

WHO/EHG/98.5  
DISTR: LIMITED  
ORIGINAL: ENGLISH

**GUIDELINES FOR HUMAN RESOURCES PLANNING  
IN ENVIRONMENTAL AND OCCUPATIONAL HEALTH**

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**WORLD HEALTH ORGANIZATION  
GENEVA, 1997**

**World Health Organization, 1998**

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## Preface

The lack of human resources is a major impediment to progress in dealing with environmental and occupational health hazards around the world, especially in newly industrialized and developing countries. The need for comprehensive national strategies to promote sustainable development\* (1), including necessary human resources, was highlighted by the United Nations Conference on Environment and Development, held in 1992. Agenda 21, the Conference's blueprint for action, calls on each country to develop the knowledge and practical skills to foresee and identify environmental hazards, and the capacity to reduce risks (2).

But how should this be done? Although national planning to ensure a sufficient quantity of primary health care personnel has been practised for many years, it did not focus on the specific skills and expertise required for the management of environmental and occupational health. In the context of follow-up to the Conference, WHO initiated a project in 1994 to support countries in developing national human resources development plans in environmental and occupational health. The goal was to promote the implementation of systematic, priority-based planning for the production of the human resources needed in the field, while maximizing the use of scarce national resources.

The project aimed to develop and test an approach to such planning in three countries: Cuba, Mexico and South Africa, and, subsequently, to offer guidelines to other countries. A collaborative effort, the project was primarily sponsored by the WHO's Office of Global and Integrated Environmental Health and Office of Occupational Health and by the United Nations Environment Programme. In addition, the National Institute for Occupational Safety and Health, United States, supported the field activities in Mexico and South Africa.

This document describes the lessons learned from the country experiences of the project and provides general guidelines to facilitate the implementation of a planning initiative for human resources development in environmental and occupational health. There is, of course, no standard recipe. Countries are encouraged to utilize this resource and the suggested references to create their own menu for a sustainable workforce in environment and health.

We gratefully acknowledge the help received from Dr Thomas Hall, author of the WHO document *Human resources for health: a toolkit for planning, training and management* (3), in developing the planning strategy. His toolkit, consultation and reviews provided ongoing guidance for the project and for the preparation of this document.

\* Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Dr Orvill Adams and Dr Alexander Goubarev from the Division of Organization and Management of Health Systems, WHO, are thanked for their general support of the project and thoughtful inputs to this document.

The work of Drs D.L. Pisaniello (University of Adelaide, South Australia), A.J. McMichael (London School of Hygiene and Tropical Medicine) and A. Woodward (Wellington Clinical School, New Zealand), who prepared a preliminary draft of a guidelines document on national training plans, is acknowledged with gratitude.

We offer special thanks for the helpful comments from reviewers of this document, including Dr Tord Kjellström, Dr Yasmin von Schirnding, Dr Carlos Santos Burgoa, Brent Powis, Chris Derry and staff of the WHO Regional Offices.

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## Executive summary

Human resources development in environmental and occupational health has been a priority of WHO for many years. Specific initiatives in human resources development have included education and training programmes for government officials on topics such as drinking water supply and sanitation technologies, hazardous waste management, environmental epidemiology and chemical safety, as well as the development of educational materials and reference texts. With the United Nations Conference on Environment and Development in 1992, came a new orientation towards national planning aimed at guaranteeing the necessary capacity to identify, manage and prevent environmental problems and to promote sustainable development.

In this context, WHO began to focus on more comprehensive approaches to capacity-building, which could include the development of institutional infrastructure, a legal framework, enforcement mechanisms and the necessary human resources. Examples of such approaches are a project to help countries incorporate initiatives on health and the environment into their development planning, the production of national profiles on the sound management of chemicals, and the promotion of national planning for human resources development in environmental and occupational health. The latter approach is the subject of this document.

This document describes a methodology for planning of human resources development in environmental and occupational health which was field-tested in Cuba, Mexico and South Africa between 1994 and 1996. In addition to outlining the rationale for such planning and the recommended steps in the planning process, the country case studies are discussed in detail with a focus on the ingredients for successful implementation in future.

**Chapter 1** highlights the incentives for developing a national human resources development plan which includes the documentation of existing personnel and training opportunities, and creation of a mechanism for producing and maintaining the necessary skills and expertise for environmental and occupational health management. Human resources development plans also provide a framework for funding proposals to support national capacity-building. Environmental and occupational human resources development are linked since the same general knowledge and expertise are required to assess and control hazards in both environments. The training of personnel and the services they ultimately provide must be coordinated in order to ensure that problems are not simply transferred from the workplace to the general environment and vice versa.

**Chapter 2** defines human resources development planning as an approach to determine how best to produce, deploy and use human resources in the right numbers, with the right skills, attitudes and motivation and at the right cost to perform environmental/occupational health functions. It provides a brief introduction to different strategies for workforce planning, or for defining the number and type of personnel needed, on the basis of their functions, required knowledge and competencies, or job category. Details on how to implement each of these strategies can be found in the annotated references.

**Chapter 3** describes the steps in human resources planning which may in some

countries be combined or carried out in a different order, depending on national or subnational needs and priorities. Although there is no standard formula, most approaches include: identifying partners in health, environment, labour, education and other sectors who have a stake in human resources development in environmental and occupational health; establishing a working group to guide the planning process; assessing existing human resources development resources, services and unmet needs; holding national forums or workshops on the issue; preparing a draft plan; reviewing, ratifying and implementing the plan; and ongoing monitoring and evaluation. Highlights of this chapter include guidelines on what to include in a country review and training institution survey.

**Chapters 4 and 5** focus on country experiences in implementing the human resources development planning process and on the lessons learned. Sample interview and survey formats developed by the project countries are included in the appendices. Problems common to all project countries included a fragmented legislative framework, inadequate training programmes (in terms of content, methodology, access, preparation of teachers, etc.) lack of intersectoral cooperation and insufficient planning.

While the planning process was advanced in all countries, some of the important lessons learned are summarized below.

#### **Human resources development planning:**

- C is time-consuming, not a one-shot deal, and, therefore, must be integrated into ongoing development planning;
- C requires a clear mandate for multisectoral involvement from high-level government authorities;
- C requires the participation of high-level decision-makers from all sectors involved in the planning process;
- C requires training in human resources development planning for those leading and participating in the planning process;
- C requires a review of human resources development which is adequately funded and documents the number, type, job profile and distribution of personnel and training institutions;
- C should result in a prioritized list of concrete activities, a proposed timeline and a budget which can be used in drafting funding proposals;
- C should provide an institutionalized mechanism for human resources development planning and clear opportunities for ongoing intersectoral participation.

The guidelines, country experiences and references cited provide guidance to countries interested in initiating a national planning process for human resources development in environmental and occupational health. The process could be further advanced by additional training for key sectors (health, environment, labour) in planning and in the development and sharing of specific planning tools for environment and health (e.g. survey instruments, job descriptions, alternative organizational structures, competencies for key professional

categories, sample curricula).

## 1. Introduction

*Are you satisfied with your country's current staffing in environmental and occupational health?*

*Are there sufficient training resources in the field?*

*If not, where are the gaps and what can be done about them?*

These are some of the questions being addressed by decision-makers as they move towards the production of national and subnational plans for human resources development (HRD) in environmental and occupational health. People with appropriate training are an essential requirement in all countries for environmental hazard control and sustainable development in both the general and the occupational (workplace) environment.

However, the task of HRD planning in environmental and occupational health may seem daunting. It involves assessing the current workforce and training opportunities, estimating the number and type of staff needed to carry out necessary functions, creating and upgrading existing educational institutions to produce new personnel, and providing continuing education for professionals in the field, as well as managing and supervising personnel. To further complicate matters, planning must be intersectoral since the identification and control of environmental and occupational hazards generally involves a number of sectors - including health, environment and labour, among others.

This document was produced in an effort to rationalize the HRD planning process for countries wishing to embark on such initiatives.

### 1.1 How to use this document

The document provides guidelines to facilitate the implementation of HRD planning. The planning strategy, field-tested in Cuba, Mexico and South Africa, is based on years of WHO experience that has been consolidated into a computer-based information source produced by Dr Thomas Hall, entitled *Human resources for health: a toolkit for planning, training and management* (1995) (3). The guidelines are drawn from the toolkit and from the lessons learned from country experiences. Although some information is provided on the scope and staffing of environmental and occupational health services, countries should consult the suggested references (e.g. 3, 6) for details on potential staffing patterns and actual workforce planning.

