PAN AMERICAN HEALTH ORGANIZATION

WORLD HEALTH ORGANIZATION

XXII PAN AMERICAN SANITARY CONFERENCE

XXXVIII REGIONAL COMMITTEE MEETING

WASHINGTON, D.C.

SEPTEMBER 1986

Provisional Agenda Item 5.9

CSP22/18 (Eng.)
30 July 1986
ORIGINAL: SPANISH

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

Document CE97/16 (annexed) on the Regional Program on Chemical Safety was presented to the 97th Meeting of the Executive Committee in compliance with Resolution V of the 92nd Meeting of the Executive Committee (June 1984), which requested the Director to prepare a status evaluation report on chemical safety in the Region and develop a medium-term program.

The document describes how the evaluation study was designed and carried out, and summarizes its results. It then presents the proposed medium-term program of the Regional Program on Chemical Safety (RPCS), drawn up on the basis of the findings of the evaluation study and in consultation with experts of countries in the Region. The main purpose of the Program is to carry out activities for the identification, evaluation, prevention and control of hazards to health and the environment from the handling of chemical substances.

After examining the report, the Executive Committee adopted Resolution XVI, as follows:

THE 97th MEETING OF THE EXECUTIVE COMMITTEE,

Having seen the report on the International Program on Chemical Safety (Document CE97/16),

RESOLVES:

To recommend to the XXII Pan American Sanitary Conference the adoption of the following resolution:

THE XXII PAN AMERICAN SANITARY CONFERENCE,

Having seen the report on the International Program on Chemical Safety (Document CSP22/18);

Considering the information available on the important health problems created in the countries of the Region by the extensive use of chemicals;

Aware of the growing importance of preventing the adverse effects of those chemicals on health and the environment; and

Cognizant of the need to initiate and strengthen concrete measures for reducing the existing problems,

RESOLVES:

1. To take note of the document presented, which contains an evaluative study of the chemical safety situation in the Region, and a medium-term program in this regard.

2. To recommend to the Member Countries the establishment or strengthening of measures for coordination of national programs for the identification, evaluation, prevention and control of hazards to health and the environment associated with the use of chemicals.

3. To encourage the Member Countries that have already started programs to share with other countries, in collaboration with PAHO/WHO, information about their experience and progress.

4. To convey to the Director its satisfaction with the effort made in preparing this document, and to thank the Member Countries for their valuable contributions.

5. To request the Director to implement, to the extent that the Organization's resources allow, the specific activities of the Medium-Term Program proposed in the document.

Annex

executive committee of the directing council

PAN AMERICAN HEALTH ORGANIZATION

working party of the regional committee

WORLD HEALTH ORGANIZATION

97th Meeting
Washington, D.C.
June 1986

Provisional Agenda Item 4.8

CE97/16 (Eng.)
1 May 1986
ORIGINAL: SPANISH

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

This document on the Regional Program on Chemical Safety (RPCS) is presented to the Executive Committee in compliance with Resolution V of the 92nd Meeting of the Executive Committee of 1984, which requested the Director to prepare a status evaluation report on chemical safety in the Region and the development of a medium-term program.

The document covers the origins and aims of the International Program on Chemical Safety (IPCS) and the Regional Program (RPCS), the resolutions on chemical safety at the world and regional levels, and regional activities and trends.

It then describes how the Evaluation Study was designed and performed, and summarizes its results. The Study reveals a great lack in the Region of information on current and potential problems associated with exposure to chemicals, and of policies and programs for dealing with them.

Finally, the document presents the proposed Medium-Term Program of the RPCS, which has been drawn up on the basis of the findings of the Evaluation Study and in consultation with country experts in the Region. The main purpose of the Program is to carry out activities for the identification, evaluation, prevention and control of hazards to health and the environment from the handling of chemical substances.

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Annex: Summary of the Evaluation Study of the Regional Program on Chemical Safety

INTERNATIONAL PROGRAM ON CHEMICAL SAFETY

I. INTRODUCTION AND POLICY BASIS

The International Program on Chemical Safety (IPCS) has been formulated as a response to the danger posed to the health of present and future generations by the widespread manufacture, use and disposal of both new and traditional chemicals all over the world. The safety of chemical substances is of interest to the Member Governments, the prevention of the adverse effects of those substances being essential to the maintenance of health and a hygienic environment.

In the United Nations Conference on the Human Environment at Stockholm in 1972, it was recommended that programs be undertaken to warn against and prevent the deleterious effects of the various chemicals present in the environment, to which man is becoming increasingly exposed. It was also recommended that an evaluation be made of the risks to human health, particularly those stemming from the mutagenicity, teratogenicity and carcinogenicity of those chemicals.

At the Thirtieth World Health Assembly, in May 1977, the Member Governments considered that attention should be given in the health policies and strategies for all countries to the growing use of chemicals in public health, industry, agriculture, food production and the home--along with the environmental pollution being spread by rapid industrialization and the development of new technologies. In Resolution WHA30.47 the Thirtieth World Health Assembly requested the Director-General to study long-term strategies for the evaluation of health risks from exposure to chemicals in the environment, including possible options for international cooperation.

In the Thirty-first World Health Assembly in 1978, following consideration of the report of the Director-General of WHO, Resolution WHA31.28 was approved endorsing the proposal for implementing the program through a central planning and coordinating unit at WHO headquarters and a network of national institutions to be assigned specific tasks. A basic principle of this program has been use of the capabilities of country institutions.

