ENVIRONMENTAL HEALTH PROJECT

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ENVIRONMENTAL HEALTH
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Bonnie Bradford

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ABOUT THE EHP PVO WORKSHOP COORDINATORS

The Environmental Health Project PVO Workshop was planned and implemented by the following people:

Helen Murphy, EHP Technical Director, Epidemiology, who served as the Activity Manager

Kathy Alison, EHP consultant, who served as team leader and workshop facilitator

Bonnie Bradford, EHP consultant, who assisted with the workshop design and prepared this report

Margo Kelly, EHP Assistant Activity Manager, who provided logistical and administrative support

A multidisciplinary advisory team, which included EHP technical staff and USAID and PVO representatives, provided advice and feedback to the workshop coordinating team during the planning process.

ACRONYMS

ARI	acute respiratory infection
CIMEP	Community Involvement in Management of Environmental Pollution
CNN	Cable News Network
DALY	disability-adjusted life year
EHA	environmental health assessment
EHP	Environmental Health Project (USAID)
EPA	United States Environmental Protection Agency
EPI	Expanded Programme on Immunization
NCIH	National Council for International Health
NGO	nongovernmental organization
ORS	oral rehydration salts
ORT	oral rehydration therapy
PVO	private voluntary organization
URC	University Research Corporation
USAID	United States Agency for International Development
WASH	Water and Sanitation for Health Project (USAID)
WID	women in development

EXECUTIVE SUMMARY

This report summarizes the proceedings of a workshop conducted on June 29, 1995, by the Environmental Health Project (funded by the U.S. Agency for International Development) for representatives of private voluntary organizations (PVOs). One of EHP's objectives is to increase the awareness of USAID missions, bureaus, and host country partners of the importance of addressing diseases related to environmental health problems. As a first step toward this objective, EHP organized the workshop described in this report, after conducting a survey to determine which PVOs are, or have the potential to become, involved in addressing environmental health issues.

EHP's overall goal for the workshop was to increase awareness of the links between health and the environment; the objectives for the workshop were to introduce the concept of environmental health within primary health care, share approaches and tools used in environmental health priority-setting, and discuss the implications for PVOs that undertake an environmental health approach in their operations. Twelve PVOs were represented at the workshop; a total of 31 people attended.

The Environmental Health Approach

The first presentation covered the environmental health approach to primary health care, which **focuses on the environmental and behavioral determinants of childhood illness to prevent morbidity**, rather than current strategies that build host resistance (e.g., vaccines) and case management once the child is ill (e.g., ORT). The new paradigm offered through environmental health is the **promotion of wellness by blocking the production, transmission, and exposure** of specific agents that contribute to childhood illness. The interventions that address these points along the disease pathway were discussed, with examples of their impacts on diarrheal disease, malaria, and acute respiratory infections. The presentation suggested that adding environmental health interventions to current child survival strategies is a means to not only **diminish the burden of continuing health care costs** but also to provide **more sustainable advances in reducing child mortality**. The urban poor were identified as those in greatest need of environmental health interventions, because they are the fastest growing group with the least access to services in the developing world. The presentation included documentation of population shifts to inner cities and of the disparities between the health status of the urban poor and the middle/upper class in developing country cities.

Community Involvement in the Management of Environmental Pollution

Community Involvement in the Management of Environmental Pollution (CIMEP), a community-based process, was presented as a tool to implement the environmental health approach to child survival. CIMEP brings together representatives of governments, PVOs, and communities in a **partnership** to address the environmental conditions that lead to ill health. CIMEP formally recognizes the critical importance of women to environmental management in terms of their technical, economic, and behavioral roles. The CIMEP steps were presented: 1) collectively **identifying environmental health problems**; 2) identifying **community-based institutions** (particularly those involving women) concerned with environmental health; 3) identifying **microprojects** that correspond to sociological and environmental conditions; 4) developing the technical skills of municipality staff; and 5) facilitating **constructive dialogue** among municipal technical staff, government staff, PVOs, and communities. The presentation included examples from the CIMEP activity in

Tunisia to show how the process can operate in peri-urban settings.

Environmental Health Assessment

This presentation introduced environmental health assessment (EHA) as a methodology to **identify and rank environmental health problems**. Other tools that estimate environmental risks (health risk assessment, comparative risk assessment) are defined and described as the building blocks of EHA. EHA uses three types of data to rank environmental health problems: **exposure data** for dose-response figures to estimate projected cases of disease (related to chemical exposures), **epidemiologic** (actual disease impact) **data** (for infectious and tropical diseases), and qualitative **ethnographic community-based data** (to characterize environmental conditions and the impacts of disease). This broader approach is necessary because most cities in developing countries are faced with **both infectious** (pre-transitional) and **noninfectious diseases** (post-transitional) as they rapidly industrialize. The urban poor are more commonly burdened with both types of health risks, yet they are often hidden statistically by their better-off urban counterparts. Other subpopulations, such as women, children, or ethnic minorities, can also be hidden, vulnerable groups. Qualitative data on these populations is used to characterize their exposures and health status, providing a more specific profile of their environmental health risks.

Implications of an Environmental Health Approach for PVOs

The final session offered the workshop participants the opportunity to think about and discuss **how an environmental health approach** would **impact the institutional structures** of the PVOs they represented. Participants were asked to consider the following issues: 1) the types of **staff skills** and experience required to implement an environmental health approach; 2) the types of **training existing staff** would need; 3) changes that would need to be made to the **organizational structure**; 4) how to **broaden the funding base** to support a focus on environmental health; and 5) the **new partners** PVOs would be working with in developing countries on environmental health issues. The report summarizes the participants' responses and their recommendations for next steps.

1 INTRODUCTION

Background

Environmental and health programs are often implemented at the community level by private voluntary organizations (PVOs) who receive funding from the United States Agency for International Development (USAID). Therefore, it is important that both PVOs and USAID understand the impacts the environment has on health as well as the critical links between health and environmental degradation and pollution. This is especially true in peri-urban areas, where population growth is rapidly increasing worldwide.

The Environmental Health Project (EHP) is a USAID-financed project being implemented by a consortium of firms led by Camp Dresser and McKee International Inc. One of EHP's objectives is to increase the awareness of USAID missions, bureaus, and host country partners of the importance of addressing diseases related to environmental health problems. Three of the highest priority diseases with environmental links are acute respiratory infections (ARIs), diarrheal diseases, and malaria.

Findings from the 1994 PVO Survey

One of EHP's first activities was to conduct a survey to determine which PVOs are, or have the potential to become, involved in environmental health, either from a health or an environmental perspective. The survey revealed that the efforts of many PVOs are sector-specific and are driven by either agency mandate or regional need. While more than 50% of the PVOs classified as either "environmental" or "humanitarian" were working in one or more environmental health subsectors, very few emphasized an integrated approach with a systematic evaluation of environmental conditions and the relationship of these conditions to health. In addition, organizations that did include "health" as one of their mandates did not necessarily link their activities to the environmental conditions which create health problems.

To have a real and sustained impact on health, programs need to go beyond alleviating symptoms or providing curative care. Resources and attention need to be directed toward addressing the underlying behavioral and environmental conditions that result in poor health. To do this will require shifting the paradigm toward primary prevention through environmental management, based on what communities themselves identify as environmental hazards. The new paradigm must include recognition of the linkages between rapid urbanization and poor health.

Workshop Rationale

As a first step toward its objective of increasing awareness of the linkages between the environment and health, EHP organized a workshop with representatives of the PVO community, based on the interests and needs expressed by PVOs. In undertaking this activity, EHP's major goals were: 1) to learn from PVOs about their experiences in environmental health and the lessons they have learned; 2) to share EHP's experiences in environmental health with PVOs and introduce two new approaches EHP is developing: community environmental management and comparative risk assessment; and 3) to help PVOs identify appropriate next steps to work more effectively in environmental health.

The Needs Assessment

The workshop coordination team conducted a needs assessment in early 1995 to determine whether PVOs would be interested in participating in an environmental health workshop and, if so, which topics they would want to have included. From the 57 organizations with potential involvement in environmental health activities identified in the 1994 survey, a sample of 21 PVOs were selected according to major interest areas, so that the needs assessment would cover the widest possible range of responses.

Based on the results of the needs assessment, the coordination team designed a one-day workshop that was held June 29, immediately following the three-day 1995 Annual National Council for International Health (NCIH) Conference and at the same site, so PVOs attending the NCIH Conference could stay on to attend the EHP workshop. The workshop was held at the Hyatt Regency Crystal City in Arlington, Virginia.

Workshop Goal and Objectives

EHP's overall goal for the workshop itself was to increase awareness of the links between health and the environment and of the role PVOs can play in reducing environmental health problems.

The three objectives for the workshop were as follows:

1. To introduce the concept of environmental health, including the relationship between health and the environment

2. To introduce key environmental health approaches and tools that can be used for priority setting

3. To discuss implications of an environmental health approach for PVOs

The workshop agenda is provided in Appendix A.

Workshop Participants

In addition to USAID, the World Bank, and the Johns Hopkins School of Public Health, twelve PVOs and USAID-funded projects were represented at the workshop, including:

- Africare
- Alliance to End Childhood Lead Poisoning
- BASICS
- CARE
- Global Environmental Research and Training Institute
- Global Tomorrow Coalition
- GreenCOM, Information Exchange Center
- Institute of World Affairs
- Institute of World Affairs, Environmental Health Project
- International Eye Foundation
- Program for Appropriate Technology in Health (PATH)
- World Vision Relief and Development

The names and addresses of the workshop participants are provided in Appendix B. Appendix C contains the results of the participants' evaluation of the workshop.

Purpose of This Report

This workshop report provides summaries of the presentations and captures highlights from the discussions, question and answer periods, group work, and participant evaluations. It is being distributed to each of the workshop participants and to PVOs who expressed interest in the workshop but were not able to attend. A list of publications available from EHP on topics discussed at the workshop is provided in Appendix D.

2 WORKSHOP PRESENTATIONS

2.1 Official Welcome

David Oot, Director, Office of Health and Nutrition, Bureau for Global Programs, Field Support and Research, USAID

I would like to welcome each of you to this environmental health workshop for PVOs, which has been organized by the Environmental Health Project. Over the years, USAID has funded many environmental projects and many health projects. It became clear to us that there was a need to link many of these activities. The creation of the Environmental Health Project, which began in 1994, came about in this context.

EHP represents an effort to focus on more sustainable improvements in health by addressing the underlying environmental causes of illness. The project is also trying to address some of the specific problems related to global urbanization, which increasingly is a critical issue for many of us working in developing countries. We have enormous problems and issues to deal with in the urban context. We all know the extreme and difficult conditions under which people in peri-urban areas live.

USAID has recently gone through a strategic planning process in which we identified a number of strategic objectives. One of these objectives is protecting human health. The Environmental Health Project is one vehicle for trying to address that particular strategic objective.

EHP is focusing its expertise on three major diseases related to environmental health conditions: 1) acute respiratory infections, 2) diarrheal diseases, and 3) malaria. EHP offers technical assistance, expertise, and support to countries around the world in a wide range of health areas and issues. These include the following:

- tropical disease control
- water supply and sanitation
- solid waste
- wastewater
- food hygiene
- air pollution
- toxic and hazardous waste
- occupational health
- injury prevention

One of the main reasons we are here today is to try to improve linkages and communications with the PVO community on issues related to environmental health. It is our hope that, through the presentations and discussions that take place today, we will gain a better understanding of what you are doing, what your interests and needs are, and how we can collaborate with you in the future.

While I think we all realize the critical importance of addressing the underlying causes of morbidity and mortality in order to improve health, it is absolutely essential that we identify approaches for addressing these issues that are both technically feasible and affordable. This is particularly true for USAID, because as we enter into an era of increasingly shrinking resources, it becomes even more important for us to find ways to accomplish these objectives as efficiently as possible.

Together we can make a special contribution working in partnership to develop and test approaches in the field. As PVOs, you have the grassroots presence necessary for

service delivery, and EHP has access to a wide variety of technical expertise. So it is possible that together we could work on developing and testing approaches and technologies which, among other things, could help shape policies and programs in countries as well as help leverage larger contributions from organizations like the World Bank or the Asian Development Bank. I see a real potential for this kind of partnership. I look forward to a productive day with you.