## **1.2 Why plan for HRD?**

The United Nations Conference on Environment and Development (UNCED), through its Agenda 21, recommended that governments prepare national plans for sustainable development, with a special focus on the necessary human resources and capabilities to implement these plans. In order to put Agenda 21 into practice, a special programme known as Capacity 21 was launched by the United Nations Development Programme (UNDP) to aid countries in the development and implementation of capacity-building programmes. In the context of UNCED, WHO prioritized HRD planning in its Global Strategies on Health and Environment and Occupational Health (4). WHO's Programme on Environmental Health has worked closely with UNDP at the national level to support the preparation of action plans for health and environment with a strong HRD component. Likewise, WHO's Office of Occupational Health has encouraged countries to develop a national programme or plan which includes a strategy for ensuring the required staffing (5). The objectives of such planning are as follows:

### **C To identify HRD resources and needs**

HRD planning serves to identify existing resources in terms of both personnel and training opportunities, to prioritize outstanding needs and, based on these priorities, to produce the necessary personnel. The HRD planning process can provide essential information on the existing types and numbers of environmental health personnel in the country and their distribution. Frequently, countries have little reliable information on the numbers and disposition of the current workforce in environmental health, so there is no solid base on which to plan for the future.

### **C To maximize resources and improve interagency coordination**

What if there are insufficient financial resources for implementation of the plan? With the help of a national framework, scarce resources can be channelled to programmes and disciplines in greatest need.

Given the multisectoral nature of the field, government ministries of health, environment and labour may sometimes appear to be duplicating functions and training activities. Better planning can help both to maximize resources and improve interagency coordination.

### **C To generate funds for capacity-building**

HRD planning can also be useful in fundraising initiatives for education and training. Experience has demonstrated that funding proposals are most successful when the needs are well documented and prioritized.

### **C To establish policies and infrastructure to maintain human resources**

Once planning for HRD has been initiated, it should be institutionalized within government structures to safeguard the country's ability to develop and maintain appropriate human resources. This is accomplished by introducing key policies, HRD personnel and practices. Failure to institute sustainable HRD capacity is usually demonstrated by imbalances of various types, such as over-supply or shortages of human resources, or their geographical maldistribution, a poor mix of different professional and other categories, and failure to involve communities and sectors other than health in environmental health planning.

### **1.3 Why a special focus on environment and health?**

Traditionally, human resources planning for health has been limited to the main categories of health care providers and their support staff. While some of the essential practitioners for environmental health management, such as the health inspector, have been considered, a variety of skills and job categories are needed to solve the wide range of environmental health problems in each country. Some of these jobs lie within the health sector while others are found in sectors such as environment, labour and industry. There has been no special effort in the past to ensure that overall staffing in environmental and occupational health is appropriate to meet national needs.

### **1.4 Why link environmental and occupational health?**

The main reason for linking the environmental and occupational environments when addressing health concerns is that the source of the hazard is often the same and the strategies for hazard control must be coordinated to ensure that problems are not simply transferred from one environment to another (as happens, for instance, when an occupational exposure is controlled by venting contaminants to the external environment, or when one substance is substituted for another that is less acutely toxic in the workplace without considering other potential health effects or the environmental impact).

In terms of human resources, the scientific knowledge and training required to assess and control environmental hazards are, for the most part, the same as those required to address health hazards in the workplace. Toxicology, epidemiology, occupational hygiene, ergonomics and safety engineering are basic sciences that underlie both fields. In fact, in countries with scarce resources, it is often practical for the same professional to oversee both areas. Even in countries with a more diversified cadre of professionals where environmental and occupational health personnel are managed by different ministries, trained by different tertiary institutions and organized into different professional organizations, coordinated human resources planning can help to eliminate duplication and foster collaboration.

### **1.5 National versus subnational HRD planning**

With the growing trend towards decentralized planning, the concept of a national HRD plan may not be realistic or desirable. In some countries, national plans may provide overall HRD targets and guidelines for subnational implementation. In others, states or provinces may choose to pursue independently the process described in this document. However, subnational plans should always be linked to or integrated with national plans.

## 1.6 ***HRD planning: how to get started***

A national or subnational HRD planning project can be launched in a variety of ways. It can be commissioned by a high-level group on sustainable development, such as a local or national Agenda 21 project. It might also be initiated by an interested Ministry of Health, Environment, or Labour, a motivated university group, or a group of citizens. However, whoever initiates the process, it is clear that high-level government support is essential to guarantee its success.

## 1.7 ***How can HRD plans be used in practice?***

All too frequently, well-intentioned plans become dusty on the shelf. To avoid this fate, HRD plans should be seen as:

- C an essential component of national plans for development, environment and health;
- C a resource document for environmental decision-making;
- C a framework for funding proposals to support national capacity-building in environmental and occupational health.

## 2. **What is HRD planning in environmental and occupational health?**

HRD planning consists of determining how best to produce, deploy and use human resources in the right numbers, with the right skills, attitudes and motivation, and at the right cost to perform environmental/occupational health functions. Consequently, HRD planning must support and interact with health and environmental planning. Although HRD planning can be undertaken independently, it must be consistent in basic methodology and take account of national policy on health and the environment **C** what is proposed, planned or under way to produce a healthy environment. For example, in Europe, where Ministers of Health and Environment agreed in 1994 that each of the 50 WHO Member States would produce a National Environmental Health Action Plan (NEHAP), provisions for HRD should be reflected in these plans.

HRD has three components **C** planning, production and management. Human resources *planning* determines the number and type of personnel needed in the short, medium and long term and how these needs may be most efficiently met with available resources. Human resources policy has been included in human resources planning, where **A**policy@ refers to statements made by relevant authorities in order to guide the allocation of resources and effort. The policy and planning function is as concerned with both the qualitative aspects of human resources for health and with the quantitative aspects of supply and requirements. Human resources *production* (education and training) supplies the trained workforce in the numbers and with the competencies specified by the planners. This component also involves curriculum

development and review as well as teacher training. *Management* of human resources implies efforts to recruit, retain and support personnel by such means as provision of effective supervision and continuing education. Although the project focused on the production of human resources, planning and management issues are inextricably linked.

## **2.1 The scope of environmental and occupational health services**

The number and type of environmental and occupational health personnel will vary from country to country in accordance with particular needs and capacities. However, a necessary first step in identifying the types of personnel needed is to define the core areas in which environmental health services may function. One such list of core areas was provided by the WHO Regional Office for Europe as part of a project to build and strengthen the capacities of environmental health services in European Member States. The key elements of the project were identified as follows: clarification of the mission of environmental health services; development of an inventory of requisite competencies to fulfil this mission based on a study of services across the European Region; and development of an overview of the professional education and training of environmental health professionals in Europe (6).

The following core areas of environmental health were identified:

- C environmental health policy;
- C environmental health management;
- C accidents and injury prevention;
- C water quality;
- C air quality;
- C food quality and safety;
- C waste management and soil pollution;
- C human ecology and settlements;
- C health of people at work;
- C transport management;
- C land-use planning;
- C ionizing and non-ionizing radiation;
- C noise control;
- C tourism and recreational activities;
- C vector control;
- C energy.

A discussion of proposed organizational structures for environmental health services goes beyond the scope of this document, but is addressed in the materials produced by WHO's Regional Office for Europe (6).

WHO has made an effort to define and strengthen occupational health services as part of its global strategy. In many developing and newly industrialized countries, no more than 5-10% of the working population, and in several industrialized countries less than 20-50%, have access to competent occupational health services in spite of the evident needs (5). Some industrialized countries have successfully achieved this objective and have found the programme both feasible in terms of health and sustainable from the point of view of the economy.

Modern occupational health services draw the required elements from each relevant

profession, discipline or science C be it biomedical or environmental C and integrate them into a comprehensive multidisciplinary approach aimed at both the work environment and the workers themselves. Disciplines relevant for occupational health services include occupational medicine and nursing, occupational hygiene, work physiology and physiotherapy, ergonomics, safety and work psychology (5).

