



**ENVIRONMENTAL HEALTH PROJECT**

# **ACTIVITY REPORT**

**No. 66**

Evaluation of a Training Program for  
Environmental Health Technicians  
in Honduras

May 1999

by

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Prepared for the USAID Mission to Honduras  
under EHP Activity No. 493-CC.

Environmental Health Project  
Contract No. HRN-C-00-93-00036-11, 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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## ABOUT THE AUTHORS

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## **ACKNOWLEDGMENTS**

The Secretary of Health has every reason to be proud of his team in the environmental health programs of his organization; they are highly skilled and dedicated professionals. The tremendous level of enthusiasm and cooperation from all respondents at the Honduran Ministry of Health made the data gathering involved in this activity a true pleasure.

The generous support of Ingeniero José Rubén Gómez, Director de Regulación y Desarrollo, facilitated movement to Sanitary Region 2, and the patient persistence of his technical assistant Suyapa Agüero allowed the consultants to contact the majority of those involved in the development of Honduras' environmental health program.

Regional director Alejandro Melara and his staff in Comayagua organized three valuable focus group sessions with the full participation of 40 field technicians and six supervisors who volunteered their Saturday morning to provide input. Thanks also go to Herb Caudill, USAID, whose wisdom and insight have advanced the cause of public health in Central America.



## ACRONYMS

|        |  |
|--------|--|
| CESSCO | Centro de Estudios y Control de Contaminantes  |
| DETV   | Departamento de Enfermedades Transmitidos por Vectores (Department of Vector-borne Diseases) |
| EHP    | Environmental Health Project   |
| EPA    | Environmental Protection Agency  |
| MOH    | Ministry of Health (Ministerio de Salud)   |
| NGO    | Nongovernmental agency   |
| PAHO   | Pan American Health Organization (Organización Panamericana de la Salud)                     |
| SANAA  | Servicio Autónomo Nacional de Acueductos y Alcantarillados                                   |
| TSA    | técnico de saneamiento ambiental (environmental health technician)                           |
| USAID  | United States Agency for International Development   |
| WHO    | World Health Organization (Organización Mundial de la Salud)                                 |





# EXECUTIVE SUMMARY

## Background

In the first two weeks of March 1999, the Environmental Health Project (EHP) responded to a joint request by the USAID Mission to Honduras and the Honduran Ministry of Health (MOH) to evaluate a program for the development of environmental health workers capable of managing intervention strategies in a variety of environmental health areas. These environmental health technicians (or *tecnicos de saneamiento ambiental* in Spanish, also TSAs) would be paraprofessionals with multiple skills in field functions such as vector control, food safety, water and sanitation, rabies control, occupational health, and health promotion.

For this evaluation, EHP consultants conducted interviews and focus group sessions involving participants from all levels of the TSA development process: directors, coordinators, faculty, tutors, and members of the ad hoc oversight committee. The consultants also visited two local environmental health field offices in the Comayagua region (Sanitary Region 2), made joint field inspections with trained technicians, and visited the training center in La Paz.

The principal objectives of the activity were to review the TSA training program from an “outsider’s” perspective and to identify ways to strengthen the program.

## General Observations

As a result of a major reform effort within the MOH over the past five years, all the essential ingredients for a strong environmental health system are in place. The Honduran MOH has the vision and institutional will for modernization and is pushing for decentralized services. A wealth of qualified human resources also exists at all levels of the MOH. If properly implemented, the system can serve as a model for other Central American countries.

The TSA concept is basic to the processes of modernization and decentralization. In planning for implementation of the TSA program, the ad hoc oversight committee projects that a fully integrated TSA can meet the environmental health

service needs for 10,000 residents (approximately 700 TSAs would be needed to serve all of Honduras). Under the current system, there are 1,400 technicians in the country with single-program responsibilities. It is from this pool of MOH technicians that the integrated TSAs will be selected.

While there is substantial interest within MOH to integrate technicians at the local service level, the consultants noted several organizational obstacles that would prevent this, including:

- C Absence of a TSA job classification developed and authorized by human resource services at the Civil Service Ministry
- C Absence of a clear organizational structure or implementation framework for TSAs at the area or regional level
- C Fragmentation or separation of environmental health programs within MOH. Of the 12 program areas in environmental health, 5 are administered by one subsecretary, while 7 fall under a second subsecretarial branch, with technical field services falling under yet another subsecretariate.

The EHP consultants observed a relatively high level of enthusiasm and interest among the 60 technicians who have completed the training course. The selection process and the course have led to high expectations among participants. Those expectations could become a negative force if structural or organizational changes are not made to allow newly trained technicians to move into their new role.

To implement the TSA program, the MOH developed “An Integrated Course in Environmental Health.” The course is designed for a maximum of 35 students, lasts for 12 weeks, and includes 15 thematic units on various aspects of environmental health. The courses for each region are organized by a central-level coordinator and corresponding regional counterpart. Faculty include trained professionals and technical experts in various programmatic areas from within MOH. According to course outlines, the faculty (docents) are assisted in the class by tutors (specialists from the regional offices), who facilitate each thematic

unit.

Of the 15 teaching units in the course, the majority are appropriately targeted to the TSA job description. Two thematic areas—mental health and nutritional health—are not related to the field of environmental health.

## Recommendations

The consultants recommend that the Ministry of Health:

- C Complete the civil service process for creating the TSA job classification as soon as possible.
- C In close coordination with Sanitary Region 6, reinstate the TSA training course in La Ceiba as soon as possible.
- C Consider establishing an environmental health department within the MOH to cluster all environmental health functions (which are currently dispersed). This branch should be elevated to the level of subsecretariat in the MOH to ensure the clear, undivided focus of the Minister of Health.