The main purposes of the IPCS are:

a) The performance and circulation of evaluations of the risk to human health from exposure to chemicals on the basis of existing information and data.

b) To advocate the use, improvement and validation of appropriate laboratory methods and epidemiological studies in the evaluation of health hazards, and the proposal of appropriate methods for evaluating exposure and risks to health.

c) To promote real international cooperation in chemical emergencies and accidents.

d) To promote the training of the personnel needed to evaluate the effects of chemicals on health and for the surveillance and control of the hazards they pose.

Other purposes are coordination of laboratory tests and epidemiological studies, which should be addressed on an international basis, and the promotion of research to improve the scientific basis for the evaluation of health hazards and the control of hazardous chemicals.

In its 73rd Meeting in January 1984 the Executive Board of WHO approved Resolution EB73.R10 encouraging the active participation of developing countries in the IPCS and calling for particular attention to:

- The determination of short- and long-term priorities on the basis of the needs of the Member States, and of measures to cooperate with Member States in implementing the Program.

- Ensuring close coordination within the Program and between it and other WHO programs concerned at the national, regional and global levels.

- Encouragement to increasingly active involvement in the Program of all WHO regional offices with a view to strengthening technical cooperation with Member States in the area of chemical safety.

Regional (AMRO/PAHO) Resolutions on Chemical Safety

In October 1970 the XVIII Pan American Sanitary Conference considered the relationship between man and his environment in light of the resolutions of the Twenty-third World Health Assembly. It resolved that PAHO should implement systems for the monitoring of environmental pollution and extend those already in operation.

In 1972 the XX Meeting of the Directing Council of PAHO considered the need to predict the physiological, toxicological, epidemiological and sociological effects of rapid environmental change and resolved to strengthen the knowledge, diagnosis and evaluation of environmental effects on health.

Under the Environmental Pollution Control Program, PAHO undertook the activities to this end and collaborated with several Member Countries in the establishment of comprehensive programs for the prevention and control of environmental pollution and in the establishment of institutions to implement them.

In the 72nd Meeting of the Executive Committee of PAHO in 1974, the Director of the Organization was asked to establish the Pan American Center for Human Ecology and Health (ECO), which would cooperate with the Member Countries in the Region in the prevention of environmental change, not excluding those associated with industrial development or those injurious

to health. In response to that mandate, PAHO and the Government of Mexico agreed to establish the Center in that country (institutionally and functionally, ECO is part of the Environmental Health Program--HPE--at PAHO).

In 1981 the XXVIII Meeting of the Directing Council of PAHO adopted the Plan of Action for Implementation of the Regional Strategies toward Health for All by the Year 2000. One of its sections stresses the need to control pollution by physical and chemical agents with special attention to the establishment of intersectoral relations with national development planning units and the industrial and agricultural sectors. The Plan of Action emphasizes the following:

a) Development of policy and legislation for prevention and control

- Analysis and dissemination of information on physical and chemical pollutants, including data on morbidity and mortality.

- Designation of national focal points to participate in the IPCS.

b) Detection, treatment and prevention of hazards from toxic substances

- Establishment of coordination mechanisms with users of physical and chemical agents for prevention, treatment and control.

- Incorporation of environmental, ecological and biological monitoring in prevention and control programs.

- Education of health service workers and the population regarding newly introduced toxic chemicals.

c) Implementation of policies and plans for prevention and control

- Establishment of information systems for management and decision making.

- Preparation of guidelines for the establishment of environmental and biological monitoring in prevention and control programs.

- Promotion of support from manufacturers and users of physical and chemical substances.

- Development of guidelines and implementation of emergency response mechanisms.

In 1983 the XXIX Meeting of the Directing Council of PAHO approved Resolution XXVIII requesting that the Director consolidate ECO as a center capable of meeting the needs presented by the Organization's Member

Countries, and that ECO's technical program be focused on the epidemiological and toxicological aspects of the effects on health of the principal chemical pollutants of industrial and agricultural origin.

The 92nd Meeting of the Executive Committee of PAHO in 1984 evaluated the Report on the IPCS and approved Resolution V recommending to the Director that he develop the measures suggested in the Report, including the preparation of a status evaluation report on chemical safety in the Region and the development of a medium-term program (1984-1989). The Director was also requested to present a report on the results of these activities to the June 1985 Meeting of the Executive Committee.

The XXX Meeting of the Directing Council held in September 1984, approved Resolution XIV on the IPCS. The resolution urged the Member Governments to participate in activities under the International Program of Chemical Safety (IPCS) and to support the policies and strategies to be adopted in the Region, and to support implementation of the evaluation of the status of chemical safety, mainly in regard to intersectoral action. It also requested the Director to implement measures for evaluation of the status of chemical safety and the framing of proposals for regional medium-term programs.

During 1985 both the Executive Committee and the Directing Council of PAHO discussed and took note of the progress report of the Evaluation Study and the framing of the associated Regional Medium-Term Program.

II. ANALYSIS OF THE SITUATION

The Evaluation Study presented in Annex 1 analyzes in detail the situation as to chemical safety in the Region. The present section of the document summarizes the highlights of that analysis.

The nature and magnitude of the effects on health and the environment of the manufacture, use, disposal and handling of chemicals are imperfectly understood. It is known, however, that the harm being done to the health of the population, the ecological damage and the economic consequences of these activities are together creating a situation so serious as to compromise both national development in general and public health in particular.

The leading problems associated with chemicals stem from the route of exposure and the resulting hazard, and include the chemical quality of drinking water, the pollution of surface and groundwaters, the treatment and disposal of hazardous wastes, pollution of the air, foods and the working environment, and accidents.