## **2.2 How to estimate staffing needs for service delivery**

In order to define staffing needs, the project of the Regional Office for Europe went on to identify specific activities and tasks related to each area, and the competencies required to carry them out. In fact, human resources planning based on functions rather than professional specialization may be most realistic. In many developing countries, one person may be responsible for tasks that call for skills from several disciplines. The strength and character of the professions may also vary from one country to another. However, it may be helpful, whatever the setting, to appreciate the range of disciplines relevant to environmental health when planning for human resources. Potential environmental/occupational health disciplines include:

- C environmental health officers;
- C sanitary engineers;
- C environmental health technicians;
- C environmental and occupational health physicians;
- C environmental and occupational health nurses;
- C occupational hygienists;
- C industrial safety engineers;
- C toxicologists;
- C analytical laboratory scientists;
- C occupational health and safety inspectors;
- C epidemiologists, statisticians;
- C ergonomists;
- C environmental and occupational health educators;
- C health physicists;
- C food technologists, nutrition specialists;
- C environmental and occupational health assistants.

There are various strategies for estimating the number of staff needed either to fulfill certain functions or to fit specific personnel categories. These numbers will reflect both new staff with specific skills or professional training and existing staff who must receive continuing education to fulfil new functions. Since planning is a political process, it should also be understood that each strategy has underlying values. What follows is a partial list of strategies. The steps for implementing each approach can be found in the resource materials in Appendix XIV.

### **A Market-oriented@ strategy**

The production of environmental health personnel in this case is based on estimates of demand for different types of personnel among government ministries and the private sector. It may be more closely related to affordability than to need. This method seeks to ascertain the level and kind of environmental health services consumers will use given the monetary and other costs

(e.g. time, inconvenience). The vacancies in the Ministry of Health reflect the posts it can afford to fill as well as the availability of existing personnel. For example, vacancies in the Ministry of Health or evidence of a very high demand for private environmental health services might signal the need for an increased output of certain types of personnel. The size of the increase would depend largely on the existing capacity of training institutions, and on how much this could be expanded and at what cost.

### **Incremental change@ strategy**

In this method, targets are set for the production and delivery of environmental health services. Targets are set by the environmental authorities and may be based on a variety of inputs. For example, a goal may be set to increase the number of occupational hygienists by 5% within a certain period (one year or five years). Application of this method includes a separate analysis of each component of the health care system. Thus if a country has 200 professional occupational health nurses per million population, it might plan to have 220 per million in five years. This implies more than simply increasing the output as compared with the number currently produced. The rate of population growth and attrition, and the retirement or migration of existing nurses will also have to be taken into account, as will age structure, current stock, number of training places, availability of qualified candidates for occupational health nurse training, and the output from education and training institutions.

### **Normative@ strategy**

This strategy applies standards or norms that have been derived systematically. The standards may, for instance, be based on HRD research in a certain region where services are provided to a defined population, together with empirical determination of the number of environmental health officers, physicians or other personnel required. Another basis for drawing up standards is the adoption of the workforce-population ratio that has been found to be satisfactory in another country. Once a standard has been adopted, it may be used as a goal towards which training programmes can be oriented. The rate of progress towards that goal will depend on the speed with which training can be expanded and the growth of population or industry, as well as on other factors.

### **Combination of Market-oriented@ and Normative@ strategies**

This approach presents data generated through the market-oriented and normative approaches to a panel of experts. For each type of personnel, the experts might apply different criteria: estimates of the market, an increase in the current supply, a standard based on empirical research, or foreign experience.

Whatever approach is used, workforce goals must be based on a clear understanding of the jobs to be done. For example, in many parts of the world, the functions of the environmental health officer are being changed or expanded. While the surveillance of foodborne and waterborne infectious disease has often been the primary purpose of the health officer, these functions have been expanded in many settings to include a broad range of areas such as hazardous waste management, emergency preparedness and response, radiation safety and workplace inspection. Such changes make it necessary to revise the training programme for these personnel and to organize additional training for existing health officers. This modification of personnel functions (job profiles) would also have a bearing on the number of personnel needed.

### **2.3 *The importance of intersectoral planning***

The personnel needed to solve the wide range of environmental health problems in each country are generally employed and trained by a variety of different sectors. While the Ministry of Health is usually responsible for health inspection, education and treating those who suffer the ill-effects of hazards, the major sources and remedies of environmental health risks lie in sectors such as environment, industry, transport and agriculture. Therefore, in developing a national or regional HRD plan, all sectors that have an impact on environmental health issues must be involved. To ensure the optimum use of skills, expertise and resources, intersectoral collaboration needs to occur in workforce planning, training and practice.

Political commitment from national authorities is essential to ensure intersectoral coordination. A single ministry, such as the Ministry of Health, may not wield sufficient power to enlist the cooperation of other sectors. Other forces include community groups and universities. Community organizations may play an important part in initiating intersectoral activities and in lobbying politicians to ensure that these activities flourish. Universities could promote intersectoral coordination by involving different faculties in joint teaching (e.g. faculties of medicine, engineering and agriculture).

## **3. How to plan: steps in human resources planning in environmental and occupational health**

Box 1 contains a list of steps in human resources planning. In some countries these steps may be combined or carried out in a different order, depending on national needs. These steps were included in the terms of reference of the WHO project on National Planning for Human Resources Development in Environmental and Occupational Health (see Appendix V), modified and applied in the three project countries. The anticipated products of the project were: a country report on the status of HRD in environmental and occupational health in each country with recommendations for a national HRD strategy; a national planning workshop to discuss the report and seek consensus on its recommendations; and a national HRD plan. Each step is described below, and is followed by recommendations or key points for implementation drawn from country experiences. To date, no HRD plans have been completed, but all of the countries have made valuable progress toward this end.



**Box 1. Steps in human resources planning in  
environmental and occupational health**

- ! Organize the planners. Identify national institutions which will be involved in the planning process, a coordinating agency and a steering committee.
- ! Raise the issue at national level and identify problems in HRD.
- ! Conduct a study and prepare a report on existing HRD resources and needs in environmental and occupational health.
- ! Hold a national planning workshop.
- ! Draft an HRD plan or framework which addresses some or all of the following issues:

*Planning*

- ! Estimate the number and type of personnel needed (e.g. by job category, necessary skills and knowledge, function).
- ! Establish priorities.

*Production*

- ! Develop and present teacher training activities.
- ! Establish training programmes in different disciplines.
- ! Strengthen libraries and improve information access systems.

*Management*

- ! Develop clear job descriptions for personnel in environmental and occupational health.
  - ! Provide sufficient incentives to motivate and maintain personnel.
  - ! Identify and prioritize continuing education needs.
- ! Monitor and evaluate progress.

### **3.1 *Organize the planners. Identify national institutions which will be involved in the planning process, a coordinating agency and a steering committee***

A national HRD planning project could be commissioned by a high-level group specializing in sustainable development, such as a local or national Agenda 21 project, or initiated by an interested Ministry of Health, Environment or Labour, a motivated university sector or a group of citizens. However, high-level government support is essential to ensure that all sectors that have an impact on environmental health participate in the process.

Recommendations for a coordinating agency will usually emerge from initial discussions with participating institutions. Although the HRD planning process addresses health issues, leadership can also be sought outside the health sector. A steering committee can help guide the process and make decisions concerning the plan and its implementation. The committee should consist of decision-makers with sufficient authority to implement the plan and may include the Ministries of Health, Environment, Labour, Education and Planning, as well as universities, professional associations, the private sector, unions and relevant nongovernmental organizations. The reason for involving decision-makers throughout the entire planning process is to ensure their input in shaping a strategy that they will be committed to implementing after it is adopted by national authorities. (For a list of agencies typically represented in the project, see list from Mexico, Appendix IV.)

At the same time, a technical group is sometimes convened to prepare materials and reports to the steering committee. It can include experts from the institutions represented on the steering committee, specialists in the planning of human resources, education specialists, and teachers, students and technical support staff from educational institutions. The project will also require a consultant or team of consultants to study existing human resources and outstanding needs. (See section 3.3 for a description of the study and the team.)