2.2 The Concept of Environmental Health

John Tomaro, Chief, Environmental Health Division, Office of Health and Nutrition, Bureau for Global Programs, Field Support and Research, USAID

I am very pleased to see that some PVOs here today represent a health focus, and others represent an environmental focus. This morning I am going to present a conceptual framework that I hope will: 1) clarify some of the important linkages between health and the environment; 2) point out a number of implications that these linkages have for the type of work you are doing; and 3) help lead into the rest of today's activities.

I will start by talking about the definition of environmental health. Then I want to suggest why, as we approach the twenty-first century, it is essential that we focus on environmental health, particularly the approach that I will outline. Next, I will talk about the primary locus for environmental health activities, which will be cities, particularly peri-urban settlements, where most of the urban poor live.

I will also talk about environmental health interventions, giving special emphasis to issues of efficacy, cost-effectiveness, sustainability, and overall impact. Unlike those of us who sit in Washington and fund a good bit of what you do, you as PVOs work directly at the community level. This provides you with an opportunity to change the paradigm and to improve conditions where you are working. Later this morning, I invite you to learn about two new approaches or tools for assessing the health risks posed by the environment.

Definition of Environmental Health

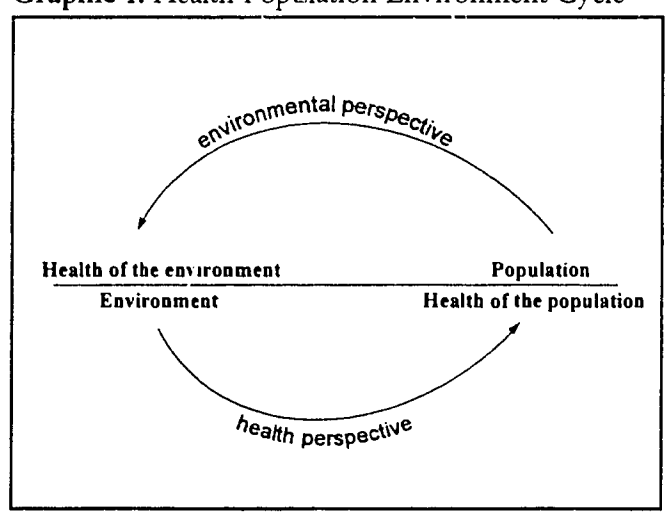
The Environmental Health Project uses the following definition of environmental health:

> *Environmental health is a branch of public health devoted to preventing illness through managing the environment and changing people's behavior to reduce exposure to biological and nonbiological agents of disease and injury.*

The Environmental Health Perspective

As seen in Graphic 1, there are two different perspectives to the interactions between health, population, and the environment. In simple terms, an environmental perspective is concerned primarily with the effects of people on the health of the environment. A health perspective is concerned primarily with the effects of the environment on the health of people. Environmental health is most

Graphic 1. Health-Population-Environment Cycle



concerned with examining the environment in terms of the agents, pollutants, and other factors that have an effect on human health.

Pre- and Post-transition Societies

In developing an environmental health approach, we need to consider the similarities and differences in the conditions of pre-transition and post-transition societies. Pre-transition societies are still dealing with diseases such as acute respiratory infections, diarrheal diseases, and vector-borne diseases such as malaria.

In contrast, post-transition societies such as the New Independent States (NIS) are dealing with diseases related to the process of industrialization. In post-transition societies, nuclear issues, such as those in the Ukraine, and toxic and hazardous pollutants, such as those in the Aral Sea that are affecting the Central Asian Republics, have tremendous impacts on human health.

Other health issues, such as lead poisoning, affect people in both pre-and post-transition societies, especially those living in peri-urban areas.

The Environmental Health Approach: Prevention

The primary concern of environmental health is the prevention of illness. Prevention is far more cost-effective than curative approaches. Environmental health focuses on preventing illness by managing the environment and by changing behaviors. To reduce human exposure to agents of disease and injury, both environmental management and behavior change are needed.

As illustrated in Graphic 2, wellness depends on successfully blocking the production, transmission, and exposure of specific agents that contribute to illness. To determine where to intervene, we need to examine the pathways to maintaining wellness and preventing illness.

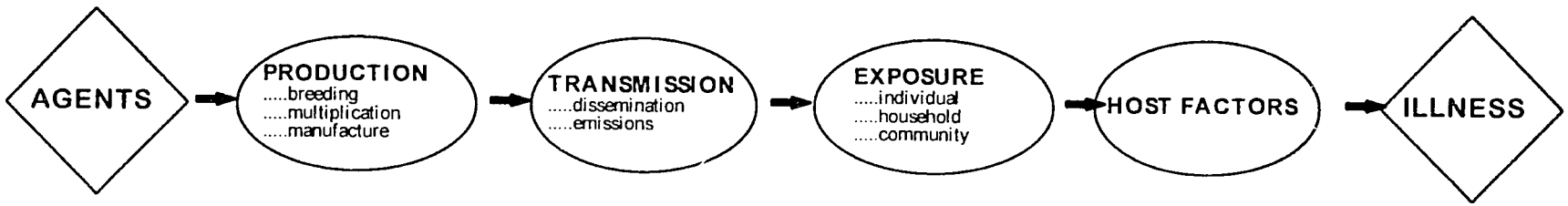
Traditional, facility-based prevention programs, especially child survival programs, focus on building up or reinforcing the resistance of the individual, or host. For example, a vaccination program is a preventive intervention that focuses on building up the host's immunity to attack by specific agents in the environment.

The traditional child survival approach has focused on strategies such as immunization, promoting good nutrition and breastfeeding, and measures to prevent low birth weight. All of these interventions target the individual and essentially ask the question: What can we do to enhance the individual's ability to resist assault by agents in the environment? The approach taken by traditional prevention programs is shown on the right of the vertical line drawn in Graphic 2.

Environmental health addresses the determinants, or causes, of ill health, as shown on the left side of the vertical line in Graphic 2. The environmental health approach is to prevent the environmental agent from attacking the individual by focusing interventions at three distinct points: production (destroying mosquito breeding sites); transmission (use of more efficient stoves); and exposure (using bed nets to keep off mosquitoes).

Graphic 2

PATHWAY TO MAINTAINING WELLNESS (PREVENTING ILLNESS)



AGENTS	PRODUCTION	TRANSMISSION	EXPOSURE	HOST FACTORS	ILLNESS
BIOLOGICAL * bacterial * viral * protozoal * nematodal	* protect amplification of contaminants in food * excreta treatment	* protection of water * handwashing * corraling of animals * excreta containment	* food hygiene: time/temp * water handling/purification * shoes (certain helminths)	* immunization * nutrition * breastfeeding * low birth weight prevention	DIARRHEA
protozoal	* larvicides * residual spraying * reduce breeding sites - drainage -filling * land use/planning	* vector diversion * surveillance/early treatment	* housing (screens) * personal protection -bednets -protective clothing -repellents	* chemoprophylaxis * immunization * nutrition * breastfeeding * low birth weight prevention	MALARIA
NON-BIOLOGICAL air particulates carbon monoxide	* fuel substitution	* efficient stoves	* ventilation	* immunization * nutrition * breastfeeding * low birth weight prevention	ARI

Source: H. Murphy

Why Focus on Environmental Health?

Investments in child survival over the last two to three decades have significantly reduced mortality and morbidity. Worldwide, from 1970 to about 1990, a significant increase in immunization coverage rates was accompanied by a dramatic drop in child mortality.[1]

However, while immunization and other interventions that build up the individual's resistance to environmental agents have been quite effective in terms of reducing mortality and morbidity, without additional investments it will be very difficult to reduce mortality much further, and it will take even more resources to sustain the impact of these interventions.

For example, UNICEF emphasized the importance of achieving 80% coverage rates with the six available EPI antigens by 1990. Tremendous resources were directed to achieve that coverage target: approximately US$17 million was spent in both 1988 and 1989 to achieve 30% coverage in Nigeria. Then, in 1991 and 1992, support for EPI went from US$17 million down to US$3 million, and coverage rates dropped from about 80% to about 25%, with resulting increases in child deaths.

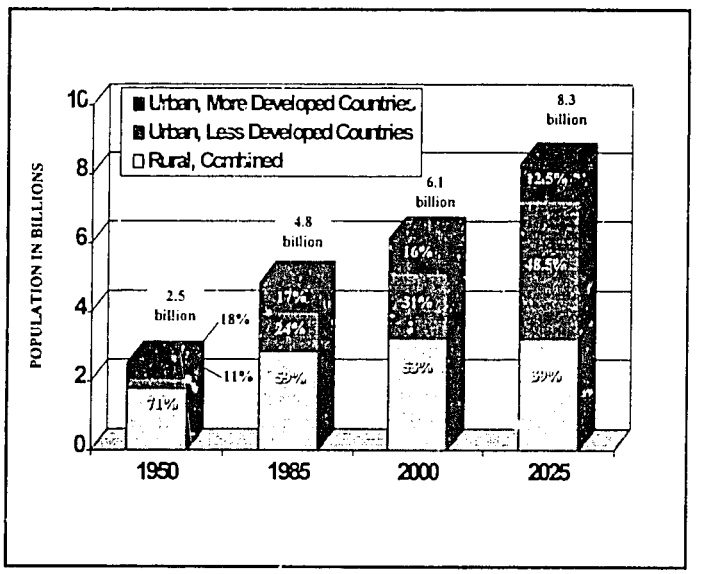
Donors and governments are questioning the value of supporting these kinds of facility-based, commodity-intensive health programs, not because of their results, but because they are seen as too expensive and unsustainable. In today's climate of shrinking financial resources, it is unlikely that these kinds of programs will continue to receive the same amount of funding, and even less likely that they will receive more, despite the importance of reducing mortality. And as long as fertility rates and population growth remain high, ever greater numbers of people will be putting pressure on social service systems, including health care, education, and housing, especially in developing world cities.

Worldwide Population and Urbanization Trends

According to UN projections, the world's population in 2025 will be four times what it was in 1950. As shown in Graphic 3, the population will have gone from about 2.5 billion people in 1950 to about 8.3 billion in 2025. In 1950, 11 percent of the world's population lived in developing world cities. By 2025, nearly 50 percent of the world's population will live in developing world cities. That means that 2.3 billion more people will be living in developing world cities in 2025 than live in them today.

Traditionally, USAID has focused on the rural poor. But now the most dramatic problems are occurring in urban areas.

Graphic 3. World Population, 1950-2025



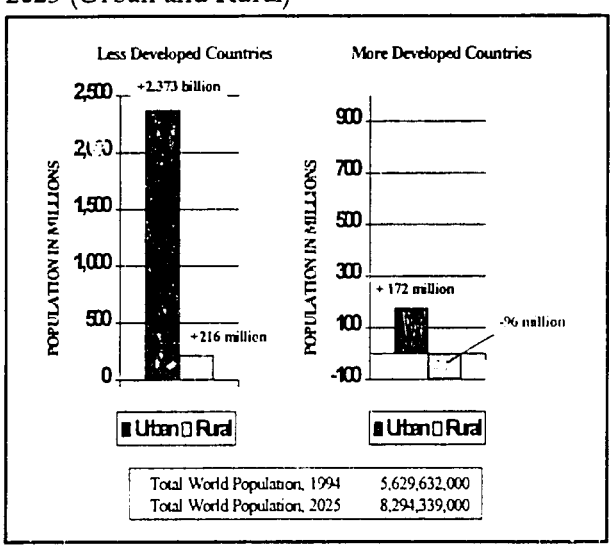
[1] Between 1960 and 1991, the under-5 mortality rate in the world's least developed countries fell from 286 per 1,000 to 180 per 1,000, and in developing countries from 217 per 1,000 to 101 per 1,000. Between 1981 and 1991, immunization coverage for children under one year in all developing countries rose from 18% to 77% (UNICEF 1993).

Graphic 4 illustrates that from now until 2025, population growth in rural areas in less developed countries will be a small fraction of total growth, and that there will in fact be negative growth in rural areas of more developed countries.

