ENVIRONMENTAL HEALTH PROJECT

Strategic Framework

1995 - 1999

March 1995

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

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Purpose of the Strategic Framework

This Strategic Framework document describes how the Environmental Health Project (EHP) will respond to the extremely varied needs of USAID-assisted countries in the environmental health arena. While there are some commonalities from USAID region to region, there are also stark differences. The needs of African countries, for example, where malaria and diarrheal diseases are big killers, require a different strategy than the needs of Central and Eastern Europe and the newly independent states of the former Soviet Union, where cancers and respiratory diseases brought about by hazardous emissions from industry and agriculture pose a major problem. The Framework is intended to define the strategies, boundaries, and approaches of EHP and to help missions and bureaus understand in detail what the project can offer them and how the "environmental health perspective" might be applied to the problems their countries face, often through coordination with programs underway.

The document begins with a chapter on the major environment-related global health problems that EHP hopes to address and the global socioeconomic trends that impact on those problems. It also explains the role of environmental health in meeting USAID goals. The second chapter reviews the environmental health burden and current trends region by region and presents the general options for intervention. The third chapter outlines the strategies that EHP will employ in setting priorities for the use of its core funds and the norms and principles that guide EHP in working toward USAID's goal of sustainable development.

The Framework document has a five-year horizon, the length of the present contract. It should be read in conjunction with each year's Annual Plan, which goes into specifics about the activities planned for the fiscal year. Both the Strategic Framework and the Annual Plan might suggest opportunities for collaboration or prompt requests for technical assistance from mission and bureau personnel. These should be discussed with the EHP Project Officer, Dennis Carroll, in the Global Bureau's Office of Health and Nutrition.

Chapter 1

Global Environmental Health Burdens and Trends: A Call for Action

The global burden of disease due to premature death and disability is strongly associated with poor living conditions, lack of water and sanitation, and contact with infectious and toxic agents. Some diseases are caused by naturally occurring pathogens or insect and rodent vectors. Others are related to environmental conditions created by human populations and exacerbated by a lack of basic services, regulations, or mitigation measures. In the last generation, millions of people in developing countries have flocked to the cities in pursuit of better economic opportunities, and new industries have sprung up and new agricultural practices have been established. But this urbanization and modernization has been largely unplanned, and industrial and agricultural enterprises have not paid adequate attention to environmental and human health issues. As a result, pollution of the human environment—the air, the water, and the soil—is a serious problem in many areas of the world. Furthermore, people are exposed to a wide range of conditions in the home and workplace that have serious health consequences. While increased economic growth has had a generally favorable impact, it has also led to some serious environmental health problems.

Environmental health is the branch of public health that addresses these kinds of environmentally related health problems. It stresses prevention through the use of a wide variety of tools, including building or rehabilitating basic services infrastructure, controlling disease vectors, instituting favorable policies and regulations, instituting incentives to reduce pollution, and changing human behavior to achieve its objective of protecting human health. In environmental health, problems are addressed through an integrated approach that draws on a wide range of skills from diverse technical areas and disciplines.

1.1 Major Environmental Health Diseases

Many diseases and hazards fall within the purview of environmental health, but looking at the developing world as a whole, there are three major ones: diarrheal diseases, vector-borne diseases (mainly malaria), and respiratory infections. According to the World Bank's *World Development Report* for 1992, subtitled *Development and the Environment*, "inadequate attention has been given to environmental problems that damage the health and productivity of the largest number of people, especially the poor." These are water-and-sanitation diseases that hit the "one-third of the world's population that has inadequate sanitation and the 1 billion without safe water" and respiratory diseases caused by soot and smoke (to which 1.3 billion are exposed) and by severe indoor air pollution (to which 300 to 700 million women and children are exposed).

Vector-borne diseases are covered by environmental health because they persist in certain ecological conditions. While some of these conditions exist in the natural environment, many are created by agricultural practices, including irrigation, or development projects that produce habitats conducive to vector growth. Other conditions favorable to the transmission of vector-borne diseases are created by inadequate sanitation and solid waste control. An exclusively chemical approach to the prevention of tropical diseases has proven to be unsustainable in countries with limited resources; there, prevention through a combination of environmental and behavioral changes is a far more promising approach to malaria and other tropical diseases, which cause 1-2 million deaths per year.

Disease Control Priorities in Developing Countries (World Bank, 1993) estimates that of the estimated 50 million annual deaths worldwide, 17 million occur in developing countries from infectious and parasitic diseases, 5 million of which are from diarrheal diseases and 6.3 million of which are from acute respiratory diseases. Of the 17 million deaths, 10.5 million are of children under five. Ambient air pollution in developing countries causes, according to World Health Organization (WHO) estimates, 300,000 to 700,000 premature deaths per year. In many developing countries, indoor air pollution from biomass fuels used for cooking or heating creates an additional health burden. Available information points to a strong connection between indoor smoke and acute respiratory infections, which cause an estimated 4 million infant and child deaths per year.

The data on mortality, however, does not fully convey the size of the disease burden of diarrhea, malaria, and respiratory infections. One must look at morbidity figures as well to grasp its extent. From the environmental health perspective, which stresses the promotion of "wellness," lowering morbidity is equally as important as lowering mortality. According to estimates in *Tropical and Geographic Medicine* (McGraw-Hill, 1990), there are 28 billion new cases of diarrheal disease a year. For respiratory disease the comparable figures are 15 billion new cases. According to WHO, 500 million persons live in areas highly endemic for malaria, and there are 300 to 500 million clinical cases per year. In many regions of the world malaria is increasing, and it is spreading to regions hitherto untouched, perhaps due to climate changes. These high morbidity figures underscore the recurring nature of these diseases and the accompanying high socioeconomic burden and point to the need for prevention.

Table 1
Estimated Causes of Death in Developing Countries, by Region

Cause of death	Annual Deaths in Thousands				
	Latin America and the Caribbean	Sub-Saharan Africa	Middle East/ North Africa	Asia	Total
Infectious and parasitic diseases	900 (28%)*	4,500 (63%)	2,400 (56%)	9,200 (40%)	17,000 (45%)
Neoplasms	300	250	200	1,750	2,500
Circulatory diseases and certain degenerative diseases	900	650	550	4,400	6,500
Complications of pregnancy	35	125	80	260	500
Perinatal conditions	300	680	420	1,800	3,200
Chronic obstructive pulmonary diseases	90	60	50	2,100	2,300
External causes	250	350	200	1,600	2,400
Other and unknown causes	425	585	400	2,090	3,500
Total	3,200	7,200	4,300	23,200	37,900

*Percent of total deaths in the region.
Source: *Disease Control Priorities in Developing Countries*, 1985 data.

The burden of diarrheal, vector-borne, and acute respiratory diseases is borne to one extent or another by three of the four USAID regions: Africa, Latin America and the Caribbean, and Asia/Near East. The Europe and Newly Independent States region, although not without diarrheal disease, presents a different profile, as will be seen in Chapter 2. The distribution of estimated deaths by region and cause of death is presented in Table 1, taken from *Disease Control Priorities in Developing Countries.*

The table shows that almost half (45 percent) of the deaths in developing countries are attributable to infectious and parasitic diseases. In sub-Saharan Africa the figure is 63 percent. (It should be pointed out that, as high as these percentages are, they do not include all environmentally related diseases. Some of the other causes of death, such as neoplasms, are also associated with environmental pollution.) Table 2, based on figures from the 1993 *World Development Report,* shows the distribution of disability-adjusted life years (DALYs) lost among the regions for various environmentally related diseases. (See the accompanying text box for information on DALYs.)

Table 2
Proportion of DALYs Lost to Four Environmentally Related Diseases, 1990
(Diarrhea, Malaria, Worm Infection, Respiratory Infection)

Africa	Other Asia	Middle East	India	Latin America and the Caribbean	New Independent States	Established Market Economies
33.8%	24.2%	22.8%	21.7%	14.8%	3.0%	2.9%

Worldwide, the total DALYs lost for these diseases is somewhere in the neighborhood of 20 percent of all losses. This translates to 272 million DALYs per year. In other words, 272 million years of healthy life are lost each year to preventable diseases. These figures probably underestimate the problem because DALYs give less weight to morbidity than to mortality.

The Implications of DALYs

The disability-adjusted life year (DALY) is a measure that combines healthy life years lost due to disability or premature death.

DALYs permit health officials to measure the burden of disease globally or in individual countries or among persons of a certain age group or sex. Because of the paucity of reliable data, the computation of DALYs must rely heavily on expert estimates. Nevertheless, the estimates give a more accurate picture of reality than mortality figures alone. For example, mortality from diarrhea, high as it is, does not convey the impact of the repeated bouts of illness per year experienced by many children in developing countries. Healthy years lost because of disease carry a high economic toll, and high morbidity levels mean that national resources are being spent for health care rather than for more productive activities.

Disease burden calculations using DALYs reveal that, although health has improved around the world, a large amount of premature mortality and disability remains. Much of the share caused by communicable diseases could be easily prevented through provision of a healthier environment: water supply, sanitation, garbage collection, clean-burning stoves, and better personal and food hygiene.

1.2 Urban and Rural Differences

Environmentally related diseases are prevalent in both urban and rural areas. In urban areas, most, but not all, environmental health problems are found in urban slums or squatter areas where water and sanitation infrastructure may be completely absent and where overcrowding, indiscriminate defecation and disposal of solid waste, and poor drainage create conditions in which health cannot be maintained. Human excreta is the pollutant of primary concern. Most domestic sewage is discharged directly without treatment onto land or into bodies of surface water. In Latin America, only 10 percent of the sewage collected in urban areas is treated before it is discharged. In the developing world the treated portion is estimated to be no more than 25 percent.

In many cities, drainage systems evacuate both sewage from domestic, commercial, and industrial sources and street runoff into surface waters. Poorly drained wastewater creates ideal conditions for the outbreak of mosquito-borne disease. In addition, industries discharge untreated effluent directly into surface water or groundwater, exposing people to a variety of heavy metals and toxic organic substances.

Municipal solid-waste services in developing countries cover only 50 to 70 percent of the total urban population, and in poor neighborhoods, waste-collection services are utterly deficient where they exist at all. In the absence of controls and proper management, hospital wastes and other hazardous materials, mixed in with residential refuse, continue to find their way into inadequate dump sites. In the majority of developing countries, most collected wastes end up in open dumps, ravines, or drainage systems, threatening the health of those exposed directly or indirectly through the contamination of surface water or groundwater.

The proportion of DALYs lost to these environmentally related diseases is high in the least-developed countries and quite low in the new independent states and established market economies. However, the ranking is completely different for cancer, an environmentally related disease that is hitting the most developed countries hardest at present. See Table 3 and accompanying discussion in Chapter 2.

Urban populations are growing explosively but infrastructure construction lags far behind, leading to increasingly crowded and unsanitary conditions responsible for significant increases not only in dengue, which is primarily an urban disease, but also in visceral leishmaniasis, bancroftian filariasis, and malaria.

Air pollution is growing in large cities, especially where motor vehicle use, industrialization, and coal consumption are heavy. The problem is exacerbated in areas with poor air circulation or that are subject to thermal inversions. Increasing traffic congestion is also raising carbon monoxide levels in most developing country cities and contributing to the large increases of lead in the environment.

Modernization and industrialization are mixed blessings from an environmental health point of view, for their byproduct is often toxic emissions or hazardous waste products that can endanger workers and the general public. In newly industrializing states, one can expect to see a corresponding increase in lead poisoning, central nervous system disorders, increased asthma, increased cancers and birth defects, and so on. Chemical pollutants within the urban environment include lead, arsenic and mercury, carbon monoxide, sulfur dioxide, PCBs, hydrocarbons, heavy metal compounds, smoke from wood or coal fires, etc.

Rural areas face other problems. Deficiencies in water and sanitation are still serious in many rural areas, although 778 million rural inhabitants were provided with a safe water supply during the Water

Decade and 344 million with adequate sanitation. In 1990, over a billion rural inhabitants were without a safe water supply and 1.6 billion were without sanitation, according to end-of-Decade reports. Until these deficiencies are remedied, diarrheal disease and other water-and-sanitation diseases will continue to cause high mortality and morbidity in the countryside. Vector-borne diseases also threaten health in many areas of the world. Malaria is by far the most serious health threat, but schistosomiasis, onchocerciasis, and guinea worm (dracunculiasis) take their toll on the health and productivity of the rural population, particularly women. As in urban areas, indoor smoke from cooking and heating fuels presents a serious health threat and may contribute to the prevalence of acute respiratory infection, which is cited by the World Bank as one of the major problems of the rural poor. The World Resources Institute states that the coal or biomass fuels used by two-thirds of the world's population, primarily in rural areas, emit "hundreds of toxic substances, including particulates coated with a variety of organic compounds." A WHO field study in rural Kenya found that the average particulate levels in houses where wood or crop residues were used as fuels were over 20 times higher than the WHO guidelines. The health impacts of such high exposure levels include chronic lung and heart diseases and cancer, as well as acute respiratory infections. The World Resources Institute states that "exposure to indoor fuel emissions is likely to be the most important occupational health hazard for women in developing countries." Other problems facing rural populations include pesticide contamination and, in some areas, the risks inherent in being downwind or down river from urban centers.

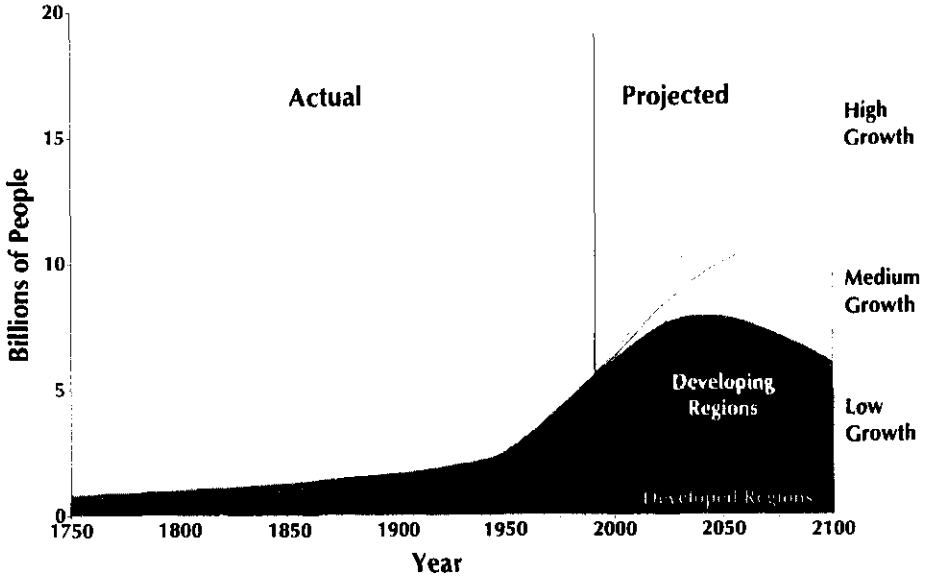
As households, whether urban or rural, advance economically, they consume more, create more wastes, use more energy, and buy and drive more automobiles that pollute the air. Because the process of modernization often takes place without proper planning and an adequate regulatory environment, it often causes damage to the environment that may take generations to clean up.

1.3 The Impact of Worldwide Trends

While there are a host of environmental problems that impact on health—from water pollution to ozone depletion—and while many of these have attracted a lot of attention from environmentalists, the more deadly environmental problems turn out to be those related to dirty air, dirty water, poor sanitation and hygiene, and disease vectors that thrive in degraded environmental conditions. These problems impact hundreds of millions of individuals in the developing world. The problem is severe now, but the burden of diarrheal, vector-borne, and acute respiratory diseases will be accentuated by a number of worldwide trends.

High rates of growth in population will continue to hamper efforts to make any real headway in reducing morbidity and mortality from environment-related diseases in the developing world. Data from the Johns Hopkins University Population Information Program is plotted on Figure 1 to show the actual (to date) and projected population growth curves under three possible scenarios. (The low growth projection assumes fertility stabilizing at 1.7 children per woman; the high at 2.5; and the medium at 2.1.) Even the most optimistic forecasts do not show the population engine slowing down until well into the twenty-first century. The next thirty years will show a worldwide increase in population of between 40 and 100 percent. Much of this increase is expected to take place in developing countries. Protecting these new populations from environment-related health problems will present a public health challenge everywhere.