### **3.2 *Raise the issue at national level and identify problems in HRD***

This stage of the planning process allows planners and policy-makers to identify those aspects of HRD that require priority attention. What are the key occupational and environmental health problems in the country? What is the country's strategy for resolving these problems? What type of workforce is needed to implement this strategy? Does the current workforce meet those requirements? If not, where are the gaps?

There are several ways to raise the HRD issue at the national level. These include a preliminary report on the issues mentioned above, a survey, interviews with planners and policy-makers, and a workshop to discuss national needs and resources, as well as other means. Ideas for the human resources planning process should emerge from these discussions. Organizers should be sure to collect existing studies, reports, experiences, plans and relevant statistics on problems and priorities for HRD in environmental and occupational health. An effort should also be made to identify existing policies that support HRD. If such policies do not exist they will need to be developed to guarantee long-term implementation of the plan.

## Key HRD issues

The following issues were among those most frequently raised in Cuba, Mexico and South Africa by interdisciplinary members of the planning team in the areas of legislation and of planning, production and management of human resources.

### Legislation

- ! Fragmentation of legislation (e.g. different agencies responsible for implementing different aspects of air pollution legislation); inconsistencies in legislation; duplication or absence of legislation.

### Planning

- ! Lack of HRD planning and needs assessment, and inadequate planning skills; lack of training in HRD planning.
- ! Lack of reliable data for HRD (e.g. numbers and types of personnel in environmental and occupational health and their geographic distribution).
- ! Lack of intersectoral collaboration; overlapping functions (especially among Ministries of Health, Environment and Labour).
- ! Lack of coordination between the academic institutions and the skills and expertise needed by potential employers.
- ! Failure to define environmental and occupational health concepts adequately and to integrate their application.
- ! The changing role of the environmental health officer. These officers, often called health inspectors, are generally responsible for local implementation of environmental health legislation. With changing environmental health concerns, they are often faced with problems they have limited skills to resolve (e.g. hazardous waste management, radiation safety, risk communication). The role and educational needs of the environmental health officer are currently being addressed in many countries.
- ! Lack of community and worker input into the HRD planning process.

### Production

- ! Need for an educational needs assessment and review of existing environmental and occupational health curricula; lack of standardized curricula or minimum criteria for curricula.
- ! Need for specialty training (e.g. epidemiology, risk assessment, hazardous waste management, radiation safety).
- ! Lack of continuing education in environmental and occupational health (especially for environmental health officers, occupational health and safety inspectors,

physicians and nurses).

- ! Need for new career tracks (e.g. occupational hygienist, environmental health assistant).
- ! Failure to incorporate priority environmental health problems in the country in educational programmes.
- ! Need for teacher training on environmental health topics and innovative teaching approaches.
- ! Need for better access to current information resources, reference materials and teaching aids.
- ! Lack of training centres with adequate facilities.
- ! Lack of outreach and publicity for educational programmes and their curricula.
- ! Lack of locally produced publications and training materials.

#### Management

- ! Lack of managers with skills and training in human resources management.
- ! Lack of motivation and incentives; staff transfer to other sectors of the economy.
- ! Lack of clear job descriptions.
- ! Income disparities.
- ! Poor geographical distribution of personnel (due to migration to cities).

### **3.3 Conduct a study and prepare a report on existing HRD resources and needs in environmental and occupational health**

At this stage the steering committee appoints a consultant or team of consultants to collect and present more detailed information about existing human resources and needs in relevant educational, health, labour and environmental institutions, and summarizes their findings in a country report. The terms of reference of the country report are outlined in Appendix V, Annex 1 and summarized in Box 2.

**Box 2. HRD study and report: what to include**

The country report should include the following information on HRD resources and needs:

- C the extent/nature/severity of specific environmental and occupational health problems;
- C available and potential resources for preventing and responding to these problems;
- C status of HRD planning and policy-making;
- C present staffing, and projected needs for and supply of human resources;
- C availability and effectiveness of various kinds of educational programmes;
- C outstanding gaps in human resources and training opportunities;
- C potential action strategies to improve HRD.

The guidelines for the country report should be adjusted to the needs and interests of each country, taking into account factors such as the political system, size, resources and time available. Elements of the study include: a summary of the environmental and occupational health system; a description of the workforce and its capacity to comply with national priorities; an inventory of current resources for education and training in environmental and occupational health; the identification of priority problems for the planning, production and management of human resources, as well as policy formulation in environmental and occupational health; and the identification of policy options, strategies and actions to improve HRD.

Two essential components of the study which provide a baseline for future planning are a description of the current workforce and an inventory of educational opportunities. A training institution survey is often conducted. Suggested components of the workforce description and training institution survey are detailed in Boxes 3 and 4 .

### **Box 3. Workforce description**

The description should include:

- C the number and description of personnel by region, subsector and activity;
- C the principle function and competencies of each discipline;
- C the projected supply and requirements of personnel for the next five years (based on current policies, trends, production and loss rates).

### **Box 4. Training institution survey\***

The training institution survey should include:

- C an inventory of training programmes in the field;
- C the number of graduates in each discipline;
- C the adequacy of educational capacity (is there room for all who wish to study?);
- C the link between education and employment;
- C the quality and quantity of teaching staff in each discipline;
- C the quality of curriculum and teaching methodology;
- C the adequacy of educational materials, reference texts, libraries;
- C the adequacy of facilities and equipment.

<p>* For both degree-oriented academic programmes (university and technical schools) and continuing education (e.g. short courses and workshops).</p>
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Ideally, the study team would meet periodically with the steering committee to ensure that the committee provides ongoing input to the process. (See terms of reference, Appendix V, for roles and responsibilities of the steering committee, project coordinator and study team.) Such meetings did not occur in the countries concerned because of the tight schedule and because frequent meetings of high-level individuals from multiple sectors are cumbersome to facilitate. More informal mechanisms for ongoing input should be sought. For example, members of the steering committee in Mexico took responsibility for implementing the workforce survey instrument within their institutions.

### **Selecting an HRD study team**

When recruiting an individual or group to conduct the HRD study, the optimum combination of capabilities should include: experience in and knowledge of environmental and occupational health; experience in conducting investigations (collection, analysis and presentation of data; interviewing skills); knowledge about environmental health policy formulation; and experience in planning, production and administration of human resources. Since it would be very difficult to find this diversity of expertise in one individual, most project countries opted for a team approach. In Mexico, the project convened a research team from the School of Public Health to conduct the study under the direction of a specialist in occupational and environmental health. Other members of the team included a planning specialist and a public health research specialist with expertise in biostatistics. Cuba recruited an interinstitutional study team of health planners, researchers and practitioners in environmental and occupational health disciplines led by the Director of the National Office of Environmental Health.

In South Africa, a national consultant was selected to conduct the country review. Although one individual had primary responsibility for the study, he had access to additional resources in his consulting firm. Since the consultant had more experience in the private sector, the Department of Environmental Health assigned one of their specialists to participate in the study and planning process.

### **3.4 Hold a national planning workshop**

The goal of the workshop is to provide a forum for discussion of the priority problems and potential solutions identified in the country report. An effort should be made to ensure the participation of high-level decision-makers for at least part of this workshop to lend sufficient authority to the outcome or products. Ideally, the report is distributed for comment prior to the workshop. The tools of strategic planning and consensus-building can be effectively utilized in the workshop, as shown in the country case studies.

On the basis of the recommendations generated at the national workshop, a small group designated by the project coordinator and the steering committee should write the national framework or plan.

### **3.5 Draft an HRD plan or framework**

The plan should include steps to improve the planning, production and management of human resources, with their proposed budget, timeline and responsible agency. The plan should also include policy initiatives to support HRD planning, if such policies do not already exist. An HRD policy might include requirements for annual review of staffing and training in the field and the establishment of an intersectoral committee to oversee HRD planning. It might also provide minimum qualifications for selected personnel, minimum criteria for curricula, and continuing education requirements for professionals in the field.

Assuming that national funds cannot support all the proposed activities, the plan can then be translated into a funding proposal for circulation to potential donors.

None of the project countries has drafted a national HRD plan for environmental and occupational health as yet. However, what follows is a list of strategies developed in Cuba, Mexico and South Africa for inclusion in such a plan. Although the national situation in each country differs, these strategies were thought to be essential by most countries.

#### **Strategies for HRD planning**

##### Legislation

- ! Revise and rationalize legislation in the environmental and occupational health field to eliminate inconsistencies and duplication and to introduce a legislative framework where this is absent.