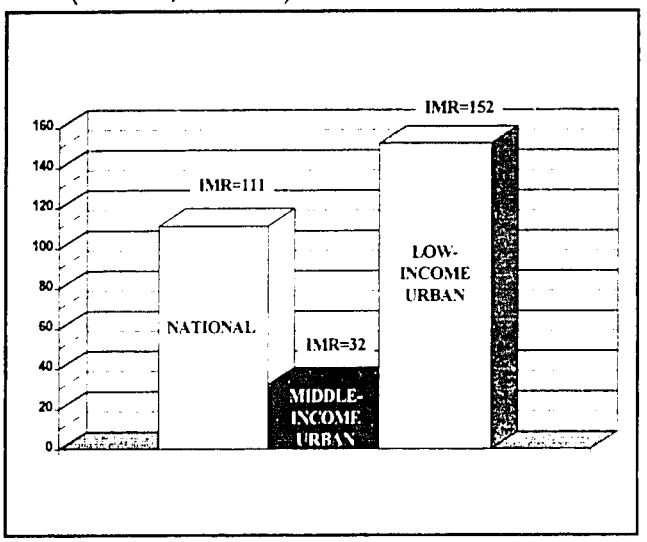
By the year 2000, 17 of the 20 most populated cities in the world will be in developing countries. In 1950, only 2 cities in the world had populations over 8 million—New York and London. In the year 2000, 17 cities will have more than 8 million people. A high proportion of this rapidly increasing urban population will live in peri-urban areas where services are inadequate or nonexistent.

To get an idea of the difference in environmental and health conditions between low-income urban areas and middle-income urban areas, we can look at the infant mortality rate in Karachi, Pakistan. The national infant mortality rate, or IMR, as shown in Graphic 5, is 111. However, when we look specifically at urban areas, the IMR in low-income urban areas is 152, compared with 32 in middle-income urban areas. While we don't have a figure on rural IMR, we can expect to find a higher IMR in peri-urban areas than in rural areas. Bear in mind that low-income peri-urban dwellers are the group that is growing the most rapidly worldwide.

Graphic 4. Projected Population Gains, 1994-2025 (Urban and Rural)



Graphic 5. Urban Versus National Infant Mortality Rate (Karachi, Pakistan)



Disease Burdens Linked with Environmental Conditions

The burden of disease attributable to environmental conditions is illustrated in Graphic 6, which shows the top 20 diseases in developing countries in 1990, based on work done by Dean Jamison and his colleagues at the World Bank (World Bank 1993). These 20 diseases cause the highest number of DALYs, or disability-adjusted life years, an economic measure of loss due to illness, injury, or premature death. The top three diseases for all groups—respiratory infections, diarrheal diseases, and unintentional injuries—are related to environmental factors. Nearly all the top ten diseases are linked to environmental conditions. In terms of child mortality, as shown in Graphic 7, the top three causes—acute respiratory infections, diarrheal diseases, and malaria—account for over 50% of child deaths worldwide. All three of these diseases are linked to environmental conditions.

Graphic 6. Top 20 Diseases in Developing Countries by DALYs Lost Annually (in hundreds of thousands)

Disease (ranked)	DALYs	Related to EH
1 Respiratory infections	1118 8	✓✓
2 Diarrheal disease	986 6	✓✓
3 Unintentional injuries	982 4	✓✓
4 Perinatal	962 3	
5 Malignant neoplasms	529 3	✓
6 Tuberculosis	459 3	✓
7 Respiratory diseases (COPD & asthma)	413 4	✓✓
8 Congenital abnormalities	369 1	✓
9 Malaria	357 3	✓✓
10 Measles	341 0	
11 Cerebrovascular	330 8	
12 HIV	284 6	
13 Ischemic heart disease	251 3	
14 STD (not including HIV)	190 0	
15 Helminths	179 7	✓✓
16 Peri-, endo-, myocarditis & cardiomyopathy	163 7	
17 Depressive	157 6	
18 Pelvic inflammatory	108 7	
19 Maternal sepsis	98 7	
20 Alcoholism	86 2	

✓✓ = environment-related ✓ = partially environment-related

DALY = disability-adjusted life year is a measure that combines healthy life years lost due to disability or premature death

We need to consider how best to intervene. Within the environmental health framework, what can we do to prevent the production, transmission, and exposure of agents in the environment? Graphics 8, 9, and 10 provide illustrations of what can be done in terms of diarrheal diseases, malaria, and acute respiratory infections.

As we think about where to intervene along the pathway to maintaining wellness, we have to think in cost-effective and sustainable terms. We need to focus on community involvement and participation because no one has the resources to be able to install water and waste disposal systems in every peri-urban area around the world. And all of us have seen examples in which governments invested in building infrastructure that is no longer functioning. To diminish this lack of sustainability, we must work as partners with the people living in communities in implementing projects and making investments.

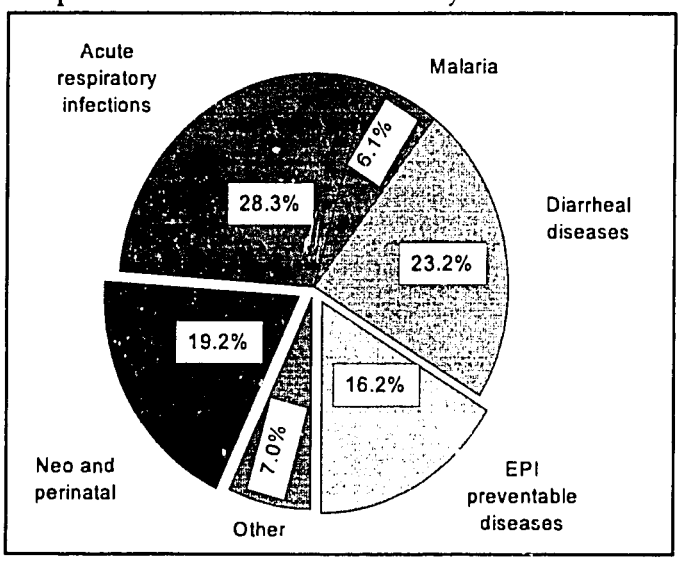
Indoor Air Pollution and ARIs

When we look at studies of acute respiratory infections in peri-urban areas, we can clearly see a gender phenomenon in terms of exposure to indoor air pollution. As shown in Graphic 11, one-half of the world's population uses biomass fuels such as wood, agricultural products, and animal dung for cooking. Indoor air particulate levels in developing countries are generally about 20 times higher than in developed countries, due in large part to the use of inefficient stoves along with inadequate ventilation. Women and young children, especially girls, who tend to spend the most time in the home, are the most severely affected by indoor air pollution. Those who cook over smokey stoves, most often women and their daughters, are affected most severely of all. Therefore, a very important intervention to reduce acute respiratory infections, especially among women and girls, is to improve cookstoves.

Environmental Health and Diarrheal Disease Burden

What do we know about the efficacy and effectiveness of environmental health interventions in terms of diarrheal diseases? An extensive review of studies, illustrated in Graphic 12, shows that the maximum impact, 35 to 50%, in terms of reducing morbidity due to diarrheal disease, results from combining

Graphic 7. Causes of Child Mortality



Graphic 8
Prevention of Diarrhea

AGENTS →	PRODUCTION →	TRANSMISSION →	EXPOSURE →	HOST FACTORS →	ILLNESS
BIOLOGICAL * bacterial * viral * protozoal * nematodal	* protect amplification of contaminants in food * excreta disposal	* protection of water * handwashing * corraling of animals * excreta containment	* food hygiene: time/temp * water handling/ purification * shoes	* immunization * nutrition * breast-feeding * low birth weight prevention	Diarrhea

Graphic 9
Prevention of Malaria

AGENTS →	PRODUCTION →	TRANSMISSION →	EXPOSURE →	HOST FACTORS →	ILLNESS
BIOLOGICAL * protozoal	* larvicides * residual spraying * reduce breeding sites ✓ drainage ✓ filling * land use/ planning	* vector diversion * surveillance/early treatment	* housing (screens) * personal protection ✓ bednets ✓ protective clothing ✓ repellents	* chemoprophylaxis * immunization * nutrition * breast-feeding * low birth weight prevention	Malaria

Graphic 10
Prevention of Acute Respiratory Infections

AGENTS →	PRODUCTION →	TRANSMISSION →	EXPOSURE →	HOST FACTORS →	ILLNESS
NON-BIOLOGICAL * air particulates * carbon monoxide	* fuel substitution	* efficient stoves	* ventilation	* immunization * nutrition * breast-feeding * low birth weight prevention	ARI

Graphic 11. Environmental Health Links for 3 Major Causes of Death in Children

DISEASE	POPULATION AT RISK	DEATHS	INCIDENCE	DALYs
ARI	• 1/2 of world's households use biomass fuels with inefficient stoves and inadequate ventilation	4.3 million	15 billion	122.7 million
DIARRHEA	• 1/3 of world without adequate sanitation • 1 billion without potable water	2.8 million	28 billion	99.1 million
MALARIA	• 2.3 billion people at risk (42% of world's population) • 1.8 billion people in unstable, reemerging, deteriorating conditions • 500 million people in unchanged endemic areas lacking resources	1 million	300-500 million	35.7 million

DALY = Disability adjusted life year is a measure that combines healthy life years lost due to disability or premature death

water quality, water quantity, hygiene, and sanitation. An integrated approach that includes behavior change and partnerships with people in communities will have the most significant and sustained impact.

Effective Interventions to Reduce Exposure to Malaria

Environmental health interventions can dramatically reduce exposure to and therefore the incidence of malaria, especially when communities are partners in these efforts. Under certain conditions, drainage, larvicides, and bednets have been found to be effective.

- **Drainage.** Malaria incidence in communities in Nepal decreased by 35% over one year as a result of clearing vegetation from ponds, draining and filling depressions, and clearing and repairing irrigation canals. These communities experienced 50% fewer malaria cases than did communities without these interventions during the same season (Ault 1994).

- **Larvicides.** A case study in Paji City, Goa, India, successfully used weekly applications of a biolarvicide in the habitats of mosquito larvae. Slide positivity rates for malaria were reduced between 69 and 84% compared with slide positivity rates in the control area (Kumar et al. 1994).

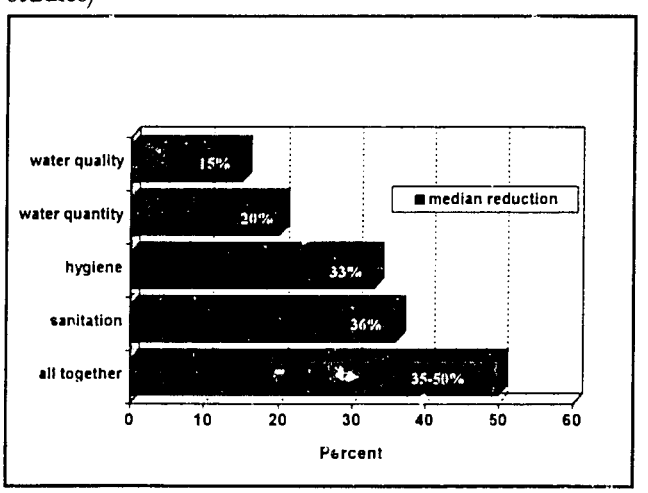
- **Bednets.** The use of bednets impregnated with insecticides has led to reductions in the incidence of malaria ranging from 30% in Kenya to 63% in The Gambia (Lines, n.d.).

The Importance of PVOs in Environmental Health Activities

Because current individual, national, and donor resources are inadequate for providing traditional facility-based approaches to prevention and treatment, I am suggesting that we have to look to community-based approaches that are designed to reduce the incidence of disease and premature death by preventing diseases from occurring. We need to look at how to reduce the burden of diseases in households, communities, and in the health care system. Among our partners in this effort are PVOs.

As PVOs, you do much of your work at the community level, directly with households. And these days, more PVOs are beginning to work with the peri-urban poor. PVOs are in the best position to promote environmental

Graphic 12. Median Reduction in Diarrheal Disease Morbidity from Interventions (based on review of studies)



health interventions, and can help provide the information needed to support effective interventions. By working at the community level and by working in partnerships with communities, PVOs can affect the design and implementation of environmental health interventions. PVOs clearly can have an effect on influencing policy decisions that prevent illness in the communities where they work. In many respects, their influence on policy decisions is as important as the interventions themselves.