Special attention is given to the problem of exposure to pesticides and their effects on health and the environment. Other areas in which deficiencies have been detected are the evaluation of risks and the techniques for evaluating the environmental and health impact of development projects.

The chemical safety situation in the region is well summed up in the conclusions of the Evaluation Study as follows:

1) It is recognized that the harm being done to the health of the population, the ecological damage and the consequences for social and economic development that have been produced in recent decades in the Region by the improper use of chemical substances are creating a situation so serious as to compromise both national development in general and public health in particular.

2) The situation found at the national and regional level is highly diverse, and under ongoing evaluation is yielding an unfavorable picture of the situation in this area.

3) The magnitude and nature of the environmental and health effects of the use, manufacture and handling of chemicals are imperfectly understood.

4) The situation in the developing countries suggests that many of the diseases and deaths in them are associated with chemical substances.

5) A lack of political will is the foremost impediment to the implementation of effective national programs.

6) Most of the countries lack clear-cut policies for harmonizing the activities in the different sectors and the involvement of the planning, promotion and development sectors, which are best placed to handle the preventive aspects.

7) In some countries these problems have grown faster than the capabilities for dealing with them when administrative and structural changes have been made that have reduced the authority of the technical units responsible for environmental health and have curtailed the manpower employed in this area.

8) In some countries the agencies in the environmental sector are doing important but insufficient work for the control of chemical substances.

9) The health ministries have not been shouldering their proper responsiblities in relation to the problem.

10) Most of the countries do not have specific programs for the prevention and control of chemical risks to health and the environment.

11) This problem is multisectoral in its analysis and solution and not a responsibility of the health sector alone. In many of the countries institutional development in this area is poor.

12) Research in this area is scanty and of limited scope in most of the countries.

13) The countries have limited access to technical information in this area.

14) Legislation in this area is inadequate in the countries.

15) The chemical and toxicological analysis laboratories are undersupplied with equipment and qualified personnel.

16) On the whole, the population is uninformed on the substances to which it is exposed, including routes of exposure and associated risks.

17) The countries have not developed mechanism for the evaluation of probable risks of chemical emergencies or any appropriate contingency plans.

III. WORKING PHILOSOPHY OF THE PROGRAM

For the conduct of the Regional Program, provision has been made for both the aspects of the identification and evaluation of risks and their prevention and control. The connection with the IPCS conducted at the world level from WHO Headquarters is close in the identification and evaluation of risks because of the emphasis and primacy that the IPCS has given to this part of chemical safety.

Because of the close connection of chemical safety with activities of different units in the Organization, an IPCS Inter-Program Coordination Group has been set up in the Health Programs Development Area of the PAHO Secretariat. The chief functions of this Group are to coordinate and harmonize the chemical safety related operations under PAHO's programs and to collaborate with the Environmental Health Program in its operations as the IPCS focal point. Hence, the Medium-Term Program is of concern to the different working units of PAHO members of the Inter-Program Coordination Group, which are operationally responsible for its specific activities.

IV. PURPOSE

The purpose is to develop a Regional Program of Chemical Safety (RPCS) that will help generate and strengthen country programs for the identification, evaluation, prevention and control of hazards to health and the environment associated with the handling of chemicals.

V. GOALS

The goals are that by 1989 the countries, on the basis of their needs and capabilities:

5.1 Will have begun the development and implementation of proposals for the evaluation of risks from exposure to chemical substances which complement the required national prevention and control programs.

5.2 Will have strengthened their respective programs for the prevention and control of health and environment effects from the production, handling and use of chemicals and the final disposal of their residues.

6. STRATEGIES

6.1 Development of National Plans in Priority Areas of Chemical Safety

- To promote research toward the identification, evaluation, prevention and control of risks.

- To encourage the governments to devise plans consonant with their needs, priorities and means.

- To frame and promote standards and guidelines that will be helpful in the framing of national plans.

- To promote arrangements for operational coordination among governmental, academic and private institutions.

- To promote incorporation of the ideas and practices of "risk evaluation" and "risk control" into programs that may be implemented locally.

- To promote, in conjunction with the countries, the performance of studies toward stengthening political support to the implementation of preventive and control measures.

- To promote the establishment of networks of national and international collaboration among institutions working in the areas of epidemiology, toxicology and environmental engineering.

6.2 Generation and Exchange of Information

- To encourage exchanges of information on program policies.

- To frame and disseminate criteria for evaluating the efficiency of programs.

- To facilitate access to information so that countries may update their legislation on the safe handling of chemical substances.

- To disseminate information on the risks associated with chemicals, utilizing to the utmost the data provided by the International Register of Potentially Toxic Chemicals (IRPTC).

- To assimilate the information on chemical safety work into REPIDISCA.

6.3 Manpower

- To collaborate with the countries in the analysis of their manpower needs on the basis of their priorities.

- To recommend the appropriate levels of instruction and training required at the regional and national levels, making the most of the studies and materials produced by the IPCS (WHO) and the IPCS (EURO), among other sources.

- To encourage the production of education materials needed for personnel training in both methodological aspects and the handling of specific problems.

- To promote increases in fellowships and exchanges.

- To promote the compilation and dissemination of information on institutions offering training in subjects of interest to the Program.

- To encourage research institutions in the countries to develop programs in support of instruction.

6.4 Institutional Development

- To promote the development of agencies and institutions in connection with the Program in the countries.

- To promote the publishing of manuals for the proper development of analytical laboratories and techniques.