Figure 1. Different Futures: Past and Projected Population Growth, 1750-2100

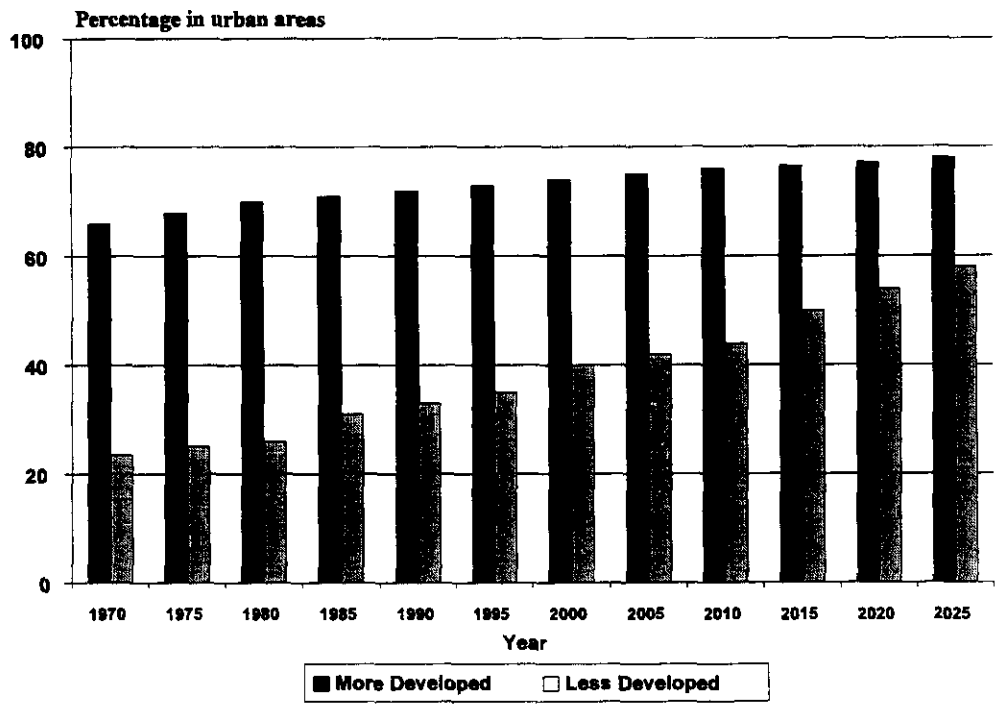


Source: Population Information Program, The Johns Hopkins University. *Population Reports.* May 1992.

Urban population has grown from under 300 million in 1950 to 1.3 billion in 1990. By 2000, an estimated additional 600 million people will live in urban areas. About two-thirds of this increase will be in developing countries. Figure 2 illustrates the percentage of populations in developed and developing countries who will live in urban areas. In developing countries, this percentage is expected to grow from just over 35 percent now to almost 60 percent within thirty years (year 2025). If the urbanization process follows the same pattern in the future as it has in the past, with most growth taking place in peri-urban shantytowns, environmental health problems will be on the rise along with demands on the already overstrained health systems of developing countries.

Another trend to consider is the reduction in children's mortality rates. Tremendous success has been achieved in reducing infant and child mortality rates through oral rehydration therapy and immunization programs—some developing countries have higher immunization rates than U.S. inner cities. Paradoxically, the decrease in deaths produces higher numbers of survivors who are increasing the burden on the health care delivery system and contributing to increased demand for basic environmental health services. As more individuals survive there are more demands for water supply, basic sanitation, hygiene education, and vector control. Without the provision of the same services and more emphasis on prevention, health care delivery systems will only see the burden on health care facilities increase.

Figure 2. Proportion of Population in Urban Areas in Developed and Developing Countries



Source: United Nations. *The Prospect of World Urbanization.* Revised as of 1984- 85. Population Studies No. 101, ST/ESA/SER/101, New York, 1987.

The major trends discussed above point to the need for population programs, strengthening of primary health care systems, and significantly increased attention to environmental health problems. While the first two are getting attention, efforts to create environmental health programs that stress prevention—especially those related to basic water supply, sanitation, hygiene education, vector control, air pollution and lead abatement—need to be redoubled if a complete program of improved health and reduced health care burden is to be achieved.

1.4 Reasons for Optimism

The overwhelming needs of developing countries, coupled with the countercurrents of increasing population and limited resources, make the job seem hopeless. However, some promising developments lend a note of optimism.

First, developing countries are recognizing the need to address environmental health. The June 1992 United Nations Conference on the Environment and Development in Rio de Janeiro and the 1990 UNICEF Summit for Children placed environmental health interventions among the highest priorities for improving the health of the poor in developing countries. In Latin America this emphasis has led to an ambitious program to generate $150 billion in local and donor funding for health and the environment. Second, the lessons of the Water and Sanitation Decade of the 1980s—including the development of appropriate technologies, the evolution of community-based approaches, and attention to environmentally sustainable development—provide a jumping-off point for continuing

successful programs and applying the principles of success to new areas of environmental health, such as new strategies for addressing tropical diseases and reducing acute respiratory infections. Third, the changing political and economic climate and the trend toward democratization, decentralization, and privatization have improved the context for making inroads into environmental health problems. For example, many developing countries now realize that practices such as using untreated wastewater for irrigating crops for export will keep them from participating fully in world markets. This gives them an added incentive to make the necessary investments in infrastructure. Deciding how to allocate limited resources is still a challenge, but it can be met given the proper tools, information, and approaches. Models successfully applied in one situation can be adopted for use elsewhere.

1.5 Environmental Health As a Strategy for Sustainable Development

USAID's *Strategies for Sustainable Development* (1993) presented the five goals of the U.S. Agency for International Development's program:

- Stabilizing world population growth and protecting human health
- Encouraging broad-based economic growth
- Protecting the environment
- Building democracy
- Providing humanitarian assistance and aiding countries undergoing political restructuring in the wake of the Cold War

Environmental health has a key role to play in helping the agency to achieve these goals.

Environmental health problems create obstacles to sustained economic growth and well-being that must be overcome: unhealthy people cannot realize their full economic potential. At the same time, environmental health programs are necessary components of economic growth in their own right. For instance, the water supply and waste management infrastructure that protects public health also provides the services—clean water and waste disposal—that are needed to support commercial and industrial growth, the engines that drive overall economic development. Like most development activities, the processes that lead to sustainable improvements in environmental health work best in democratic societies that foster or at least allow public participation. In countries where democratic practices have not matured, development assistance in environmental health can be an effective vehicle for building public involvement and supporting the processes that lead to more democratic decision making. Finally, environmental health, especially disease control, is a basic part of nearly all humanitarian assistance programs. In countries undergoing political restructuring—Russia, Central and Eastern Europe, or Gaza—public demand for improved environmental health offers a solid opportunity for a government to demonstrate its responsiveness to the needs of its constituencies.

USAID's established track record in providing development assistance positions it to play a formative role in developing environmental health programs in the countries that it assists. This role and the results that can be achieved from environmental health programs can make significant contributions to achieving the agency's overall goals.

Chapter 2

Regional Environmental Health Burdens, Trends, and Approaches

2.1 Overview

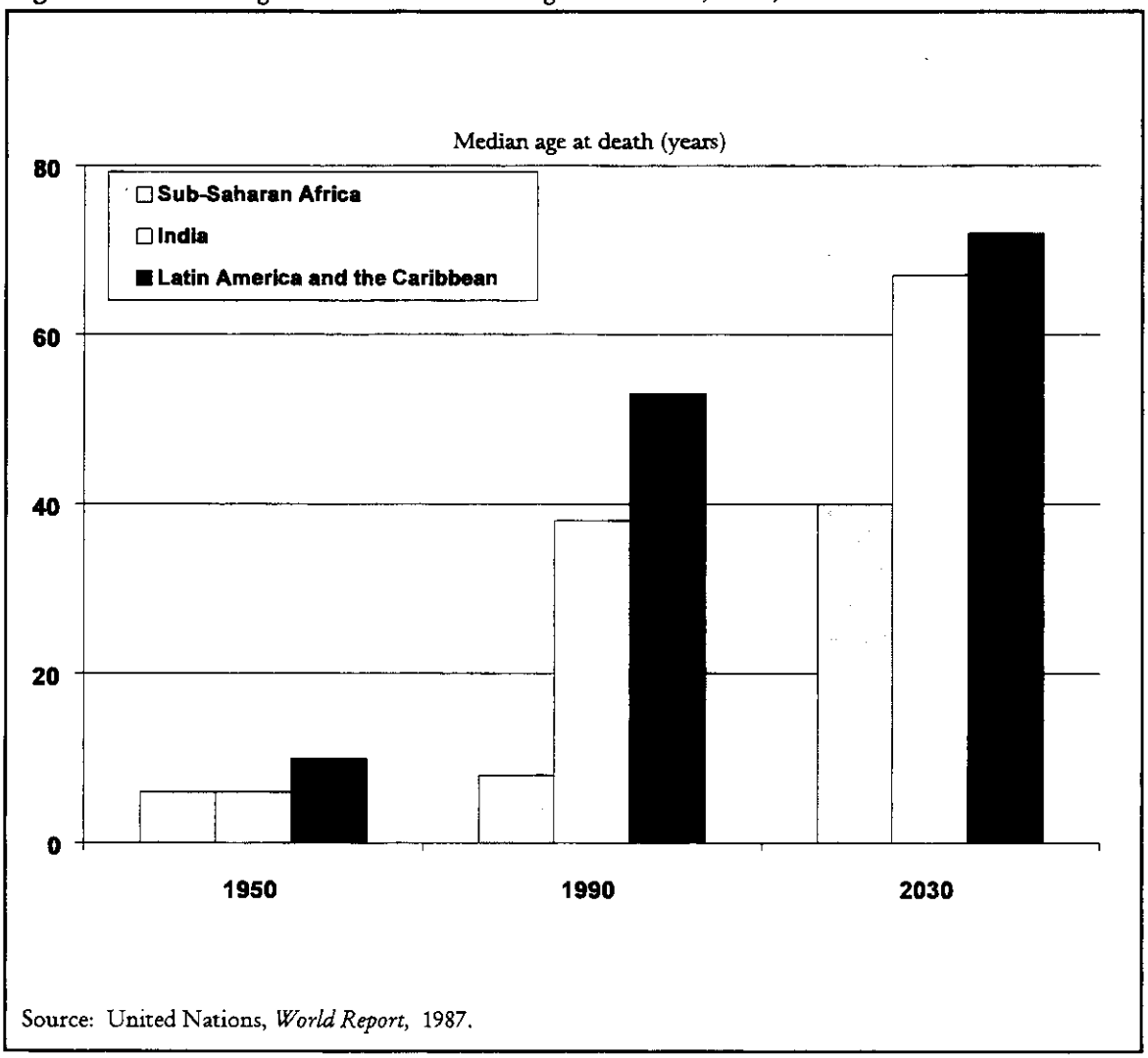
When developing an approach to environmental health, a prime imperative is to be responsive to regional diversity, for environmental health problems in nations that USAID assists vary widely by type, severity of impact, and segment of the population affected. Rather than offering a certain technology or prescriptive intervention, environmental health efforts should offer a problem-solving approach in which the most effective technologies or interventions are employed, given the location. On one level, all problems are unique and tied to one locale, but, generally speaking, each USAID region or subregion has characteristic problems which manifest themselves in characteristic ways.

This chapter presents an analysis of each of the geographic regions covered by USAID. The purpose of the analyses is to highlight the key environmental health problems in each region and suggest approaches to these problems that could be supported by USAID. Since only a few pages are allocated to each region, it is not possible to cover the many regional variations in environment-related disease patterns. But the broad brush strokes of the analyses do portray the striking differences between regions and point to the need for tailor-made approaches.

WHO's *Strategy for Health and Environment* (1993) divides environmental health hazards into two basic categories: (1) those that produce infectious diseases and (2) those that are related to environmental pollution and lifestyles based on high resource consumption. The first category is called "traditional," the second "modern." Traditional hazards, which are characteristic of developing countries, include unsafe drinking water, poor sanitation and waste management, unsafe food handling, disease vectors, and hazards in agriculture. Modern hazards, which are characteristic of developed countries, include vehicle emissions, toxic chemicals and hazardous wastes, industrial pollutants, and the like. However, a growing number of countries have the double burden of facing both types of problems.

Similarly, countries may be categorized according to whether they have gone through the demographic and epidemiological transitions. In the demographic transition, mortality from infectious diseases declines due to improved conditions and health care, and, partly as a result, fertility also declines. This brings about an epidemiological transition: as the average age of the population increases, noninfectious diseases supplant infectious diseases as the main cause of ill health. All regions are expected to experience these transitions, but the timing will differ. Figure 3 shows the variable rates at which three illustrative regions or countries will make the transition. It is worth noting that, while Africa and India had about the same median age at death in 1950, by 1990, the gap between them had widened considerably, not to be narrowed appreciably in the foreseeable future. Generally speaking, pretransition countries and regions experience high rates of infant and child mortality and morbidity. In post-transition countries, the opposite is the case: the health problems of the elderly outweigh those of the young. Table 2 in the previous chapter showed the high percentage of DALYs lost due to environment-related pre-epidemiological transition diseases. Table 3 shows DALYs lost to cancer, a post-epidemiological transition disease. Cancer is related to more modern environmental hazards and is more prevalent in countries with older populations.

Figure 3. Median Age at Death in Three Regions in 1950, 1990, and 2030



Source: United Nations, *World Report*, 1987.

Table 3
Proportion of DALYs Lost to Cancer, 1990

Sub-Saharan Africa	Middle East	India	Other Asia	Latin America and the Caribbean	New Independent States	Established Market Economies
1.5%	3.4%	4.1%	4.4%	5.2%	14.8%	19.1%