Assessing Problems and Determining Priorities

As we face the future, the challenges are deciding where to focus our attention, how to choose which problems to tackle with our counterparts at the community level, and how to begin.

Those PVOs currently working on health programs are trying to address simultaneously the problems of infectious diseases and health problems associated with industrialization. How do you decide which problem has the highest priority? Which solutions are most cost-effective? Which diseases contribute most to the burden of illness and death within the society? How is each ranked?

The following two presentations will introduce two methodologies that can be used to set priorities and to answer some of these basic questions. We want feedback from you. Are these methods relevant to your organizations? Do they have immediate applicability in terms of helping you address the problems that you face? Can these methods be transferred to your counterparts? If so, how do they need to be modified?

You will also have an opportunity later in the day to consider how adopting these approaches and tools, if they are relevant for your organization, would alter the way your organization operates. What would you have to change? How would you have to change to improve the impact and sustainability of your activities? We look forward to your participation in this workshop, and to continued contact with you in the future.

2.3 Key Points from the Discussion Period following the Opening Presentations

Funding, Project Proposals, and Donors

- PVOs expressed concern that they are unable to obtain funds from USAID for environmental health interventions such as water and sanitation. They consider this to be a major funding and organizational issue that needs to be resolved within USAID. Could the definition of child survival be broadened to include water and sanitation, for example?

- PVOs said that in preparing proposals for environmental health interventions, they need more data on the cost-effectiveness and efficacy of environmental health interventions to help convince many donors of the importance of these kinds of programs.

- PVOs noted that donors typically want specific information about the interventions to be carried out with the funds requested. If communities are to play a major role in deciding which interventions to use, then ways need to be found to build this into the project design and proposal preparation processes, and donors need to change their approach. A number of examples were given of how USAID, the World Bank, and other donors are trying to develop more innovative programming and funding mechanisms, and that these are becoming more popular. For example, increasing numbers of donors have programs in which

they provide large grants to NGOs or NGO umbrella groups, who in turn administer small-grants programs for a variety of local NGOs.

Cost-Effectiveness and Demand

- Should PVOs start at the policy level, assuming that policy change will filter down to the community, or start at the community level, build up experience and examples, and have those evolve into policy? The World Bank is moving into responding according to demand, linking lending to issues such as: What do communities want? What does the country want?

- In looking at cost issues in terms of who pays for what and actual demand, many water and sanitation programs have been quite successful. For example, five years after CARE's involvement in Bolivia ended, water supply and sanitation programs were operating and producing benefits to communities. Services that communities want, such as more efficient stoves and better access to water, are important health interventions that can have many other benefits as well.

- PVOs noted that water and sanitation interventions need not be viewed as "too expensive." They are not always infrastructure-based, and are not always expensive. Walsh and Warren (1979) compared interventions like use of ORS packets to building water systems. We need to go beyond the simple analysis they carried out over fifteen years ago. The framework they developed is only a small part of what needs to be considered. USAID should conduct studies to look closely at the underlying assumptions and analysis used in that model.

- If we want children not only to survive, but to thrive, we need to do something about the problem of repeated illnesses. For example: How many children are saved by ORS who in turn become ill again because nothing has been done to correct the environmental conditions, such as not having enough potable water, that caused them to have diarrhea in the first place, and that keeps causing them to have episodes of diarrheal disease?

Prioritizing Needs

- Many communities identify lack of adequate water as their most important problem and want to work on this first, and often this is clearly the place to begin. However, hygiene issues, behavior changes, and disposing of the additional wastewater also need to be considered so that new problems are not created.

- When people in communities are asked what they want to improve, health concerns will not be first on the list. Water may appear first, but water is usually seen as beneficial in terms of increased productivity or for irrigation rather than to improve health. Often what communities want first relates to generating more income, such as increasing agricultural yields. Once communities have increased productivity, the next inputs desired often relate to infrastructure improvements so they can get their products to market. It is often not until after these concerns are addressed that health issues move to the forefront, problems such as why so many children die or why women are not healthy. Prioritizing is also a gender issue, because it is usually the men who present the main problems and proposed solutions to outsiders. If you ask women, the ordering of priorities is likely to be different.

- It is not possible to have a formula to determine what priority areas should come first, second, or third. One of the major questions to ask is: How do we build

partnerships that will lead to defining problems, deciding which ones to work on, and how to implement strategies to solve them? Without active partnerships, you will end up with a pump, a health clinic, or a road that is never used.

Other Issues: Nutrition, Priority-Setting, Community-Level Interventions

- Nutrition is an important factor related to environmental health, for example, a strong case can be made that perinatal deaths are related to environmental health. In some countries iodine deficiency is likely to be a leading cause of perinatal death, and iodine deficiency is clearly, among other things, an environmental problem. Iodine is found in the soil, but can be leached out when the watershed upstream is altered. While the problem can be solved by putting iodine in foods, such as salt, it would be better not to leach it out of the soil in the first place.

- There is a paradigm shift when we begin working in environmental health. It is not just a matter of combining water, sanitation, and wastewater and then adding other services. If you are supply-driven, then you say: "We offer water. Do you want it? Yes or no." That is one approach and is often the way water and sanitation services have developed. But in an environmental health approach the paradigm shifts to "If you have nine choices, how do you go about deciding which is the first one?" And this is a fundamentally different approach.

- For sustained achievements in health, it is essential to build partnerships with communities and to focus on interventions that really work at the community level. It is much more likely that people using their own resources, complemented by outside resources, will be able to sustain the interventions and levels of achievement.

2.4 Panel Presentation on Community Involvement in Management of Environmental Pollution (CIMEP)

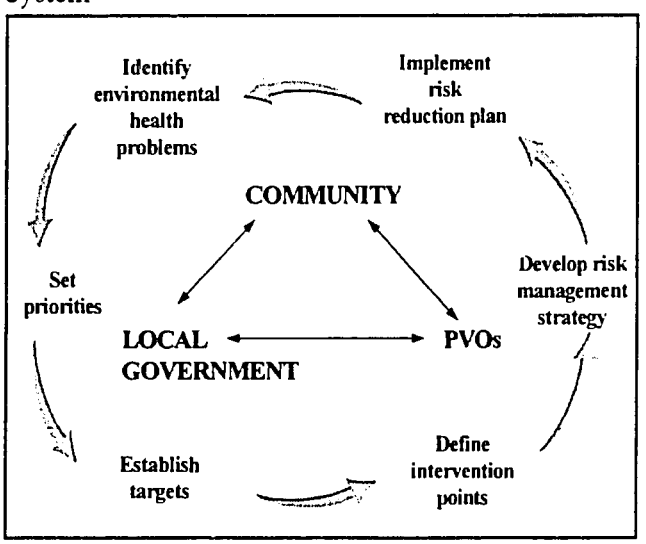
Rosalie Huisinga Norem, Project Manager, Office of Women in Development, Bureau for Global Programs, Field Support and Research, USAID

Before describing the CIMEP approach, I would like to suggest we look at a systems perspective, outlined in Graphic 13, as a useful way to consider interventions on the prevention/risk reduction side of environmental health problems. The steps in this systems perspective include identifying environmental health problems, setting priorities, establishing targets, defining intervention points, developing risk management strategies, and implementing a risk reduction plan.

Potential Linkages among Municipalities, Communities, and PVOs

Clearly, elements of policy and behavior are involved in this process. Therefore it becomes critical to look at partnerships among communities, governments, and PVOs, and to

Graphic 13. Environmental Health Intervention System



think about the specific kinds of roles PVOs can play.

John Tomaro spoke earlier about the policy process, and someone raised the question of whether you should start from the top down or from the bottom up. If the process is working well and responding to the needs of the community then it should be working in both directions. There are initiatives that need to come from the community, and policies that need to be set at the local, regional, and national government levels. Certainly the donor community has a role in this entire process. So a dialogue is needed, as well as an opportunity for communication among the various partners. For that dialogue to be successful, certain functions and processes have to be in place. This is where PVOs have an important role to play: helping to set up these functions and processes.

For example, in a municipality, for an open dialogue to take place and for policy to be set and implemented in a collaborative way, the municipality has to have some way to **provide access to agenda setting**. One cannot assume a municipality automatically has the capacity to provide access to agenda setting. Often PVOs are in a position to help build that access and help build channels of communication.

The municipality has to be willing to **share leadership with community members** and has to **provide open channels of communication**. There has to be some degree of **organizational capacity** in municipalities to take action to address community needs. Often local officials see peri-urban communities as a nuisance and are not really interested in setting up the organizational capacity to deal with their problems.

The municipality also needs to be able to **provide a structure for participation**, to **formulate policy alternatives collaboratively**, to **provide access to the management process**, and to **promote community representation in decision making**.

The idea that decision making can be a participatory process is sometimes a real threat to local authorities. PVOs are often in the position to help local authorities build their capacity for a participatory process of decision making. Helping PVOs get involved and helping municipalities adapt their approach are elements of the CIMEP model.

The Importance of Women in Development

Some of you may be interested in why I am giving this presentation. It's partly because May Yacoob, who has done a lot of the CIMEP work in Tunisia, is out of the country at this time. But I'm here also because USAID's Women in Development (WID) office became interested in this activity and saw opportunities to more fully integrate women's concerns and women's roles into environmental health. The Environmental Health Project is very supportive of this integration and has some intriguing ideas about how it might be done. The WID office is contributing to this project and is paying careful attention to the roles of women, how the differences in the roles of women and men have been a very important part of community-level development.

Some of the aspects related to women's concerns and roles in environmental management can be summarized by considering three dimensions:

- **Technical.** Women and young girls are most often the ones who manage the day-to-day technical (or physical) aspects of the household. Therefore, women need to be actively involved in programs involving environmental education and interventions related to capacity building for better management of household environmental quality. Women's use of and development

of their technical skills must also be considered.

- **Economic.** The Tunisia example (described below) will provide an illustration of how policymakers had totally missed an important economic component in the community in their initial assessment of the situation. What they missed was closely related to women's economic activity in the community.

- **Behavioral.** Women's individual behaviors, and the collective behavior of women's groups, usually set the behavior patterns for the entire household related to household resource use. The use of resources such as water, and the quality of the air both inside and immediately outside the household, is very much a part of a woman's role.

A simple example of the behavioral dimension is that since good water supplies are often lacking, women tend to reuse water for several household tasks. This reuse expands the potential for various kinds of contamination. So while women are trying to conserve a scarce resource, which is commendable, this conservation behavior is actually exacerbating environmental health problems.

Components of the CIMEP approach

CIMEP is an acronym that stands for "Community Involvement in Management of Environmental Pollution." A schematic representation of the steps involved in the CIMEP approach is provided in Graphic 14. The CIMEP process and principal activities include:

- identifying environmental health problems within the community, using a collaborative process

- identifying community-based institutions concerned with environmental issues, with special efforts to include women and women's groups

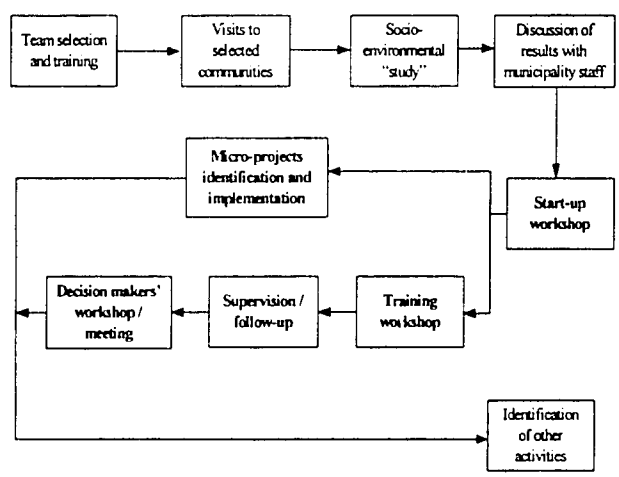
- identifying microprojects that correspond to sociological and environmental conditions

- developing technical skills of staff in the municipality

- facilitating a constructive dialogue among the municipality's technical staff, elected officials, central ministries, PVOs, and communities

Use of the CIMEP method reveals the differences in individual perceptions of problems, causes of problems, or possible solutions. A woman trying to use fuel as efficiently as she can to provide food for her household will have one perspective on the situation. A community official trying to look at overall air quality will have another perspective. A member of a community group who is trying to look at broad-based problems may have another perspective. CIMEP tries to include all these perspectives as part of the assessment process.