##### Planning

- ! Estimate the numbers and types of personnel needed in environmental and occupational health using the national HRD review.
- ! Refine the national HRD review with the help of institutional and regional meetings to assess the strengths and limitations in each institution and their ability to contribute to the national plan.
- ! Establish norms and standards for HRD planning (e.g. job profiles, evaluation criteria, etc.).
- ! Establish intersectoral coordination (e.g. a committee) for HRD planning in environmental and occupational health, with representation of key employers and educators of human resources (ensure linkage between the employers and the academics).
- ! Conduct training on HRD planning for planners in environmental/occupational health agencies.
- ! Establish a strategy for community participation in HRD planning.
- ! Explore creative funding strategies for HRD (e.g. use national and international funds more efficiently, provide economic incentives to employers who support HRD in the field, implement a system of "polluter pays" to help finance HRD activities).

### Production

- ! Define and distinguish between environmental and occupational health.
- ! Implement an educational needs assessment for students in academic and technical programmes, professionals in the field and teachers of environmental/occupational health.
- ! Conduct a review of existing curricula and establish minimum criteria for curricula in the environmental and occupational health fields. Revise content accordingly and incorporate innovative teaching approaches.
- ! Develop educational programmes, based on the needs assessment, considering the possibility of distance education for:
  - C technical staff;
  - C professionals (at the high school, undergraduate and postgraduate levels);
  - C continuing education;
  - C teacher training (including content and innovative teaching approaches).
- ! Review and upgrade the system of accreditation of relevant disciplines.
- ! Improve "marketing" of educational programmes in environmental and occupational health.
- ! Conduct a needs assessment of HRD infrastructure (e.g. educational materials, libraries, reference texts, equipment) and upgrade on the basis of the available budget.
- ! Improve access to current sources of information for both professionals in the field and teachers.

### Management

- ! Develop clear job descriptions for personnel, with a multisectoral and multidisciplinary perspective.
- ! Establish clear evaluation criteria for personnel appraisal.
- ! Provide continuing education for personnel.
- ! Provide incentives to motivate and sustain the workforce (especially front-line technical staff such as environmental/occupational health inspectors).

### **3.6 Monitor and evaluate progress**

On a regular basis, the progress of the planning, the implementation process and the results needs to be monitored and evaluated in order to adjust the plan to suit local needs and conditions. To monitor HRD programmes in health and environment, data must be collected and analysed on training and education, service delivery and administration and should be compared with targets and objectives. Evaluation and review of progress should be undertaken at least annually, and should be followed by corresponding adjustment of plans.

## **4. Country experiences**

This section contains a description of how the HRD planning process was implemented in each of the project countries: Cuba, Mexico and South Africa. As will be noted, each country revised and implemented the proposed steps for developing a national HRD plan on the basis of needs and interests.

### **4.1 Mexico**

#### **The planning team**

In Mexico, the project was based in the Secretariat of Health, General Directorate of Environmental Health. The head of this directorate convened a large interinstitutional steering committee with representatives of all agencies interested in the topic, from both the public and private sectors, as well as a smaller executive committee that included programme directors from the Secretariat of Health, Secretariat of Environment, the University of Mexico's Environmental Programme and the School of Public Health of Mexico. The strategy was to utilize the executive committee in ongoing project management and keep the interinstitutional group informed with the help of a newsletter, the Carta RECHUM, (from *RE*Cursos *HUM*anos or human resources) (Appendix III). In fact, RECHUM was the official name of the project in Mexico. The study team decided that, for more effective outreach and promotion, the project would benefit from its own identity and logo.

There was no regional representation in ongoing project management, although input from the regions was solicited during the HRD study. It was assumed that the project would be launched in the capital and shared with other states in Mexico if it were successful.

#### **Getting started**

The planning process was initiated with a combination of interviews and a meeting of interested parties. Interviews were conducted with directors of the key institutions that employ human resources in environmental and occupational health (Secretariats of Health, Environment and Labour) as well as representatives of principal educational institutions with programmes in these fields. Other informants were representatives of planning agencies, research institutes,

professional organizations, and organizations with a special focus such as the water authority. The primary objective of the interviews was to introduce the project and the planning process. A short brochure was developed in Mexico to accompany the interviews and other outreach efforts (see Appendix I).

During the interviews, input was sought on key problems and recommended solutions in environmental and occupational health as well as on HRD planning, training and policy, and on the availability of educational resources. The interviews were followed by a formal meeting of all interested parties to officially launch the project and seek input on the workplan, including a proposal for the country review and report.

## **The HRD country review**

### Objectives

The goal of the HRD review was to get a better understanding of the functions of environmental and occupational health professionals and their levels of qualification and competency to fulfill their tasks. A companion objective was to carry out an inventory of certain targeted educational programmes in the country and document their offerings. Given the size of the country and the project's scarce resources and timeframe, the researchers decided to limit the study to mid-level managers and the corresponding bachelor's and master's degree programmes. Typical job categories included in the survey were: district health officers, department heads, area directors, laboratory heads, industrial safety heads, and supervisors. Job categories such as environmental health inspector were not included, nor were the technical training programmes they receive. In spite of this proviso, the training needs of technical staff were raised during the study and will be included in the final plan.

### Methodology

Three research tools were utilized: a survey of a representative sample of mid-level managers in environmental and occupational health, focusing on perceived competency in their jobs, prior education and future training needs (see survey instrument, Appendix VI); interviews with key informants in the field (see interview format, Appendix VII); and a review of relevant reports and training programme catalogues. After the survey had been pilot-tested in the Social Security Institute and in the health services department in the state of Morelos, 450 copies were distributed around the country. Several agencies participating in the planning process (the National Ecology Institute, the Secretariat of Health, the Social Security Institute, the University of Mexico and two private companies) assisted in administering the survey among their constituents.

Researchers hoped to achieve at least a 70% response rate (352 surveys returned). The anticipated outcome of the survey was the professional profile of employees, their principal activities, and their continuing educational needs. Different survey instruments were developed for each field (one for occupational and one for environmental health).

Interviews were conducted with 17 key informants, such as agency directors, experts in the field, educators, and representatives of nongovernmental and other organizations to assess their perception of HRD resources, needs and priorities. Important questions asked by interviewers in Mexico were, "Why do we not have human resources of the quality and in the

quantity needed to meet our country's environmental health challenges? Why have the public and private sectors not dedicated sufficient attention to the problem?" The summarized responses formed part of the report on the study.

The training programme inventory consisted of a request for catalogues from institutions and the preparation of a comparative listing of courses and degrees offered.

### Study results

The study revealed interesting differences between personnel in the occupational and environmental areas. Occupational health staff are primarily based in the Social Security Institute and in the private sector, are more medically oriented and have a variety of post-graduate degree options. In contrast, environmental health is less well developed, with an abundance of technical staff based in government and academic positions. The survey also identified a large number of professionals in both areas who are working without any formal preparation for their jobs.

The survey of courses showed that educational curricula were very diverse with no apparent linkages with the operational needs of potential employers. The distribution of educational opportunities around the country was also found to be very imbalanced, with a high concentration of programmes in the centre and north of the country and a complete absence of postgraduate courses in the south. Consistent themes in both the survey of professionals and the interviews were the need for policy on the type of personnel desired, their qualifications and educational background, and the need for a mandatory core curriculum that could be adapted to meet regional needs. Both increased regulation and the establishment of an independent body to oversee HRD in environmental/occupational health were recommended.

The results of the study were presented in a report. The following strategies were proposed for addressing the problems that were identified:

- ! Legislative reform should be instituted to resolve the inconsistencies and duplications in agency roles and responsibilities; policies should be implemented to regulate HRD (e.g. minimal educational preparation, mandatory core curriculum for different disciplines).
- ! A regulatory body should be established for HRD in environmental and occupational health.
- ! The knowledge and teaching skills of instructors should be updated.
- ! Educational programmes should be linked with the needs of the services and the real problems in the private and public sectors.
- ! International and national technical assistance should be channelled to priority areas.

### **The national workshop**

The purpose of the workshop was to present the results of the country review and to outline the basis of a national strategy to improve HRD in the field. The 28 participants included representatives of key agencies (e.g., the Ministries of Health, Environment and Labour, the

National Water Commission and the Mexican Social Security Institute), academic institutions with programmes in environmental and occupational health, and professional and special-interest organizations.