The consultants recommend that the USAID Mission:

- C Present the TSA program to the new Minister promptly to obtain his support. As a component of the New Health Agenda 1998-2002, the program can legitimately be presented as a key health reform strategy.
- C Continue technical and financial support because this is an innovative model for modernizing environmental health services delivery in Central America.
- C Fund the basic field equipment package outlined in this report.
- C Select, fund, and directly distribute a set of basic educational and technical materials, manuals, and references.

Additional recommendations relative to the five areas evaluated follow.

Regarding the selection process:

- C The ad hoc commission, which was established by MOH in 1995 to develop the TSA program, should recruit a small percentage of TSAs as new MOH employees.

- C Priority should be given to recruiting women as TSAs to promote equity and to take advantage of different skills and experiences as shaped by gender and culture.

Organizational structure and support:

- C Programmatic areas of responsibility of the proposed environmental health branch (and of TSAs) should be limited to those falling legitimately within the scope of environmental health.
- C The list of tasks under each environmental health program in the TSA occupational profile is not prioritized, but should be. TSAs should prioritize tasks based on health risks and MOH goals.
- C Consideration should be given to transferring responsibility for nutrition programs to family health or health education departments (if resources are available).
- C TSA environmental contamination responsibilities should be reviewed in concert with Centro de Estudios y Control de Contaminantes (CESCCO) to ensure that TSAs are authorized under the law to carry out the tasks listed in the occupational profile.
- C Occupational health responsibilities should be evaluated the same as environmental contamination themes (see preceding bullet). TSA tasks should probably be limited to hazard identification, exposure pathway assessment, and referral of violations to appropriate agencies.
- C Mental health responsibilities should be removed from the TSA profile and assigned to public health nurses, social services, or health education departments.

Motives and incentives:

- C When refining the TSA job classification, central and regional planners should include an incentive program (both monetary and nonmonetary).
- C Long-term planning should include an opportunity for advancement.
- C USAID and the Pan American Health Organization (PAHO) should promote opportunities for professional interaction with affiliate environmental health organizations.

- C A system of prompt payment of per diem and travel costs should be implemented for all training course participants.

Physical support:

- C TSAs should receive a basic set of equipment and tools to successfully monitor and enforce environmental health regulations.
- C Reference materials should be purchased as part of the training program and kept accessible for use by field staff.

Training:

- C The ad hoc commission should develop a plan for ongoing professional development, continuing education, and on-the-job training.
- C Because several years will be required to train 700 TSAs and to integrate the TSA program, a permanent course coordinator should be appointed at the central level to ensure course continuity.
- C Long-term plans should include a two-year university course for TSAs, who could eventually assume supervisory roles at the local, area, and regional levels.
- C The MOH should incorporate in the training materials a basic introduction to risk

assessment, which includes hazard identification (surveillance, monitoring, etc.), exposure pathway evaluation, health outcomes, and risk communication.

- C The department of vector control should revise the curriculum in vector control to emphasize prevention and control strategies. Environmental management, social communication, and community participation should be used as the basis for the program, complemented by chemical and other control measures.
- C A communications plan for prevention of vector-borne diseases should be incorporated into the TSA curriculum.
- C The TSA curriculum should maximize the use of case studies as a powerful, practical teaching tool.
- C All lesson plans should include practical, hands-on exercises (in the field, if possible).
- C The ad hoc commission should stress the involvement of regional personnel and tutors in the training course. Tutors and docents should participate in joint planning activities before beginning each module. Teaching responsibilities, especially in the practical realm, can be shared by tutors with expertise in specific areas.

# 1 INTRODUCTION

## 1.1 New Agenda for Health

In the “New Agenda for Health 1998-2002,” the Honduran Ministry of Health (MOH) reaffirmed its commitment to strengthen environmental health programs by (1) declaring environmental health a health sector priority, (2) promising to integrate the framework of environmental health into all MOH administrative and technical levels, and (3) strengthening the training, formation, and placement of integrated environmental health technicians, *tecnicos de saneamiento ambiental* or TSAs, in the public health services network. This USAID/EHP consultancy focuses on this third priority.

## 1.2 Integrated Environmental Health Technicians

Nearly all of those involved in the delivery of environmental health at the MOH agree on the need for integrated TSAs. Under the current system, environmental health services are compartmentalized, especially at the local level, and the scope of responsibility among field workers is usually limited to one or two programmatic functions. Field offices may have five or six technical programs (e.g., vector control, food protection, water quality, sanitation, rabies control, and health promotion), each staffed by a different person and all covering the same geographical area.

This account, provided by the Regional Director for Sanitary Region 2 about one of his Comayagua field offices, illustrates the problem of compartmentalization:

When Juan Fulano found dead fish floating in the lagoon, he collected them in a bucket to take home for dinner. He wanted to ask an expert at the local sanitation office if the fish were safe to eat. His first stop was the office of the health promoter. The health promoter

looked at the fish and said, “Fresh fish are healthy and nutritious, but I can’t answer your question about food safety, Mr. Fulano. Since you are going to eat the fish, you will have to ask the food control technician.”

Later, the food technician looked at the fish and said, “The fish appear fresh and wholesome, but I can’t tell whether they are safe, because they may have died from pesticides. You should ask the vector control technician if there have been any pesticide applications near the lagoon.”

When the vector control technician looked at the fish, he said that he had not treated any lagoons with larvicide for months, so the fish had not died from larvicide. “But because the fish lived in water,” said the vector technician, “you should ask the water and sanitation technician.”

After a few days, the water and sanitation technician determined that the fish had died from a lack of oxygen in the water caused by an algal bloom. “They would have been safe to eat, if properly cooked,” the water technician finally explained to Mr. Fulano. “But now, three days after you harvested them, the fish have spoiled. You’ll have to talk to the solid waste technician about proper disposal of your rotten fish.”