Figure 4. Probability of Dying before Age 5

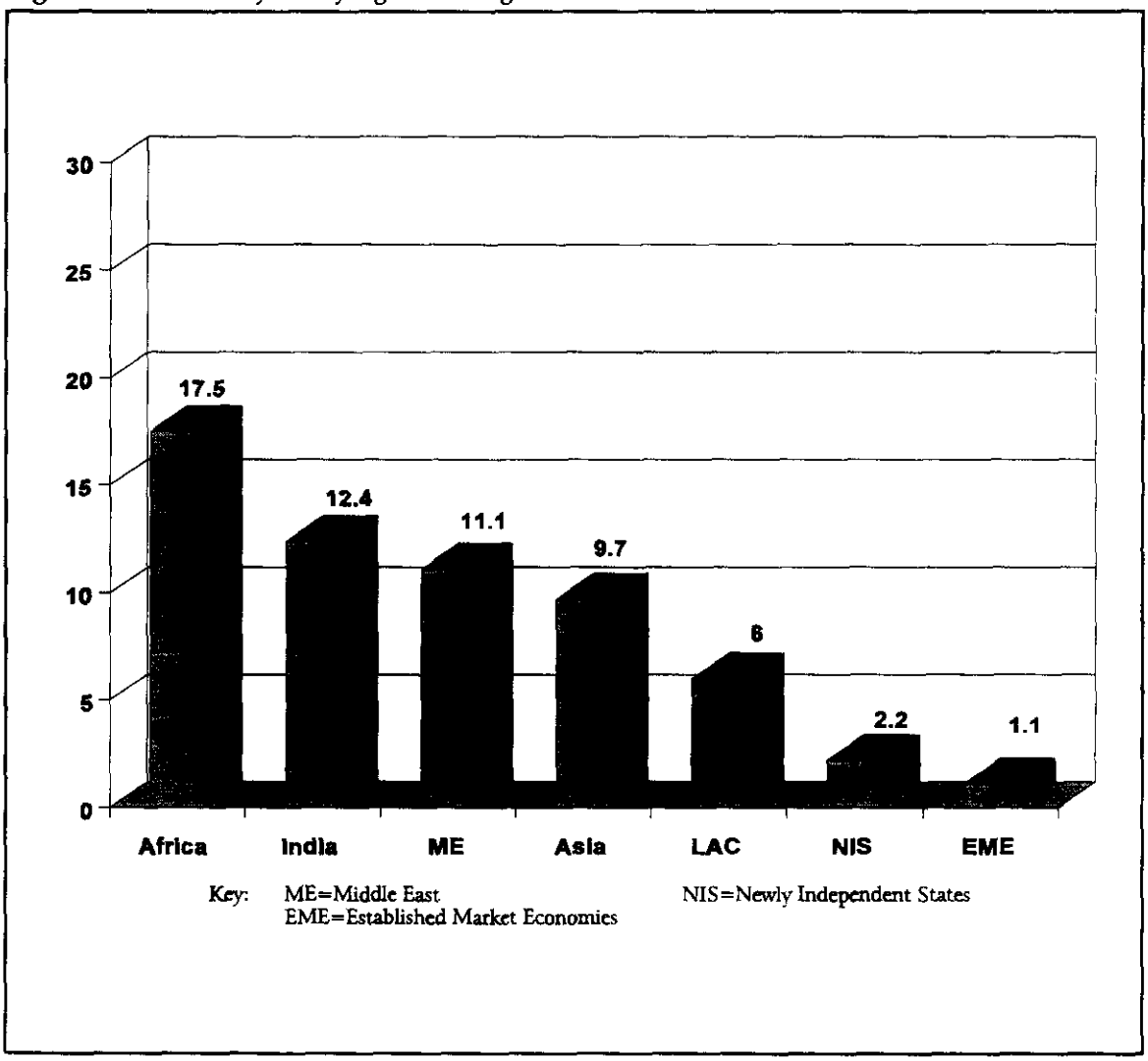
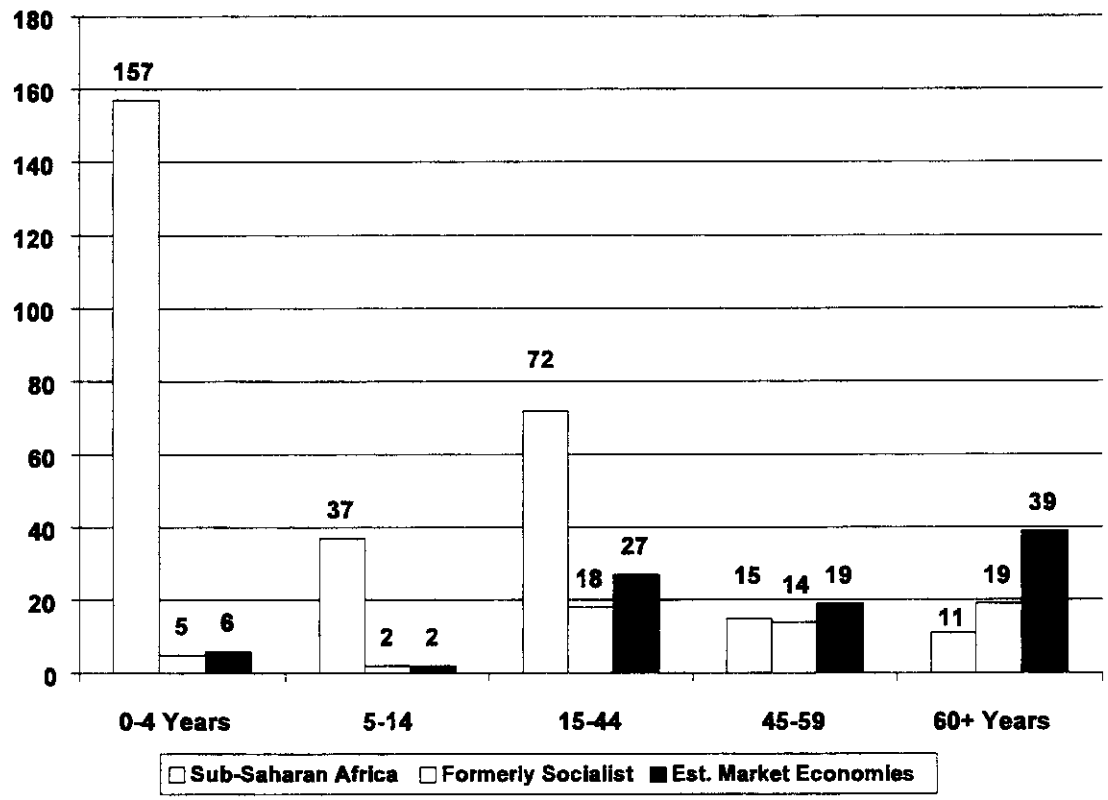


Figure 4 shows the probability of dying before the age of five in various regions. Figure 5, which again uses DALYs lost, contrasts sub-Saharan Africa and the formerly Socialist economies as to the burden of diseases by age group. Africa's higher disease burden falls heavily on the young.

In the following sections, the key environmental health problems, related socioeconomic and demographic trends, and possible options for taking action will be discussed for each USAID region, beginning with sub-Saharan Africa (AFR), a region where traditional environmental health problems persist. In contrast, modern hazards predominate in Europe and the New Independent States (ENI), the next region discussed, caused largely by unrestrained industrialization. The other two regions, Latin America and the Caribbean (LAC) and Asia and the Near East (ANE), are transitional, with some subregional variations: they face both modern and traditional environmental hazards. Although it is not specifically mentioned under each region, unforeseen disasters or emergencies calling for environmental health interventions are likely to occur. Responding to them is a high priority for USAID.

Figure 5. Burden of Disease: Premature Death and Disability in Three Regions



Source: *World Development Report,* Table B.5, Page 221, 1990 data.

2.2 Sub-Saharan Africa

2.2.1 Summary

- The chief environmental health problems of sub-Saharan Africa are infectious and vector-borne diseases arising primarily from inadequate water and sanitation infrastructure and changing ecological conditions due to expanding economic development activities, including agriculture and forestry. Major environmental health hazards include malaria, cholera and other diarrheal diseases, and acute respiratory infections. These affect infants and children disproportionately.

- Underlying trends exacerbating these diseases include expanding population, civil disorder, migration, rapid urbanization, deteriorating economic conditions, and inadequate government services.

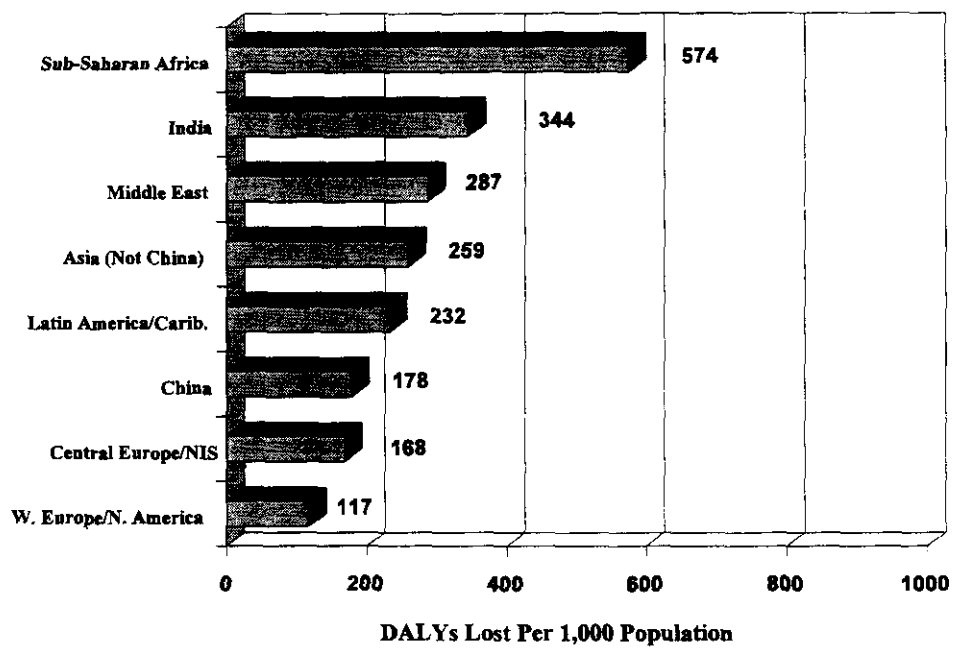
- The most promising option is to emphasize control of diarrheal diseases and malaria prevention through 1) integrating the environmental health approach into maternal and child health and child survival activities; 2) strengthening the capacity of NGOs to implement environmental health activities; 3) focusing on rural areas; and 4) working toward empowering individuals and communities to act on their own behalf.

2.2.2 Priority and Emerging Health Problems in Sub-Saharan Africa

The life expectancy of 51 years in sub-Saharan Africa is the lowest in the world, while its disease burden is the highest (Figure 6). In contrast with most other regions, it remains in a condition of pre-epidemiological transition. Communicable diseases, many of which are environmentally related, are responsible for much of the excessive morbidity and mortality in the region.

Although the burden of ill health is high, infant and child morbidity and mortality showed significant decreases during the 1980s. The infant mortality rate (IMR) fell from 128 per 1000 in 1975-80 to 108 per 1000 in 1985-1990. This decrease took place in the face of falling economic indicators and declining government services and was a product of concerted efforts by African governments and development organizations such as USAID to strengthen the health sector. But the IMR is again rising in some countries of the region. Declining environmental health, exacerbated by population growth and civil unrest and dislocation, is a contributing factor. Environmental health problems of particular concern are diarrheal and vector-borne diseases, especially malaria. The contribution of environmental causes to acute respiratory illness is unclear at this point and warrants further examination.

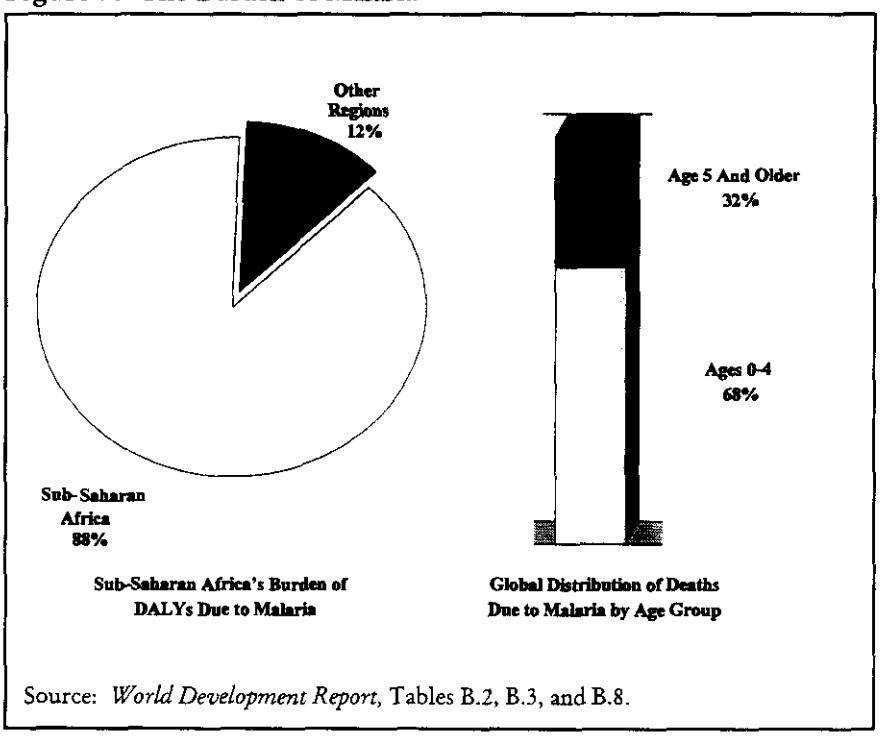
Figure 6. The Global Burden of Disease



Source: *World Development Report,* Table B.1, Page 215, 1990 data.

Malaria and other vector-borne diseases: Malaria remains the single most important cause of morbidity and mortality among vector-borne diseases in Africa, although other vector-borne tropical diseases, including schistosomiasis, onchocerciasis, guinea worm, and filariasis are responsible for considerable morbidity and lost productivity. Sub-Saharan Africa has only 10 percent of the world's population, but, as can be seen from Figure 7, it suffers nearly 90 percent of the world's malaria infections, with children constituting the largest percentage of those who die. More than 90 percent of Africans live in malarial areas, about 250 million people are infected, and the yearly incidence of new cases is at least 90 million. The cost of malaria is high. It is estimated that in 1995 the total annual cost of the disease to Africa will be $1.8 billion. In addition, indirect costs are frequently overlooked. USAID-supported economic studies in Kenya and Nigeria found productivity losses among women taking care of their sick children. Since women are often the economic mainstay of the family and community, the absence of women from the work force spells reduced resources for families. In Africa, unlike other parts of the world, *Plasmodium falciparum*, the most dangerous malaria-causing organism, is the chief parasite, and its resistance to available drugs is increasing.

Figure 7. The Burden of Malaria



Source: *World Development Report,* Tables B.2, B.3, and B.8.

Cholera and other diarrheal diseases: Diarrheal diseases are consistently ranked as the major killers of African children, and cholera is now endemic on the continent. Inadequate or unreliable water supplies and sanitation infrastructure in both rural and urban areas combined with poor hygiene practices, including food hygiene, are major factors in the continued growth and propagation of these diseases.

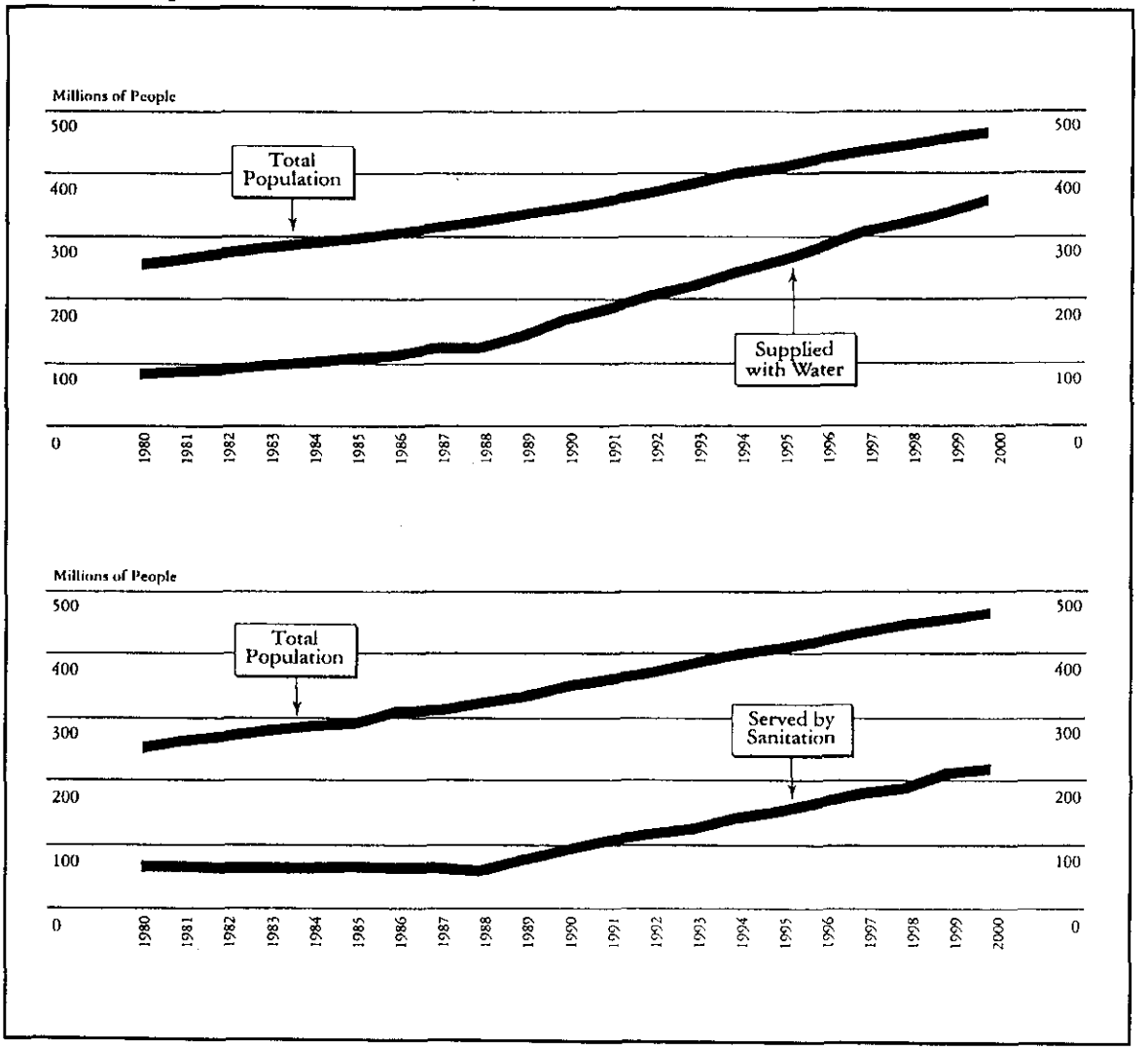
2.2.3 Trends Affecting Environmental Health in Sub-Saharan Africa

High population growth rate: Sub-Saharan Africa has the highest population growth rate in the world. The 43 countries of the region currently have an estimated population of 489 million (World Bank, 1993), which is expected to grow to 1.3 billion people by the year 2030.

