

# ENVIRONMENT, HEALTH, & PEOPLE

An Update from USAID's Environmental Health Project

Spring 1996

## Risk Assessment Leads to Action in India

*"Policymakers need a systematic way of looking at environmental problems, common terms for talking about them, and a tool for evaluating their diverse risks and setting priorities among them."*

**P** eople moving in transit along major transportation routes are continually exposed to vehicular emissions [that are] exaggerated by slow moving, congested traffic... Winter evenings the problem is visible, with haziness and reduction in vision in almost all the major transport routes... Drivers, passengers, people on the sidewalks and roads constantly complain of giddiness, headache, nausea, lacrimation and a burning sensation in the eyes, and general lassitude." This description of the most obvious health problems caused by vehicular emissions is taken from the report of a USAID-supported comparative risk assessment recently completed in Ahmedabad, India.

The seriousness of Ahmedabad's air pollution problems is the bad news. The good news is that Ahmedabad and other cities in India are beginning to appreciate the negative health effects of environmental pollution and to take action to address them.

In many countries, particularly in Latin America and Asia, environmental health risks include such "pre-transitional" diseases as diarrhea, acute respiratory infections, and malaria, which arise from the conditions of inadequate water, sanitation, and housing generally associated with developing countries, and such "post-transitional" health problems as asthma and lead poisoning, which result from exposure to environmental pollutants from urban growth and industrial development. Risk assess-



Asansol/Durgapur risk assessment team meets with officials from a pharmaceutical company in Durgapur to discuss data needs for the risk assessment. Photo: Robert Hetes

ment offers policymakers a systematic way of looking at environmental problems, common terms for talking about them, and a tool for evaluating their diverse risks and setting priorities among them.

### A Lightning Rod

Ahmedabad, located on the Sabarmati River in Gujarat State, is known for its giant textile industry. Its population grew in this century from just under 186,000 in 1901 to about 2.9 million in 1991, and is probably over 3 million today. Ten percent of the city's 190 square miles is used by industrial concerns, many of which make heavy use of coal and lignite as fuels. The number of motor vehicles has grown rapidly in the last fourteen years, from 103,200 in 1981 to 696,120 in 1994.

The risk assessment in Ahmedabad

has served as a lightning rod to direct attention to major health-related environmental problems. With technical assistance from USAID, participants in the assessment examined a range of problems, evaluating the probability that citizens would be exposed to each problem and the potential consequences of such exposure. Using a systematic process, they identified air pollution from

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## UPDATE: Current Activities of Note

### Communities Uncover High-Risk Cholera Behaviors

In several Ecuadorian communities in Chimborazo and Cotopaxi, where cholera remains in a state of "continuous epidemic," EHP consultants trained municipal-level teams to identify behaviors and beliefs that place people at high risk for cholera and to develop interventions for changing them. The teams later passed on their knowledge to community groups.

Comprehensive behavioral data collected through interviews and observation were supplemented by mapping exercises in which community members identified factors that might contribute to disease transmission. The communities are now implementing their own plans to address behaviors they identified as risky.

In a follow-up activity, EHP will assist the Ecuadorian community teams to evaluate the interventions as sustainable behavior-change activities and as a contribution to reducing cholera and other diarrhea-related mortality and morbidity.

### Soap Companies Urged to Use Health Messages in Their Advertisements

EHP and BASICS (Basic Support for Institutionalizing Child Survival) are collaborating on an effort to encourage soap manufacturers in Central America to include health messages in their advertisements. The idea is to mobilize the private sector to extend the reach of social marketing campaigns that promote handwashing as a way to prevent diarrheal diseases. At present, the consultant team is meeting with representatives of soap companies; those that express interest will receive assistance in conducting the research,

formulating the messages, and studying the impact of the campaign.

The utility of handwashing with soap has been documented in both developed and developing countries. In urban Bangladesh, dysentery was reduced among all age groups through handwashing with soap; in Guatemala during the peak season, the incidence of diarrhea in children under five was reduced by 32 to 36% through a simple handwashing intervention.

### Malaria Prevention Efforts Take Shape in Zambia

A team of consultants from EHP and the Centers for Disease Control and Prevention are running a second series of trials to test the efficacy of chloroquine in malaria treatment in Zambia. The first series was completed in July 1995. (*See Activity Report 15, listed on page 8.*) If the results point toward a growing resistance of the parasite to the drug, the implications will be profound for Zambia, where malaria is the number one cause of morbidity, hospital admissions, and mortality. The crude incidence rate there is 355 per 1,000.