Many steps were taken to maximize the participation of department directors. For instance, the event was called a "national meeting to formulate HRD policy" rather than a planning workshop. Directors would be less likely to attend a "workshop" and more comfortable with participation in policy development. The directors also participated in a high-level breakfast meeting to shape the agenda for the national HRD meeting. Since it would be difficult for directors to be available for more than one day, the two-day agenda allowed for problem definition by the technical group on the first day and development of a final plan on the second day when directors were expected to join the meeting.

The process of the meeting was developed by a consultant with experience in strategic planning and group consensus techniques. It is described here in some detail to facilitate its adaptation and replication in other countries.

#### Identification of priority problems in HRD

After a brief review of the HRD study, participants were invited to identify five priority problems and record them on a piece of paper (the nominal group technique). The facilitator then requested one problem from each individual and compiled a list on a flip chart. Participants were asked not to repeat ideas that had already been mentioned and the exercise continued until all ideas were listed. The group then generated a list of problem categories which were later refined to include: education and training, the labour market, quality of the teaching-learning process, financing, legislation, monitoring of demand, interinstitutional coordination, international cooperation, and planning/programming.

A list of all the problems that had been identified was typed and distributed to the group. Participants were asked to prioritize the problems.

#### Definition of an ideal vision for HRD

The large group was then divided into two smaller groups to describe a vision of the ideal HRD scenario in each of the thematic areas outlined above. This vision would be used as a guide when developing strategies for solving the problems identified. Without an ideal vision, planners are often constrained by current reality and reluctant to look beyond the most conservative of solutions. The ideal visions were shared in the plenary session. During the evening of the first day, the meeting facilitator assigned the problems to the categories identified by the group and listed them according to the group's priorities.

#### Definition of strategies for improving HRD

On the second day, the group received a list of prioritized problems and ideal visions as a basis for defining strategies to resolve these problems (see Appendix X). Once again, the group was divided into two, with each subgroup assigned the task of identifying strategies for half of the problem categories.

Examples of strategies were: (for education and training) defining environmental and

occupational health and performing an educational needs assessment throughout the country; (for the labour market) linking academic institutions with workplace needs and developing job profiles; (for quality in the educational process) implementing systematic evaluation and linking teaching to practice and research; (for financing) improving efficiency in the use of resources, especially international ones; (for legislation) conducting a legislative review and adapting laws on the basis of the findings; (for interinstitutional coordination) defining competencies for key jobs in each institution; (for international cooperation) establishing technical cooperation programmes with international partners; (for planning) establishing an interinstitutional committee for HRD and forming regional groups to develop their own HRD programmes. (See list of strategies, Appendix XI).

### Identifying challenges, opportunities and risks in developing a national HRD plan

Before developing an HRD strategy, it is important to identify potential obstacles that need to be overcome and advantages that can be exploited when devising the plan. Participants were given two small cards and asked to write the biggest obstacle to developing a plan on one and the biggest risk in *not* developing a plan on the other. The facilitator began the discussion by asking for one obstacle and then inviting participants to point out other obstacles on the same theme. This process continued until all the obstacles in each thematic area were mentioned. The resulting themes were: lack of political will, "everyone wants to run the show", lack of interinstitutional coordination, absence of representation of all of the appropriate institutions/sectors, lack of finances, lack of an "environmental and training-oriented culture", and lack of leadership.

There was no time to discuss the risks in not developing a plan. Ideally, this exercise would have been followed by a discussion of strategies to overcome the obstacles identified and to avoid the risks of inaction.

### Developing an action plan

Since most of the key programme directors (Health, Environment, Labour, Social Security) were not present at the meeting, it became clear that the action strategies for developing a national HRD plan needed to proceed simultaneously on two levels: one directed at programme directors to guarantee support for a national plan, and one directed at the technical group which attended this meeting to encourage coordination of their activities in plan implementation.

The group agreed to schedule a meeting for programme directors to present the proposed strategies for a national plan, define the role of each agency, make decisions on specific issues such as the formation of an interinstitutional committee on HRD, and select 2-3 priority HRD activities for implementation in the short term. Directors would be provided with a brief executive summary of the proposed strategy and audiovisual aids to support presentations on the HRD initiative in their department.

A follow-up meeting was also scheduled for those who attended the workshop to exchange information on HRD activities and to discuss strategies for promoting the project in each institution. It was recommended that a process of "institutional reflection" be initiated to discuss the proposed plan in each institution and to define possible agency contributions. In addition to defining the strengths and weaknesses of each institution in HRD, it was hoped that this process would document HRD activities undertaken by each agency and possibilities for

interagency collaboration.

### Evaluation of proposed strategies

The final activity of the workshop was to evaluate the feasibility and effectiveness of each proposed strategy for addressing priority HRD problems. Each participant was asked to complete two worksheets: one which evaluated the potential impact of each strategy on the problem and another which evaluated the feasibility of each strategy (potential impact on traditional power structures, economic costs, institutional resistance, impact on legislation and timeline for implementation). These worksheets were analysed by the study team and used to produce a new list of prioritized strategies (see worksheets, Appendix XII).

The meeting was successful in accomplishing its objectives of achieving consensus on priority problems in HRD and elaborating of strategies to resolve these problems. The group of participants was composed of highly skilled managers and educators. The only shortfalls, in terms of participation, were the absence of key decision-makers for the action planning session, the need for a stronger presence by the Secretariat of Health, and the absence of representation from the private sector.

The group process was very creative and succeeded in achieving the desired results. However, a more realistic timeframe might have been a three-day meeting, with two days to develop consensus on priority problems and proposed strategies and a third day for action planning by decision-makers.

The study results did not serve as the basis for subsequent discussions since they were incomplete at the time of the meeting. In an ideal situation without the pressures of a donor's schedules, the project should schedule the planning workshop when study results are tabulated and ensure that participants have time to read and digest these results prior to the meeting.

### **Status of the National HRD Plan**

The project continues in the Secretariat of Health, General Directorate of Environmental Health. On the basis of the recommendations of the national planning workshop, the intersectoral steering committee has initiated the following activities:

- ! A legislative review to document the legal mandate of Mexican governmental departments to provide education and training on environmental and occupational health.
- ! Production of a presentation and series of overhead transparencies to facilitate a process of institutional reflection on the project in each of the participating sectors. In addition to defining the strengths and weaknesses of each institution in HRD, it was hoped that this process would document existing HRD activities in each agency and possibilities for interagency collaboration.
- ! Establishment of an academic subcommittee to review curricula in environmental and occupational health and criteria for certification.
- ! Definition of job profiles of key environmental and occupational health professionals.
- ! Production of a national roster of institutions and individuals in environmental and

occupational health.

The subcommittee will proceed to draft a national HRD strategy based on the outcome of the above activities.

## **4.2 South Africa**

### **Initiating the planning process**

In South Africa the HRD planning process was based in the Department of Health under the direction of the Director of Environmental Health. An interinstitutional steering committee was convened with appropriate representation from all relevant sectors, including the office responsible for the social reconstruction and development of the country. Key questions to be addressed in South Africa were how to ensure input from the provinces in creating a national plan and how to develop a document with national ramifications when health and environmental administration is decentralized. At the inception of the project, an effort was made to designate individuals to represent the four provinces closest to Pretoria on the steering committee but this did not work out in practice. It was agreed that the national strategy will provide criteria for consideration and guidelines for implementation at provincial level.

The project was launched with a series of three regional workshops in Pretoria, Bloemfontein and Cape Town. Individual interviews were not feasible given the geographical distances and the amount of time available. The interinstitutional group was convened for one-day or two-day meetings to identify resources, key problems and potential action strategies to improve the situation. Participants worked in small groups that were geographically and professionally diverse. The small groups identified gaps both in the existing workforce and in available training resources and action strategies to address these problems. Worksheets (on Resources and Limitations and Action Steps; see Appendix II) were used to guide small group discussions.

In addition to identifying limitations and weaknesses, the group brainstormed a list of national "strengths" in support of HRD planning. This highlighted the existence of many resources, such as studies and reports which had been produced, and national institutions and legislation which will contribute to the planning process. The proposed action steps that emerged served to highlight issues of primary concern which should be considered by the HRD planners.