- To study the feasibility of setting up and supporting specialized regional, subregional and national laboratories in support of programs.

- To encourage the development of programs for controlling the quality of laboratories.

- To encourage interinstitutional collaboration both in and among the countries.

Goal		Activity	Executing Unit	Linkage
1. By 1989 the countries shall have initiated, based on their needs and capabilities, the development and implementation of principles and procedures for the evaluation of risks from exposure to chemical substances, such as to faciliate the formulation of needed national prevention and control programs.	1.1	Cooperating in the diagnosis of the chemical pollution situation, including the determination of needs, policies, strategies and resources for the development of national programs.	HPE-ECO-WH	HST
	1.2	Promoting and cooperating in the building in the countries of networks of collaborating institutions in the areas of environmental epidemiology, toxicology, and the prevention of risks from pesticides and other chemical pollutants.	HPE-ECO	
	1.3	Selecting, adapting, preparing and disseminating guidelines, criteria and procedures on the epidemiological methodology and evaluation of risks, toxicology and analytical techniques, and the prevention of poisoning by chemicals, and pesticides in particular.	HPE-ECO	
	1.4	Selecting, adapting, preparing and disseminating education materials on epidemiological surveillance and environmental monitoring, epidemiological research of environmental risks, basic and intermediate toxicology, and the prevention of poisoning and reduction of specific risks from pesticides and heavy metals.	HPE-ECO	
	1.5	Cooperating in the training of health service personnel in techniques for the evaluation of impacts on the environment and health.	HPE-ECO	
	1.6	Providing information and technical cooperation for the formulation of programs and measures for the prevention and control of chemical hazards consonant with the development level of each country.	HPE-ECO	
	1.7	Promoting and supporting scientific research on the health effects of environmental hazards, such as the frequency and distribution of pathologies, the evaluation of environmental and health impacts, and others.	HPE-ECO	
	1.8	Integration of ECO into the PAHO/PAHO-LINE, REPIDISCA and BIREME information system, the identification of collaborating institutions to become part of the system and disseminate information on the toxicology and epidemiology of risks from exposure to chemicals and on the impact of environmental pollutants.	HPE-ECO	WHO/GEMS
	1.9	Preparing a catalogue of specialized institutions to be consulted in chemical emergencies.	HPE-ECO	PED
	1.10	Promoting the establishment of toxicology and environmental chemistry laboratories in the countries.	HPE-ECO	

Goal		Activity	Executing Unit	Linkage
2. By 1989 the countries, based on their needs and capabilities, will have strengthened their specific programs for the prevention and control of the health and environmental effects from the production, handling, and use of chemicals and the final disposal of their residues.				
	Drinking water	2.1 Promoting and supporting evaluation of the chemical quality of water supplied to rural and urban populations in the Member Countries, and identifying the main hindrances to improving that quality.	HPE	
		2.2 Disseminating WHO Drinking Water Quality Guidelines to the Member Countries.	HPE	EHE/WHO
		2.3 Conducting two workshops and four seminars to promote and update the drinking water quality standards of the counties and to develop and strengthen country programs for improving that quality, with emphasis on chemical aspects.	HPE	
		2.4 Promoting and collaborating in the establishment and organization of a system or network of analytical quality control laboratories (PRELAB).	HPE/CEPIS	
		2.5 Promoting and collaborating in the strengthening of programs for monitoring the quality of water for human consumption in the Ministries of Health, including planning, methodologies, the drafting of legislation, coordination.	HPE	
		2.6 Providing technical cooperation to the countries in launching and expanding their programs for fluoridation and the removal of excess fluorides, as appropriate.	HPE	HSD
	Control of pollution of surface waters by toxic substances	2.7 Developing methodologies for evaluating the fate of toxic substances in surface water in order to establish the level of control of discharges thereof for the protection of public health.	HPE/CEPIS	Manhattan College
		2.8 Establishing and disseminating criteria and guidelines for the control of discharges of toxic substances.	HPE-CEPIS	
		2.9 Preparing a manual on evaluation of the impact of discharges of toxic substances.	HPE-CEPIS	

Goal		Activity	Executing Unit	Linkage
	2.10	Conducting one regional or subregional seminar a year for the dissemination of evaluation and control technologies.	HPE-CEPIS	
	2.11	Providing technical assistance in the performance of five specific studies and research projects on the pollution of surface waters by toxic substances	HPE-CEPIS	
Control of groundwater pollution	2.12	Establishing and disseminating criteria for the control of groundwater pollution.	HPE-CEPIS	
	2.13	Development and dissemination of techniques and methodologies for the identification and evaluation of groundwater pollution, and the preparation of a manual on its control.	HPE-CEPIS	EGWI
	2.14	Conducting two regional seminars to disseminate methodologies and techniques for the detection, evaluation and control of groundwater pollution, and providing technical cooperation to six countries in the conduct of control programs based on case studies.	HPE-CEPIS	
Control of air pollution	2.15	Providing technical cooperation to four countries in evaluations of the situation, including the determination of needs, personnel, equipment, infrastructure, legislation, etc., and in the conduct of control programs.	HPE	EHE/WHO GEMS
	2.16	The conduct of a regional seminar to analyze the situation in the countries and frame guidelines and procedures for the conduct of programs and planning.	HPE	
	2.17	Promoting participation by the countries in the project.	HPE	
Safe handling of hazardous wastes	2.18	Collaborating with Argentina, Brazil, Mexico and two other countries in the formulation and implementation of national programs for the handling of special and hazardous solid wastes.	HPE-CEPIS	HPW
	2.19	Holding a Latin American gathering of those in charge of the handling of special and hazardous solid wastes.	HPE-CEPIS	
	2.20	Compiling and disseminating technical information on plans, strategies and technologies for the handling of hazdardous wastes.	HPE-CEPIS	

