assistance for a local effort. In countries with large populations, linkages may be more appropriate at the state or regional level than with national agencies.

Evidence suggests that institutional involvement that leads to sustainability is difficult to achieve, but it can be fostered. Institutions both within the government at

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In Romania, action to address the smelter problem in Zlatna has expanded from one community to others, due largely to the involvement of regional and national institutions.

different hierarchical levels and outside (donors) must be carefully identified. Sustainability and replicability, in the context of environmental health projects, is not just a continuing flow of cash but a continuation of interest and a sense of ownership. The lesson drawn from a review of the CIMEP efforts, in particular, is the importance of developing that sense of interest and ownership from the beginning.

In the CIMEP activities, particularly in Benin, partnerships have been developed between national and municipal leaders and between local citizenry and their governmental institutions. Through training of municipal staff at the grassroots level and informing national leaders of these activities, interest at higher levels of government has been stimulated. The Jamaica case also supports this lesson, albeit in a negative fashion. Since the Jamaican government did not step in with a source of credit after the initial (USAID) funding was exhausted, the replicability of the approach is now in doubt. Still, the Montego Bay effort offers an excellent opportunity to involve the private sector as an important institution for sustainability nationwide. Since the project served a peri-urban area that was contaminating (or threatened to contaminate) the profitable resort beaches, the successful abatement of this hazard could be presented to the country's tourism industry for support in other areas that are at similar risk.

In Zambia the approach to developing ownership started at the top with workshops involving multi-ministerial staff. Through a series of workshops, starting with elemental communications and proceeding to determination of roles and responsibilities, the various institutional representatives have developed working protocols as well as mutual respect.

In Romania, action to address the smelter problem in Zlatna has expanded from one community to others, due largely to the involvement of regional and national institutions in the planning, implementation, and evaluation of the project in Zlatna. By skillfully involving each governmental level in what it could do best (the local community developed the educational program, the regional authorities the laboratory monitoring, and the national government the role of regulation), the Zlatna activity has protected a growing number of children from lead poisoning.

The regulatory institutions in Egypt will play a major role in lead reduction. It will be through their power that the private sector brings about the changes necessary nationwide in an initiative that originally had a local (Cairo) focus. The careful institutional assessment that was part of LEAP made it possible to identify which national institutions have the authority to take appropriate measures that can lead to specific steps in lead abatement.

IMPLICATIONS FOR ACTION

5

The lessons described in Chapter 4 imply actions that USAID health and environment officers and their consultants should take in environmental health activities. Section 5.1 reviews the lessons, and Section 5.2 discusses the implications that flow from them.

5.1 Lessons Learned: In Review

Many and varied institutional changes can be made which are likely to improve health outcomes. A significant portion of these changes have to do with directly strengthening institutions. Such initiatives as improving management skills and developing management systems, charting an overall sense of direction, and restructuring an organization can be critical. These kinds of efforts have been documented and analyzed in reports from EHP's predecessor, the Water and Sanitation for Health (WASH) Project (1980-94), and the Environmental Health Project itself. This report, in contrast, looks at improving health in developing countries *where environmental health is not a well-defined sector* and where collaboration among a range of institutions is often needed. These lessons have less to do with institutional development in the conventional sense and more to do with developing understanding and collaboration among existing institutions, reorienting some institutions—such as service-delivery units—to put more attention to health, and establishing conditions in which health information and perspectives are brought to bear in a timely fashion on action.

The most essential points are summarized below.

- For environmental health efforts to be sustainable, attention must be paid to institutional issues. The most successful projects reviewed are those that not only paid explicit and early attention to the institutional contexts for correcting the health problem, but also spelled out the responsibilities and roles of the various institutions. A work plan for addressing institutional issues is as important as one for environment or health activities.
- In addition to identifying the responsible and available institutions, activity planners must find ways to make sure those institutions are involved and become vested in the process and its outcome. The best involvement is meaningful rather than token and starts at the beginning rather than coming in midcourse as an afterthought.
- Coordinating multiple institutions for environmental health programs is a most difficult task. Turf and technical jealousies, as well as inadequate understanding of each others' roles, make coordination not only difficult but very important. Generally, the institutions with the greatest stakes are those involved in environmental quality and those involved in public health; institutional barriers often hinder their collaboration. Even in more developed countries, turf jealousies persist and are difficult to overcome, so it comes as no surprise that similar

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If quantifiably improved health conditions are expected, health measurements must be taken at the baseline and as time passes.