### **The HRD review: a framework for environmental health services**

The South African project followed a different course from those in Cuba and Mexico. The HRD initiative coincided with a major change in government and the reorganization of most institutions. The challenge the new South African government faced was to extend environmental health services to previously disadvantaged and marginalized communities while simultaneously striving to maintain adequate standards. As a first step, the Director of Environmental Health opted to define the framework for environmental health services and the role and function of the key practitioner, the environmental health officer (EHO). The project steering committee decided to dedicate the first phase of the project to producing a position paper on this proposed framework for discussion at a national workshop. A broader HRD study would be part of the

second phase.

The position paper proposed a strategy for improved service delivery which includes the following elements: the creation of an Environmental Agency to oversee environmental and occupational hygiene services; the establishment of a career track for the EHO which would create the additional positions of environmental health assistant and environmental health practitioner; and the expansion of EHO functions to include occupational hygiene in addition to environmental health services.

### **HRD planning workshop**

The national planning workshop was attended by more than 200 people from around the country. The participants were primarily EHOs but also included provincial directors and line staff. The other government departments represented were Environmental Affairs and Tourism, Mineral and Energy Affairs, the National Centre for Occupational Health (part of the Department of Health) and several technikons (technical schools at university level which are responsible for EHO training).

The purpose of the workshop was to facilitate discussion of the position paper. A key issue for debate was the capacity of the EHOs to deliver occupational hygiene services. This expansion of their role would require additional training but would provide a much-needed service at provincial and district levels. A major obstacle to this proposal is that EHOs are based in the Department of Health while responsibility for occupational hygiene and safety currently falls under the jurisdiction of the Department of Labour.

The keynote address of the Director of Environmental Health was entitled "South Africa has the human resources to deliver a one-stop environmental health service: fact or fiction". Presentations on the following themes set the tone for the meeting: "Environmental Health Protection Agency: A possible solution to environmental health services in South Africa"; "A perspective on occupational health in the Department of Mineral and Energy Affairs"; "A proposal for revision of the EHO curriculum"; and "Involvement of the EHO in occupational health and the redefinition of the roles and application of environmental health practitioners".

### Small group work on HRD problems and potential solutions

The meeting continued with work in small groups on key topics identified by the steering committee. These topics were: environmental health services delivery; education and training; HRD needs; the role and function of the EHO; establishment of an environmental agency; structure and coordination of environmental and occupational health services; and legislation, norms and standards.

The task for each group was to describe the current situation with regard to the topic, identify problems, describe their vision of the ideal situation and propose steps for moving towards this vision. Groups were also asked to indicate the human resources and budgetary implications of their recommendations.

General points of consensus were:

- C EHOs are already delivering environmental and occupational health services in many provinces on an informal basis. They should be officially authorized to do so and be given appropriate training.
- C There is a need for an environmental agency to ensure intersectoral coordination on environment and health.
- C There is a need to clarify the roles of other agencies in the field (e.g. Department of Agriculture, Department of Water Affairs, etc.).
- C There is a need to rationalize existing legislation which is fragmented, overlapping, inappropriate and, in certain instances, non-existent.
- C There is a need for an HRD study to further clarify and define the role and function of the EHO. The study should include a task analysis, a community needs assessment and a review of current training resources.
- C There is a need for review and revision of the EHO curriculum. Specific recommendations included use of more practical exercises.
- C There is a need to develop a career structure for the EHO which includes three to four levels of practitioner. Environmental health assistant is a job category that needs to be further defined, and those holding this position should be better trained.

### Workshop conclusions

The meeting was officially closed with a review of the next steps: production and distribution of a final report on Phase I of the project, including the workshop, and initiation of Phase II. Potential activities for Phase II include the implementation of selected training programmes recommended in Phase I, formation of provincial HRD committees, an HRD study (including a situation analysis, a community needs assessment, the review and revision of existing job descriptions and a training institution survey), action planning workshops in the nine provinces and production of a national strategy.

It was agreed that the second phase of the project would seek to broaden representation to include the Departments of Labour, Agriculture, and Housing, and representatives from local governments and institutes of safety management.

### **Preparing for a national HRD strategy**

Plans for Phase II of the project, including the drafting of a national HRD strategy, have been delayed by a series of transitions in project leadership. The redefinition of the role and function of the EHO remains a priority. As part of plans to review and update the EHO curriculum, the steering committee organized a meeting between representative EHOs in the field and teachers in technikons. Curriculum revision will include the strengthening of curriculum on occupational health in keeping with the EHOs=expanded role in this area and the integration of more community-based experience into academic training.

## 4.3 Cuba

### Organizing a planning team

As in Mexico and South Africa, the HRD planning process in Cuba was based in the Ministry of Health, under the Director of the Department of Environmental Health. Because of Cuba's relatively small size and centralized government, a multisectoral steering committee was initially limited to representatives from the capital. It was decided that provincial representatives would be recruited at the time of the national planning workshop. A unique aspect of the project in Cuba was the active participation of planners in human resources for health. Cuba has a long history of centralized planning for the health sector and planners were drawn from the centres responsible for continuing education for physicians and technical staff.

The interinstitutional team that was appointed to do the HRD review also became the project steering committee. The team consisted of researchers and practitioners from the Ministries of Health and Environment together with health planners.

The planning process was launched by a series of interviews with department directors followed by a large initial workshop with representative sectors. The meeting, which served to publicize the project, identified HRD problems and proposed action strategies for inclusion in the subsequent study.

### The HRD study

#### Objectives

The study was designed to document the size, functions and capability of the environmental and occupational health workforce and to identify existing training resources.

#### Methodology

Two survey instruments were developed: one to collect data on the number and category of personnel working in environmental health in each agency, and the other to evaluate the preparation of personnel for their jobs and to assess continuing education needs (see survey instruments, Appendix VIII). The latter survey was completed by 400 people. As for national participation, the survey was announced at a meeting of environmental health directors who took copies for completion in their provinces. Although the directors were informed on who should complete the survey, the process was not controlled.

Interviews with key informants were another source of data. Interviews were conducted with the Ministry of Higher Education, the University of Havana (careers in environmental health), HRD specialists, health planners, the medical science department, and provincial directors of environmental health.

#### Results and evaluation

Specific deficiencies identified by the study included the need for revision of the

environmental health curriculum for nurses and health technicians. Technician training, in particular, does not correspond to the tasks required on the job. The report also identified a shortage of personnel trained in specialty areas. Insufficient training materials, references and bibliography are particularly acute for medical and nursing practitioners and teachers.

In retrospect, the team concluded that the results of the study could be used to draw general conclusions but that they were not completely valid because of the absence of control over who participated in the survey and how representative they were of the target population. In spite of the multisectoral orientation of the planning process, the Cuban study focused primarily on the health sector. The survey was administered only among health personnel although the project did identify educational programmes outside the health sector which have curricula on environmental health. It was also observed that it would have been useful to involve the planners from each of the different sectors and disciplines. The planning process differs from sector to sector, since students aiming at health careers are guaranteed jobs while in other disciplines (biology, ecology and engineering), this is not the case.

When evaluating the process, the study team also recommended that the survey be revised to modify questions that were very ambiguous, and that its application be controlled.

### **The national planning workshop**

The workshop was attended by some 40 people from the Ministry of Health in Havana, the provincial health administrations, planning and research institutes and educational institutions. Unfortunately, the country report had been distributed quite late and, therefore, was not used as the basis for workshop discussions. As in South Africa, the planning team decided to use the workshop as a forum for identifying problems and priorities for HRD in environmental and occupational health and for drawing up an action proposal that could be incorporated into a national plan. Any findings in the country report that were not mentioned during the workshop would be incorporated when the plan was drafted.

#### Identification of priority problems in HRD

The first day of the workshop was dedicated to work in four interdisciplinary and geographically diverse small groups. These focused on identifying problems in Cuba for planning, production and management of human resources in the field. The four facilitators were members of the project steering committee. The nominal group technique was applied in the small groups. Each person was asked to identify problem areas individually, and then the facilitator solicited one idea from each participant until all ideas were recorded. Each group then prioritized the problem areas.