Rapid and unplanned urbanization: Africa is one of the least urbanized areas of the world and will remain mostly rural for the next generation. However, the urban population is growing fast. At present only 20 percent of the population lives in urban areas (World Bank, 1993), but the urban and peri-urban population is expected to double by the year 2020, when 40 percent of Africans will live in urban centers. The trend is illustrated in Kenya, for example, where the urban population will rise from the present level of 28 percent to an estimated 48 percent in 2020.

Inadequate infrastructure and services: Among the most significant reasons for environmental health problems are inadequate access to clean water and sanitation services; only 32 percent and 22 percent, respectively, of the rural population is covered, according to the end of the Water Decade reports prepared by the World Health Organization. While access to sanitation services in urban areas is usually higher, the rapid rate of urbanization will strain available facilities. As can be seen from Figure 8, although the total number of people with access to water and sanitation facilities has grown, the proportion of the population served has hardly changed.

Figure 8. Population and Current Projected Water and Sanitation in 20 African Nations



Economic forces: Economic conditions throughout most of the region have deteriorated through the 1980s, resulting in negative GNP per capita growth during this time (World Bank, 1993). The GNP per capita for 1991 was estimated to be US$ 350, higher than for South Asia (US$ 320), but foundering. Declining resources have limited the ability of governments in the region to expand services to meet the demands of a rising population. For example, 10 countries spent less than US$ 10 per capita on health in 1991.

Social forces: While sub-Saharan Africa is made up of diverse ethnolinguistic groups, the region has certain consistent features. Most people are farmers who live in extended family networks in traditional housing. Ethnic ties are very strong. Local community structures are relatively intact and traditional leaders continue to wield substantial influence and political power. The public sector lacks resources, both monetary and human, and is often not strong enough to carry out programs in far-away rural areas.

Migration: The two forces behind large-scale migration are political disturbances and the lure of the city. Political disturbances, like those in Rwanda, have caused massive and sudden population movements that have created huge refugee communities without adequate water and sanitation facilities. Epidemics of environmentally related diseases such as malaria, cholera, and bacterial dysentery have accompanied these population movements. A unique characteristic of the movement of populations to urban areas is the creation of "urban villages." Populations tend to move intact from rural areas, preserving ethnic, language, and community ties, and to settle in peri-urban areas, where environmental conditions are radically different.

Industrialization and development: Agricultural production, particularly rice cultivation, has expanded, bringing more areas under irrigation and thereby increasing the breeding sites for vectors with an associated rise in the incidence of vector-borne diseases. Large-scale infrastructure projects such as dams have also contributed to this problem. The misuse of agricultural pesticides has resulted in some exposure of workers to insecticides. Additionally, small-scale industries often discharge solvents, dyes, and other industrial chemicals into urban and peri-urban environments with little regulation.

2.2.4 Options for Improving Environmental Health in Sub-Saharan Africa

Focus on the control of diarrheal and vector-borne diseases: Primary emphasis should be given to the prevention of diarrheal diseases and malaria in the most vulnerable populations: women and children.

Build on current programs: Prevention of diarrheal diseases and malaria receives too little attention in current mission programs. These diseases should be given attention commensurate with their impact on the health and well-being of the populations of sub-Saharan Africa. USAID has already invested much effort in child survival and primary health care, as well as family planning and AIDS prevention in the region. Integrating environmental health into these programs should therefore be a priority.

Work with NGOs: In order to augment the capabilities of governments, partnerships with NGOs should be forged to help them integrate environmental health approaches into their maternal and child health (MCH) primary health care, and other development activities and strengthening their capacity to implement environmental health activities.

Focus on rural problems: Despite rapid urbanization, Africa is, and will remain, predominantly rural for the near future. Rural areas should be the focus of environmental health activities, especially water supply and sanitation issues and malaria control. At the same time, because sub-Saharan Africa has

urbanized more slowly than other regions, there is still time to address the problems of preventing cholera and other diarrheal diseases in urban settings and to understand the effects of urbanization on malaria transmission before these problems get out of hand.

Work toward the empowerment of individuals and communities: It is important to work with missions and host country governments on community-level activities such as 1) improving environmental health practices; 2) developing programs to provide individuals with effective personal protection from environmental hazards, such as bednets; and 3) helping communities to confront environmental health problems through community-based environmental management (CEM), a process developed by the former Water and Sanitation for Health Project that enables communities to define their own environmental problems and propose solutions.

2.3 Europe and the New Independent States

2.3.1 Summary

- In Europe and the New Independent States (ENI), which comprise Central and Eastern Europe and the former Soviet Union, the environmentally associated diseases from which people suffer are primarily chronic rather than infectious. Of particular concern are chronic diseases arising as a product of exposure to low doses of toxic and hazardous industrial and agricultural chemicals, especially diseases associated with air and water pollution. Adults are the population most at risk, except in certain countries where infant diarrheal disease rates may be high.

- Industrialization and the modernization of agriculture after World War II, both poorly regulated, had a marked negative effect on the environment. Because of economic uncertainties created by the transition to democracy and market economies, there is a lack of incentive for devoting scarce resources to improving environmental health.

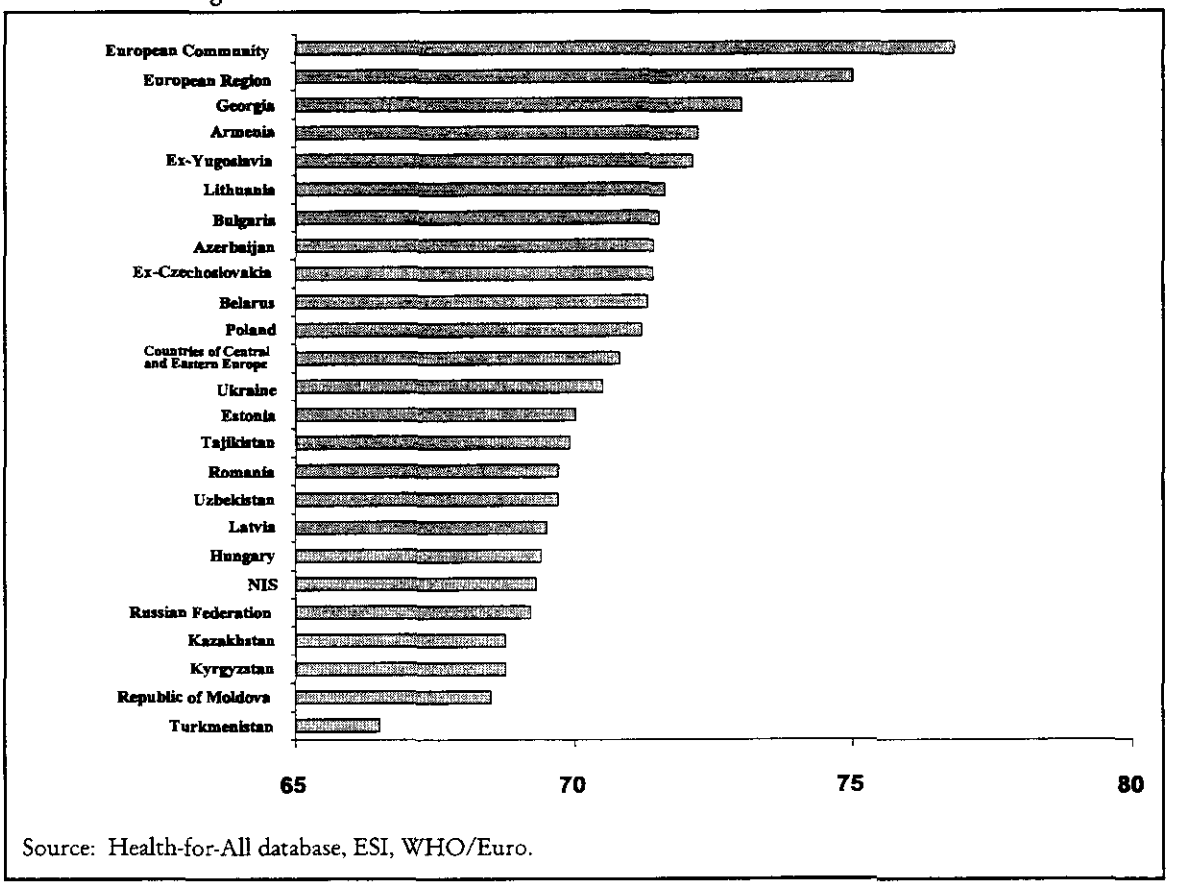
- The most promising option is to focus on control of environmental pollution arising from activities in the industrial, transportation, and agricultural sectors that pose epidemiologically detectable risks to the public. Efforts to control air pollution, raise water quality, and improve the handling of toxic and hazardous substances should be emphasized.

2.3.2 Priority and Emerging Health Problems in Europe and the New Independent States

Except for some areas of Central Asia, disease patterns in ENI are characteristic of societies that have made the demographic and epidemiological transitions. Under post-epidemiological transition conditions, chronic rather than infectious diseases are the predominant causes of morbidity and mortality. Studies show that cardiovascular disease is the leading cause of death in Central and Eastern Europe and that life expectancy is five to nine years lower than in Western Europe (see Figure 9), which has also made the epidemiological transition and where chronic diseases also predominate (Rose and Bloom). Similarly, while Western Europe has seen its cancer rates decline, Russia's cancer rates have doubled in the past 20 years, and the incidence of congenital malformations and respiratory and

allergic diseases is alarmingly high. Although diet, lifestyle, and inadequate access to health care may explain many of these problems, poor environmental quality is a significant factor that cannot be ignored.

Figure 9. Average Life Expectancy at Birth in 1990 for the European Region and Selected Subregions and Countries



Source: Health-for-All database, ESI, WHO/Euro.

A recent World Bank report prepared by Clyde Hertzman, Wendy Ayres, and others, entitled *Environment and Health in Central and Eastern Europe* (1994), develops a model for understanding the relationship between the epidemiological transition and various environmental risks. Under post-epidemiological transition conditions, health risks from environmental pollution can be placed in three categories:

> **Category I**: Occupational diseases from exposure to high pollutant concentrations in the workplace.
> **Category II:** Epidemiologically detectable risks to the general public, including cancers and other chronic diseases related to long-term low exposures. These risks were first recognized in the 1960s when the link between cigarette smoking and lung cancer was established.
> **Category III:** Subepidemiological risks from exposures that are too low to lead to epidemiologically detectable increases in disease rates. Examples are possible increased cancer rates in populations living near hazardous waste sites and high-intensity electromagnetic fields.

In Central and Eastern Europe, the second category of risks should be given priority. The first category of problems can be addressed through better enforcement of standards largely in place; the third category is not well enough understood and therefore the greatest need now is more research.

Problems in the second category affect large populations, and we understand these problems well enough to design effective interventions. Table 4 lists the four principal types of environmental exposure in this category with the greatest impact on human health. The high and medium priority areas are the ones which USAID should emphasize.

Table 4
Epidemiologically Detectable Environmental Health Risks in Central and Eastern Europe

ENVIRONMENTAL HEALTH RISKS	PRIORITY
Air Pollution Lead in Air and Soil Airborne Dust SO_2 and Other Gases	HIGH
Drinking Water Contamination Nitrates in Water Other Contaminants in Water	MEDIUM
Food Contamination (Toxics)	MEDIUM
Other Environmental Health Risks Occupational Disease Surface Water Pollution Hazardous Waste Disposal	LOW

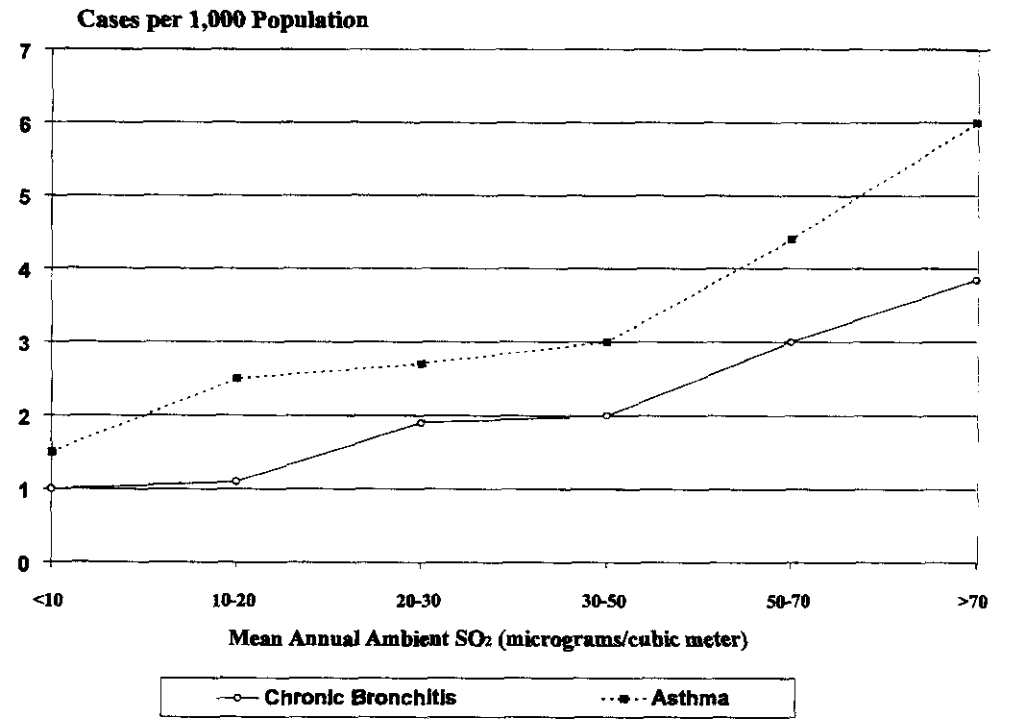
Air pollution: Air pollution should be the first target because it is the most harmful and can be remedied by policy changes and relatively inexpensive investments. Air pollution is pervasive, affects the most people and, when the concentration of particulates is high, causes severe damage very quickly. Among its immediate effects are acute and chronic respiratory infections from airborne dust. Among delayed effects are the retarded mental development of infants and children from lead in the air and soil. Figure 10 shows the correlation between rises in sulfur dioxide in the air and two types of respiratory illnesses in Poland.

Drinking water contamination: Six countries in the region report methemoglobinemia in infants, a disease that inhibits the oxygen-carrying capacity of blood cells and arises from exposure to nitrate-contaminated drinking water. The problem is especially widespread in Romania and in Lithuania, where one-third of the country is covered by a water replacement program for pregnant women. The widespread overuse of pesticides, herbicides, and fertilizers in agriculture has contaminated the soil and groundwater in the region with nitrates and toxic chemicals. Inadequately designed, poorly maintained, or improperly located septic tanks have also contributed to groundwater contamination.

Food contamination: Toxic contaminants in food are less prevalent and less clearly related to ill health than the first two risks. Data on chemical contamination of food are available from five countries in the region: Bulgaria, the Czech Republic, Slovakia, Lithuania, and Poland. In Bulgaria, rice crops have been irrigated with water containing arsenic. In the Czech Republic and Slovakia, high levels of polychlorinated biphenyls (PCBs) have been measured in breast milk and in human fat samples, a possible result of ingesting contaminated meat and dairy products. Lithuania reports microbiological contamination of food in processing plants and some pesticide contamination of food supplies.

Other environmental health risks: Hertzman et al. assign a low priority to occupational exposure to hazardous substances, pollution of surface water and wells with pesticides and PCBs, and risks associated with poor waste disposal. However, in specific cases a particular occupational problem is often severe, affecting, as in Zlatna, Romania, where a copper smelter is having a negative health impact on the whole town, a large percentage of the local population. Occupational exposure to hazardous substances can be controlled by reducing pollutant emissions within the industrial setting and by protecting workers from exposure; health risks associated with exposure to PCBs and pesticides from surface water and wells are low; and relatively few people live close enough to waste disposal sites to be affected.

Figure 10. Sulfur Dioxide and Respiratory Disease in Poland, 1979-1982



Source: *Environment and Health in Central and Eastern Europe*, Report No. 12270-ECA, The World Bank, February 1994.

2.3.3 Trends Affecting Environmental Health in Europe and the New Independent States

Industrial and agricultural development: After World War II, the countries that now make up ENI industrialized rapidly and greatly expanded large-scale mechanized agriculture. Few controls were placed on environmental pollution and degradation. Industrial and agricultural managers held more real power than local political leaders and were answerable to central authorities only for meeting production quotas, not for the environmental and health impacts of their enterprises. Under these circumstances, environmental conditions deteriorated on an alarming scale.

The use of soft coal and leaded gasoline has released very high levels of lead, arsenic, sulfur, and nitrogen oxides and dust into the environment. The metallurgy, steel, and petrochemical industries have contributed cadmium, beryllium, and petroleum products to air and soil contamination.