EHP is involved in several malaria

prevention activities in Zambia, in conjunction with the mission's new child survival initiative. Currently, an interdisciplinary team that includes specialists in malaria and environmental health, an epidemiologist, and a local social demographer is developing a strategy for malaria control in urban Zambia.

Most sub-Saharan African countries are urbanizing rapidly, with the most growth in poor "informal" peri-urban areas where there may be little or no provision for water and sanitation, drainage, or waste disposal. Zambia is no exception. In peri-urban areas, environmentally linked diseases, such as malaria, filariasis, and even schistosomiasis, are establishing themselves with local transmission cycles.

The lack of well-documented studies of urban malaria has made it impossible to design feasible control and prevention strategies. The consultant team will study urban malaria in one medium-sized city in Zambia, paying special attention to the environmental and socio-demographic characteristics associated with the disease.

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<http://www.access.digex.net/~ehp>



In Cité Soleil, Haiti, (see NGO story on page 3) solid waste clogs drainage canals, which flood homes with sewage during the rainy season. Revenues from a new UNDP water system will be used to finance solid waste collection and disposal. Photo: Eduardo Perez

### NGOs Improve Their Ability to Serve the Urban Poor

Most peri-urban slum areas are not legally part of the cities they encircle and thus not commonly viewed as the responsibility of municipal officials. Many of these areas are totally lacking in infrastructure for water supply, sanitation, and solid waste disposal. The resulting environmental pollution creates a situation inimical to the maintenance of good health. Children living in these communities are most at risk. They suffer the highest rates of mortality and morbidity from diarrheal disease in developing countries.

In many communities, the void left by the formal governmental structure is filled by nongovernmental organizations (NGOs) that work with the communities to provide services. EHP is helping to better equip three such organizations to improve health conditions in peri-urban areas.

In **Peru**, EHP is working with the

NGO *Alternativa* to implement a low-cost peri-urban solid waste management program in the *pueblos jóvenes* of the northern section of greater metropolitan Lima, home to approximately 1.5 million people, 70% of them peri-urban residents. An estimated 590 tons of waste are generated there daily; 118 tons are not collected at all and 70% of what is collected is not disposed of properly. Inadequate solid waste collection has led to contamination of surface water and groundwater resources and of the ambient air, from waste burning. *Alternativa* is introducing a private-sector market approach to providing solid waste services. Its program includes reduction of the solid waste stream, use of innovative technologies, and health education and social marketing to change community- and household-level behaviors. EHP's role is to provide assistance with project monitoring and evaluation.

In **Haiti**, EHP is assisting the

Haitian NGO *Centres pour le Développement et la Santé* (CDS) to establish an autonomous district to manage Cité Soleil's water and environmental sanitation services over the long term. UNDP has provided funds for a water supply system that is currently under construction and will be completed in June 1996. Cité Soleil is a large informal settlement located on a man-made landfill peninsula which extends into the Bay of Gonaïves. About 200,000 residents live in two square kilometers without piped water, sewer systems, or solid waste services. In Cité Soleil, 30% of pediatric admissions are due to diarrhea. EHP is working with GreenCom, another USAID centrally funded project, to assist CDS to establish the autonomous district. EHP is concentrating on the institutional, financial, and technical aspects of the plan and GreenCom on the behavioral and community participation aspects.

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## DENGUE: The Fastest Spreading Tropical Disease

Dengue fever has been recognized clinically for more than 200 years, but dengue hemorrhagic fever (DHF) was first encountered in Manila in 1954. Classic dengue fever results from any of four virus strains; sequential infections with different strains may produce the severe hemorrhagic and shock symptoms associated with DHF. Air transport has carried the mosquito vector, *Aedes aegypti*, and dengue virus strains around the world, allowing them to find perfect breeding conditions among poor urban populations that lack proper water supplies and sanitation.

In Asia and the Western Pacific, 30,000 cases of DHF were reported between 1956 and 1980. That number jumped to 130,000 from 1981 to 1985 and to 450,000 from 1986 to 1990. DHF, now endemic throughout Southeast Asia, is the third or fourth leading cause of children's hospitalization in some areas.