Graphic 14. Starting CIMEP in the Field



Applying the CIMEP Approach: An Example from Tunisia

The CIMEP approach is currently being implemented in Tunisia. The WASH (Water and Sanitation for Health) Project, the predecessor of EHP, had extensive experience in Tunisia in the creation of water-user associations. CIMEP activities are taking place in two peri-urban areas, one in Kasserine and one in Sousse. In both of these areas, it has been possible to identify highly skilled teams that could provide the necessary technical expertise. One of the key factors in the CIMEP approach is to have local people who know the situation play a significant role in the process. This type of participation is an important aspect of building local capability. The technical team, along with some of the municipal officials and some EHP personnel, visited selected communities and began to put the CIMEP process together.

One of the first steps is the socio-environmental study. I am going to talk about certain aspects of the socio-environmental study, and Gene Brantly will talk about other aspects when he describes risk assessment. The socio-environmental surveys can build a database for decision making by communities, municipalities, and, in some instances, national and regional staff. For a listing of environmental hygiene problems identified during the socio-environmental study, see Box 1.

Elements of these surveys include focus groups from the community: groups of women, men, community officials, and PVOs, as well as in-depth interviews with community members to ensure that the study team has as complete an understanding as possible of personal perceptions of problems and possible solutions at the intra-household level.

The following example shows how different perceptions come into play. In one of the Tunisian communities, the municipality was quite concerned about the problem of garbage, and, in a seemingly logical response, set up lots of garbage cans in the neighborhood. But residents didn't use the cans.

People in the community continued their practice of throwing food scraps into their household yards or into the streets. The municipal managers saw this behavior as bad management of household wastes and blamed the community members for not being more responsible, not realizing or taking into account the context in which people were living.

The residents of the peri-urban area were primarily migrants from rural areas who brought their livestock with them. They continued to raise sheep, cattle, and goats as they had in their rural communities. In many instances, the women were dependent on the animals for a source of income (this is where the economic dimension comes in), and tossing out garbage was the traditional way to feed the animals. From their point of view, if the garbage is thrown away in garbage cans, then how will they feed the animals, what will

Box 1: Environmental Hygiene Problems Identified

The principal environmental hygiene problems identified in the CIMEP socio-environmental study include:

Pre-transition Problems

- water supply
- evacuation of wastewater
- solid waste
- food hygiene
- exposure to vector-borne diseases

Post-transition Problems

- external and internal air pollution
- presence of toxic substances

happen to their income, and what will happen to the food supply that the animals provide? This is an example of how a certain behavior can be perceived in different ways.

Regarding possible outcomes, members of the community suggested that if they could get a little bit of money to build corrals, they could collect the scraps of food and feed the animals in a more controlled situation. This would alleviate the environmental health problems related to the scraps of food, and perhaps also lead to economic improvements.

The results from all of the focus groups and interviews were brought back to a session with the municipal staff. In some cases the focus groups had been videotaped, and these were played back to the officials. The information presented was a revelation to many of them. They had never really thought about or heard opinions and ideas from people who lived in these communities. Information from the interviews provided the impetus for a start-up workshop, which is the next step in the process.

A start-up workshop is an opportunity to look at all the information and, with the local technical team and municipal leaders, to start thinking about possible local programs. Microprojects can come out of this process, such as the corrals. Some money was set aside to fund these small projects.

The Importance of Follow-up

Now, we have all seen how people can go into communities and ask them about their problems, and then everything disappears and nothing gets done. The next time someone comes back, people in the community say they don't want to bother taking the time to go through the process again.

In CIMEP, there is a provision for follow-up to actually implement some of the community-identified interventions. Next steps include a training workshop for municipal authorities, which has not yet happened in Tunisia, but will occur soon. CIMEP has a long-term provision for follow-up, not only in communities, but also in the municipality. So the CIMEP process is not something that happens in two or three weeks. The process often happens over a period of several months, or perhaps even longer—however long it takes to build local capabilities and to address the sustainability issue which John Tomaro talked about this morning. CIMEP works to set up processes that can work not only for one particular intervention, but that can be used by communities and municipalities in the future.

Increased Understanding of Peri-urban Areas

The CIMEP process in Tunisia is ongoing, so it is not possible to outline all the specific results in a neat package. One of the findings so far is that there is a much better understanding of the character of peri-urban communities, of the chaotic, rapid neighborhood growth. They are communities in which both traditional structures and municipal structures are weak. As people move to peri-urban areas from rural areas, some of their traditional structures break down. There may be a lot of improvised housing construction, and the residents may be economically marginalized without many employment opportunities. People continue their rural activities and behaviors in an urban area, which causes various problems.

In any case, it is the process that is most important. One of the elements of the process that occurs within the communities is a systematic assessment of environmental health risks using various types of data, which Gene Brantly will discuss in his presentation.

2.5 Panel Presentation on Environmental Health Assessment: Setting Priorities in Community-Based Environmental Management

Eugene Brantly, Technical Director, Risk Assessment/Risk Management, EHP

I will be talking with you today about the methodology used to identify and rank environmental health problems. As Rosalie mentioned in her presentation on CIMEP, this methodology is used in the course of the socio-economic study (see Graphic 14).

Defining Environmental Health Assessment

Environmental problems cause a number of different kinds of impacts. What we are primarily talking about this morning is the impact of environmental problems on human health. Environmental problems also cause impacts on ecological integrity and natural resources, and cause both direct and indirect impacts on social structures and the economic vitality of communities.

The term "risk assessment" has been used to refer to the evaluation of each of these kinds of impacts, so I want to use the term somewhat generally, but first I will offer definitions of the various pieces.

Health risk assessment is a process for evaluating the health impacts of a particular environmental problem. It has been used primarily in industrialized countries for setting standards and for determining clean-up levels for hazardous waste sites. It is an analytical process to determine how much exposure to a particular contaminant human beings can stand before damaging health effects occur.

Environmental health assessment is a comparative process which evaluates and compares the health and quality of life impacts of several different environmental conditions. It looks at a number of problems out of which we draw a comparison and a ranking.

Comparative risk assessment is a process for evaluating and comparing the health, quality of life, and ecological impacts of several environmental conditions. It is similar to an environmental health assessment in that it is a comparative analysis, but it is a more comprehensive methodology.

Today I will be talking about the **environmental health assessment**. In Graphic 13, in Rosalie Norem's presentation, this process would fall in the upper left quadrant, with "identifying environmental health problems" and "setting priorities."

I want to make clear the distinction between risk assessment and risk management. Both are part of a rational approach to environmental management. Risk assessment is the process of identifying and characterizing risks. Risk management is the process of ranking risks, setting priorities, and mitigating risks, taking into account both political priorities and public opinion.

Examples from Risk Assessment Projects

The study done in Tunisia identified a number of problems that appeared to be high risk problems, but there was no real effort to rank these problems in terms of objective measures of impacts on health. They were ranked in terms of the communities' preferences, their concerns about the various problems, and their willingness to do something about them. The problems included:

- lack of adequate potable water supplies
- lack of sanitation
- animals in households and yards
- garbage, primarily food wastes
- toxic food contaminants

The diseases related to these problems, as identified by the community, included:

- childhood diarrheas
- typhoid
- scabies
- ringworm
- leishmaniasis

Another example, a risk assessment study that was recently completed in Cairo, was a more quantitative assessment which tried to estimate the health impacts of several problems, including exposure to particulate matter in air. Cairo has the highest levels of airborne particulates in the world: normally between 5 and 10 times the U.S. standard for particulates, and sometimes 20 times that level. Additional work is underway to determine the sources of the various particulates. Among the preliminary estimates of the health effects caused by exposure to these particulates are the following: between 90 and 270 restricted activity days each year, days on which people stay home from work because they don't feel well for reasons mainly attributable to air pollution; and 3,000-16,000 premature deaths each year from asthma, chronic obstructive pulmonary disease, and other effects of exposure to particulates.

The results of a comparative environmental health risk assessment, carried out in Quito, Ecuador, are shown in Graphic 15. Problems are categorized into high, moderate, and low risk. For example, in urban areas of Quito, particulates in air, microbiological disease (food, water, excreta), and pesticides (food) appeared to be the highest sources of health risks from environmental causes.

In this chart, problems are referred to in terms of routes of exposure rather than according to specific diseases. The chart doesn't mention anything about diarrhea, the disease that manifests from microbiological contamination in food, or asthma, which results from particulates in the air, or cancers, which result from pesticides in food. The chart looks at the agents that cause or contribute to health problems, just as we saw earlier this morning on the graphic John Tomaro presented, where the agents of illness appeared to the left of the line and traditional approaches that address the results of exposure to these agents appeared on the right.

When conducting an environmental health risk assessment, it is important to take into consideration intra-urban differentials. The problems in middle-class neighborhoods are not going to be the same as in poor neighborhoods. In Quito, there was an explicit attempt to rank problems for the city as a whole and separately for peri-urban communities. Many of the problems that fall into the moderate risk category for the city as a whole belong to the high risk category for peri-urban areas.

A good deal of evidence indicated that the water supply was in fairly good shape in Quito, although that indication does not apply to all the peri-urban areas. Some data showed that food supplies were not well protected, because there was a high rate of bacterial contamination in food. There was also some evidence that sanitation, while adequate in the city as a whole, was inadequate in peri-urban areas. We

Graphic 15. Risk Assessment: Ranking Environmental Health Problems

RISK CATEGORY	ENVIRONMENTAL HEALTH PROBLEMS		
	BANGKOK	QUITO	
		Urban Areas	Barrios Populares
HIGH RISK	✓ *Particulates in Air* ✓ *Microbiological Diseases (water & sanitation)* ✓ *Lead*	✓ *Particulates in Air* ✓ *Microbiological Disease (food)* ✓ *Pesticides (food)*	✓ *Particulates in Air* ✓ *Microbiological Disease (food, water, excreta)* ✓ *Pesticides (food)*
MODERATE RISK	✓ *CO* ✓ *Metals Other Than Lead*	✓ *Traffic Injuries* ✓ *Indoor Air Quality* ✓ *Occupational Disease & Injury* ✓ *Microbiological Disease (excreta)*	✓ *Occupational Disease & Injury* ✓ *Indoor Air Quality*
LOW RISK	*Toxic Air Pollution* ✓ *SO2, NO2, O3* ✓ *Surface Water* ✓ *Groundwater* ✓ *Food Contamination (pesticides &metals)* ✓ *Solid & Hazardous Waste Disposal*	✓ *Solid & Hazardous Waste Disposal* ✓ *Lead (air, blood)* ✓ *Microbiological Disease (water)*	✓ *Traffic Injuries* ✓ *Solid & Hazardous Waste Disposal* ✓ *Lead (air, blood)*

made an intelligent guess that a lot of the problems with diarrheal diseases were coming from the food supply, probably from food hygiene and household practices for food preparation. It didn't seem to be coming from the water as much as from the food. That is why we put microbiological disease from food in the high-risk category for urban areas as a whole, microbiological disease from excreta in the moderate-risk category, and microbiological disease from water in the low-risk category.

One of the real challenges we face in carrying out risk assessments in developing countries is trying to compare the health effects of pre- and post-transition diseases. If you look on the chart at Bangkok, you can see the number of problems there, such as particulates in air, lead contamination, and toxic air pollution, that are post-transitional. In a large city, there will be a mix of these problems, and it is a challenge to try to rank them, set priorities, and gain a vantage point from which to view the full range of problems that people are experiencing.

History of Risk Assessment

The methods I have been describing were developed mostly in the United States and to some extent in other industrialized countries. In 1987, the United States Environmental Protection Agency (EPA) launched its first comparative risk assessment project, called "Unfinished Business." The goal of the project was to objectively compare the magnitude and severity of all the environmental problems that still face us.