The inefficiencies and overlap involved in environmental health services has prompted the MOH to create the TSA position to integrate all environmental health responsibilities into one officer. Local field workers in these positions will respond to a wide range of environmental health problems. The TSAs will assume program responsibilities in well-defined geographic areas or districts and will develop strong collaborative relationships with the municipalities in which they work. USAID advisors estimate that improvements in efficiency resulting from the TSAs’ combined skills will ultimately reduce human resource needs in environmental health by nearly 50%, while at the same time improving the quality of service.

To integrate these skills, the USAID Mission in Honduras supported the development of a training course for selected technicians currently working in single program areas. To date, the MOH has trained two groups of 30 technicians. A third training course, begun October 1998, was interrupted by Hurricane Mitch and has not been resumed.

After several years of development, all the ingredients for a strong environmental health program are in place within the MOH. The MOH has a clear vision and commitment to modernizing environmental health programs. Substantial momentum and support exists for decentralization strategies. The MOH has a pool of skilled professionals and technicians with the leadership skills needed to integrate environmental health services effectively. USAID is providing financial support for training and for implementation of a fully integrated environmental health program. However, there are still a few major obstacles to the rapid implementation of the TSA program. The goal of this EHP activity was to identify some of these obstacles.

### 1.3 Scope of Work

The Honduran MOH, in concert with the USAID Mission, invited assistance from EHP consultants to evaluate the direction of the TSA program. The primary objectives of this consultancy were to (1) provide a professional perspective from outside regarding the program's "fit" within MOH disease prevention objectives and (2) determine what changes, if any, are needed to strengthen the program. The scope of work included the following major tasks:

- C Hold discussions with principal stakeholders (MOH officials, USAID Mission participants, and faculty from the first two training courses)

- to determine the level of understanding of and expectations for the TSA program
- C Discuss recruitment and selection of TSAs to determine whether criteria should be changed
- C Determine if the eventual target number of TSAs is appropriate to the needs of the country and whether plans for recruitment and training are realistic
- C Review the training curriculum to determine if it is consistent with trainees' work in the field
- C Review training materials to determine if the balance and depth of the material is adequate for the messages delivered
- C Interview (via focus groups) as many participants as possible from the first two courses to understand how their new skills and positions have become institutionalized in the existing MOH program

The consultants used all discussions, interviews, and document reviews to investigate five areas:

- C Recruitment and selection
- C Organizational support
- C Motives and incentives
- C Physical support
- C Training

Two EHP consultants participated directly in the activity. The primary consultant stayed in Honduras for 14 days (February 28 to March 13, 1998). The support consultant, a representative of the Pan American Health Organization (PAHO) of Guatemala, spent two days in the field. The consultancy was facilitated by the high level of cooperation received from all persons contacted. The consultants' itinerary is given in Appendix A, and a list of individuals contacted is provided in Appendix B.

# 2 BACKGROUND

## 2.1 Evolution of the TSA

## Concept

Early in this decade, the Honduran Ministry of Health embarked on health sector reform as part of a nationwide effort to achieve institutional efficiency and effectiveness. There was renewed interest in strengthening environmental health services as part of the reform.

To realize this change, the MOH set as a goal the creation of an integrated personnel category called environmental health technicians (TSAs). The TSA was envisioned as a field technician capable of managing a full range of health problems related to the environment, recognizing and responding to community environmental health needs, and defining and executing operational disease prevention strategies involving intersectoral collaboration, local action, and community participation. Early on, MOH recognized that TSAs would be an integral part of the decentralization process and would help in ensuring equity, efficiency, and effectiveness of service delivery at the local level.

In 1995, the MOH formed an ad hoc commission of professionals from MOH and collaborating agencies such as USAID and CESCO to further define the TSA concept and develop plans for transforming single-program technicians into TSAs with multiple skills. The commission created an occupational profile and began developing plans for cross-training.

Commissioners considered developing a two-year degree program in environmental health with opportunities for distance learning and extension classes, but the costs and time involved prevented the quick implementation of this plan. The ad hoc commission instead chose to develop a short course in environmental health to provide TSAs with training and to promote rapid integration of field services.

By 1997, the MOH had developed a curricular outline for *El Curso Integral en Salud Ambiental* (An Integrated Environmental Health Course) with 15 teaching modules (see chapter 3 for a detailed discussion of the training course), including:

- C Health policy
- C Concepts of environmental health
- C Environmental contamination
- C Research methodology (scientific methods)
- C Epidemiology
- C Health promotion

- C Water and sanitation
- C Vector control
- C Food safety
- C Zoonoses
- C Disaster sanitation
- C Mental health
- C Occupational health
- C Food and nutrition
- C Legal framework for environmental health

The first course was held June-September 1997 for 30 aspiring TSAs in Region 2. A year later (mid-July to September 1998), a second group of 30 took the course, again in Region 2. A third course, being presented in La Ceiba (Region 6), was suspended after four weeks because of Hurricane Mitch.

## 2.2 TSA Training and Organization

As envisioned by the USAID Mission, the TSA program will train a total work force of approximately 700 technicians, who will operate at the local level in the nine sanitary regions. They will assume the responsibilities of nearly 1,400 single-program technicians but will operate in relatively small geographic limits or districts. Current plans anticipate that one TSA can meet the needs of 10,000 inhabitants (depending on travel times).

To date, 60 technicians, all within Region 2, have completed the training course. Thirty participants are waiting for the third course. Very few of those who completed the course have moved into their new positions, primarily because the organizational structure within the region has not yet been modified to accommodate the change. A second obstacle is that the MOH Human Resources Department and the Civil Service Ministry have not yet classified the new positions.

Under the current structure, field activities are coordinated from local or area offices, and technicians are managed by a local operations chief, usually a doctor or nurse associated with public health clinical services. Management oversight is additionally provided by an area chief, a doctor who also manages clinical health services. Technical and administrative support for the health area offices is provided by the staff of the sanitary regions.