Dengue in the Americas began with a few cases of DHF in Puerto Rico in the 1970s and leapt to a full-

blown epidemic in Cuba in 1981, with 34,000 documented DHF cases and 158 fatalities. Since then, classic dengue epidemics have hit cities across South America. Sixteen Latin American countries have reported DHF deaths, and several have declared emergencies. Classic dengue, but as yet no DHF, has reached the Texas-Mexico border.

It may be ten years before a vaccine is available, so other interventions must be used. Insecticides are too expensive and larvicides must be applied on all breeding sites to be effective. The most promising long-term solution is to eliminate breeding sites by destroying discarded tires, bottles, and other trash that collects water and by covering water storage containers. Effecting these changes will require behavioral changes by communities and individuals, but must be a top priority if dengue is to be brought under control.

— Andrew Arata

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**Update** (Continued from page 3)

(The Haiti and Peru activities are being funded through USAID's Environmental Initiative for the Americas [EIA].)

In **Jamaica**, EHP is providing training and technical assistance, with funding from RHUDO/Jamaica, to the Jamaican NGO Construction Resource and Development Centre (CRDC) for a demonstration urban environmental sanitation program in the slum areas of Norwood and Rosemont in Montego Bay. The last issue of *EH&P* discussed how EHP assisted RHUDO to assess conditions in the target areas and to determine residents' needs and preferences. The assessment findings were used to design the project now underway.

So far, EHP has conducted three training workshops: one for CRDC personnel, leading to the development of a detailed workplan; another for public health inspectors and CRDC technical staff on on-site sanitation technologies, gray water disposal systems, and innovative sewage systems; and a third for CRDC field staff on how to organize a hygiene behavior-change program.

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**EHP Participates in AIMI Start-Up**

The use of mosquito nets impregnated with insecticides (IMNs) is a key intervention of the Africa Integrated Malaria Initiative (AIMI) just getting underway, with the joint sponsorship of the Office of Health and Nutrition and the Africa Bureau. EHP, one of a number of centrally funded projects that will provide technical assistance under the initiative, is involved in two AIMI-related activities:

- A team of malaria specialists is preparing guidelines to facilitate rapid go or no-go decisions on the feasibility of implementing IMN programs in a given locality.
- Three target countries for AIMI are

Kenya, Malawi, and Zambia. EHP is preparing base maps of designated districts in these countries, using geographic information systems (GIS). The intent is to develop GIS as a monitoring tool in malaria control.

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**EHP Achieves Results in Gaza Wastewater Rehabilitation**

Since October 1995, EHP has been providing short-term technical assistance to the U.N. Relief and Works Agency (UNRWA) during the start-up and emergency phase of a four-year, USAID-funded, \$40 million Gaza Wastewater Project, which aims to improve wastewater collection and treatment in Gaza City. The city's sewage and storm water systems were built for the 1948 population of 75,000; the population has since swelled to 252,000, largely from an influx of refugees, and the systems are completely overloaded. The flow of refugees has also increased demand for potable water and contributed to the depletion and subsequent pollution and salinization of the Gaza Strip aquifers.

Over the past few years, the rains of November-December have flooded the streets of Gaza City with raw sewage, which contributed to outbreaks of cholera. To avert a public health disaster, the mayor of Gaza called for emergency work in connection with the wastewater project. By January, the EHP team had achieved all high-priority activities of the emergency phase:

- Repair of the storm water reservoir's pumping station.
- Procurement of a jetter suction machine that is now being used by the municipality to clean the sewers.
- Completion of the first contract for excavating one of the clogged reservoirs of the Gaza wastewater treatment plant.

- Cleaning of 300 meters of storm drains in collaboration with teams from the Municipality of Gaza.
- Completion of procurement requirements for all emergency items.

EHP will continue to provide short-term technical assistance throughout the start-up phase of this project.

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**USAID Assistance Helps to Turn Around a Ponderous Bureaucracy**

USAID has invested over \$900 million since 1977 to improve sewage collection and treatment in the greater Cairo area. As a condition of this investment, the Egyptian Government agreed in 1984 to undertake institutional reforms within the Cairo General Organization for Sanitary Drainage (GOSD) regarding cost recovery, upgrading of staff skills and management capacity, effective O&M, and creation of a financially viable and autonomous organization. To increase the rate at which these institutional reforms were being put in place, an institutional support contract (ISC) was signed in 1992.