"Unfinished Business" evaluated and ranked 31 major environmental problems, some of which primarily affected health and some of which primarily affected natural resources. The assessment looked at residual risks, that is, the risk after regulatory programs were in place and operating, and found that the problems on which the greatest resources were spent, such as hazardous waste management and underground storage tank cleanups, posed relatively small risks, at least in terms of human health. Bigger problems, such as indoor pollution, radon, and climate change, were virtually ignored.

One of the most important things EPA learned from "Unfinished Business" was that the resources available were not being spent on the environmental problems posing the highest risks to human health. The agency also learned that policies based on relative risks could result in greater public health protection at lower cost.

U.S. Experience with Risk Assessment

In the United States, EPA has completed comparative risk assessments in all ten federal regions. Comparative risk assessments have been completed by 6 states and have been initiated in 14 other states and 11 cities. [Ed. note: At the time of publication of this report, 11 states had completed comparative risk assessments, and 28 other states or localities were conducting them.] Most of the studies have generated useful products and results, including organized information, improved knowledge of the participants, and greater trust among groups and institutions. Most have also produced a ranked list of problems, and some have resulted in an increase in public awareness and follow-up actions.

In the past three years, the use of risk assessments has been increasing internationally. In Bangkok, the results of a major risk assessment accelerated the government's existing plans to ban the use of lead in gasoline. In Cairo, risk assessment findings caused the Ministry of the Environment and USAID to reconsider the design of an air pollution project. In Silesia, Poland, a health risk assessment helped USAID select industrial facilities for technical assistance. And, as we heard in Rosalie's presentation, the risk assessment carried out in Sousse, Tunisia, provided the

catalyst for a community project to build communal corrals for animals.

It is useful to look at the risk assessment methodology as a conceptual model which links environmental conditions and health as shown in Graphic 16. Health risk assessment assumes that a predictable chain of events links the production and release of environmental contaminants with resulting health problems.

Graphic 16 illustrates how a pollutant is discharged into the environment and then transported through the environment, for example, in air or water. An individual is then exposed to the pollutant by such actions as eating, drinking, or swimming. The pollutant can become more or less toxic as it travels through the person's body, during which time specific target organs are affected, depending upon the pollutant, which in turn results in illness, disability, or death.

One of the major challenges we face today is the need to simultaneously assess the risks related to infectious and tropical diseases and the risks related to diseases linked to chemical exposures. We can estimate the incidence and prevalence of infectious and tropical diseases from existing health surveillance data. For these diseases, there is usually no significant time lag before results can be seen, maybe a matter of months, while seeing the effects of chemical exposures usually takes years.

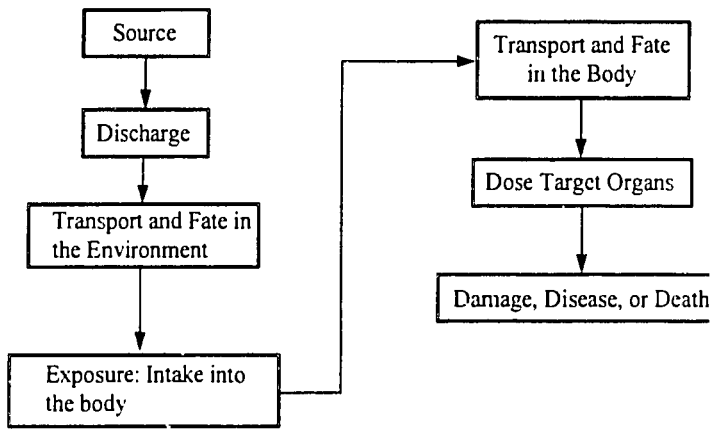
To assess diseases related to chemical exposures, it is necessary to rely on measuring emissions or ambient concentrations, estimating people's exposure to them, and using a dose-response model to estimate the health risks that may result from such exposure. Since we cannot measure exposures directly, we have to predict what the exposure is likely to be, based on measuring, for example, the amount of certain chemicals found in the air that people are breathing. This information can then be used to estimate exposure rates, and the dose-response model used to estimate the health risks.

The health risk assessment approach developed by EHP uses three components and three different methods:

- quantitative risk assessment, for diseases related to chemical exposures;
- epidemiology and surveillance, for infectious and tropical diseases; and
- ethnographic investigations, for determining social and economic impacts.

In the process of risk assessment, difficult questions such as "How do we rank these problems?" and "Which do we choose as most important?" involve judgements based on personal values. Environmental problems cause different health effects, for example, respiratory infections, anemia, neural disorders, diarrhea, or cancers. Judgements have to be made in which these health effects are compared with one another. The same problems affect different

Graphic 16. Conceptual Model Linking Environmental Conditions and Health



groups in different ways. Children, working adults, the elderly, the poor, middle-income earners, women, and men may experience different health effects.

Most critics of risk assessment view it as an elitist exercise in which scientists or technicians generate conclusions without taking into consideration the perspectives and values of the people being affected by these risks. Partly in response to these criticisms, EPA is trying to incorporate more participatory approaches into its risk assessment approaches in the United States.

Organization of a Comparative Risk Assessment

As shown in Graphic 17, a comparative risk assessment needs to address five necessary functions. The individual or unit that carries out each of these functions will vary depending on the specific situation.

One of the things we are trying to do at EHP is to develop materials that people can use to carry out risk assessments themselves. So far, most risk assessments have been done by "parachute teams" that go to a country, often hiring local consultants to assist them, to carry out the assessment. This is beginning to change. For example, in India, EHP has relied heavily on local teams, and we serve as advisors to them. Our focus now is on improving the methodology and finding effective ways to transfer this methodology so it can be used in the field.

Graphic 17. Comparative Risk Assessment: Organization

The organization of a comparative risk assessment must address five necessary functions:

Function	Typical Unit
Management and oversight regarding methods, consistency, and schedule.	Project Manager
Policy setting, general technical direction, and access to information	Steering Committee
Coordinate public communication and participation	Public Advisory Committee
Make final decisions regarding priorities and problem ranking	Steering Committee or Public Advisory Committee
Collect and analyze data, develop proposed rankings, and report results.	Technical Committee(s)

Potential Roles for PVOs in Risk Assessment

There are a number of important roles that PVOs can play in risk assessment and ways PVOs can use risk assessment in their work:

- If a PVO wants to know what the worst problems are in a community, it can use risk assessment techniques to help determine these problems and to focus projects on addressing them.
- The CIMEP approach helps to open up the dialogue between communities and local governments. Local PVOs play an important role in helping to represent communities to local government officials.
- PVOs can become involved in designing and managing risk assessment studies, or in training local and national institutions in how to do them.
- PVOs can conduct community environmental health projects.
- PVOs can help bring attention to existing problems and enter into a policy dialogue with government officials about ways to address them.

2.6 Questions and Answers following Panel Presentations

How can CIMEP be evaluated? What kinds of indicators are used to measure how well it is working?

The ongoing monitoring and evaluation process has to be participatory, has to continue

to involve all the players. Some of the specific types of indicators that can be used along the way include the following: 1) whether the technical skills of people being trained are improving; 2) whether people in communities and municipalities are able to articulate problems; 3) how well the various actors understand the process that is taking place; 4) whether local technical training is changing people's attitudes; and 5) whether people from the municipality attend community meetings. It is also possible to measure, for example, whether the microprojects are functioning well or whether communities and local governments are using the skills and the processes put into place through CIMEP in other areas in addition to community environmental management.

How are communities selected in CIMEP?

In Tunisia, the USAID mission and the government of Tunisia were specifically interesting in working in secondary cities and in peri-urban areas where there was already some type of community representation. In general, donors will typically want a certain amount of synergy already in place, and it is often more practical to work where some of the groundwork has already been done.

Where else is CIMEP operating?

Since the work in Tunisia is going so well, planning has started for EHP to work in Morocco, Jordan, and Egypt.

Do interventions like risk assessment ever lead to political change?

Yes. For example, in Zlatna, Romania, we found that the manager in the copper smelter was not initially interested in participating in the process. However, given the pressure that was put upon him, he did become involved and did promise to reduce emissions from his copper smelter.

In Ahmedabad, India, the project director involved in the risk assessment study had been unsuccessful in having his findings and concerns heard regarding air pollution problems. But because one of the commissioners got involved in the risk assessment process, the pollution problems became a political issue. During the process of the risk assessment, this commissioner saw that auto emissions were being ranked as a high risk problem. He was already interested in starting a motor vehicle emissions control program and was able to use the findings of the ongoing risk assessment to argue his case. He knew that he could gather political support for this since there was clearly a class issue involved. Upper- and middle-class children attending private schools were driven to school in closed taxis and therefore were exposed to fewer air pollutants than lower-class children who had to walk to school or use public transportation.

How much does the CIMEP process cost? Wouldn't each communal corral end up being very expensive?

An important part of the CIMEP process is opening up the ears of local governments and strengthening the voices of communities. Often the channels of communication are just not there between municipalities, communities, and others such as the private sector. In CIMEP you need to work on opening up these channels. Once the channels are there, they can be beneficial for many different situations.

The costs of CIMEP are really related to the process that is being put into place rather than any specific microprojects that may be part of the outcome. The cost of CIMEP technical assistance in two sites in Tunisia is approximately US$ 450,000. A fixed amount of US$ 25,000 was set by the USAID mission for microprojects. With an investment of between US$ 200,000-US$ 250,000, CIMEP could be expanded to reach additional cities, train people, and develop additional microprojects.

USAID has about 18 months of experience in Tunisia. One of the things we have learned there is that initially, the government was not really interested in giving a voice to communities, and was suspicious of increasing levels of community participation. However, government officials learned that the municipality can better target its resources, be more efficient with limited resources, and do a better job of covering its costs by opening up the channels of communication and increasing community involvement and participation.

Are there ways to use CIMEP and risk assessment on a smaller scale or over a shorter time period?

A lot of the studies carried out as part of traditional risk assessments do take a very long time. At EHP, we try to limit the scope of work as much as possible so it is more manageable. For example, we have found it is more useful to focus on the local level rather than the state level or the national level, and try to focus on a smaller geographical area. We also try to look at a limited set of problems. In our work, we focus on the health impacts, and we use a lot of qualitative methods like focus groups and in-depth interviews rather than long-term quantitative studies, although we use quantitative information that is already available. There is also more judgment about the information we have available than in more rigorous kinds of risk assessments.

Replicability, sustainability, and costs have a great deal to do with reliance on local resources. For example, in India, the government required that the data analysis would be done by local institutions. We have taken on the role of trainers and advisors, which is the appropriate role for us to have. Risk assessments can be carried out for relatively modest costs, especially when local resources and local volunteer labor can be relied upon. In Ahmedabad, the follow-up has been very good, and the studies have been used to garner public support for new policies. In most cases, results from risk assessments carried out elsewhere are being used, even if simply to redesign a project.

2.7 Implications of an Environmental Health Approach for PVOs: Introduction to Small Group Task

Fred Rosensweig, Program Manager, Technical Director for Institutional Development, EHP

In addition to my responsibilities at EHP as a program manager, I am also the technical director for institutional development. What are the implications of an environmental health approach for the institutional structure of PVOs? We need to look at the concepts we have been discussing and think about what it would take from an organizational point of view to actually put them into action.

In the WASH project, we worked primarily in the two sectors of water and sanitation. In EHP we are working in nine sectors, which is much more complex. During the shift from WASH to EHP, we needed to consider how to implement a project much broader in scope than the one we had been administering.

I would like you to begin thinking about five broad areas that can be framed into five different questions. These are some of the more fundamental questions that PVOs will need to grapple with in considering the implications of an environmental health approach.

1. **What mix of staff skills and experience is required to plan and implement environmental health programs?**

Here we are referring to what is required for PVOs, or for a project like EHP, rather than for a host country. At EHP we added a range of

health skills, such as epidemiology and health information systems, which were not included in the WASH project, plus other skills. We have thirteen technical people on the staff, and each one represents a different discipline and technical area. Environmental health cuts across many different sectors and technical disciplines, yet it is not possible to have an expert in every area on the staff. In addition, there are cross-cutting areas such as finance, institutional development, community participation, and information dissemination. All these areas are important in an environmental health approach.