# 3 EVALUATION OF THE TSA TRAINING PROGRAM

## 3.1 Selection and Recruitment

The ad hoc commission drew from the pool of environmental health technicians currently in the field to capitalize on the experience and training already in place. To identify the most qualified candidates, the MOH developed the following selection criteria:

- C Current permanent employment with an MOH program related to environmental health (at least two years of experience)
- C Completion of secondary education with an emphasis in sciences and letters, social promotion, community health, elementary education, or public accounting
- C Age between 20 and 50 years
- C Satisfactory results on aptitude tests
- C Strong leadership skills and work record
- C Final approval by the Regional Selection Committee and acceptance by the ad hoc commission

Focus group respondents at the regional and local levels noted that the selection process was fair; however, it excluded some candidates with excellent leadership skills who failed to meet the minimum academic requirements. In developing selection criteria, the ad hoc commission considered the issue at length and concluded that the minimum requirements should establish a clear standard. Depending on the needs and priorities of regions, skilled single-program employees could be retained for specialized work in their field of expertise until they are phased out through attrition.

Respondents also noted that, given the limited pool of applicants (those currently working in MOH environmental health programs), there is little opportunity to include more women in the profession. Of the 60 technicians who have completed the course to date, only three are women.

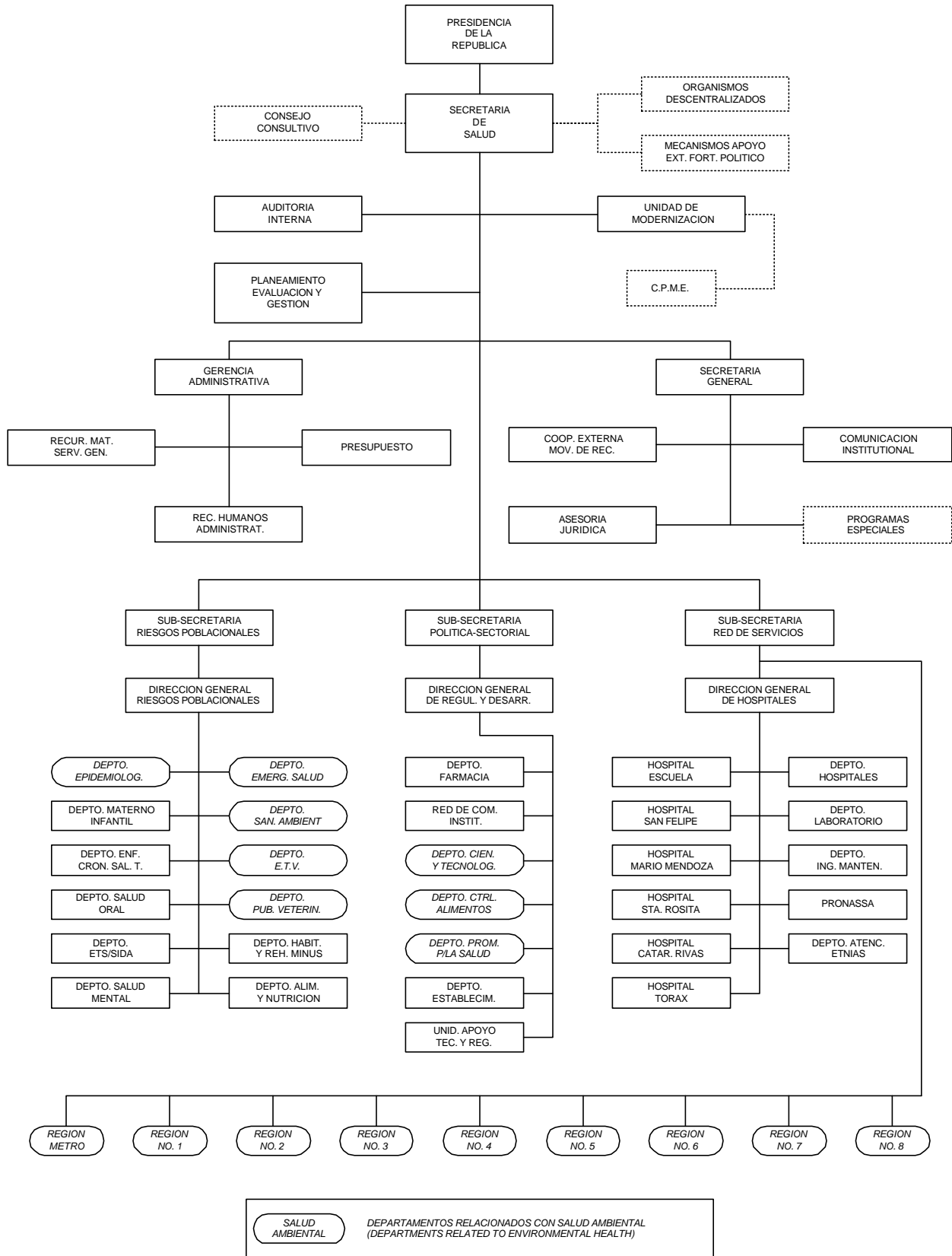
## 3.2 Organization and Support

Stakeholders in this activity were almost universally supportive and highly enthusiastic about the TSA concept, even though, at some levels within the MOH structure, there is no unified vision of the organizational changes needed to fully integrate TSAs into the system. This is due in part to the fragmentation of environmental health programs at various levels of the institution. At the central level, for example, programs in disaster response, drinking water quality, rabies control, and vector control are under the direction of the subsecretary of population risks, while programs in food sanitation and environmental health promotion fall under the subsecretary for sectoral policy. The actual delivery of services is administered by a third branch, the subsecretary of health services network (see Figure 1).