The unrestricted application of pesticides, herbicides, and fertilizers in agriculture has contaminated the soil and groundwater with nitrates and toxic chemicals. This is particularly the case in the Central Asian Republics. Septic tanks that have been inadequately designed and maintained or improperly located have also contributed to groundwater pollution.

Impurities found in the food chain include lead dust, heavy metals, polycyclic aromatic hydrocarbons, and chlorinated organics such as PCBs, and, in the particular case of the Ukraine, radioactive contamination resulting from the Chernobyl accident.

Political and economic uncertainty: As countries in the region move from economies dominated by central planning and public ownership of productive assets to more market-driven economies and democratic political processes, people are more concerned with the impact of change on their ability to maintain a minimal standard of living than with environmental quality and its effects on public health. Where tradeoffs are perceived between environmental quality and economic growth, economic growth is given priority. Because the ENI governments do not have the required resources, the governments of Western Europe and the United States have agreed to support environmental improvements for the next five to ten years through the Lucerne Environmental Action Programme (EAP).

Decentralization and privatization: ENI countries are moving rapidly away from models of service delivery based on centralization and toward more decentralized and privatized options. Vertical centralized government programs are being transformed into local horizontally organized programs.

2.3.4 Options for Improving Environmental Health in Europe and the New Independent States

USAID's environmental program in Central and Eastern Europe is well underway, covering environmental law and policy, public environmental services, private sector reform, and environmental training. Its program in the new independent states of the former Soviet Union is off to a good start. The ENI bureau is undertaking initiatives in environmental policy (legal reform), public services (drinking water), natural resource management, and other areas. The recommended options, described below, aim to complement the ongoing efforts of ENI missions.

Focus on chronic diseases: Diseases caused by air pollution and the chemical contamination of water and food predominate in ENI.

Support the Lucerne Environmental Action Programme (EAP): The EAP places the highest priority on environmental problems that damage human health; countries participating in the EAP have agreed to devote most of their attention to the problems listed as high and medium priority in Table 4. The ENI bureau is currently shifting much of its attention from improving public services to addressing problems of hazardous materials handling at industrial facilities that may be privatized. This calls for technical assistance not only in the on-site management of hazardous industrial and agricultural wastes and chemicals but also in the areas of risk assessment, policy reform, and finance, including improving cost recovery and cost management in public sector services.

Focus on facility-based interventions: Facility-based control of pollution, with industrial and agricultural production facilities as the locus of intervention activities, is a promising approach. In this connection, the primary focus should be on controlling industrially and agriculturally generated pollution at its source rather than the "Superfund" approach of post facto environmental clean-up.

Facility-based interventions often bring to light institutional issues that are gradually addressed through phased activities.

Sectoral reform: Assistance should be offered in the sectoral reform process, on decentralization issues in particular. ENI's Health Office is attempting to improve the ability of public health care systems in Central and Eastern Europe to address environmental health problems and to improve epidemiology and access to information on environmental hazards in Central Asia. The Bureau's Housing Office continues work in Slovakia on devolving responsibility for water supply and wastewater management from the central government to semi-private companies operating under the direction of local governments. These are promising activities.

2.4 The Latin American and Caribbean Region

2.4.1 Summary

- The significant environmental health problems of the LAC region are of two types: 1) infectious and vector-borne diseases including cholera and diarrheal diseases, Chagas disease, malaria, and dengue; and 2) diseases associated with air pollution and exposure to toxic and hazardous industrial and agricultural chemicals and wastes. Children and infants are the population most at risk from the first type; adults are most at risk for the second.

- Major trends impacting environmental health in the region include unregulated industrialization and expansion of urban and peri-urban areas, which has outstripped the capability of governments to provide infrastructure.

- The most promising options for the LAC regions are 1) to integrate the environmental health approach into current programs; 2) highlight issues of cost, cost-effectiveness, cost recovery and privatization in environmental health; 3) concentrate on the urban and peri-urban sectors; 4) promote problem-oriented intersectoral cooperation; and 5) coordinate with other international organizations active in environmental health.

2.4.2 Priority and Emerging Health Problems of Latin America and the Caribbean

The LAC region faces both pre- and post-epidemiological transition problems, with wide variations among countries.

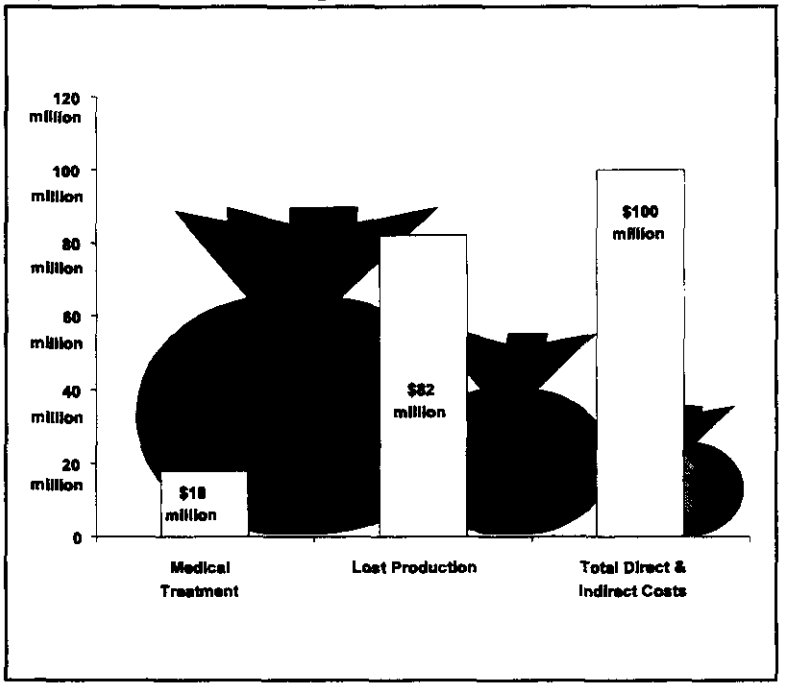
Cholera and other diarrheal diseases: The ongoing cholera epidemic in the region and the high background rates for other gastrointestinal diseases are largely products of poor hygiene practices, particularly poor food hygiene, in an environment of contaminated surface water and groundwater and polluted coastal waters resulting from inadequate water supply and sanitation systems. Although the region is rich in water resources, it has some of the highest levels of biological and chemical pollution in the world, caused largely by the unregulated discharge of untreated sewage into the sources of water supply. As a result, waterborne diseases remain the largest cause of deaths among

children under five years of age. Cholera infected 204,543 people and killed 2,362 in 1993, and although the epidemic has receded in the Andean region, it is expanding in Brazil, Argentina, Guatemala, Honduras, and Nicaragua.

Tropical and vector-borne diseases:

Chagas' disease: PAHO has identified Chagas' disease, associated with poor housing and the proximity of animals to human habitation, as the most serious parasitic infection and the major cause of myocardial disease in the region. The World Bank has found it to be the fourth most serious among a cluster of communicable/perinatal/maternal diseases in the region. Millions are infected from Argentina to Mexico. In Bolivia, the worst affected country, rural communities may have seroprevalence rates for the Chagas' disease parasite *Trypanosoma cruzi* that range from 27 percent to 80 percent of the local population. Figure 11, taken from *Chagas' Disease in Bolivia* (USAID, 1994) illustrates the economic costs of the disease in Bolivia. According to the same source, an adequate control program would cost $75 million over fifteen years. That is no small sum, but it is dwarfed by the economic impact of the disease in just one year.

Figure 11: Economic Impact of Chagas' Disease



Malaria: Uncontrolled urbanization, the growth of peri-urban areas with poor services, and the movement of nonimmune populations into newly settled areas are responsible for rising malaria rates. About 2 million cases of malaria occur in the region each year, an estimated half of these in Brazil alone, mainly in the Amazon River Basin, and in urban and peri-urban areas.

Dengue: Dengue is an emerging health issue in the region. Dengue outbreaks and epidemics are on the rise in the region as vector breeding sites expand because of urban and peri-urban growth and poor potable water storage and solid waste handling. The spread of dengue serotypes has resulted in an increase from 1 to 14 since 1981 in the number of countries reporting dengue hemorrhagic fever/dengue shock syndrome (DHF/DSS). The risk of dengue seems particularly great in urban and peri-urban coastal areas, due to the introduction of *Aedes aegypti* and the movements of infected people. This risk will be magnified by the growth in coastal populations; according to PAHO,

58.1 million people lived in coastal areas in 1983, but over 110 million are expected to live there by the year 2000.

Post-epidemiological transition environmental health problems: The rapid rate of industrialization raises concerns about the careless handling of hazardous substances and the unregulated discharge of industrial and agricultural chemical wastes into the environment. Exposure of industrial workers to toxic chemicals and agricultural workers to pesticides have been recognized as a growing problem in the region. According to PAHO, in Bolivia, major occupational poisonings with lead, mercury, and pesticides have occurred. Pesticide poisoning of agricultural workers occurs frequently and is well documented in Brazil and Central America. Moreover, the linkages between workers' occupational exposures (e.g., lead and pesticides) and environmentally related illnesses in worker households have scarcely been noted by public health authorities, despite the fact, for example, that high levels of agricultural pesticide residues are commonly found in blood and breast milk and in surface water sources used for farm worker family bathing and drinking. In addition, the proportion of women in the urban and rural workplace is generally rising, bringing new types of risks to women's health not often recognized by clinics and hospitals, nor by the women themselves.

2.4.3 Trends Affecting Environmental Health in Latin America and the Caribbean

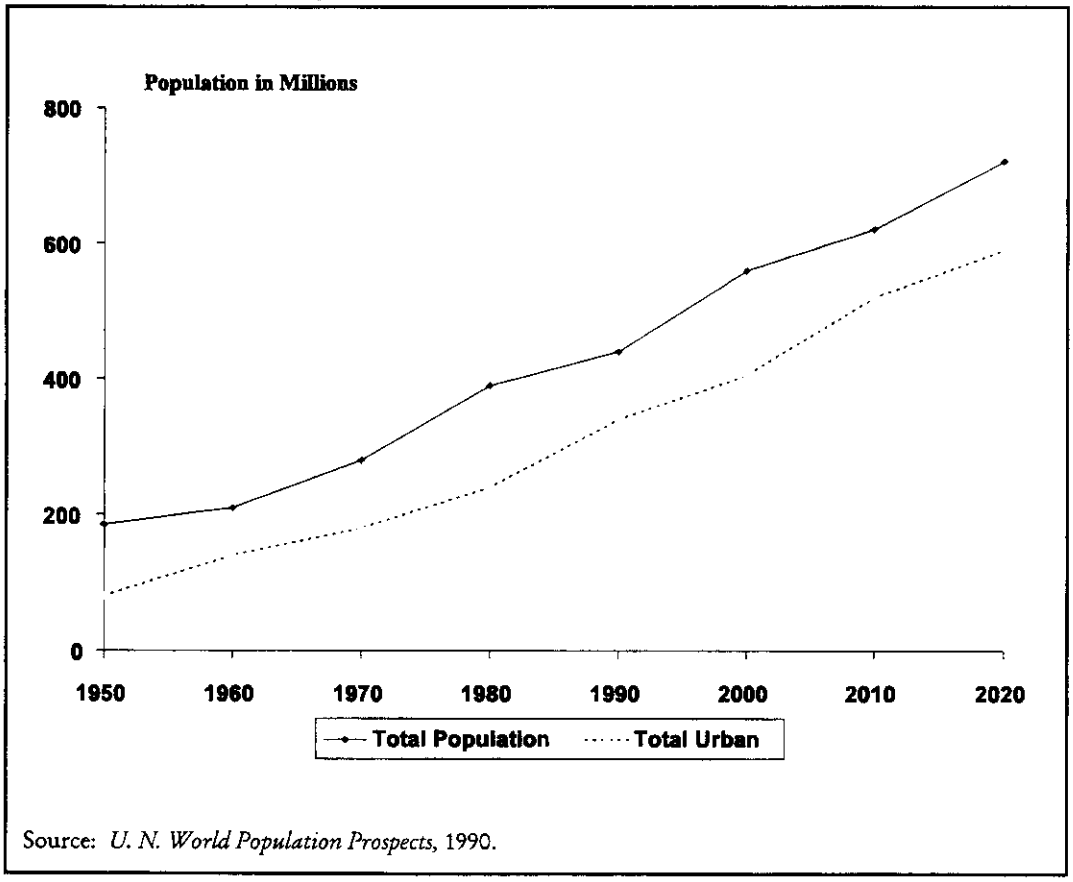
High population growth rate: The LAC region had a population of 455 million in 1991 (World Bank, 1993). By 2020, this is expected to reach 705 million. The current overall population growth rate is about 2.1 percent per year, but this is unevenly divided between rural and urban areas. The rural population is growing at a rate of about 0.4 percent per year, compared with an urban growth rate of 3.8 percent per year. Urban and peri-urban areas will absorb most of the 55 percent increase in population expected by the year 2020.

Rapid and unplanned urbanization: Currently, 70 percent of the population in the region lives in urban areas according to the World Bank; it is estimated that by 2020, 80 percent will be urban dwellers (Figure 12). The peri-urban population that now constitutes 10 to 20 percent of the total population will grow to 40 percent by the year 2000. PAHO estimates that 80 percent of new urban growth in the 1990s will occur in peri-urban areas. One-third of the region's urban population lives in one or the other of 15 megacities (containing over 2 million inhabitants each), and the region itself has 3 of the 10 largest cities in the world: Mexico City, Sao Paulo, and Buenos Aires-La Plata.

Inadequate infrastructure and services: The 1970s and most of the 1980s were periods of great political and economic turmoil in the region. Pervasive problems with military rule, hyperinflation, debt crises, and military conflicts were responsible for insufficient investment in public infrastructure. As a result, there are serious deficiencies in water and sanitation and solid waste infrastructure especially for the urban and rural poor. Approximately 15 percent of urban dwellers and 45 percent of rural dwellers do not have access to formal water services (PAHO, 1990). Urban water systems often provide water that is unsafe or unpalatable and deliver it intermittently; peri-urban areas are rarely served at all by formal systems. About 51 percent (60 million) of urban dwellers have inadequate household sanitation systems, including 19 percent, mostly in peri-urban areas, who lack them altogether. At least 90 percent of untreated sewage is discharged into surface streams. In 1988, according to a conservative estimate, 225,000 tons of solid waste per day were generated in the region's cities, of which 18 percent was not collected by municipalities. Again, peri-urban areas are the most underserved; it is these areas that are most likely to have no solid waste pickup arrangements.

Development and unregulated industrialization: Rapid industrialization and foreign trade are bringing larger proportions of the population, including women, to work in factories, agribusiness, and cottage industries. Textile, tanning, pulp and paper, printing, basic chemicals, metal finishing, and ferrous and nonferrous industries generate millions of tons of hazardous wastes and emissions each year, little, if any, of which are treated, recycled, or properly disposed of. Efforts to increase agricultural production have led to more extensive use of pesticides. In 1985, 20,000 tons of pesticides were used in the region. Outbreaks or epidemics of malaria, leishmaniasis, or arboviruses have been associated with dam and reservoir construction, mineral and forest exploitation, ranching, road construction, or land colonization in the region.

Figure 12. Trends in Population and Urbanization in Latin America



Source: *U. N. World Population Prospects*, 1990.

Ambient air pollution is a region-wide problem associated primarily with development in urban areas. About 60-80 per cent of the urban population breathes air of marginal or unacceptable quality (PAHO 1990:10). PAHO notes that motor vehicle emissions constitute the main source of air pollutants in most cities of the region.

2.4.4 Options for Improving Environmental Health in Latin America and the Caribbean

Focus on water and sanitation, solid waste management, and control of tropical diseases: LAC missions are working on a variety of projects in environmental health, contingent on the needs of particular countries, but have identified water supply and sanitation, solid waste management, and control of infectious and vector-borne disease as the areas requiring immediate attention. (At the same

time, the growing importance of environmental health problems related to air pollution and occupational exposure to hazardous industrial and agricultural chemicals and wastes should be recognized. These problems might be addressed in cities like La Paz and Lima, where air pollution is an issue, and in other areas in the region as appropriate. In addition, policies and standards for urban and industrial waste management should be developed, and national and local governments should be assisted in designing occupational health programs, particularly with regard to the ways in which occupational health affects women and children. Also, ways should be found to reduce pesticide use and to standardize regulations on pesticide use in the region.)