EHP recently conducted an assessment of GOSD/ISC progress and found that GOSD is definitely making the transition from a ponderous, ineffectual bureaucracy to an autonomous, business-oriented utility. Improvements stand out in operations and maintenance, financial management, capacity to manage the design and construction of new facilities, desire for organizational change, improved management skills, and training. With ongoing USAID support, GOSD should continue to build on the current momentum and improve its effectiveness. The success of this effort is critical to the sustainability of USAID's substantial investment in upgrading sewage collection and treatment in Cairo. (*See Activity Report 14, listed on page 8.*)

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## Community Assessments: Looking at Risks from the Residents' Perspective

Collecting community-level data is an important aspect of CIMEP—Community Involvement in the Management of Environmental Pollution—a project now being implemented in Tunisia. CIMEP is designed for peri-urban communities, where environmental pollution often causes major health problems. Its goal is to promote greater understanding and partnership between municipalities, national decision makers, and the residents of the communities they represent. The qualitative information collected through a community assessment can help identify problems from the perspective of the residents and can serve as a useful adjunct to the more technical, quantitative risk assessment.

Municipal managers tend to regard information for decision-making as a specialty of researchers and thus believe that no action is possible until a specialist gets involved. An important purpose of the CIMEP assessment is to show these managers, through experiential training in participative techniques, that they can solve local environmental health problems on their own.

The community assessment is a rapid “research” process that employs interviews, focus groups, community mapping, and direct observation to collect

information. Its problem-solving orientation enables the manager to define the action and resources needed. For example, in one Tunisian neighborhood the community maps pinpointed the houses where sanitation was lacking; everyone in the community knew which they were and understood what constrained those households from constructing and using latrines. With this information, managers were able to take action in neighborhoods that may have felt forgotten.

In a scientific survey, the questions, hypotheses, and generalizations are developed in advance; in a rapid community assessment, investigators allow the process of interviewing and observing to lead them to unexpected insights. For example, in one of the Tunisian communities, municipal officials addressed the problem of garbage in the streets by installing garbage bins. But the streets stayed littered. The community assessment found that the residents, mainly animal herders, were simply retaining their rural behavior of throwing garbage into the streets and courtyards as food for the animals. Once the behavior was understood, a valid solution could be devised: neighborhood corralling of the animals and collection of garbage to feed them.

— *May Yacoub*

### Update (Continued from page 4)

#### Regulating Pesticides in the Former Soviet Union's Cotton Belt

Twenty-six Uzbekistani scientists, physicians, and private-sector researchers gained familiarity with Western policies and procedures for evaluating and regulating the use of agricultural pesticides at a USAID/CAR workshop planned and delivered by EHP in Tashkent from October 30 to November 3, 1995. At present, pesticide regulations in Uzbekistan are not based on a systematic review of benefits and potential health and environmental problems, and there is no system in place to bring together data about pesticide use. Yet, for decades, large amounts of insecticides and herbicides have been used in cotton production, the mainstay of Uzbekistani agriculture and a large portion of its economy. Most pesticides used were the old “DDT-type,” i.e., highly residual and

toxic. The participants made recommendations to the Ministers of Health, Agriculture, and Industry and to the State Committee for the Protection of Nature on steps that the government should take to protect the health of its citizens. The recommendations included the need for a comprehensive monitoring system, an information database, and a national committee to coordinate pesticide-related activities.

#### Environmental Health Seminar Series Continues

The Office of Health and Nutrition-sponsored seminars on environmental health will continue this spring with sessions on the public health risks of pesticides (in April) and the unintended health effects of development (in May). Contact EHP for times and places.



In CIMEP/Tunisia municipal managers can use the information from community maps, like the one they are examining here, in the municipal planning process. (See box above.) Photo: Scott Dobberstein

## Information Center Resources

Dengue fever and dengue hemorrhagic fever (DHF) have emerged in the last 20 years as the leading arthropod-borne viral diseases affecting human health. Dengue fever epidemics have increased, the number of DHF cases is up, and the disease is spreading to new geographic areas. Listed below are some sources of information on these diseases available through the EHP Library.

- **From the Library's Collection.** "Dengue: The Risk to Developed and Developing Countries," a chapter in *Infectious Diseases in an Age of Change* (National Academy Press 1995). *Economic Issues in DHF and Their Role in Dengue* (WHO 1995).
- **From the Centers for Disease Control and Prevention.** The April/June 1995 issue of CDC's electronic *Journal of Emerging Diseases* includes "Dengue/Dengue Hemorrhagic Fever: Emergence of a Global Health Problem."
- **From MEDLINE, 1985 to 1995.** The National Library of Medicine's database contains over 1,130 citations and/or abstracts about dengue, more than half of which have been published since 1990. Potential

users should note that the majority of journals are clinical and most are published in North America and Europe.