Compared to EHP, it is likely that PVOs have less flexibility and more constraints on their resources, making it difficult to increase the number of people on staff, both at the headquarters and field levels. You may find yourselves moving into technical areas where you have little expertise. Yet during the process of a community risk assessment, people in the community may tell you that some of these areas are their priorities.

2. What kinds of training will you have to arrange for existing staff?

You may begin to work more in peri-urban areas with a staff that has more experience working in rural areas. As Rosalie discussed this morning, working in municipalities is very different from working in rural areas with village councils and elders. Working in municipalities requires different training and skills and means that staff have to begin thinking in new and different ways.

In the past year, many of us at EHP have had to redirect our thinking and begin using a different paradigm. While many organizations may truthfully say that they already know a great deal about environmental health because they have been working on projects involving water and sanitation and solid waste, there is a whole range of new areas to consider. Unless you can redirect the thinking of existing staff to incorporate new concepts, or are able to access new people, it may be difficult to move in new directions and integrate new perspectives.

3. What changes, if any, would you have to make in your organizational structure?

Where does environmental health fit in a PVO's organizational structure—in the health unit or the environment unit?

Organizationally, EHP is part of USAID's Office of Health, although we have many points of interaction with the Center for Environment. Since some of our work focuses on changing the environmental conditions that cause health problems, we are doing some of the same things that the Center for Environment is doing. This creates interesting organizational issues. In a PVO that has two separate offices, one that deals with environment and one that deals with health, you will have to determine how to collaborate, how to make those linkages, because the skills that you need lie in both places.

If your health program has traditionally focused on child survival and you want to broaden that perspective to include environmental health issues, the focus of staff in your child survival unit will be different than that of staff in your environment office. You may decide to create a new department that can work more effectively than two separate departments.

4. How would you broaden your funding base if you wanted to focus on environmental health?

In other words, what are the funding implications for a PVO that begins to work more in environmental health areas or in peri-urban areas?

5. **Which new partners would you be working with in host countries?**

When you work with just water and sanitation, you work with more than one actor, but you tend to work with a more limited set of actors. When you work in rural areas, you tend to work with local NGOs or governmental organizations. When you move into urban areas you work more with municipalities, with a different level of government.

In EHP, we have found we are working with different organizations than we used to. We are working with municipal governments, institutes of hygiene or statistics, ministries of environment—a wider set of actors, both governmental and nongovernmental. That has led to significant changes in the ways we operate, since it takes time to learn about these organizations and actors.

In the next part of the workshop, the small group task, we would like you to begin thinking about what it would mean in your organization if you were to include an environmental health approach. We would like you to follow the sequence outlined in Graphic 18 and be ready to report back to the entire group in one hour.

Graphic 18. Small Group Task

1. Identify the implications of adopting an environmental health approach in terms of:
   - ✓ staffing
   - ✓ training
   - ✓ organization
   - ✓ funding
   - ✓ partners
   - ✓ others
2. How realistic is it for PVOs to do more environmental health programming? What would it take to move into environmental health?
3. Select a leader.
4. Record your responses to questions 1 and 2 on a flipchart.
5. Be prepared to report out in a five minute presentation.

You have 60 minutes for this task.

2.8 Reports from the Small Group Task

Combined responses from Groups 1 and 2

1. **What mix of staff skills and experience is required to plan and implement environmental health programs?**

- An environmental health approach would require increased and broadened human resource requirements.
- Most PVOs would try to fill new needs by drawing on outside technical resources rather than hiring new permanent staff.
- Guidelines and criteria prepared by EHP on the human resources necessary for PVOs to carry out environmental health projects would be useful.
- PVOs can leverage necessary expertise through mechanisms for sharing resources with existing technical groups (for example, memoranda of understanding).
- May require a coordinator at the PVO headquarters level to coordinate the process of changing to an environmental health approach.

2. **What kinds of training will you have to arrange for existing staff?**

- There would be training needs at all levels.
  - At headquarters: in planning, developing, and backstopping environmental health projects
  - In the field: in technical areas and in community development
  - In the community: in empowerment and skill building
- Recognize that PVO staff are 1) extensionists within the context of

environmental health projects, and 2) technicians.
  - A first step to incorporating training is to be able to "sell" the concept to your own people.

- Access needed to technical consultants and materials.

- Updates needed through newsletters, E-mail, and networks such as those on Internet for:
  - information about training needs and opportunities
  - technical updates to keep current

- An annual environmental health workshop to update people and to inform new staff members.

3. What changes, if any, would you have to make in your organizational structure?

- Strategies will vary among PVOs.

- Need people supportive of an environmental health approach on the board or within the staff, and coordination and collaboration within the PVO, with other PVOs, with technical groups, and with donors.

- May require formalizing responsibility/interaction between technical groups that are currently separate.

- May evolve into merging skills and an actual restructuring of technical groups under an "environmental health banner."

4. How would you broaden your funding base if you wanted to focus on environmental health?

- To get more funding for environmental health projects, more research is needed to produce supporting hard data, such as cost-effectiveness data and results from operations research. The better the data, the easier it is to develop coalitions. There is a need to counter the idea that interventions like water and sanitation are "too expensive."

- Access potential donors with environmental interests:
  - power companies, utilities
  - chemical and pharmaceutical companies
  - businesses
  - foundations

- Lobby, educate, and raise awareness within USAID and the U.S. Congress to allocate funds for environmental health-related issues.

5. Which new partners would you be working with in the host countries?

- Ensure community interest and involvement.

- Promote visibility of programs and environmental issues within PVOs (especially upper management), at the community and national levels in countries, and among donors.

- Need to look for new groups as partners, such as:
  - pharmaceutical companies
  - American Express
  - military
  - universities

- Implies an overall acceptance of the framework. It is a process involving small steps of all "partners" in the transition to programming sensitive to environmental health. May be similar to the past 5-10 years of changes in water and sanitation programs. Ideally, at the end everyone will be claiming credit for an acceptance of a new way of looking at things.

- PVOs typically view the process as donor-driven. Nevertheless, PVOs play a crucial part in selling the projects of their choice. Data is important in selling the environmental health approach to donors.

- With respect to private donors, the environmental health approach departs from the traditional "care package" approach and may well draw in younger, environmentally active individuals as donors.

2.9 Next Steps

A group discussion about next steps led to a number of specific recommendations from workshop participants.

Resources, Programmatic Guides, Access to Information

- Develop a resource guide of private foundations that might support environmental health programs.

- Help develop and establish criteria for "best practices" and environmental health programmatic guidelines to move existing projects forward towards an environmental health approach.

- Find ways for PVOs to access the EHP library and its database of information resources and set up ways to share information.

- Develop information to support environmental health funding proposals, such as economic data and exposure rate information. Some of this information may be available within EHP already.

- Have EHP review existing training materials related to environmental health and serve as a clearinghouse for training materials. Publish an inventory of training materials related to environmental health, or collect and discuss these materials as part of the next environmental health workshop.

Preparations for 1996 NCIH Annual Conference

- Submit this report to NCIH, along with an abstract, for inclusion in next years' conference. In addition, submit an abstract for a half-day open forum on environmental health during the last day of the conference.

Developing Better Institutional Linkages

- Establish a coordinating function between USAID's Office of Private and Voluntary Cooperation and Office of Health so that projects funded by both offices can be more effective. Information sharing and coordination between these two offices needs to be strengthened.

Networking and Additional Workshops

- Plan an annual workshop on environmental health.

- Provide additional training in CIMEP and risk assessment.

- As noted under the section above on resources, the next environmental health workshop could focus on collecting and assessing training materials related to environmental health.

- Ask Aga Khan/URC to add an environmental health module to their MAP training.

- Add a regularly featured column for PVOs in EHP's *Voices from the City* newsletter. This column would focus on PVO field

projects and updates for PVOs on environmental health issues.

- Send this report to key people within USAID, including Administrator Brian Atwood. Provide a copy of the report to former President Jimmy Carter and the Carter Center.

- Get CNN involved in these activities, given their interest in environmental issues.

- Create an environmental health alliance, an organization that can carry out the kinds of activities outlined here and to advocate for additional resources and paying more attention to environmental health issues.

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Appendix A

Workshop Goal, Objectives, and Agenda

Environmental Health Project PVO Workshop
June 29, 1995
Hyatt Regency Crystal City
Arlington, Virginia

Overall Goal:

To increase awareness of the links between health and the environment and the role PVOs can play in reducing environmental health problems.

Objectives:

1. To introduce the concept of environmental health, including the relationship between health and the environment.

2. To introduce key environmental health approaches and tools that can be used for priority setting.

3. To discuss implications of an environmental health approach for PVOs.

Workshop Agenda

8:30 - 8:45 **Official Welcome**
David Oot, Director, USAID's Office of Heath and Nutrition

8:45 - 9:15 **Overview of the Workshop: Introductions, Objectives, and Agenda**
Kathy Alison, EHP Workshop Facilitator

9:15 - 10:15 **The Concept of Environmental Health**
John Tomaro, USAID's Office of Health and Nutrition/Environmental Health Division

10:15 - 10:30 **Break**

10:30 - 12:00 **Panel**

Community Involvement in Management of Environmental Pollution (CIMEP)
Rosalie Huisinga Norem, Project Manager, Women in Development Strategies and Resources Project, USAID

Environmental Health Assessment: Setting Priorities in Community-Based Environmental Management
Eugene Brantly, Environmental Health Project

12:00 - 1:30 **Networking Lunch** (no-host lunch in Hyatt Regency Hotel)

1:30 - 2:00 **Implications of an Environmental Health Approach for PVOs: Introduction to Small Group Task**
Fred Rosensweig, Environmental Health Project

2:00 - 3:00 **Small Group Discussions on Implications of an Environmental Health Approach for PVOs**

3:00 - 3:15 **Break**

3:15 - 4:15 **Group Reports**

4:00 - 4:30 **Next Steps**

4:30 - 5:00 **Workshop Evaluation**

5:00 **Adjourn**

APPENDIX B

Environmental Health Project PVO Workshop
List of Participants

Kathy Alison, EHP Workshop Facilitator
EHP
1611 N. Kent St., Suite 300
Arlington, VA 22209-2111
703 247-8730
Fax: 703 243-9004
kathy_alison@trg.ccmail.compuserve.com

Joseph Amon, Consultant
1812 Swann St., NW
Washington, D.C. 20009
202 332-7814
jeswann@aol.com

John H. Austin, Environmental Engineer
USAID
G/PHN/HN/EH, SA-18, Suite 1200
Washington, D.C. 20523-1817
703 875-4477
Fax: 703 875-4686
jaustin@usaid.gov

Lori Barg, Project Development Director
Global Environmental Research & Training Institute
58 E. State St.
Montpelier, VT 05602
802 229-4541
Fax: 802 229-5417
702.4683@MCImail.com

Bonnie Bradford, Consultant
EHP PVO Workshop Coordination Team
3341 18th St., NW
Washington, D.C. 20010
202 667-5096
75227.303@compuserve.com

Eugene Brantly, Technical Director,
Risk Assessment/Risk Management
EHP
1611 N. Kent St., Suite 300
Arlington, VA 22209-2111
703 247-8730
Fax: 703 243-9004
EHP@access.digex.com

Jeff Brown, Public Health Coordinator
International Eye Foundation
7801 Norfolk Ave.
Bethesda, MD 20814
301 986-1830
Fax: 301 986-1876
jbrown@IEF.permanet.org

Bart Burkhalter, Technical Officer
BASICS
1600 Wilson Blvd., Suite 300
Arlington, VA 22209
703 312-6819
Fax: 703 312-6819
bburkhal@basics.org

Ellen Coates, Child Survival Coordinator
World Vision Relief and Development
2201 I St., NE, Suite 270
Washington, D.C. 20002
202 547-3743
Fax: 202 547-4834

Chris Drummond
Johns Hopkins School of Public Health
3811 Canterbury Rd. #607
Baltimore, MD 21218
410-889-4961