Highlight issues of cost, cost-effectiveness, cost recovery, and privatization in environmental health: Governments, at both the national and local levels, need assistance in determining the most cost-effective ways of addressing problems of unsafe drinking water, wastewater pollution, and solid waste in cities and towns. Comparative risk assessment of environmental health problems should be employed to help local governments and communities rank environmental health problems and more efficiently allocate scarce resources accordingly.

Concentrate on the urban and peri-urban sectors: Given that Latin America is one of the most urbanized areas of the world, the pressing problem of expanding water supply and sanitation and solid waste infrastructure and services to meet current and future needs in urban and peri-urban areas should be a main thrust of environmental health in Latin America and the Caribbean.

Promote problem-oriented intersectoral cooperation: Most environmental health problems cut across many sectors; therefore, intersectoral cooperation to arrive at solutions is critical. Such cooperation can be facilitated through joint problem solving. Thus, a ministry of works responsible for building a dam may cooperate with the health sector on a joint plan to reduce opportunities for mosquitos to breed at the new dam site.

2.5 Asia and the Near East

2.5.1 Summary

- Some countries in the ANE region are clearly pretransitional; others are experiencing both pre- and post-transitional problems. Pretransitional countries can be characterized as mainly rural, with low integration into international markets, low literacy, little foreign capital investment, and low industrial capacity. In these countries the major environmental health problems are vector-borne diseases and diarrhea and the population most at risk are infants and children. Countries whose environmental problems are "mixed" are characterized by high population growth, rapid and uncontrolled urbanization, and growing industrial and agricultural sectors. Their water and sanitation infrastructure, both urban and rural, is inadequate and their regulatory capacity is poorly developed. Some of them have high or rising levels of foreign investment and are fairly well integrated into world markets; others do not. In these countries, vector-borne and diarrheal diseases may also be prevalent, but they are combined with problems of air pollution, toxic and hazardous wastes, that affect adults predominantly.

- In pretransitional countries, the most promising option is to focus on integrating environmental health into ongoing programs and institution building. In "mixed" countries, host country governments should be assisted in institution building, community-based environmental management, and integrating environmental health into ongoing programs. For

countries with high levels of foreign investment, the focus should be on policy dialogue with industry and government about the economic consequences of negative environmental health conditions and on finding ways to affect the character of capital investment and the types of technology adopted by industry to improve environmental health conditions in the future.

2.5.2 Introduction

The region for which the Asia Near East Bureau is responsible is vast, stretching from the Atlantic Ocean to the Pacific Rim and encompassing areas that are ethnically and culturally distinct. Even within ANE's subregions, there is a wide diversity of population densities, economic structures, and ecosystems. Asia by itself accounts for over half of the world's population and 14 of the world's 21 megacities. This makes attempting to construct a regional strategy particularly difficult. At the same time it must be noted that within the ANE, various countries linked by common geography, ecology, and history often share common problems and can utilize similar solutions adapted to their particular circumstances.

The discussion in the following subsections will refer frequently to the three subregions into which the Bureau for Asia and the Near East divides its countries: the Near East, South Asia, and East Asia.

2.5.3 Priority and Emerging Health Problems in Asia and the Near East

Near East

The principal environmental health problems of the Near East arise from both infectious and vector-borne diseases and industrial and agricultural development. Vector-borne diseases include malaria, schistosomiasis and leishmaniasis, and some helminths. Infectious diseases include diarrheal disease and acute respiratory infections. In many Near East countries, water and sanitation systems are primitive and diarrheal diseases are a significant cause of morbidity and mortality. Figure 13 shows DALYs lost from preventable disease by age group. At the same time, drinking water supplies are often contaminated by fertilizer and pesticide run-off and may contribute to the rising cancer rate and other illnesses. This is the case in Egypt, the West Bank, and Gaza. Urban air pollution is also a problem.

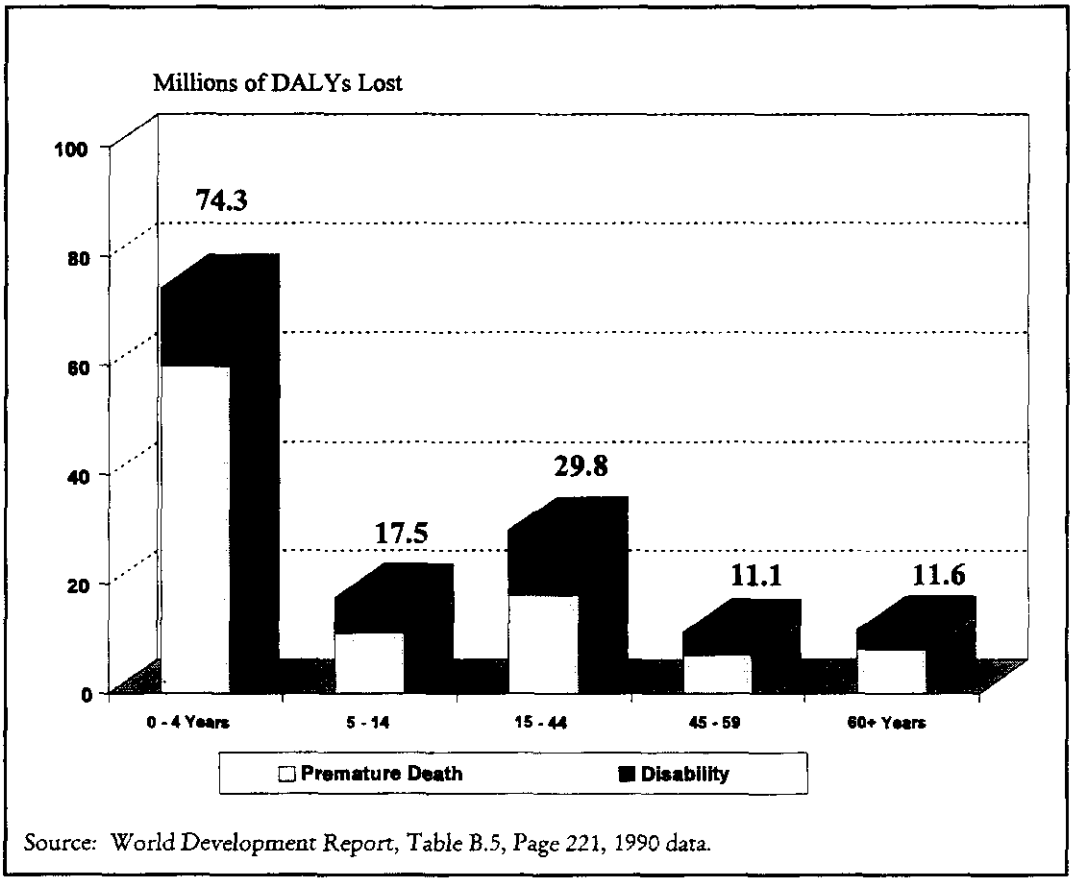
South Asia

In South Asia improper industrial and toxic waste disposal is aggravating already serious environmental health problems arising from poor water supply, insufficient or nonexistent sanitation facilities, and low levels of public awareness of environmental health hazards. Figure 14 presents a graphic display of the increases in air pollution in India. In addition, several vector-borne diseases are common to the subregion. Malaria and dengue are spreading in urban and peri-urban areas. Bancroftian filariasis, from organically polluted water, and Japanese encephalitis, whose vectors are based in rice fields, are also both on the increase. India alone reports approximately 2 million cases of malaria per year, although the actual number may be five times that level. Leishmaniasis outbreaks are reported from India, Bangladesh, and Nepal. The subregion also has pretransition countries, such as Nepal, where urbanization is less marked and where the major health risks are from communicable and waterborne diseases.

East Asia

East Asia has the most diverse environmental, cultural, economic, and demographic conditions in the ANE. Environmental health problems in the region are both pre- and post-epidemiological transition

Figure 13. Burden of Disease: Premature Death and Disability, Middle Eastern Crescent



Source: World Development Report, Table B.5, Page 221, 1990 data.

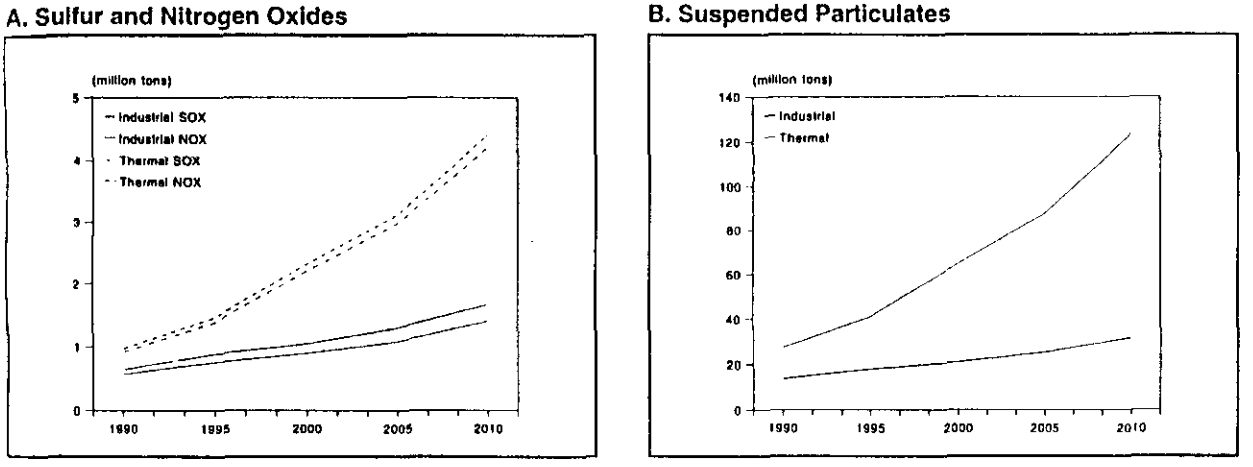
in nature. Urban areas, for instance, have high incidences of diarrhea and other infectious diseases, combined with health problems related to poor air quality and exposure to hazardous and toxic wastes, arising from industrialization.

At one extreme, Indonesia is paying a price for heavy capital investment without adequate environmental regulation. It is currently experiencing an export-led boom that is attracting U.S. and other foreign capital. The rapid urbanization accompanying this boom is creating serious environmental health problems, related not only to inadequate water supply and sanitation, but also to hazardous waste management, occupational safety, and air pollution. Rural areas are adversely affected by pesticide use, and Java's high rural population density makes water supply and sanitation a continuing government concern.

Cambodia, at the other extreme, has an extremely underdeveloped infrastructure. Country-wide there are virtually no water supply and sanitation systems. As might be expected, the country has one of the highest infant mortality rates in the region at 112 per 1,000. Also, Cambodia and the neighboring Thai areas have the worst problem with drug-resistant malaria in the world: resistance to chloroquine, fansidar, mefloquine, and even quinine is reported.

The Philippines falls somewhere in between the two extremes. Environmental conditions in both rural and urban areas have been deteriorating for decades, and diseases related to poor water and sanitation remain major health hazards. Diarrhea is the second leading cause of illness and the fourth leading cause of infant deaths nationally. Both cholera and typhoid are endemic, and other diseases with an environmental link, such as acute respiratory illness and malaria, are among the top ten leading causes of morbidity and infant mortality.

Figure 14: Trends and Projections in the Emission of Selected Pollutants from Major Industrial Sources and Thermal Power Plants in India, 1990–2010



Source: Tata Energy Research Institute (TERI), *Environmental Considerations in Energy Development,* final report submitted to the Asian Development Bank, New Delhi, 1992, p. 73 and 83.

2.5.4 Trends Affecting Environmental Health in Asia and the Near East

Near East

Rapid urbanization and industrialization. In the Near East the population is expected to double between 1990 and 2010, and the area is urbanizing rapidly. Air pollution, groundwater pollution, and inadequate solid waste management result from unregulated urbanization and industrialization, not only in potential megacities such as Cairo and Alexandria, but also in secondary cities.

Weak institutions. Institutional and management weaknesses, not lack of resources, appear to be largely responsible for ineffective water supply and sanitation and solid waste disposal systems. In Egypt, for example, the prospects for sustainable development of the water supply and sanitation sector are still uncertain despite several decades of generous grant assistance.

Program for Peace. Although USAID commitments to the Near East from the Sustainable Development Account to the region are small, the total level of assistance, when the Program for Peace is included, dominates the U.S. overseas development budget. Major allocations from the Program for Peace are already earmarked for water supply and sanitation, solid waste management and the control of associated diseases, and adult and child health programs in Egypt. The new Palestinian authority in Gaza, Jericho, and parts of the West Bank has been given an annual allocation of $75 million for five years and is also receiving assistance from other donors. The change in focus is from emergency relief and the management of refugee camps to planning the development of the

physical and institutional infrastructure of an independent state. In Palestine, although water resource management is the focus of international assistance, progress is unlikely until the external donors and the Palestinian authorities can arrive at common standards and a common framework for planning and implementation. A new civil administration soundly established must precede any serious attention to environmental health issues.

South Asia

Rapid population growth and urbanization. Major cities such as Dhaka, Bombay, Calcutta, Delhi, and Karachi are projected to become megacities with populations of more than 10 million each by the year 2010. Many cities are swollen by the seasonal migration of farm workers who seek temporary employment during the agricultural off-season and return home for the planting season. These workers are potential carriers of infectious diseases between urban and rural areas. Urban water and sanitation and solid waste management systems even now are inadequate for the populations they serve.

Economic restructuring. India, with the second largest population in the world, has embarked on a radical restructuring of its economy, based on free-market enterprise, less regulation, and an invitation to foreign investment. Bangladesh, Sri Lanka, and Pakistan are also beginning to develop export-oriented economies with the help of foreign private capital. This transformation has produced industrial growth, steadily rising consumption, and a capable middle class. It has also created a new array of environmentally related health hazards from air pollution and toxic waste.

East Asia

Multinational private sector investment. Projections indicate that by 2010, 85 percent of the capital stock in Indonesia, the Philippines, and Cambodia will be the product of investments made from 1994-2000. These investments are generating enormous growth in the informal sector, and most investment in housing and small-scale industry is taking place without, or in spite of, government interventions. Because of the scale of this activity and because environmental regulation and enforcement are weak, the business sector has less regard for environmental controls and safeguards than it would in the United States or other developed economies. For this reason, there is a well-founded fear of catastrophic effects on the environment and human health.

Asian analysts stress that this period of intensive capital investment provides a critical opportunity to improve future environmental health conditions in the region by influencing the character of this new investment and the types of technology adopted. They emphasize that such efforts should have priority over attempts to clean up current pollution.

Rapid urbanization. Both Indonesia and the Philippines are undergoing rapid urbanization. Manila is projected to become a megacity with a population of 12.5 million by the year 2010. Cambodia, however, still remains overwhelmingly rural.

2.5.5 Options for Improving Environmental Health in Asia and the Near East

Near East

Support decentralization: A number of countries in the Near East Region are moving towards giving increased responsibilities to provincial and local governments. In some instances, outside technical assistance might be able to help countries plan the decentralization process and sort out the division of responsibilities between central and lower levels of government.

Concentrate on the urban and peri-urban sectors: Rapid population growth and urbanization will create a greatly increased need for urban environmental health programs, the most pressing being in water supply and sanitation, solid waste, and air pollution.

Increase community involvement in environmental management: Increased decentralization and attention to environmental issues has created a need for greater involvement of communities in identifying their problems and participating in the development and implementation of environmental management activities. For example, RHUDO/Tunisia has expressed great interest in fostering community involvement in the Near East Region, using approaches developed by the Water and Sanitation for Health Project.

Promote water conservation through reuse: Water resources remains one of the most important and contentious issues in the Middle East. Improvements in wastewater reuse, wastewater treatment, and water quality can, in the long run, greatly contribute to easing the problem of water resources and are promising areas for technical assistance.

South Asia

Support the capacity to set priorities: The scale of environmental health problems in South Asia and the relative scarceness of resources make it especially important to develop host-country capacity to set priorities. Risk assessment is one of the key tools for setting priorities, and the demand for it will likely grow.

Focus on tropical and infectious diseases: Significant opportunities exist in the area of control of tropical diseases. Especially promising are community-based approaches to control programs, introducing tropical diseases into child survival programs.

Focus on urban areas: The rapid urbanization in such cities as Dhaka, Bombay, and Karachi make the urban areas a target of great concern. Environmental health problems which could be addressed include solid waste, water supply and sanitation, and tropical diseases. The World Bank and Asian Development Bank are providing significant resources for urban projects; however, there is an opportunity for USAID to provide some specialized assistance in such areas as increasing community involvement, setting priorities, and institutional development.