- **From the Pan American Health Organization.** PAHO's Public Information office provides up-to-date statistics on dengue in Latin America; the quarterly *PAHO Bulletin* regularly includes articles about dengue fever in specific countries; and in 1994 PAHO published a report entitled *Dengue and Dengue Hemorrhagic Fever in the Americas: Guidelines for Prevention and Control*.
- **From PROMED.** An electronic discussion group devoted to emerging diseases, PROMED has recently distributed bulletins on dengue outbreaks in Texas and the history of dengue in the United States.
- **From the World Health Organization.** WHO's *Weekly Epidemiological Record* reports on recent dengue outbreaks and provides yearly worldwide statistics, and its Tropical Disease Research division maintains an electronic discussion list.

— Dan Campbell

### Assessment (Continued from page 1)

mobile sources (autos, trucks, and motorized rickshaws) as the number-one problem, followed closely by ambient (outside) air pollution from other sources and indoor air pollution from the use of biomass fuels in traditional cooking stoves. Inadequate sanitation, which results in contaminated drinking water and disease transmission, was also identified as an important problem in certain districts.

The study has provided the impetus local officials needed to begin addressing these problems. Ahmedabad's municipal commissioner (a powerful administrative position in the Indian system) had long been concerned about air pollution from vehicles but did not have political support for addressing the problem. The risk assessment process, which included many people and was cover-

ed extensively in the local press, educated the public about environmental health risks and focused citizens' concerns on the problems. The commissioner praised the study publicly, endorsed its conclusions, and formed a city-wide task force to develop a plan to address the risks identified.

Local and state officials, health experts, and major stakeholders, such as industry representatives, owners of transport vehicles, and auto-rickshaw drivers, have formed working groups to develop action plans. Pollution abatement efforts may affect some stakeholders significantly. For example, auto-rickshaw drivers agreed to support emissions testing to detect the illegal use of kerosene in their vehicles in return for the city placing limits on the number of new permits issued and providing designated stands where they can wait for passengers.

### Part of RHUDO/USAID New Delhi's Program

Conducting the risk assessment was the idea of RHUDO/New Delhi Director Earl Kessler and staff member N. Bhattacharjee. As Kessler explained, "We want to help cities in India deal with environmental problems by using a tool kit that includes environmental mapping and risk assessment. And we are working with key institutions, like CEPT, that can bring these tools into common usage in the urban planning process." CEPT is the Centre for Environmental Planning and Technology, an independent academic institution in Ahmedabad that provides graduate-level training in urban and environmental planning. By providing technical assistance to local and state governments, CEPT is ideally situated to help spread the new tools.

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## Assessment (Continued from page 6)

Kessler and Bhattacharjee arranged a two-stage process of technology transfer: EHP would provide assistance to CEPT for the assessment in Ahmedabad, and CEPT in turn would assist state and local government bodies to conduct a second assessment in West Bengal. The goal is to develop CEPT's capability in risk assessment and then to use CEPT as a focal point for replicating the methodology in India.

### Moving on to Steel Country

The plan is working so far: the Environment Department in West Bengal has hired CEPT to assist with a risk assessment in the Asansol/Durgapur region, which has been listed as one of India's seventeen "critically polluted areas." Asansol is the center of a coal mining district. Durgapur is the site of intensive industrial development, including three steel factories, a carbon black plant, chemical production, and pharmaceuticals. While the assessment in Ahmedabad was in its last stage, the Asansol/Durgapur assessment was beginning. Just before the final public meeting in Ahmedabad, CEPT and the local parties in Durgapur held their start-up workshop. CEPT has assumed many of the training and technical assistance roles for the Asansol/Durgapur assessment that were EHP's responsibility in Ahmedabad.

The Asansol/Durgapur assessment will be completed in May 1996 and will be used to define an Environmental Management Plan for the region to be submitted for consideration under West Bengal's next Five Year Plan.