Constraints to the implementation of an integrated TSA system also exist at the regional, area, and local levels, where programs are compartmentalized by programmatic functions corresponding to those at higher levels of the MOH. An additional complication is that local and area administrators may be primarily oriented toward medical treatment and clinical services and have little background in environmental health service delivery. This results in a lack of resources allocated to environmental health activities and inadequate prioritization of community needs.

During focus group discussions and field visits at all levels, EHP consultants observed that environmental health technicians lack the basic field equipment required for tasks. Without simple tools and instruments such as probe thermometers, tape measures, chlorine test kits and reagents, and basic personal protective gear (rubber gloves, hard hats, and rubber boots), TSAs are severely limited in

**Figure 1**  
**Secretaria de Salud**



their ability to deliver quality environmental health services.

### **3.3 Motives and Incentives**

Field visits and focus group sessions revealed a relatively high level of interest and enthusiasm among those completing the course. The strong interest level was evident at an optional focus group meeting on Saturday, when 40 of the 60 TSA graduates participated.

The few technicians who have assumed their broadened responsibilities at the two field offices visited during this activity exhibit a strong sense of teamwork. This may be due in part to the current restructuring efforts in Sanitary Region 2 and the general level of attention given the recent training.

Given the competitive selection process for entry into the training course, aspiring TSAs expect more institutional recognition, greater support, and improved advancement opportunities and salaries. However, the TSA position has not received a job classification nor has it been integrated into the MOH management structure. This may have a demoralizing effect on the people holding these positions and be counterproductive in meeting the goals of improved efficiency and effectiveness.

In discussions on incentives, focus group respondents expressed a desire for ongoing professional development. The suggestions included periodic conferences at area or regional offices to share solutions and problems encountered during field work as well as a national TSA network to share professional ideas. Many respondents at all levels indicated the need for more rapid payment of per diems and travel costs related to the training course. Several respondents indicated that they still had not been reimbursed for the last training course completed in October 1998.

### **3.4 Location and Physical Support**

The first two training courses were held at a training center in La Paz (Region 2). The center is well equipped with classrooms that facilitate a focus on learning. Coordinators and docents expressed the need for a computer, printer/copier, and a more complete selection of resource

materials. Respondents at all levels indicated a general satisfaction with the facilities; however, some participants expressed concern over the distance to the nearest town and the lack of after-hours support and diversions. The training center selected for the third course at La Ceiba (Region 6) was evidently equally well suited for learning.

## **3.5 TSA Training and Formation**

### **3.5.1 Course structure**

As currently structured through written procedures, the TSA course is designed for approximately 35 students and covers 12 weeks. Its objectives are twofold: (1) to impart a standardized set of practical skills in each environmental health area, and (2) to elevate the technical knowledge of all participants. For the entire period, the participants lived full-time at the training center and attended classes five days per week.

### **3.5.2 Coordination**

A technical coordinator from the central level of MOH is responsible for local arrangements and coordination of schedules, activities, and logistics, and for ensuring that the course runs smoothly for the entire three months. The coordinator is assisted by a counterpart at the regional level who helps with local arrangements. A different coordinator was appointed for each of the three courses to date. In the case of La Ceiba, however, the responsibilities were shared by two professionals from within the vector control department. At the end of each course, the coordinator prepared a written report on lessons learned for the ad hoc commission.

### **3.5.3 Faculty**

Each of 15 thematic units is taught by a technical specialist from the central level of the MOH (or a collaborating agency such as CESCO or Servicio Autonomo Nacional de Acueductos y Alcantarillados (SANAA), who usually stay at the training center during of their teaching module. All docents are university trained and well experienced in their specialization. Docents are responsible for assembling training materials

appropriate to the level of education of the participants, for planning practical activities, and for evaluating students at the end of their unit.

Docents are assisted in the classroom by tutors, technical specialists from the regional level, who facilitate learning in small groups, provide additional educational resources, and share practical experience with students. EHP interviews with docents and tutors revealed that both groups lacked a clear understanding of the docent's responsibilities and level of participation. Communication between the groups needs to be strengthened.

An evaluation of each course is developed by the coordinator with formal input by docents, tutors, and other regional personnel and with informal input by students. The ad hoc commission considers the results of the evaluation in refining the training program. Currently, the regions are responsible for the follow-up in-service training and continuing education of the TSAs, but no written plan is available.

#### **3.5.4 Course content**

In the most recent version of the course, 15 thematic modules are divided into three blocks, each connected by the common themes of scientific method (investigations), environmental health policy, and the environmental health legal framework. Block 1 includes basic concepts of environmental health, health promotion, environmental contamination, and epidemiology (see Figure 2).

The time allotted to each of the units in the first block is appropriate to TSA field responsibilities. It was not clear from course outlines whether the basics of risk assessment, risk communication, and risk reduction strategies in their most pragmatic sense were sufficiently emphasized. Nor was it clear whether case studies were used by docents in presenting their subjects.

However, some responders at all levels indicated that modules in scientific method and environmental contamination were theoretical and lacked practical applications.

The second block of modules includes water and sanitation, vector control, food safety, and zoonoses. The relative emphasis devoted to each programmatic area again seems appropriate to the TSAs' scope of work. As with units in Block I, the orientation is on the theoretical rather than emphasizing practical knowledge through the use of case studies. Recommendations specific to the content of thematic units are given in section 4 of this report.

The third thematic block includes modules in mental health, disaster planning, health and nutrition, and occupational health. The mental health module includes an introduction to prevention and intervention strategies in domestic violence, alcoholism, and substance abuse. These programs normally fall within the scope of family health and health education and are not integral to the field of environmental health. Even though these programs are extremely important to a strong public health effort, they should not be the responsibility of the TSA, whose role is environmental monitoring, surveillance, and hazard analysis. The same is generally true for the unit on nutritional health, although this subject is helpful in broadening the TSAs' overall understanding of disease prevention. If the TSAs are to conduct routine inspections of workplaces, then more attention should be given to the unit on occupational health.