Goal		Activity	Executing Unit	Linkage
Health of workers	2.21	Establishment of environmental and health monitoring activities in different places of work and groups of workers.	HPE-WH	
	2.22	Promoting and cooperating in the development of rules and standards of occupational health, hygiene and safety for the protection of workers from exposure to chemicals and to avoid occupational accidents, diseases and other hazards.	HPE-WH	
	2.23	Promoting and providing technical support to the incorporation of exposure-effect relationships into monitoring programs as an important epidemiological procedure for monitoring trends in the health of workers.	HPE-WH	
	2.24	Encouraging and sponsoring seminars and meetings at the national and regional levels, particularly for occupational health personnel in industry and other sectors, on the formulation of policies and principles for the protection and promotion of workers' health.	HPE-WH	
Food protection	2.25	Cooperating in the development, adjustment and refinement of analytical techniques for the detection and quantification of residues.	HPV	HPE
	2.26	Preparing, publishing and distributing manuals on analytical chemical techniques for testing foods - Food chemistry - Food toxicology - Analytical techniques for detection and quantification of residues.	HPV	HPE
	2.27	Compiling, publishing and distributing bibliographical and technical information on the problem of residues in foods.	HPV	HPE
	2.28	Cooperating in evaluation and development of new analytical techniques for the chemical and microbiological testing of foods, particularly techniques that are quick, simple and inexpensive.	HPV	HPE
	2.29	Cooperating in studies for development of quick and inexpensive analytical techniques for the detection of residues.	HPV	HPE
	2.30	Performance of studies for development of new nondestructive sampling techniques for analysis of foods.	HPV	HPE

Goal		Activity	Executing Unit	Linkage
	2.31	Cooperating in conduct of surveys on level of food contamination with undesirable residues.	HPV	HPE
	2.32	Organizing and conducting seminars and workshops on the epidemiology and prevention of food-borne diseases (FBDs).	HPV	HPE
	2.33	Cooperating in epidemiological research on FBD outbreaks to determine etiologic agents, the foods that carried them, and the causal factors.	HPV	HPE
	2.34	Performing studies and compiling information on chemical composition and quantities of additives and other residues as aid to preparation of food specifications and standards.	HPV	HPE
Control of application of pesticides in animal health and veterinary public health	2.35	Cooperating in design of procedures for the use of pesticides in the control of ticks and other livestock ectoparasites.	HPV	HPE
	2.36	Collaborating in conduct of surveys on environmental pollution from use of pesticides in animals.	HPV	HPE
	2.37	Design of system for monitoring and reporting on human poisoning with pesticides applied to animals.	HPV	HPE
	2.38	Organizing and conducting seminars and workshops on application of pesticides in animals.	HPV	HPE
	2.39	Framing of standards for use of pesticides in animal health and veterinary public health on basis of their hazardousness.	HPV	HPE
Chemical accidents	2.40	Organizing reporting networks and indexes of information sources.	PED	HPE
	2.41	Acquisition, adaptation, translation and dissemination of important information.	PED	HPE
	2.42	Development of a reference system.	PED	HPE
	2.43	Technical support to workshops in the countries.	PED	HPE
	2.44	Assistance to governments in preparation of plans for responses to chemical accidents.	PED	HPE

Goal		Activity	Executing Unit	Linkage
Maternal and child health	2.45	Collaborating in activity 2.24 to broaden seminars and meetings so as to include aspects of poisoning prevention in the protection and promotion of maternal and child health.	HPE-WH-HPM	
	2.46	Promoting and cooperating in development of programs for prevention of exposure to chemicals in the home, and for avoidance of accidents and direct injuries to mothers and children.	HPE-HPM	
	2.47	Promoting and providing technical support to incorporation of epidemiological surveillance of chemical accidents in the home and place of work into maternal and child health programs as an important element for assessing importance of this aspect to health of mothers, young people and children.	HPE-HPM	

Note: HPE: Environmental Health Program
PED: Emergency Preparedness and Disaster Relief
WH: Workers' Health
HST: Health Situation and Trend Assessment Program
ECO: Pan American Center for Human Ecology and Health
CEPIS: Pan American Center for Sanitary Engineering and Environmental Sciences
HPV: Veterinary Public Health
EHE: Environmental Health Program (WHO)
HSD: Health Services Development

CE97/16 (Eng.)
ANNEX

SUMMARY OF THE EVALUATION STUDY OF THE REGIONAL PROGRAM ON CHEMICAL SAFETY

APRIL 1986

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Appendix: List of Chemical Substances

SUMMARY OF THE EVALUATION STUDY OF THE REGIONAL CHEMICAL SAFETY PROGRAM

1. Purposes

1.1 Purposes of the Evaluation Study

In its XXX Meeting in September 1984, the Directing Council of PAHO approved Resolution XIV requesting the Director to implement the measures for evaluation of the status of chemical safety in the Region and the framing of proposals for medium-term programs.

The principal purpose of the Evaluation Study of the Regional Program on Chemical Safety (RPCS) was to determine the nature of the chemical safety problems in the Region of the Americas, and particularly the effects of chemicals on health and the environment. The information obtained was used as a basis for the continuation of instruction and development of the Regional Program. In addition, the Study would help in:

a) Examining and defining the nature of the problems associated with chemical safety in the countries.

b) Fostering intersectoral collaboration in the countries through intersectoral participation in the conduct of their respective evaluation studies.

c) Assessing the effectiveness of existing control programs and improving them as needed.