### Building Risk Assessment Capacity

Risk assessment is growing more popular as a method for setting priorities in environmental management for developing countries. Since 1991, when USAID and USEPA co-

sponsored the first overseas risk assessment project in Bangkok, assessments have been conducted in Russia, Poland, Egypt, Ecuador, El Salvador, and India. Some have involved local partners and public participation; others have been more traditional technical assistance efforts performed by a consultant team.

EHP has made a commitment to build institutional capacity in developing countries for performing risk assessments. The two assessments in India are a case in point: the scopes of work for these tasks limit EHP to an advisory role and make CEPT directly responsible for performing the assessments.

Drawing on the India experience, EHP has developed a program of technical assistance to help counterpart institutions learn the methodology and has learned what tools are needed to provide clear, operational support to these institutions. For example, EHP has recently completed a Data Collection Workbook to help USAID partners understand what data they need to collect and where to find it. EHP has also designed workshops and training sessions to support project start-up, data collection and analysis, problem ranking, and public

discussions and has developed the first prototype of a decision support program to help evaluate results and develop conclusions.

EHP's model for conducting risk assessments was first developed in Quito, Ecuador, and has three characteristic features:

- It evaluates a wide range of environmental health risks, including infectious hazards, tropical diseases, occupational hazards, and traffic hazards, as well as the health impacts of chemical pollution.
- It combines: (1) quantitative models to predict health impacts from exposure to chemicals; (2) analysis of public health data to determine current incidence and distribution of environmentally related diseases; and (3) qualitative, ethnographic data to investigate the environmental health problems of communities unrepresented in official statistics.
- It focuses on transferring risk assessment skills to local institutions.

EHP encourages the organizations it works with to adopt these features in their approach to risk assessment.

— Gene Brantly

*Environment, Health & People* is published three times each year by the Environmental Health Project (EHP), a consortium of firms and research institutions headed by Camp Dresser & McKee International Inc. For information, contact EHP headquarters, 1611 N. Kent St., Suite 300, Arlington, VA 22209-2111. Tel: (703) 247-8730; Fax: (703) 243-9004; Internet: EHP@ACCESS.DIGEX.COM.

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

## New EHP Publications

### Recent Activity Reports

EHP published seven new reports since the last issue of *EH&P*. All are available on request to development organizations.

Three reports from the Provincial Cities Development Project in Egypt, by Daniel B. Edwards, David Laredo, Tarek Selim, Mohmoud Bakr, Mostafa El-Tayeb, Neamat Genena, and Salah Zaki:

- *Findings and Institutional Options for Future Management of Water Supply and Wastewater in the Governorates of Fayoum, Beni Suef, and Menya*. 266 pages. (Activity Report 10)
- *Action Plan*. 34 pages. (Activity Report 11)
- *Summary Report*. 28 pages. (Activity Report 12)

*Summary of Activities* (re: Lead Exposure in Young Children, Air Quality Monitoring and Control, and Occupational Health and Safety) in Zlatna, Romania; 1994-1995. Patricia Billig. 114 pages. (Activity Report 13)

*Evaluation of the Institutional Support Contract for Cairo General Organization for Sanitary Drainage*. Fred Zobrist, James Carney, and Kennedy Shaw. 128 pages. (Activity Report 14)

*Chloroquine Efficacy Study in Zambia*. Mary Ettling, Peter B. Bloland, and Trenton K. Ruebush II. 70 pages. (Activity Report 15)

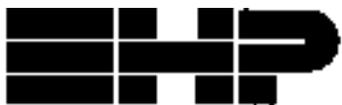
*PVO Workshop on Environmental Health*. Compiled by Bonnie Bradford. 54 pages. (Activity Report 16)

(A list of Activity Reports 1-9 appeared in the Summer 1995 issue.)

### New Capsule Report

EHP coordinated a seminar in 1995 on "Urbanization and Environmental Health" cosponsored by the Office of Environment and Urban Programs and the Office of Health and Nutrition. Margaret Catley-Carlson, chair of the Water Supply and Sanitation Collaborative Council, and Dr. Diana Silimperi, specialist in integrated child health services with the BASICS Project, stressed the urgent need to address the environmental health problems of the urban poor before the situation gets out of hand. Close to half the world's urban dwellers live in neighborhoods threatened by polluted water and air, lack of sanitation, and re-emergent vector-borne diseases. EHP has just published an eight-page "Capsule" Report based on the seminar entitled: *Health & the Environment in Urban Poor Areas: Avoiding a Crisis through Prevention*. Copies are available upon request.

— Betsy Reddaway



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