#### **3.5.5 Course materials**

Coordinators for the TSA course have developed a "mobile library" of reference materials for participant use during the course. Each tutor assembles training materials for

## Figure 2

TSA use from his or her own resources and references. As yet, the course has not identified a standard field manual or text covering all TSA functions. A wide array of suitable training resources and references are available in Spanish and appropriate for use in Central America; they could be included as part of the course. Appendix

C contains a list of proposed references and resources for TSA use. In addition, the course materials currently do not include the tools and instruments commonly used in the field, which are vital to competent work. A list of recommended tools and equipment is given in Appendix D.

# 4 RECOMMENDATIONS

## 4.1 Recommendations for MOH

The consultants recommend that the Ministry of Health:

- C Complete the civil service process for creating the TSA job classification as soon as possible. The lack of a well-defined, validated job classification is a major obstacle to fully integrating TSAs at the local level.
- C In close coordination with Sanitary Region 6, recommence the TSA training course in La Ceiba as soon as possible. Course planning should include a one- or two-week review to rebuild continuity. A second course should be planned for Region 6 to complete training for all TSAs in the region.
- C Consider establishing a single environmental health department or division within MOH. This office should be elevated to the level of subsecretariat to ensure the clear, undivided focus of the Minister of Health. Each level (central, regional or district, and local office) should be staffed and managed by professionals well versed in environmental health programs and strongly committed to environmental health principles.

## 4.2 Recommendations for USAID

The consultants recommend that the USAID Mission in Honduras:

- C Present the TSA program to the new minister promptly to obtain his support. As a component of the New Health Agenda 1998-2002, the program can legitimately be presented as a key health reform strategy.
- C Encourage the minister to accelerate the job reclassification actions necessary to implement the TSA program.
- C Continue technical and financial support because this is an innovative model for

modernizing environmental health services delivery in Central America.

- C Fund the basic field equipment package outlined in this report (Appendix D).
- C Select, fund, and directly distribute a set of basic educational and technical materials, manuals, and references. The delivery of materials should be planned to ensure ready access by field technicians (Appendix C).

## 4.3 Recommendations in Five Areas of Evaluation

Additional recommendations relative to the five areas evaluated follow:

The selection process:

- C The ad hoc commission should recruit a small percentage of TSAs as new employees. Priority should be given to recruiting women to promote equity and to take advantage of different skills and experiences as shaped by gender and culture.

Organizational structure and support:

- C Programmatic areas of responsibility of the proposed environmental health branch (and of TSAs) should be limited to those falling legitimately within the scope of environmental health.
- C The list of tasks under each environmental health program in the TSA occupational profile is not prioritized, but should be. TSAs should prioritize tasks based on health risks and MOH goals.
- C Consideration should be given to transferring responsibility for nutrition programs to family health or health education departments (if resources are available).
- C TSA environmental contamination responsibilities should be reviewed in concert

with CESSCO to ensure that TSAs are authorized under the law to carry out the tasks listed in the occupational profile. This review will help ensure there is no overlap or jurisdictional conflict.

- C Occupational health responsibilities should be evaluated the same as environmental contamination themes (see preceding bullet). TSA tasks should probably be limited to hazard identification, exposure pathway assessment, and referral of violations to appropriate agencies. TSAs are not industrial hygienists or safety engineers.
- C Mental health responsibilities should be removed from the TSA profile and assigned to public health nurses, social services, or health education departments.

#### Motives and incentives:

- C When refining the TSA job classification, central and regional planners should include an incentive program (both monetary and nonmonetary) that includes recognition from regional and area offices for innovative and successful interventions.
- C Long-term planning should include an opportunity for advancement, such as the development of a new occupational profile for TSAs who complete a two-year college degree, who could then assume supervisory roles.
- C USAID and PAHO should promote opportunities for professional interaction with affiliate environmental health organizations.
- C A system of prompt payment of per diem and travel costs should be implemented for training course participants.

#### Physical support:

- C TSAs should receive a basic set of equipment and tools to successfully monitor and enforce environmental health regulations. The basic tools could be provided as part of the training course (see suggested list, Appendix A).
- C Reference materials should be purchased as part of the training program and kept accessible for use by field staff.

#### Training:

- C The ad hoc commission should develop a plan for ongoing professional development, continuing education, and on-the-job training. General goals can be established at the central level, but they should be implemented at the regional or area level.
- C Because several years will be required to train 700 TSAs and to integrate the TSA program, a permanent course coordinator should be appointed at the central level to ensure course continuity.
- C Long-term plans should include a 2-year university course for TSAs, who could eventually assume supervisory roles at the local, area, and regional levels. The program should be structured to allow advancement from TSA to environmental health specialist.
- C The MOH should incorporate in the training materials a basic introduction to risk assessment, which includes hazard identification (surveillance, monitoring, etc.), exposure pathway evaluation, health outcomes, and risk communication.
- C The department of vector control should revise the curriculum in vector control to emphasize prevention and control strategies. Environmental management, social communication, and community participation should be used as the basis for the program, complemented by chemical and other control measures.
- C A communications plan for prevention of vector-borne diseases should be incorporated into the curriculum.
- C The TSA curriculum should maximize the use of case studies as a powerful, practical teaching tool. TSA graduates noted that docents cited very few case studies.
- C All lesson plans should include practical, hands-on exercises (in the field, if possible).
- C The ad hoc commission should stress the involvement of regional personnel and tutors in the training course. Tutors and docents should participate in joint planning activities before beginning each module. Teaching responsibilities, especially in the practical realm, can be shared by tutors with expertise in specific areas.





# APPENDIX A: Itinerary

## **Sat., February 27**

Arrival in Tegucigalpa, Honduras

## **Mon., March 1**

Meeting with Herbert Caudill, Sanitary Engineer, USAID, and Joseph Lombardo, Deputy Mission Director, USAID, while enroute to inaugural meeting of a training course for Water and Sanitation Technicians and Operation and Maintenance Technicians, Comayagua, Honduras.