East Asia

Develop the capacity to set priorities: The enormous industrial expansion in East Asia and the lack of environmental regulation and enforcement have created the potential for serious environmental health problems. It is clear that no country will have the resources to address all their environmental health problems. Assistance in setting priorities based on health considerations will allow countries in the region to better target their resources.

Target air pollution: Because of the rapid urbanization in the region, air pollution has become a major environmental health problem. Assistance in developing the capacity to monitor air quality and develop programs to reduce harmful air emissions are likely to be well received.

Introduce community-based environmental management: Countries in this region do not have a tradition of involving communities in such issues as environmental management. Programs focusing on decentralization and strengthening local government provide opportunities for introducing methodologies of community-based environmental management.

Chapter 3

The EHP Strategy

3.1 Overview

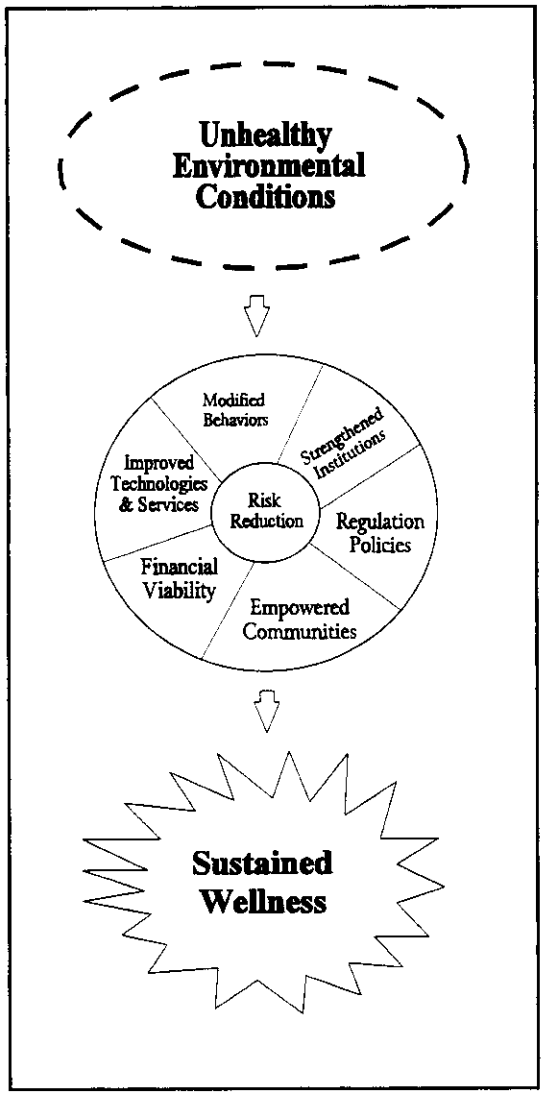
The Office of Health and Nutrition has given EHP the dual responsibility of responding to mission and bureau needs *and* exercising leadership in environmental health as it relates to field support. In Chapter 2 the types of problems that could be addressed by USAID programs were discussed by geographic region. This chapter discusses EHP's strategy for responding to mission and bureau needs and exercising leadership to improve the effectiveness of USAID's environmental health programs and to help address the problems identified in Chapter 2.

EHP's overall goal is to reduce the incidence of environment-related diseases and hazards so that USAID-supported countries can develop their full social and economic potential. Achieving this goal means assisting developing countries to plan and implement cost-effective programs that reduce the risks that populations face from poor environmental conditions.

The reduction of risks is the principal means to achieving wellness through prevention. Figure 15 shows the basic components of a program to reduce risk. A comprehensive environmental health program would incorporate all of the components shown. However, selected components may be implemented and still achieve significant reductions in health risk. Because USAID-assisted countries face institutional, financial, and other resource constraints that limit what they can do, they must choose carefully what problems to try to address and what program components to include in their risk management, or reduction, strategies. EHP's challenge is to help USAID programmers and host-country policymakers set priorities across the full range of problem areas that might be addressed and to select the most appropriate mix of potential environmental health interventions.

Environmental health is a relatively new program area for USAID. Although some of the specific elements—water, sanitation, and vector-borne disease control—have long been part of USAID's program, this is the first time that they have been grouped programmatically so that work in different technical areas and disciplines can be integrated for maximum impact. Grouping nine technical areas of environmental health under one umbrella enables EHP to respond to mission and bureau needs in a wide variety of areas with quality assistance and to set priorities as to how it will use its funds.

Figure 15: Prevention through Risk Reduction



This chapter describes EHP's approach (Section 3.2), how EHP will respond to mission and bureau requests (Section 3.3), and how EHP will help improve the effectiveness of USAID programs through its proactive activities (Section 3.4).

3.2 EHP's Approach

3.2.1 Guiding Principles

EHP's approach, both responsive and proactive, reflects USAID's priority areas: population and health, economic growth, democracy and public participation, and environmental protection and management, as discussed in Chapter 1. EHP will address some of the most serious diseases in developing countries, such as diarrhea, malaria and other tropical diseases, and respiratory ailments that sap the economic vitality of developing countries. Devoting more resources or making better use of available resources to provide the infrastructure for preventing those diseases today, through environmental health, will free up more resources in the future and improve the economic productivity of households. Investments in environmental health are investments in people. USAID's *Strategies for Sustainable Development* states that USAID will "invest in people" by supporting broad-based economic growth through

> *programs that address inadequate health services, particularly in the area of basic and preventive. . . health care . . . and reforms that encourage . . . investments in . . . capital projects such as . . . water supplies, sewage, and waste systems.*

EHP was designed to create a bridge between institutions, agencies, and individuals dedicated to protecting and cleaning up the environment and those dedicated to improving public health. The two sides have been working largely independently, but they could both be more effective if they were to collaborate. Two proposed EHP proactive strategies promote this type of collaboration or "bridging": finding ways to bring more of a health orientation to environmental impact assessments for development programs and helping host-country governments to introduce principles of environmental health into basic health services.

EHP working norms are listed in the following subsection. They are all elements of sustainability as articulated in *Strategies for Sustainable Development*:

> *The fundamental thrust of USAID's programs . . . will aim at building indigenous capacity, enhancing participation, and encouraging accountability, transparency, decentralization, and the empowerment of communities and individuals.*

EHP has the capability to respond expeditiously to requests for emergency assistance, in keeping with USAID's commitment to humanitarian support.

3.2.2 EHP Working Norms

All work carried out by EHP conforms to ten working norms.

EHP operates in a health framework. The project will focus on environmental conditions that affect human health. The agenda of environmental programs—both "green" and "brown"—is not within the EHP scope of work unless there is a clear health connection. However, where such connections exist,

it is EHP's job to increase awareness of them. In this way the project builds bridges between the health and environment sectors.

EHP concentrates on capacity-building. Technical assistance is focused on capacity-building and helping people to solve their own problems, whatever the type of activity. In the long run, developing countries must be able to rely primarily on their own resources. Capacity-building also includes helping public sector institutions understand and incorporate roles for the private sector and NGOs. Private sector entities can take on functions that may be difficult for governments with their limited resources. Also—and perhaps more important—these other entities do a better job of providing many types of services (i.e., solid waste collection and hazardous waste management).

EHP employs participatory processes in the development and delivery of its technical assistance. Participatory processes include team planning meetings to prepare a team before the field work as well as workshops to design projects, get new projects started, and keep projects on track during implementation. Also, EHP encourages developing countries to foster wide, meaningful participation of those affected in environmental health activities. The concept of locally based demand being developed by EHP is closely related to participation. Locally based demand combines the concept of demand-led development with the concept of involving local groups in policy making, planning, and implementation. Public participation is a key element of the risk assessment framework being developed by EHP, in which community groups work with outside technical experts to assess environmental risks and to design and carry out remedial actions.

EHP offers assistance that is integrated. EHP extends proven program techniques, such as those developed in the WASH and VBC projects, to a wider array of environmental health activities. The integration of environmental health activities, formerly covered under separate vertical projects, offers unique opportunities to gain benefits from the commonalities among health subsectors. Many areas of environmental health are mutually reinforcing if addressed in an integrated approach by staff capable of recognizing and addressing the relationships that may exist. For example, EHP will explore the tropical disease implications of inappropriate water resource designs, the impact of inadequate solid waste disposal and poor wastewater handling on vector-borne diseases, and the effect of individual and community sanitation on food hygiene. EHP encourages missions and USAID host-country partners to look for opportunities to integrate related vertical programs in the areas of environment and health.

EHP employs an interdisciplinary approach. Addressing environmental health problems calls for a diverse and broad range of disciplines. EHP can draw on expertise not only in technical but also in cross-cutting areas such as community involvement, finance, training, education and public awareness, and institutional development. But the key to success in the application of these disciplines lies in their integration throughout the provision of technical assistance. In EHP's interdisciplinary approach, synergy is a main goal. Disciplines do not just work side by side, they integrate their work so that the whole is greater than the sum of the parts.

EHP acknowledges the important role of gender issues in development. Gender issues go beyond women in development to include the roles that all members of society must play in achieving sustainable development. The goal is to lower the barriers that prevent the full participation of all groups in the development of their communities.

EHP considers resource constraints to be of major concern in the design and implementation of technical assistance. Nearly every country in the developing world and in the newly emerging nations faces resource constraints, human as well as financial and material. Proposing conventional solutions that rely on expensive technologies is not viable in most situations. EHP stays abreast of the more

affordable options that exist and finds ways to convince decision-makers that these are workable. Resource constraints also affect the setting of priorities and the selection of appropriate regulatory policies that do not exceed the country's enforcement capability.

EHP pays special attention to developing linkages with other projects. EHP works with other projects within the Office of Health and Nutrition and with the Center for Environment as part of its bridge-building approach. EHP and the BASICS project are exploring ways to develop better models for integrating case management and prevention. EHP is working with the Center for Environment to coordinate technical assistance and to develop tools and methodologies that provide both environmental and health benefits. Environmental health issues, especially solid waste, wastewater, air pollution, and hazardous waste, must often be addressed within urban and environmental programs.

EHP pursues all possibilities for leveraging resources. This working norm is especially important because USAID does not have the resources to fund large projects. In addition to leveraging the financial resources of other USAID organizations, EHP also tries to interest other development organizations in the environmental health approach, as the most cost-effective and sustainable way to reduce the burden of disease. Increasing the number of organizations participating in this development goal is a way of extending the impact of USAID activities, as well as mobilizing more resources to address the challenges faced by so many developing countries.

EHP monitors its performance and institutionalizes ways to capture and apply lessons learned. Performance indicators are tied to each of EHP's strategic objectives. In addition, all EHP activities have clear outputs against which success can be measured. Articulating and synthesizing lessons learned from individual activities is an integral part of EHP programmatic management. Following the precedent set by WASH, EHP plans to publish lessons learned documents periodically.

3.3 Responding to Mission and Bureau Requests

EHP is organized as a consortium of professional organizations that specialize in various fields related to environmental health. It is able to provide USAID missions and bureaus with the highest quality technical assistance. EHP not only responds to USAID requests through buy-ins to the EHP requirements contract but the project also will establish a reserve fund in each year's core contract annual plan to support a select number of requests from missions and bureaus that do not have funds readily available for technical assistance. EHP will also look for sites for applying the proactive strategic objectives described in the next section. EHP is especially interested in supporting those requests that assist missions in planning and implementing long-term environmental health programs. In particular, EHP is looking for opportunities to assist the missions and bureaus by assigning either regional or country-specific long-term advisors. They could be used to help coordinate a regional approach to environmental health or could provide assistance to a specific country program or several programs.

Through cables, project communications, and periodic workshops, EHP solicits input from missions and bureaus to help set the project's priorities. The following section, which describes the strategic objectives which underlie the project's approach to improving the effectiveness of USAID environmental health programs, was developed with input from USAID missions and bureaus. EHP will look for opportunities to implement the activities associated with each of the strategic objectives where mission objectives are also supported. In this way, missions can take full advantage of and have input into the development of state-of-the-art approaches to environmental health.

3.4 Improving the Effectiveness of USAID's Environmental Health Program

EHP was created as a vehicle for USAID to respond to the increasing worldwide environmental health burden. EHP can operate in a wide variety of technical areas and draw upon an array of skills and services to achieve this goal, as shown in the accompanying text box. The technical areas and skills that are listed confirm that environmental health is a critical bridge between the environment and health. To be effective in improving health, the underlying causes of poor environmental conditions and exposure (i.e., ineffective institutions, lack of appropriate technologies, or lack of community involvement in environmental health efforts) need to be addressed. EHP's goal is to address these problems to improve human health.

With the numerous problems that developing countries face, EHP will need to concentrate its efforts to have an impact on health. Accordingly, in the use of proactive funds, EHP will concentrate its resources in five of the nine technical areas of the project. These are **water supply, sanitation, wastewater management, vector-borne disease control, and air pollution**. EHP believes that applying solutions that emphasize these technical areas and the full range of cross-cutting skills will have the greatest potential to reduce mortality and morbidity from the leading environment-related diseases: diarrheal, vector-borne (especially malaria), and respiratory diseases.

Technical Areas within the EHP Scope of Work

- tropical diseases
- water supply and sanitation
- solid waste
- wastewater management
- air pollution
- food hygiene
- hazardous materials
- occupational health
- injury

Illustrative EHP Technical Specialties and Cross-Cutting Areas

- public health
- risk assessment
- epidemiology
- engineering and technology transfer
- health information system development
- tropical disease control
- procurement of equipment and commodities
- institutional and human resources development
- policy and planning
- community participation
- financial management
- evaluation and applied research
- information services

EHP has developed a set of interrelated strategic objectives intended to lessen environmental health problems and address constraints that at present diminish the effectiveness of environmental health activities and keep us from the goal of improved environmental health. The activities that EHP plans to carry out under these strategies include developing new techniques and tools, conducting workshops and seminars, and carrying out applied research. All are related to the overall goal of EHP: to reduce environmentally related diseases and hazards, so that USAID-assisted countries can develop their full economic and social potential. EHP work on these activities will benefit not only USAID missions where the new approaches and tools and concepts are applied, but also other development organizations that are facing the same constraints. EHP's assistance to and collaboration with other agencies will provide USAID with opportunities to leverage its resources for better technical assistance or higher levels of infrastructure funding.

3.4.1 Strategic Objective 1: Setting Priorities

Strategic Objective 1 is ***to increase the willingness and ability of host-country institutions to set priorities among environmental health problems based on systematic analysis.***

Constraints Addressed: The incidence of "pretransition" diseases associated with inadequate sanitation, contaminated water supplies, and solid waste are worsening, especially in peri-urban settlements; at the same time, growth in industrial employment, the use of hazardous materials in agriculture and small-scale enterprises, air pollution, and other sources of environmental pollutants are increasing the occurrence of respiratory diseases, heart disease, cancer, and other "post-transition" health problems. To target their resources and produce the greatest benefit to public health, host-country policymakers in health and environmental agencies must be able to set priorities among environmental health problems in a rational way.

Approach: In the developed countries, risk assessment is the main tool used to evaluate environmental health problems and set rational priorities. The first strategic objective reflects EHP's intent to encourage USAID-assisted country institutions to adopt comparative health risk assessment as the conceptual framework for setting priorities in their environmental health programs. Under this objective EHP will develop risk assessment methods appropriate to developing countries and disseminate information about the utility of risk assessment. EHP will explore possibilities of applying the methods in field studies to be performed in close collaboration with host-country technical professionals, policymakers, and NGOs in order to achieve three complementary aspects of this strategic objective:

- to develop the technical capacity for performing risk assessment studies in host countries;
- to encourage the adoption of risk assessment and risk management as the conceptual framework for environmental health programs; and
- to promote public participation in evaluating, prioritizing, and mitigating environmental health risks.

Outputs Anticipated: Three outputs are expected from this strategy; all related to changes in how host-country institutions make decisions. If the strategy is successful, host-country institutions will have increased capacity to

- conduct community-based environmental health risk assessments,
- monitor environmental conditions and health status and use these data in making decisions, and
- establish effective communications and negotiations among stakeholders in environmental health.

Relation to Regional Strategies: Priority-setting tools are relevant to all regions, but they are particularly relevant to the two transitional regions, ANE and LAC. The developing economies of the ANE present a pressing case for the application of rational risk assessment to environmental health problems. In this region, with its rapidly expanding national economies, fueled by intense multinational capital input, "pretransition" environmental health risks (including tropical diseases) are swiftly being augmented with the risks associated with industrial activity. Understanding issues such as the relative importance of these new risks and their interaction with the old "pretransitional" risks or

the economic implications of health costs produced by industrial activity, but externalized to communities and individuals, is critical to the ability of national and local governments to set priorities for effective and efficient action to control negative health impacts. In turn, maintaining and improving the health of the populations producing this economic transformation is essential to continued economic growth.