Facilitators from the small groups met to combine their lists of problems into one master list. On the second day of the workshop, the master list of problems was reviewed, discussed and edited in plenary. Following this, the list was prioritized within each area (planning, production and management) by using two methods. In the first, each person was asked to prioritize the top 10 problems by assigning the most significant problem a value of 10, the second a value of 9, and so on. When the points were tallied, the problem with the highest score was rated as the most significant and the others were rated accordingly. In the second method, priorities were determined by majority vote. All participants selected their own top 10 problems and those were tabulated and prioritized according to the number of votes received. Only the top 10 problems

in each area were discussed. The others were included in the final report.

Examples of problems in HRD planning included lack of skills and training among the personnel responsible for planning, insufficient interagency coordination, and insufficient health survey data to facilitate planning. High priority problems in training were the lack of sufficiently trained teaching personnel, inadequate training on environmental and occupational health for physicians and nurses, and poor access to up-to-date bibliographic, teaching and learning materials. As in Mexico, the lack of coherent legislation was cited as a problem for HRD management, as was the exodus of technicians with training to other areas of the economy.

### Development of action strategies

Participants then returned to their small groups to develop proposed action strategies to address the problems. Two groups dealt with production and training issues, one addressed planning, and the fourth dealt with management. Proposed action strategies were reviewed, discussed and edited on the third and final day of the workshop. Participants were invited to discuss the problems, action strategies and country report in their provinces and institutions and to submit comments and corrections to the study team. The final workshop product, the list of problems and proposed strategies to address them, is included in Appendix IX.

### **Preparation of a draft HRD plan**

The steering committee drafted a preliminary HRD plan. This documented the problems identified in the HRD study and national workshop in the areas of planning, training and management of human resources along with proposed activity areas, responsible agencies and individuals and target dates for completion. Although individual training activities have been implemented, the proposed plan has not been pursued due to administrative changes in the country.

## **5. Conclusions and recommendations: lessons learned**

As demonstrated by the country experiences, there is no standard approach to HRD planning in environmental and occupational health. Each country adapted the proposed steps or guidelines to its own needs and situation. Yet much was learned in the process which has assisted the countries in their ongoing projects and which can provide insights to other countries that wish to initiate similar HRD planning efforts. What follows is a summary of lessons learned and key points to remember in implementing the steps of HRD planning.

### **5.1 Organize the planners**

In all three countries, the project was based in the Department of Environmental Health of the Ministry of Health, and all faced the common challenge of having to seek collaboration from other sectors that have an impact on environment and health management. It became clear that, without a clear mandate for a multisectoral HRD planning process from high-level decision-makers, the necessary cooperation would not be forthcoming. An alternative approach would be

to base the project in a more neutral setting than the Ministry of Health under the jurisdiction of an intersectoral steering committee.

Equally challenging were the countries' efforts to involve high-level decision-makers from relevant agencies in the planning process. One suggestion for the future is to exact a commitment to assign senior personnel to this activity from those responsible for environmental and occupational health at the beginning of the project. A parallel effort in public relations is also necessary to sustain the ongoing interest and collaboration of decision-makers. The team conducting the HRD study assumed responsibility for this task; however, it might be more successful in the hands of the project coordinator or his/her designate. Ideally, someone should be delegated to the HRD planning project full-time for this purpose.

Subnational rather than national planning may also be more realistic and appropriate for countries with decentralized administration of health and environment. Alternatively, national plans may simply provide criteria and guidelines for provincial HRD planning.

### **Key points**

The following key points may assist future planning efforts:

- ! Identify the core group of implementers of the plan and involve them at the outset. Priority agencies may include Ministries of Health, Environment, Labour, Education, and Planning, as well as the private sector and trade unions.
- ! With decentralized administration in many countries, develop HRD models, policies and criteria at national level for subsequent consideration at subnational level.
- ! Consider forming a larger committee of individuals/institutions who must stay informed and a smaller steering committee for actual implementation.
- ! Clarify the managerial level of the steering committee. Input from both decision-makers and implementers is essential to the ultimate success of the plan.
- ! Develop a strategy to promote intersectoral collaboration. Without concerted efforts, agencies will continue to work along traditional, parallel tracks.
- ! Recognize the need for public relations efforts to gain and maintain interest (e.g. newsletter, personal visits/phone calls, breakfast meetings, etc).

## **5.2 *Raise the issues at the national level***

Most countries utilized a combination of interviews with key decision-makers in relevant sectors followed by a workshop or meeting to launch the project. The workshop proved to be an excellent tool for initiating a national planning process; it provided an opportunity for input from

a variety of sectors and generated interest around the country. However, as the key points below suggest, some prior planning will contribute to a more successful meeting.

### **Key points**

- ! Consider a national workshop/meeting with key sectors present.
- ! Collect relevant data (e.g. reports, surveys) prior to the workshop.
- ! Propose concrete activities and a timeline for the HRD planning process.
- ! Provide clear opportunities (e.g. working groups) for ongoing participation.

### **5.3 Conduct an HRD review and prepare a report**

An important first step in conducting the study is to define its parameters in terms of both the job categories and training opportunities it will document and whether it will have a national or subnational scope. Due to limitations in time, resources and experience, none of the countries conducted the study according to the project's terms of reference. In spite of this, the studies that were done, in combination with the interviews and national workshops, provided countries with a wealth of general information about the status of HRD in environmental and occupational health.

It must be noted, however, that much specific information on the current workforce was not uncovered. This includes information on existing job categories, the number of staff in each position and their distribution by region, their principal functions and competencies, and projected supply and requirements for the next five years. This more quantitative component of HRD planning in environmental and occupational health remains to be done. In many cases, the required data does not exist and needs to be compiled and constructed (e.g. number and type of staff, job profiles). An organizational chart with levels of responsibility for environment and health would also have been useful. In short, the elements of the proposed country review (as presented in Appendix V), if consolidated, would provide countries with a very clear basis for decision-making.

### **Key points**

- ! Clarify the scope and purpose of the study, as well as the definition of environmental and occupational health in the national context. The terms of reference and the WHO Toolkit can be used as resources to design the study.
- ! Ensure that HRD planning is integrated with other health and environment planning.
- ! Consider providing training for the study team in HRD planning and tools for conducting an HRD study.
- ! If surveys are used, define the population to be surveyed. Ensure that the surveyed population is representative of the target group. Enlist participating agencies to administer the survey with their own staff.
- ! Translate data gaps into action proposals in the final plan (e.g. commission a specific study on training needs, including distance learning).
- ! Anticipate how the HRD study can be updated and institutionalized. Identify agencies that will assume this responsibility.

### **5.4 Hold a national planning workshop**

The workshops attracted a very impressive group of experts in the field and the proceedings which emerged from the meetings made a valuable contribution to the ongoing planning process. Common shortcomings were the late distribution of the country report, the absence of certain sectors and disciplines, and the lack of support from political leaders. Some points to remember in setting up such workshops are highlighted below.

### **Key points**

- C Invest time in public relations activities to ensure participation of key decision-makers and sectors. Consider a pre-meeting with essential participants. Organizers may wish to limit the amount of time when decision-makers must be present.
- C Distribute the country report in sufficient time to ensure that it can be read prior to the workshop. If necessary, delay the workshop.
- C Include a brief review of the country report on the workshop agenda.
- C Take advantage of the tools of strategic planning and techniques for group consensus when designing the workshop agenda.

- C Ensure that the workshop includes concrete steps for follow-up with delegation of responsibility and a timeline.

### **5.5 Draft a national HRD plan or framework**

At present, there are no model national HRD plans in environmental and occupational health, but there are works in progress. Some brief orientation to the scope of environmental health services and key job categories is presented in section 2 of this document and further guidelines can be found in the references. Much can also be learned from the years of experience in planning for human resources for general health services which is summarized in the WHO document on *Human resources for health: a toolkit for planning, training and management*. Key topics of the toolkit are highlighted in Appendix XV.

Unfortunately, in most countries, the status of human resources in the field is determined by market forces, environmental crises, and existing access to training opportunities, rather than by multisectoral, priority-based planning. In order to achieve and sustain a workforce with appropriate expertise, planning is essential. A parallel effort should be undertaken to draft national policies that support HRD planning. As more countries undertake and institutionalize similar planning initiatives, more specific guidelines for the field will be developed.

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