An important aspect of environmental health programs is working with service-provider institutions to help them focus more on environmental health.

difficulties are found in developing countries. Open discussion and involvement of both major institutional structures, from the highest levels to those involved in field operations, are essential.

- In the implementation of environmental health projects, it is essential to make a systematic effort to determine which institutions are best suited to address which portions of the task to reach the desired health objective(s). An explicit data-gathering effort to map out the institutional landscape can be a key step in this process. Working out the most sensible allocation of roles and responsibilities for the initiative in question, furthermore, is best accomplished with the involvement of and discussion among stakeholders, including the relevant institutional representatives themselves.
- If quantifiably improved health conditions are expected, health measurements must be taken at the baseline and as time passes. These data are needed to define the problem as well as to mobilize the stakeholders into action. In this regard, local data collected by local institutions are essential for local decision making. Institutional arrangements for recording and disseminating such measurements in the future need to be set up in the planning stage.
- If the activity gives serious weight to health outcomes, top health experts from developing country institutions and donor institutions must be brought into the project from the outset.
- In environmental health, institutional infrastructure is usually very limited, and organizations with an explicitly environmental health focus are rare. This circumstance underscores the importance of intersectoral collaboration to improve health outcomes. And it also points out that working with service-provider institutions to help them focus more on environmental health can be an important part of the effort.
- Locally initiated environmental health efforts will be sustainable and replicable only if supported at the national level. Sustainability involves not just a continuing cash flow but a continuation of interest and sense of ownership. Projects that bypass national and regional governments are likely to remain dependent upon external assistance.

5.2 Implications

The lessons in this analysis carry implications for action for environmental health projects in the future. These have to do with some of the major themes developed, particularly:

- the importance of placing institutional issues, institutional assessment, determination and allocation of roles and responsibilities in the foreground of project planning and implementation
- the key role of health expertise and health-related information in achieving sustainable outcomes
- the central place of collaboration in environmental health efforts
- the impact of meaningful involvement among stakeholders and authorities in assessing situations, devising solutions, and allocating tasks

5.2.1 Involving Appropriate Health Expertise

The cases and lessons demonstrate the importance of health expertise, along with environmental expertise, in environmental health efforts. Greater engagement of the appropriate kinds of senior and experienced health professionals is warranted. Two issues are involved here: appropriate technical expertise and the appropriate level of seniority. The first issue is dealt with here, the second in Section 5.2.2.

The primary kinds of knowledge necessary in environmental health activities are similar to those in other kinds of health projects: technique-based rather than subject-matter based. The key techniques include epidemiology, health survey technology, surveillance, health information systems, and health promotion. These capabilities can be adapted to problems of lead poisoning as well as to malaria. Health consultants need not necessarily bring with them environmental health expertise to be effective. Indeed, it is sometimes not possible to know the precise kinds of subject-matter specialties that will be relevant at the outset of a project; viral threats can masquerade as chemical ones, and vice versa. Thus, a solid public health background is the primary requirement. Still, for future efforts, it would be useful to identify a cadre of health professionals with the requisite kinds of technical knowledge who are also interested in and familiar with environmental health issues. Doing so would expand the ability of project planners to address the kinds of environmental health challenges likely to arise in the future.

5.2.2 Involving Senior Health Professionals

The chances of continued success in achieving health outputs in the future will hinge on the involvement of senior health personnel. Engaging environmental and health institutions in achieving outcomes, and particularly stimulating collaboration across sectors, will occur only if the activity wins the support and confidence of high-level ministerial leadership, as well as leaders from other relevant institutions. The case studies reviewed for this analysis illustrate such involvement in the environmental sector and also show the positive contributions made by skilled health personnel. Even greater involvement of more senior personnel with distinguished backgrounds in public health technology and policy would be helpful, for instance, in reaching high levels of the health bureaucracy and focusing its attention on key project needs and goals. USAID might be able to identify and bring together a core group of senior health professionals who could play that role.