3.4.2 Strategic Objective 2: Increased Institutional Effectiveness through Locally Based Demand

Strategic Objective 2 is ***to enhance the effectiveness of environmental health programs to meet locally based demand.***

Constraints Addressed: Top-down approaches to development assistance are less likely to succeed and to be sustainable than those that respond to local demands. If poor and disenfranchised clients are to be served, means must be found for them to express their preferences—through their willingness to pay for goods and services, and in support for local representatives and leaders. The "Voice and Choice" theme encapsulates two dimensions of a shared vision of the poor and disenfranchised being responsible for their own destiny. "Voice" represents the arguments for increased participation through community and national, political processes, beginning with the individual's basic human rights to community, local government, and national governance. "Choice" underlies the conceptual framework of those stressing "economic growth" and market mechanisms as the core of "development." Locally based demand tries to bridge "voice" (as an expression of society's resolution of resource allocation issues at various institutional levels) with "choice" as interpreted by new insights drawn from institutional economics and microfinance.

Approach: Development requires both broad-based consensus on the goals of new policies and effective institutions to implement those policies. Institutions obtain public support in the same way businesses do—by understanding the needs of their clients or constituents, i.e., by identifying and meeting "locally based demand." As understood by EHP, locally based demand originates from diverse constituencies from diverse spheres. In one context, "local" may mean municipal and local government with respect to central government. In another context, "local" may be identified with consumers of services or communities. The phrase "demand" as used here has a dual meaning, the first being specifically economic. The second meaning is a more diffuse but widely understood interpretation as the right of individuals, communities, and local governments to pursue, through some sort of political process, demands for basic human rights, entitlements, and a say in decision making.

The core of this objective is to identify opportunities to demonstrate the effectiveness of

- **advocacy techniques** for leveraging limited resources;
- **demand-oriented management** in assuring service quality;
- **public education** in influencing demand; and
- **disciplined client/customer-centered financial relationships** for achieving sustainable programs.

Outputs Anticipated: In the central planning paradigm, a program is judged to be a success if it achieves the predicted *target outputs and impacts*. In locally based demand, a program is successful if it starts up

processes in which local-level demands determine the allocation of public resources and the outcomes achieved. The following outputs are expected:

- A more open and responsive policy-making process
- Increased capacity of environmental health institutions to stimulate and respond to locally based demand
- Increased community capacity to contribute to the planning and implementation of environmental health programs
- Financing systems developed to support demand-led investments that improve environmental health

Relation to Regional Strategies: Involving communities in the process of determining environmental health priorities not only opens up channels of communication and trust between community and government but also provides missions and host-country governments with the opportunity to leverage community institutional and cultural resources for the control and prevention of environmental health problems. In sub-Saharan Africa and on the Indian subcontinent, for example, the bonds of shared institutions and traditions are potential bases for helping communities to organize to implement water and sanitation systems or vector-control measures. This is true, not only in rural areas, but in emerging urban and peri-urban settings where neighborhoods are often created on the basis of those shared institutions. At the same time, IEC efforts can draw on rich traditions for the creation of new relevant educational materials.

Likewise, local NGOs may be assisted to scale up innovative financing schemes where they have an active presence, such as Latin America and parts of Asia.

3.4.3 Strategic Objective 3: Integration of Environmental Health and Basic Health Care

Strategic Objective 3 is ***to increase integration of environmental health perspectives with host-country health care systems.***

Constraints Addressed: In recent years, USAID has concentrated on improving child survival through the reduction of infant and child mortality. Intervention strategies have focused on immunizations and case management, with far less attention to primary prevention, or addressing problems in the child's environment that lead to illness. Maintaining "wellness" through integrated prevention strategies has been the missing element in child survival activities. To promote a healthy maternal-child model, the health care paradigm needs to be transformed to reflect a balance between prevention and case management.

Approach: The task of shifting the focus by integrating prevention and basic health care is a two-step process. The first step is to clarify what is meant by "integration" and examine its advantages and disadvantages. The next is to examine the capacities and resources of both the environmental and health sectors to determine the points of convergence in their services and the potential for integration. This step involves identifying and tracking environmentally related diseases through the health care system and exploring linkages between health and environmental information systems. For example, EHP will try to determine how to add environmental health-related messages to standard

case management instructions in such a way that patients will learn how to *prevent* the illness for which they are seeking care.

Outputs Anticipated: Under this strategy EHP hopes to develop, test, and evaluate approaches and models to integrate environmental health preventive interventions/services with basic health care. The preventive interventions chosen will focus on high priority diseases discussed in Chapters 1 and 2. Success will be realized if host countries

- include environmental health data in their health information systems,
- include environmental health issues in their health education programs, and
- consider environmentally related diseases in case management provided through health care services.

Relation to Regional Strategies: In sub-Saharan Africa, USAID has invested strongly in maternal child health and primary health care programs. Diarrheal disease is the single most significant disease in the region, and it is a major source of morbidity and mortality, especially among infants and children. The EHP will work with missions and host-country governments to seek ways of integrating the prevention of diarrhea into MCH and PHC programs to significantly reduce its incidence and to free up resources devoted to malaria case management for use in other areas.

3.4.4 Strategic Objective 4: Environmental Health of the Urban Poor

Strategic Objective 4 is ***to increase USAID and host-country focus on the environmental health problems of the urban poor.***

Constraints Addressed: Unrestrained rural-to-urban migration has caused rapid urban growth in most USAID-assisted countries and is expected to continue, as already mentioned. This rapid urbanization has caused a demand for urban services, housing, and infrastructure that the public sector cannot satisfy; service deficiencies are worst in the poorest urban areas, which lack adequate shelter, access to potable water, and sanitation services. While urbanization has contributed to overall productivity, per capita income, and well-being, the incidence of urban poverty has risen alarmingly. In 1988, about 25 percent of the total urban population in developing countries (330 million urban residents) lived in absolute poverty. By the year 2000, up to 420 million will. The World Bank's *1992 World Development Report* concludes that urban poverty will become the most significant and politically explosive problem in the next century. Environmental pollution problems that are otherwise geographically dispersed tend to concentrate in urban areas. Many studies confirm that both mortality and morbidity from environmentally related diseases are significantly higher for the urban poor than for others. The main problems, as discussed in Chapter 1, are pollution from human excreta, poor drainage and wastewater disposal, minimal solid waste services, and air pollution.

Approach: EHP seeks to draw attention to these serious problems to tip the balance slightly more towards the problems of poor urban areas. More attention should be paid to peri-urban areas now while the problems are manageable, for growth in these areas shows no sign of slowing down. In practical terms, this may be done by working on specific problems such as technology choice for peri-urban sanitation, tropical disease control in urban settings, and solid waste management. EHP also hopes to fill gaps in knowledge about peri-urban environmental health and to draw on the work done

under the five other strategies, which will provide essential tools and knowledge for working in peri-urban areas.

Outputs Anticipated: EHP outputs anticipated involve policy making, resource allocation, and capacity building, as follows:

- Policies adopted that support increased attention to urban environmental health problems
- Increased share of USAID and host-country resources allocated to urban environmental health
- Planning, analysis, and implementation capacities increased in host-country institutions responsible for urban environmental health prevention and remediation

Relation to Regional Strategies: By the year 2020, 80 percent of the population of the LAC will live in cities and the region will contain 15 megacities. In the ANE, Dhaka, Bombay, Calcutta, Delhi, and Karachi will each have populations of more than 10 million by the year 2010. Even Africa, the least urbanized of regions, will see 40 percent of its population living in cities by 2020. In the LAC, the EHP is concentrating on working with host-country governments to build up its deteriorated peri-urban infrastructure in water supply and sanitation. The relatively unurbanized character of sub-Saharan Africa provides EHP the opportunity to work with missions to pro-actively develop effective interventions for urban and peri-urban areas. In particular, EHP proposes to learn more about the health effects of urban air pollution—both ambient and indoor—and integrated tropical disease prevention in urban settings in Africa.

3.4.5 Strategic Objective 5: Health Impact of Development Projects

Strategic Objective 5 is ***to increase the emphasis on environmental health considerations in determining the impact of development projects.***

Constraints Addressed: The concept of sustainable development implies balancing environmental protection with generating increased opportunities for employment and improved livelihoods. However, the human health aspects of development policies and development projects are often inadequately addressed. It is not uncommon for development projects inadvertently to cause new problems while they are addressing old ones. For example, construction of a dam and reservoir, while it might generate needed power, might at the same time provide new breeding sites for tropical disease vectors. USAID has in place a system of environmental impact assessments, but these do not adequately address environmental *health* impacts.

Approach: This strategic objective specifically addresses the mitigation and prevention of negative health effects caused by development projects such as road networks, agriculture and irrigation, dam construction, and housing developments and resettlements. It will emphasize increasing the awareness of planners, policymakers, and entrepreneurs of the health effects of ecological and environmental changes likely to occur as the result of development projects. The objective will focus on enhancing the capacity of USAID and other donors and development project planners to address and implement preventive measures and health safeguards by improving the methods used in Environmental Impact Assessments.

Outputs Anticipated: These far-reaching outputs would represent a fundamental change in how USAID (and other development organizations) plan development.

- Policies developed in USAID and host countries that stress environmental health considerations in development projects

- Enhanced capacity of development project planners and managers to lower environmentally related diseases and hazards occurring in association with development projects

- Improved methods to evaluate the environmental health impacts and the accompanying economic and social costs of planned and existing development projects

Relation to Regional Strategies: Consideration for the environmental health impact of development projects is a priority issue for LAC and Africa, where development activities such as dams, roads, agriculture, and uncontrolled urbanization have made dramatic contributions to increases in environmentally caused diseases like malaria, dengue, and leishmaniasis. Assisting missions and host-country governments with the evaluation of the environmental impacts of proposed development projects is a priority activity for the EHP in these regions. In the ANE, where much of the development is driven by private sector investment, the EHP will seek policy dialogue between stakeholders in the region to integrate environmental health considerations into privately funded development activities.

3.4.6 Strategic Objective 6: Promoting Environmental Health

Strategic Objective 6 is ***to increase the emphasis given to environmental health approaches by USAID missions and bureaus and host-country partners.***

Constraints Addressed: Environmental health is a new program area for USAID. As in any new initiative, it will take USAID time to fully understand the implications of the environmental health approach. This strategic objective aims at helping USAID bureaus and missions and host-country partners to make the transition to a new way of looking at their health and environment portfolios. EHP hopes to build bridges between health and environment programs, bringing about a stronger preventive orientation to health programs and directing the attention of environment programs to the health effects of environmental pollution and degradation.

Approach: EHP has a major responsibility, in collaboration with the Office of Health and Nutrition, in promoting the concept of environmental health and in assisting USAID to develop a new generation of activities. This will include documenting the magnitude of environmental health problems and working to concentrate more on prevention in the interests of sustainability.

Many of the basic ideas and concepts to be communicated under this objective relate to the other objectives:

- importance of priority setting,

- integrating environmental health with basic health care,

- increasing awareness of the health impacts of development projects such as dams and road construction, and

- peri-urban areas as a focal point for environmental health problems.

Activities carried out under this objective will range from one-on-one meetings with mission and bureau personnel, to formal workshops and courses, to periodic seminars. Informative materials on environmental health in print and other media will also be produced to support this communications effort.

Outputs Anticipated: If the outputs anticipated are achieved, USAID missions and bureaus and host-country partners will progress from learning about the concept of environmental health to adopting environmental health approaches and integrating them into present programs and strategies. The mission personnel EHP hopes to reach are health, environmental, urban, and general development officers.

- Increased understanding of the environmental health perspective (including wellness and its relation to the environment) and appreciation for its advantages
- Increased ability to articulate environmental health problems, needs, and potential solutions
- Increased integration of environmental health into current health, environmental, and other related strategies

Relation to Regional Strategies: In the LAC, EHP will work with the bureaus and missions to integrate the concept of environmental health prevention into host-country MCH, CDD, and tropical disease control programs and activities. The EHP will assist missions in South Asia to sensitize host-country governments to the impact of environmental factors on health through seminars to be held with government representatives and work with new ministries of the environment to set country level environmental health agendas. In Africa, the project is proposing a special focus on helping NGOs to incorporate environmental health into their MCH, PHC programs and other development activities.

Chapter 4

From Framework to Action

EHP is in the advantageous position of being able to respond to USAID mission and bureau requests as well as to use core funds to develop new, more effective approaches to environmental health. As illustrated in Chapters 1 and 2, the needs of the developing world and the opportunities for EHP to make a contribution to environmental health are many. However, EHP is well aware that it must use its resources wisely. The principal challenge will be to respond to the diverse needs of USAID missions, bureaus, and client countries while keeping the Project's efforts focused. To meet that challenge, EHP must provide high quality technical assistance and demonstrate that it is contributing significantly to USAID's goals and strategic objectives—especially those that relate to improving health by addressing environmental conditions that contribute significantly to mortality and morbidity. EHP's overall approach to assisting missions and bureaus and improving the effectiveness of their environmental health programs is outlined in Chapter 3.

This framework document with its call to action is the starting point for ensuring that EHP makes an impact. Because the ultimate goal of the project—improving people's health—can be realized only by USAID programs and the countries that they assist, achieving an impact will require that the Project and its counterparts in USAID work in partnership. USAID and its client countries will design and implement the programs that are the vehicles for improving health by improving environmental conditions. EHP will provide the technical support and the tools and methodologies that will help USAID and client countries address locally determined priority problems. However, when EHP is using its relatively small amount of core resources, for example, to carry out applied research or improve the capabilities of host countries to deal with environmental health problems, it will emphasize those problems that in the aggregate take the biggest toll on human life and well-being. These problems are identified in Chapter 2 region by region. EHP is well aware, however, that its core funds will not be sufficient to have a wide impact on priority problems. It can only point the way.

To implement this Strategic Framework, EHP will produce a plan each year that presents how the project will use its resources. Each year's plan will be developed with input from USAID missions and bureaus. It will be flexible enough to respond to mission and bureau needs and it will identify proactive activities that the project believes should be undertaken to improve USAID's environmental health programs. These proactive activities will be designed not only to benefit USAID generally but also to support specific USAID country programs. As mentioned above, EHP will work with missions to target its efforts toward the highest impact environmental health problems. Each year EHP will review its progress under the previous annual plan and the lessons learned before developing the subsequent annual plan.

As the project proceeds, EHP will monitor and report on its performance, using indicators consistent with the Project's goal and strategic objectives and with the goals and objectives of the Center for Population, Health and Nutrition and the Office of Health and Nutrition. These indicators will provide the Project and the Office of Health and Nutrition with a systematic method to ensure project focus and accountability. Selected project indicators are presented in the accompanying text box.

EHP is a unique project whose resources can be brought to bear on some of the most critical problems faced by developing countries. Its attention to environmental health and its development-oriented approach makes the Project an ideal vehicle for USAID to achieve many of its strategic objectives. EHP expects to develop a strong and supportive relationship with USAID missions and bureaus. In the end, it also expects to make significant contributions to improved human health and well-being in the developing world.

SELECTED INDICATORS OF EHP PERFORMANCE

Consistent with the Project's overall goal, EHP will contibute to the prevention and control of environmentally related diseases, especially the highest impact diseases such as diarrheal diseases, acute respiratory diseases, malaria (principally in Africa) and Chagas' disease (in Latin America).

The following indicators, organized by strategic objective, illustrate how EHP performance will contribute to the project goal. These example indicators, and others that will be developed as a part of EHP's management plan, will be applied in and specifically tailored to programs where EHP has worked and provided a significant level of technical assistance.

Raise Awareness of Environmental Health ■ In each region, awareness of the disease burden and approaches for the prevention and control of environmentally related diseases, especially the highest impact diseases, will be increased at the USAID mission and host-country level.

Improve Priority Setting ■ Methods for including infectious and tropical diseases in risk assessent will be utilized by host-country professionals. ■ The capacity of host-country institutions to use risk assessment methods will be improved.

Strengthen Institutions ■ Institutions responsible for environmental health will be better able to operate on a sustainable basis, improving management and financial systems and using demand assessment and market research to improve services to the public.

Integrate Environmental Health and Case Management ■ Environmental health indicators will be defined and included in national health information systems. ■ Host-country health care programs will demonstrate an improved balance between preventive and curative health care.

Increase Assistance to the Urban Poor ■ USAID and host countries will increase their attention to and support of programs addressing the environmental health problems of the urban poor.

Improve Environmental Impact Assessments ■ Environmental health linkages will be more clearly addressed in the methodologies used to assess the environmental impacts of development projects.