1.2 Methodology

To perform the Study, it was considered necessary to have the collaboration of the authorities in the countries of the Region for the carrying out of national evaluation studies, which in turn would be merged into a regional study.

Because of time and funding constraints, it was decided to carry out individual evaluation studies in Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Peru and Venezuela.

PAHO prepared a study guide to provide orientation on the content and the manner of performing these studies. The guide was discussed first in a meeting of the RPCS Inter-Program Committee in October 1984 at PAHO headquarters in Washington. Later, in January 1985, a second meeting was held at the Pan American Center for Human Ecology and Health (ECO) to define the information requirements and to consider the strategies, timetables and proposals needed to structure the Study. In addition, the final version of the study guide was prepared and the views of the participants in the countries on how to conduct it were discussed. The participants in that meeting were experts from Argentina, Brazil, Mexico, and the United States of America, and staff of PAHO.

Exactly how the country studies would be performed was then discussed with the local authorities of Argentina, Chile, Colombia, Cuba, Mexico, Peru and Venezuela. In addition to the study guide, the discussion covered the institutions and personnel needed to do the work.

The country evaluation studies were carried out between July and October 1985. All the countries except Peru presented their reports on the Study to ECO by mid-October. In early November a meeting of the coordinators of the country studies and PAHO staff was held at ECO to discuss the studies and begin work on a joint document at the level of the Region and of the Medium-term Regional Program. This meeting generated the first draft of the Evaluation Study and the Medium-Term RPCS.

On 23 January 1986 the RPCS Inter-Program Committee met again to consider and discuss the first draft of the Evaluation Study and the Medium-Term RPCS. Suggestions were made on how to improve the documents, and were carried out to produce a second draft of them.

A meeting of representatives of Bahamas, Brazil, Canada, Chile, Mexico, United States of America, and Venezuela, was held from 26 to 28 February to review and discuss the second draft. On the basis of those discussions, revised versions of the Study and the Medium-Term Program were prepared. These versions were again reviewed by the staff of PAHO and presented to another meeting of the RPCS Inter-Country Program on 27 March 1986. It was from that meeting that emerged the version here presented of the Evaluation Study and Medium-Term RPCS.

The specific subjects considered in the Evaluation Study in accordance with the study guide drawn up by PAHO were as follows:

1.2.1 Chemicals suggested for consideration in country studies

For this study, 84 chemicals were selected to which WHO had assigned priority because of their effects on health and the environment, and their common use the world over (See Appendix). The countries participating in the Study could include other substances of interest to themselves. It was proposed that the following aspects be studied for each substances:

- Quantities produced and imported.
- Legislation (laws, regulations, standards, etc.) on uses, storage, transportation, exposure, disposal of wastes and other aspects of the handling of these substances.
- Existing chemical analysis laboratories able to give support to chemical safety programs.
- Information on population exposed both occupationally and otherwise.
- Chemical accidents.

1.2.2 Distribution among government agencies and sectors, such as health, labor, transportation, agriculture, the environment, etc. of responsibilities for the safety of chemicals, including the availability of human and financial resources.

1.2.3 Analysis of activities for manpower training in disciplines relevant to the control of chemical substances, and information on programs, university courses, and specific instructional and training events in the subject.

1.2.4 Access to information on chemical safety, including determination of whether the leading government agencies and institution of higher learning receive and are acquainted with the leading publications on the subject, particularly the international publications, such as those prepared by the IPCS/WHO/UNEP/ILO and PAHO/ECO.

1.2.5 Community participation in the planning and execution of activities and programs on the subject.

As previously mentioned, the country studies that contributed to the Evaluation Study of the Americas were carried out in seven countries of the Region: Argentina, Brazil, Colombia, Cuba, Chile, Mexico and Venezuela. These studies were complemented with information and experience available on these subjects in PAHO and other international agencies of the Region both for those countries and for the others in the Region.

The coordination work done by the institutions that conducted the country studies was of decisive importance for obtaining the necessary data, which were generally dispersed among different goverment and private agencies.

2. Results of the Evaluation Study

Following is a summary of the salient parts of the Study. The text frequently makes qualitative assessments of aspects that it would be desirable to present quantitatively. Quantification is very difficult, however, and goes beyond the purposes of the Study at the present time.

2.1 Public health problems associated with exposure to chemical substances

What little information was obtained on the epidemiological aspects of exposure to chemical substances was of a disparate and uncomparable nature. There is a very serious shortage of representative and quality epidemiological information, and ignorance about the effects of exposure to chemicals on the health of human populations in the Region. This is also true of exposure in occupational situations and dramatically so of exposure through environmental pollution. This information is difficult to

gather because, among other reasons, it is widely dispersed in the records of different institutions and sectors; the records are not continuous and access to them is restricted, or else there are simply no data. Moreover, the quality of the information that could be obtained is uncertain in some cases and may lack the desirable representativity.

Despite these limitations, there are grounds for suspecting the existence of a number of health problems associated with exposure to chemicals through their concentrations in the natural and occupational environments. The presence alone of certain types of industries, energy-generating processes, means of transport, mining and industrial centers, and agricultural activity in the different countries is itself an indication of the existence of these health problems.