5.2.3 Exploring and Disseminating the Most Effective Ways to Generate Cross-Sectoral Collaboration

The cases and lessons highlight the key role of encouraging more and better cross-sectoral collaboration, particularly between environmental and health jurisdictions and viewpoints. The institutional weakness of the environmental health field itself and the barriers to collaboration underscore the issue. The cases show beyond question the importance of collaboration and offer some evidence of promising practices, but much more must be learned in this regard. A useful step would be to gather data more regularly and systematically on methods that show promise for encouraging the appropriate kinds of cooperation. EHP has employed a range of methods, including participatory approaches such as workshops, the collection of data to carefully define

In environmental health activities, the key health skills required include epidemiology, health survey technology, surveillance, health information systems, and health promotion.

For health consultants, a solid public health background is the primary requirement.

The chances of an activity's continued success in achieving health outputs in the future will hinge on the involvement and support of senior health personnel.

a problem, written agreements between organizations, and interagency committees established specifically for coordinative purposes. Project managers can be required to report explicitly on collaboration issues, to explore successful approaches reported from earlier efforts, particularly among the same or similar institutions in the same or similar national settings, and to document and disseminate a set of best practices.

5.2.4 Encouraging Cross-Sectoral Cooperation on the Donor Side

The cases and lessons emphasize the central importance of cross-sectoral collaboration. Overcoming barriers to it is likely to be one of the most important challenges to environmental health projects in the future. Any approach that makes cooperative efforts easier is likely to pay dividends. A significant and obvious implication, therefore, is that if donors and their cooperating agencies—contractors and grantees—work together cross-sectorally, that will help catalyze similar collaboration among institutions in developing countries. Recently, a number of centers within USAID have sought in a variety of ways to work together because of growing recognition of their interdependencies. The international community is also paying increasing attention to the importance of cross-sectoral collaboration. The topic should be stressed in conferences and workshops as well as in the literature to keep it in the forefront of development discussions. Environmental health is an important field and deserves public consideration and debate, given the inherently cross-sectoral and multi-institutional nature of the territory.

5.2.5 Reorienting Service Delivery Institutions toward Environmental Health

Lesson 7 in particular emphasizes the limitations in institutional infrastructure often experienced in environmental health efforts in developing countries. One point that follows, in light of the existing institutional patterns typically found in such settings, is the importance of reorienting service delivery institutions, like municipalities and utilities, to take environmental health concerns into account when planning and implementing programs. It is through such organizations that “the rubber hits the road”—e.g., the waste stream hits the populated environment. The results have consequences in health outcomes. Yet such service units are understandably preoccupied with issues of day-to-day service delivery effectiveness and efficiency, as well as budgetary challenges, and the local regulatory function is often bypassed or overlooked by national environmental authorities. Strengthening the ability of service units to incorporate health concerns into their work can be a significant way to improve health. The focus should be on developing tools, training, and creating institutional incentives. Water utilities could, for example, learn how to use existing health data in planning new projects. They could also learn how health agencies might contribute to their efforts by maximizing health benefits of water supply systems. Ministries of health that are responsible for rural sanitation and latrine programs could implement hygiene education programs to complement the construction of water supply systems to foster health improvements. Similarly, they could also provide health education and household hygiene information to promote safe water practices in urban settings.

If donors and their cooperating agencies work together cross-sectorally, that will help catalyze similar collaboration among institutions in developing countries.

5.2.6 Formalizing and Enhancing Institutional Assessments

In all the cases analyzed in this report, there is a correlation between the amount of attention paid to institutional assessments and institutional issues, on the one hand, and the likelihood of sustainable institutional focus on health outcomes, on the other. All the cases suggest useful ways to improve practice, and all illustrate the difficulties involved in generating longer-term health improvements in developing countries. But the following is clear: early, organized, and systematic attention to assessing the institutional landscape; reviewing roles and responsibilities; identifying institutional weaknesses and barriers; and assigning project-related tasks (including longer-term data-gathering and reporting responsibilities) sensibly and with the involvement of the relevant institutional stakeholders—all these elements substantially increase the chances for project success. The long-term success of environmental health projects can be enhanced to the extent that they initially include explicit data-gathering and analysis regarding the relevant institutional setting. Although institutional assessments can vary with the kind of project and the setting, these are best initiated through a systematic set of interviews with representatives of core institutions and others, as well as a review of the written resources available on institutional issues. Including such review and subsequent consideration of institutional roles and responsibilities as parts of project work plans can increase the odds for achieving better health outcomes.

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