Brief tour of the Comayagua Agricultural Training Center.

Brief meeting with Ruben Gomez, Director General and Director of Regulation and Institutional Development, Ministry of Health.

Discussion, retrieval of course materials, and TSA training program documentation with Ms. Suyapa Aguera, Technical Assistant to the General Director.

Brief interview with Health Ministry Vital Statistics personnel.

## **Tues., March 2**

Office review of course outline and compendium of teaching units and related documents

Returned to MSP to retrieve additional documentation. Programmed field visits by phone with Dr. Alejandro Melara, Director of Sanitary Region #2, Comayagua. Additional program history from Ms. Aguera.

Reviewed additional materials in office.

## **Wed., March 3**

Discussion with Marta Ochos and Lilian Herrera, coordinators for the first two training courses. Interview with Mercedes Martinez, member of TSA planning committee. Review of class curriculum resources in the MOH library/reference center. Obtained copies of TSA program planning and descriptive documents.

Meeting with Herbert Caudill, USAID.

## **Thurs., March 4**

Field visit to Comayagua. Focus group session with seven field technicians, five who participated in the first course, two in the second. Field visits to typical environmental health sites: an open dump, an untreated sewage outfall, and an improved lagoon and to the home of a community vector control volunteer.

Discussion with Dr. Alejandro Melara, Regional Director.

**Fri., March 5**

Steve Ault, PAHO/WHO representative, joins EHP consulting team.

Interview with biologist Catalina Sherman, vector biology instructor and co-coordinator for second course.

Review of PAHO reference materials. Conference with Herb Caudill.

**Sat., March 6**

Focus group discussions with 40 field technicians and six tutors in Comayagua. Additional briefing with Dr. Alejandro Melara, Regional Director.

Visit to La Paz training center with three TSAs working as integrated technicians. Visit to new well site. Tour of medical waste disposal system. Discussion of flexi-pump technology.

Return to Tegucigalpa. Review of course curriculum.

**Sun., March 7**

Steve Ault returns to Guatemala.

**Mon., March 8**

Discussion with Douglas Manzanares, legal technician, DETV, brief meeting with Homero Silva, PAHO Honduras, and Catalina Sherman.

**Tues., March 9**

Continue interviewing faculty (docents from within MOH and DETV). Review of materials assembled for mobile reference library.

**Wed., March 10**

Final interview with MOH training personnel and Dr. Barahona, Department of Science and Technology. Preparation and elaboration of draft.

**Thurs., March 11**

Preparation of draft. Meeting with Herb Caudill at USAID offices to discuss first draft and recommendations.

**Fri., March 12**

Elaboration of draft, debriefing with Mary Anne Anderson, John Rogosch, and Herb Caudill, USAID

Debriefing with MOH (Dr. Ochoa, Director General for Population Risks).

**Sat., March 13**

Final changes to draft and executive summary; travel to California.





# **APPENDIX B: Primary Contacts**

## **Contacts with the Ministry of Health, Tegucigalpa, Honduras:**

Jose Ruben Gomez, Director General, Policy and Institutional Development  
Suyapa Aguero, Technical Assistant to the Director  
Fidel Barahona, Department of Science and Technology  
Lilian Guevara, Sociologist  
Laura Julia Salgado, Malaria Control Manager, DETV  
Catalina Sherman, Dengue Program Manager, DETV  
Mercedes Martinez, Health Education, DETV  
Mirna Moreno, Manager, Department of Zoonoses  
Marta Ochoa, Sociologist  
Douglas Manzanares, Legal Counsel, DETV

## **Contacts within USAID and other international agencies in Honduras:**

Herbert Caudill, Sanitary Engineer, USAID, Honduras  
Joseph Lombardo, Deputy Mission Director, USAID, Honduras  
Mary Anne Anderson, Development Officer, USAID, Honduras  
John A. Rogosch, Health Officer, USAID, Honduras  
Homero Silva, PAHO  
Andrew A. Arata, Senior Tropical Disease Specialist, Environmental Health Project, Arlington, Va.

## **Contacts in the Ministry of Health, Sanitary Region 6, Comayagua:**

Alejandro Melara, Regional Director  
Group of six tutors (focus study group: tutors)  
Group of seven participants (first focus study group TSA course participants)  
Group of 40 (second focus study group TSA course participants)



## APPENDIX C: Printed Materials for TSAs

EHP consultants recommend the purchase and delivery of the following materials for the TSA central program and its libraries and document centers. Other useful pedagogic materials are available from USAID/EHP, U.S. Centers for Disease Control and Prevention (CDC), National Institute of Environmental Health and Safety (NIEHS), National Institute of Occupational Health and Safety (NIOSH), WHO, PAHO/CEPIS, and the U.S. Environmental Protection Agency (US EPA), among others.

### General Environmental Health

Merida Aliaga Santa Maria (editor) *Salud Ambiental: Aportes al manejo del ambiente para una salud de calidad en el Peru*. 1997. Ministerio de Salud de Peru (DIGESA).

Yassi, Annalee, et al. 1998. *Basic Environmental Health*. Geneva: WHO, Office of Global and Environmental Health.

World Health Organization. 1997. *Health and Environment in Sustainable Development: Five Years after the Summit*. Geneva: WHO.

Pan American Health Organization/HEP. 1998 *Regional Meeting on Institutional Development of the Environmental health Units of the Ministries of Health*.

Agencia Espanola de Cooperacion Internacional/Ministerio de Salud Publica. *Medio Ambiente y Salud*. Guatemala. 1998.

OPS/Paltex. *Manual sobre Vigilancia Ambiental*. 1996.