The data obtained are the results of different approaches to the problem, and cannot be used to quantify or estimate the population occupationally exposed to specific chemicals. The studies done by the different countries identify groups exposed to only very small numbers of substances, in which specific programs are being carried on for very limited geographic areas within the given country. Another methodology would allow an indirect assessment of the number of persons exposed to groups of substances--solvents, for example--based on the distribution of the working population among the different employment sectors.

Depsite these limitations, it is valid to infer that a substantial number of people are occupationally exposed to chemical substances in the Region.

Some identified examples of occupational exposure to chemicals in the Region are as follows: Cuba reports about 5,000, 14,000 and 17,500 individuals occupationally exposed throughout the country to mercury, lead and organophosphorus pesticides, respectively. Venezuela has reported, for the Federal District of Caracas alone, about 1,000, 1,500 and 14,000 individuals occupationally exposed to organophosphorus pesticides, mercury and lead, respectively. These and other estimates of occupational exposure in Venezuela are presented in Table 1.

Table 1

ESTIMATES OF OCCUPATIONAL EXPOSURE TO DIFFERENT SUBSTANCES IN VENEZUELA

	No. of workers exposed	Percentages
Cement, lime, solvents, detergents, chemical and other agents	25,014	30.25
Lead	13,760	16.64
Mercury	1,414	1.71
Chromium	910	8.45
Industrial solvents	7,072	8.45
Gases and vapors (chlorine)	1,133	1.37
Organophosphorus insecticides	959	1.16
Acids and caustic alkalis	108	0.13
Carbonmonoxide	396	0.48
Arsenic	25	0.03
Others	31,900	38.68
Total	82,690	100.00

Source: Evaluation Study Report of Venezuela.

Information on non-occupational exposure--that incurred because of chemical pollutants in the environment--is virtually nonexistent or very general as to the populations exposed. Almost all the countries reported the urban populations as exposed in varying degree to chemical air pollutants. There are some populations, however, on which specific information is available. One matter of special interest is the identification and study of populations exposed to environmental pollution by specific substances, as, for example, to arsenic in drinking water and foods in Argentina, Chile and Mexico. In Chile there is a very well identified, discrete population of about 380,000 who are potentially exposed to natural pollution of water by arsenic.

There are also specific cases of exposure to man-made air pollutions which have been analyzed in detail. Greater Buenos Aires, with a population of almost 10 million persons, has extensive sections that draw their drinking water from underground sources which, being high in nitrates, pose a high health risk to infants.

In the town of Santo Amaro, Bahía State, Brazil, a study has been made and reported on the environmental effects and hazards to health of emissions and discharges of lead and cadmium from a lead smelting plant. The results have been recently published of a study designed to detect lead poisoning in the children of this area by measuring the levels of zinc and lead protoporphyrin in the blood of the children. The results of the study demonstrated the existence of a serious health problem caused by lead poisoning.

The results of an evaluation study of human exposure to lead in several countries, including Mexico, conducted by WHO in collaboration with other international and local agencies, were published in 1985. The study measured lead concentrations in the blood and feces of about 200 teachers in each city, and concentrations in the air. The figures for these three concentrations in Mexico City are considered high. In Venezuela the national authorities are beginning a similar study that will measure lead concentrations in the air and in human blood in the city of Caracas.

Moreover, the diversified and extensive use of pesticides on farms, in inappropriate health campaigns, and in households, is causing varying degrees of exposure in major sectors of the general population.

2.1.1 Morbidity and Mortality

There are no systematic records of morbidity and mortality associated with exposure to chemicals. The difficulty of determining the denominators for morbidity and mortality rates has already been cited. The case is the same for the numerators, and the difficulty is added to by an

absence of diagnoses and the currently used classification of causes of death, which does not allow the clear identification of the etiologic agent or the circumstances of its contact with the individual.

It is important to mention that, with rare exceptions, there is nowhere in the Region any program for the evaluation of environmental or biological quality which, apart from its preventive aims, would enable the quantification of morbidity and mortality associated with exposure to chemical substances.

Some countries have morbidity data obtained from occupational medicine records, which show that about half of the diagnoses are in three major categories: dermatoses, lead poisoning, and pneumonopathies, including occupational asthma and pneumoconiosis. Tables 2 and 3 present, by way of example, the information obtained in this regard for Mexico and Venezuela, respectively. There are also figures on hospital consultations for acute poisoning, which point to a high frequency among the general population.

Although the available data do not yet convey an accurate picture of mortality, there are some that could give an idea of the mortality from exposure to chemical substances.

Firstly, Cuba reports 24 deaths from chemical accidents in 1984. Mexico reports 43,435 cases caused by chemicals in 1982, resulting in 1,000 deaths. Venezuela recorded an average of 406 cases a year of pesticide poisonings during the period 1974-1982, and this figure rose to 812 a year for the period 1983-1984; overall lethality during the period 1974-1984 was 9.1%. In 1973 and 1977, respectively, Colombia recorded 804 and 608 deaths from chemical poisoning. Table 4 shows the incidence of pesticide poisoning in Costa Rica and Venezuela in recent years.

Fatal accidents associated with pesticide contamination of foods are surprisingly frequent in the Region. Some years ago in Costa Rica a truck was hauling a load of flour together with containers of parathion; apparently parathion spilled out of one of the containers, contaminating several sacks of flour; the result was the death of seven persons and acute illness in another 36 who ingested the flour. Part of the same load of flour reached Panama, where it caused the death of 25 persons.