Alexa Hanke, Assistant Librarian
Global Tomorrow Coalition
1325 G St., NW, Suite 1010
Washington, D.C. 20005
202 628-4016
Fax: 202 628-4018

Carol Hooks, Program Officer
Program for Appropriate Technology in Health
1990 M St., NW, Suite 700
Washington, D.C. 20036
202 822-0033
Fax: 202 457-1466
path@access.digex.net

Brad Johnson, Executive Director
Institute of World Affairs
1321 Pennsylvania Ave., SE
Washington, D.C. 20003
202 544-4141
Fax: 202 544-5115
bjohnson.iwanet@epo.com

Margo Kelly, Assistant Activity Manager
EHP
1611 N. Kent St., Suite 300
Arlington, VA 22209-2111
703 247-8730
Fax: 703 243-9004
EHP@access.digex.com

A. Dennis Long, Division Chief
USAID
ENI/HR/EHA, NS - Rm. 2941
Washington, D.C. 20523-0000
202 647-7626
Fax: 202 736-7288

Josh Moga, Urban Development Fellow
USAID
G/ENV/UP, SA-18, Rm. 409
Washington, D.C. 20523-1822
703 875-4266
Fax: 703 875-4384
jmoga@usaid.gov

Helen Murphy, Technical Director, Epidemiology
EHP
1611 N. Kent St., Suite 300
Arlington, VA 22209-2111
703 247-8730
Fax: 703 243-9004
EHP@access.digex.com

Joseph Narkevic, Consultant, Water/Sanitation Specialist
CARE
442 Pine St.
Ambridge, PA 15003
412 251-0530
Fax: 412 251-0530

David Newberry, Senior Public Health Advisor
CARE
151 Ellis St.
Atlanta, GA 30303
404 681-2552
Fax: 404 577-1205
newberry@msmail.care.org

Rosalie Huisinga Norem, Project Manager
USAID
G/WID, SA-38, Rm. 927
Washington, D.C. 20523-1816
703 816-0288
Fax: 703 816-0266

David Oot, Director, Office of Health and Nutrition
USAID
G/PHN/HN, SA-18, Suite 1200
Washington, D.C. 20523-1817
703 875-4907
Fax: 703 875-4686

Maria Rapuano, Project Manager
Alliance to End Childhood Lead Poisoning
227 Massachusetts Ave., NE, Suite 200
Washington, D.C. 20002
202 543-1147
Fax: 202 543-4466
mcapuano@aeclp.permanet.org

Toni Richardson, Coordinator
Environmental Health Project
Institute of World Affairs
1321 Pennsylvania Ave., SE
Washington, D.C. 20003
203 868-0809
Fax: 203 868-0809
trichar850@aol.com

Jeffry Roberts, Head Librarian
Global Tomorrow Coalition
1325 G St., NW, Suite 1010
Washington, D.C. 20005
202 628-4016
Fax: 202 628-4016

Fred Rosensweig, Technical Director,
Institutional/Human Resources Development
EHP
1611 N. Kent St., Suite 300
Arlington, VA 22209-2111
703 247-8730
Fax: 703 243-9004
EHP@access.digex.com

Stephan Solt, Child Survival Program Manager
Africare
440 R St., NW
Washington, D.C. 20001
202 328-5382
Fax: 202 387-1034

Tova Solo, Urban Planner
World Bank
1818 H St., NW, Rm. S-5024
Washington, D.C. 20433
202 458-4230
Fax: 202 522-3247

Paula Tarnapol, Director
Information Exchange Center
GreenCOM
1255 23rd St., NW, Suite 400
Washington, D.C. 20037
202 884-8899
Fax: 202 884-8997
ptarnapo@aed.org

Liz Terrell, Researcher
Global Tomorrow Coalition
1325 G St., NW, Suite 1010
Washington, D.C. 20005
202 628-4016
Fax: 202 628-4018

Scott Tobias, Consultant Water/Sanitation
Specialist
CARE
411 Carlyle Lake
Decatur, GA 30033
404 320-9556

John Tomaro, Chief, Environmental Health
Division
USAID
G/PHN/HN/EH, SA-18, Suite 1200
Washington, D.C. 20523-1817
703 875-4523
Fax: 703 875-4686

APPENDIX C

Workshop Evaluation

Participants were asked to complete a one-page evaluation form during the last 30 minutes of the workshop. The first three questions were designed to evaluate how well the objectives of the workshop were met. For questions 1 through 3, participants were asked to rank their responses on a scale from 1 (not well achieved) to 5 (very well achieved). Questions 4 through 7 were open-ended questions with space available for participants to write their responses.

1. **To introduce the concept of environmental health, including the relationship between health and the environment.**

   Average: 4.5

2. **To introduce key environmental health approaches and tools that can be used for priority setting.**

   Average: 4.0

3. **To discuss implications of an environmental health approach for PVOs.**

   Average: 4.0

4. **What was the most useful part of the workshop?**

General issues:

- The presentations and discussions.
- Working in small groups.
- Learning a different way to think about health and especially learning why environmental health is important.
- While I do not have a background in environmental health, I found the speakers to be clear and understandable. They gave me a good base from which to work.

Networking opportunities:

- Getting to know people in PVOs.
- Networking and sharing ideas.

- Opportunity for networking and learning about USAID activities.

Morning session:

- The EHP portion and the presentation on "The Concept of Environmental Health."
- The overview presentation of "The Concept of Environmental Health." The idea of thinking about where to do interventions.
- The presentations on CIMEP and risk assessment.
- The risk assessment presentation and talking with people at the breaks.

Afternoon session:

- The discussion on implications for PVOs.
- The afternoon group sessions.
- The group exercise, because it produced a "product," in other words, recommendations.
- The workshop allowed for maximum interaction, and the afternoon group exercise generated ideas.

Both sessions:

- The group discussion on implications for PVOs and presentations on CIMEP and risk assessment.

5. What could have been done better?

Physical space, venue, logistics, and attendance:

- Better temperature control—the room was too cold.
- A good start. Space could have been better in a more convenient location, perhaps downtown.
- Save paper by using double-sided copies for handouts, not single-sided.
- More groups in attendance.

More group work:

- Would have been better to intersperse group work throughout the day rather than have it just in the afternoon.**

- Less lecture style and more working together rather than having the experts telling PVOs what they should do [in morning sessions]. Too much discussion by other staff people in the audience rather than letting the PVOs talk [in morning sessions].**

Longer workshop, more on existing topics, additional topics:

- Extend the time. Cover the various epidemiological components, PVOs as implementers in "the world of donor and host country reality." Provide precise description of what environmental health is in the developing world.

- More emphasis on providing tools and integrating approaches to problem-solving in CIMEP and risk assessment to plan for action.

- More concrete tools. Also, look at how environmental education and communication could draw on health, and how the educational aspects could be brought into doing environmental health.

- I was unclear as to the implications for PVOs in environmental health.**

- Link community development strategies within the context of environmental health programming.

- Greater focus on community participation in environmental health initiatives. Additional examples of successful environmental health programs.

- A lot of time spent on the community development model. A link between environmental protection and reproductive health is important, especially in light of the population data presented.

6. What specific follow-up activities would you be interested in, based on today's workshop?

Manuals, publications, resource guides, and information:

- Establish program guidelines for environmental health.

- Access to further EHP information, and a PVO column in the newsletter *Voices from the City.*

- I would like to see some of the case studies mentioned and the results of actions mentioned during the morning sessions.

- I would like to learn how the current restructuring of your organization has helped or hurt you in accomplishing goals.**

- I would like to learn more about EHP's approaches and methodology, especially with regard to participation, and how PVOs respond to these approaches.

- A follow-up report on the workshop and on the various projects in which EHP is involved.

Networking and information sharing:

- Networking
- Linking-up
- The creation of an environmental health coordinating center or alliance, including continued contact among group members, preferably by E-mail.
- Need much greater PVO participation in group session.
- Meetings to discuss specific ways PVOs and USAID can work together on environmental health projects.

More on specific content areas:

- Discuss in greater detail the process of setting priorities within a context of community participation.

Multiple responses:

- Everything on the list of next steps developed during the workshop.
- Development of core training materials. Prepare for and participate in the NCIH half-day open forum in next year's conference; legislative education.
- Set up an E-mail network, a compendium of potential funders for environmental health, an annual workshop, a PVO column in newsletter *Voices from the City*, set up a database of training materials. All these activities should include developing country nationals.

7. What other comments do you have about today's workshop?

General comments and follow-up:

- Well organized and clearly focused.
- I was very glad to be there and I felt you did a stellar job in organizing the workshop.
- Keep on going, we need to be persistent.
- Great.
- Excellent.
- I look forward to follow-up in workshops, E-mail, and newsletters.

- I would like to know what mix of PVO people were at the workshop. Was the workshop successful and useful to the PVOs? What recommendations for further action have come out of the workshop?**

Content:

- The workshop was a well-organized introduction to environmental health.
- Very educational work. Made clear the environmental health evolution from the WASH Project.
- The workshop was a bit over my head but I do feel I learned quite a bit and would like to participate in the future.
- The workshop helped to better define environmental health as a programmatic area. The small number of groups was most likely due to lack of knowledge of environmental health. Maybe better promotion is needed for future events.
- The networking lunch was a good opportunity for sharing ideas and talking with other workshop participants.
- Well organized. Implications of an environmental health approach was good. More time on networking, coordination, and brainstorming on next steps would be good.

Note: ** identifies responses by workshop participants who were not able to attend the afternoon sessions in which the issues or topics mentioned occurred or were discussed.

Appendix D

Selected Publications Available from EHP

The following EHP/WASH publications are available upon request from: Environmental Health Project, 1611 N. Kent Street, Suite 300, Arlington, VA 22209; Telephone: 703-247-8730; Fax: 703-243-9004.

Overview/General

1. *EHP Strategic Framework: 1995-1999.* February 1995.

2. *Lessons Learned in Water Sanitation and Health: Thirteen Years of Experience in Developing Countries* (Updated Edition). 1993. WASH Project.

3. *Progress Report No. 15.* December 1994. Prepared by Diane B. Bendahmane. WASH Project. (This report includes summaries of tasks carried out by WASH through December 30, 1994.)

Peri-Urban

1. *Voices from the City.* Newsletter published three times each year by USAID's Center for Population, Health and Nutrition and Center for Environment. Coordinated by EHP.

2. *Constraints in Providing Water and Sanitation Services to the Urban Poor.* March 1993. Prepared by Tova María Solo, Eduardo A. Perez, and Steven D. Joyce. WASH Technical Report 85.

3. *The Unique Challenges of Improving Peri-Urban Sanitation.* July 1993. Prepared by William Hogrewe, Steven D. Joyce, and Eduardo A. Perez. WASH Technical Report 86.

CIMEP

1. *Intersectoral Municipal Institutions: Towards an Effective Social Policy for the Peri-urban Poor.* June 1995. Prepared by May Yacoob for RHUDO/NENA Annual Meeting in Cairo.

2. *Creating Institutional Capability for Community-Based Environmental Health Programs: Lessons from Belize.* March 1994. Prepared by May Yacoob, Bob Hollister, Al Rollins, and Gail Kostinko. WASH Field Report 434.

3. *Description of the CIMEP Methodology as Applied in Tunisia.* Unpublished EHP report. April 1995. Prepared by Diane Bendahmane.

4. *Public Participation in Urban Environmental Management: A Model for Promoting Community-Based Environmental Management in Peri-Urban Areas.* Updated May 1995. Prepared by May Yacoob, Eugene P. Brantly, and Linda Whiteford. WASH Technical Report 90.

Risk Assessment

1. *Environmental Health Assessment: An Integrated Methodology for Rating Environmental Health Problems*. October 1993. Prepared by Eugene Brantly, Robert Hetes, Barry Levy, Clydette Powell, and Linda Whiteford. WASH Field Report 436.

2. *Environmental Health Assessment: A Case Study Conducted in the City of Quito and the County of Pedro Moncayo, Pichincha Province, Ecuador*. October 1993. Prepared by Gustavo Arcia, Eugene Brantly, Robert Hetes, Barry Levy, Clydette Powell, José Suárez, and Linda Whiteford. WASH Field Report 401. Joint paper with PRITECH.