### Occupational Health

*International Program on Chemical Safety Documents*, Geneva  
ACGIH's TLV and BEL Manual (available in Spanish).

### Food Safety

*Las diez reglas de oro para la preparacion higienica de los alimentos*. Secretaria del Estado de Salud Publica (SESPAS), Direccion General de Salud Ambiental, Republica Dominicana.

### Water and Sanitation

*Drinking Water Supply Surveillance*, 1990, by WHO and Robens Institute/London.

*Estrategias del UNICEF en materia de abastecimiento de agua y saneamiento ambiental*. 1994, by UNICEF.



## **Solid Waste Management**

*Lineamientos para la Elaboracion de Planes de Aseo Urbano*, OPS/Guatemala, 1994. 7 volúmenes.

*Residuos solidos municipales: guía para el diseno, construccion y operacion de rellenos sanitarios manuales*, sept. 1991, por OPS/CEPIS, Lima Peru.

## **Integrated Vector Control**

*Social Mobilization as an approach to prevention and control of dengue in Guatemala*. EHP Activity Report No. 52, 1998. USAID/EHP Washington DC. (A video is also available.)

Najera, J.A., et al. 1998. *Malaria epidemics: Detection and control forecasting and prevention*. Geneva: WHO.

Rozendaal, J.A. 1997. *Vector Control: Methods for use by individuals and communities*. Geneva: WHO.

*Guidelines on the use of insecticide-treated mosquito nets for the prevention and control of malaria in Africa*. 1997. Geneva: WHO.

PEEM materials of Geneva: WHO.

## **Air Quality**

*Contaminacion del aire en interiores: una introduccion para los profesionales de la salud*, por US EPA y CEPIS/OPS Peru.

## **Environmental Epidemiology**

*Linkage Methods for Environment and Health Analysis: General Guidelines (1995) and Technical Guidelines (1997)*, 2 vols. Geneva: WHO, HEADLAMP Program.

*Investigating Environmental Disease Outbreaks: a training manual*. 1991. Geneva: WHO, IPCS.

*Vigilancia en epidemiologia ambiental, serie vigilancia 1*, 1995, por G. Corey, OPS/CEPIS, Lima, Peru.

## **Environmental Management**

Hunter, J.M. 1994. *Enfermedades parasitarias y desarrollo hidraulico: necesidad de una negociacion intersectorial* Geneva: OMS WHO.

*La proteccion de las captaciones*, 1997. WHO Europa, Dinamarca.

*Manual de auditoria ambiental: taller de pintura*, por MF Leiva, 1996. Instituto de Ecologica Politica, Santiago, Chile.

## **Urban Environmental Health**

*USAID/EHP Applied Study No. 7. Providing urban services for the poor: lessons learned from three pilot projects.* December 1998.

## **Community Participation**

*Atencion Primaria Ambiental*, por OPS/CEPIS 1998.

*Manual de Vigilancia Ambiental: ¿Como hacer denuncias ambientales?*, por Instituto de Ecologia Politica, Santiago, Chile, 1996.

## **Appropriate Technologies**

*Guia latinoamericana de tecnologicas alternativas en agua y saneamiento*, 1997. OPS/HEP/Programa MASICA, Wash. DC.

## **Disaster Prevention**

*Mitigaciona de desastres naturales en sistemas de agua potable y alcantarillado sanitario: guias para el analisis de vulnerabilidad.*, 1998. OPS Programa de Desastres.

*Accidentes quimicos: aspectos relativos a la salud: guia para la preparacion y respuesta*, 1998. OPS Programa de Desastres.



## APPENDIX D: TSA Equipment

The consultants recommend the following minimal field equipment packages for TSA use:

- C General field use: clipboard (for holding inspection forms and writing in the field), refillable ballpoint pens, TSA field manual, local maps, small flashlight with batteries and spare bulbs (useful in housing food inspection and vector control)
- C Team building and professionalism: cap with logo, T-shirt or vest with logo, business cards, cloth briefcase (portapales)
- C Food safety: probe thermometer, alcohol wipes or rubbing alcohol bottle, pH testing paper, chlorine test strips
- C Potable water quality: chlorine residual kit with reagents
- C Vector surveillance: larva dipper with long handle, eyedropper, vials with alcohol, vial labels, pick (to punch holes in containers)

The following specialized field equipment is recommended for TSA use:

- C Portable water quality test kits: physical-chemical, bacteriological (Millipore), turbidity
- C Tape measure and rule
- C Vector control: mosquito light traps, insect net, specimen vials, ovitraps, portable UV light (rodent urine) and tracking powders, stereoscopic microscopes
- C Tracking dyes for testing water quality

Additional field equipment needs expressed by TSAs during focus group sessions:

- C Personal protection equipment (hardhats, rubber gloves, overalls, rubber boots)
- C Stopwatch
- C Iodine test kits
- C Basic tools for adjusting or repairing water system hardware
- C Grease pens
- C A plentiful supply of water sample bags
- C Chlorine comparator test kits
- C Backpacks for carrying equipment



## APPENDIX E: References

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- Direccion General de Atencion al Medio. 1996. Perfil Ocupacional, Tecnico de Sanamiento Ambiental (TSA). Tegucigalpa, Hondura: Ministerio de Salud Publica.
- Direccion General De Regulacion y Desarrollo Institucional. February/June, 1997. Curso Integral en Salud Ambiental, Compendio de Cartas Descriptivas-Unidades. Tegucigalpa, Honduras: Secretaria de Estado en el Despacho de la Salud.
- \_\_\_\_\_. July, 1998. Modificaciones a Cartas Tematicas al Curso Integral en Sanamiento Ambiental. Tegucigalpa, Honduras, Secretaria de Estado en el Despacho de Salud.
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- United States Agency for International Development. December 1997. Technical Consultation on USAID's Infectious Diseases Strategy. Proceedings Report. Washington, D.C.: USAID.