In January 1975 in Jamaica, a load of flour was received that had become contaminated with parathion before being unloaded in the port. That flour was distributed to three different towns--Dalvey, Bull Bay and Yallahs--where it produced a total of 72 cases of poisoning, of which 17 proved fatal. At Chiquinquirá, Boyacá Department, Colombia, a similar case of contamination of wheat flour by parathion occurred in 1967 which resulted in more than 100 cases of poisoning and 30 deaths. In Argentina, three children were reported to have died as a result of an accidental contamination of milk powder by parathion.

Table 2

OCCUPATIONAL DISEASES IN THE MEXICAN SOCIAL SECURITY INSTITUTE
1978-1982

Occupational Diseases	1978		1979		1980		1981		1982	
	No.	%	No.	%	No.	%	No.	%	No.	%
Dermatoses	589	28.7	601	30.3	580	26.4	723	29.1	511	29.3
Pneumoconiosis from silica and silicates	582	28.4	599	30.2	750	34.2	614	24.7	236	13.5
Toxic effects of lead	185	9.0	205	10.3	231	10.5	229	9.2	253	14.5
Toxic effects of aromatic and corrosive substances acids and caustic alkalis	85	4.1	63	3.2	82	3.7	248	10.0	159	9.1
Respiratory insufficiency rhinopharyngitis, asthma, bronchitis, laryngitis, etc.	55	2.7	51	2.6	68	3.1	273	11.0	190	10.9
Silicotuberculosos	26	1.3	15	0.8	8	0.4	6	0.2	2	0.1
Other diseases unrelated to chemical substances	525	25.8	448	22.6	476	21.7	392	15.8	368	22.6

Source: Evaluation Study Report from Mexico.

Table 3

OCCUPATIONAL DISEASES
JUNE 1980-JUNE 1985
METROPOLITAN AREA
VENEZUELA

Diagnosis	No. of Cases	Percentages
Hypoacusis	1,216	39.03
Dermatosis: Dermatitis caused by cement, solvents, detergents, fats and oils, chemicals, lime, gum, and other specific agents; unspecific dermatitis, neurodermatitis, occupational acne, leukoderma, xeroderma, hyperkeratosis, radiodermatitis, folliculitis, onycholysis	938	30.11
Toxic effects of lead	484	15.53
Disorders of the respiratory system	152	4.87
Toxic effects of industrial solvents	109	3.49
Toxic effects of mercury	52	1.66
Toxic effects of organophosphorus insecticides	34	1.09
Toxic effects of chromium	32	1.02
Irritative actinic conjunctivitis	32	1.02
Occupational neuroses	17	0.54
Toxic effects of carbon monoxide	14	0.41
Diseases caused by x-rays	13	0.41
Toxic effects of gases and vapors (chlorine)	8	0.25
Toxic effects of corrosive substances	4	0.12
Viral meningoencephalitis	1	0.03
Toxic effects of arsenic	1	0.03
Others	8	0.25
Total patients seen up to June	24,367	
Total verified occupational diseases	3,115	
Average consultations/patient	6	
Percentage of occupational diseases	12.78	

Source: Evaluation Study Report of Venezuela.

Table 4

CASES OF PESTICIDE POISONING IN
COSTA RICA AND VENEZUELA

Year	Costa Rica	Venezuela
1978	307	361 (26)*
1979	423	408 (43)
1980	593	438 (39)
1981	491	458 (60)
1982	613	387 (70)
1983	790	669 (60)
1984		955 (73)

*Figures in parentheses are numbers of deaths; no deaths reported for Costa Rica.

Sources: Evaluation Study Report of Venezuela; PAHO, Proceedings of the Symposium on Chemical Emergency Preparedness, 23-27 July 1984, Metepec, Mexico State, Mexico.

Secondly, there are studies and information in the Latin American countries, particularly during the last two decades, on the presence of toxic chemicals in the body in human populations. Samples of hair, nails, blood, urine, adipose tissue and breast milk have demonstrated high levels of pesticides, heavy metals and other substances, frequently above the maximum levels recommended by WHO and other agencies.

A collaborative study carried out recently by WHO and the United Nations Environmental Program (UNEP) in China, India, Mexico, Belgium, the Federal Republic of Germany, Israel, Japan, Switzerland, Yugoslavia and the United States of America showed that average levels of organochlorine pesticides in breast milk were regularly much higher in the first three named countries than in the others.

It is important to note that in most of the countries of the Region the mortality profile has changed substantially in recent years. After being caused primarily by communicable diseases in the past, mortality is becoming increasingly associated with the so-called chronic pathologies. Moreover, exposure to chemicals is increasingly associated with the incidence of chronic diseases; good examples are certain types of cancer and some congenital malformations.

To summarize, despite the absence of adequate figures on morbidity and mortality associated with exposure to chemical substances, it can be asserted that acute poisoning and the diseases that emerge as a long-term effect of exposure to chemical substances are an important and growing problem in the Region.

2.1.2 Chemical Accidents

As here defined, an accident is an unforeseen event that changes the usual order of things and results in injury to persons or objects.

Three important aspects may be cited that greatly affect the quality of the diagnosis of accidents. Firstly, there is no consensus on what the different countries enter in their records as "chemical accidents," for the entries under this heading range from individual cases of poisoning through occupational accidents to catastrophic accidents. Secondly, there is obvious disparity among the countries in their perception and recording of the incidence of accidents: some have a systematic procedure for the compilation of data whereas others apparently record them only anecdotically. Thirdly, the information betrays a substantial degree of ignorance and underrecording on the part of the health sector of events of this type in the countries.

The foregoing notwithstanding, there is enough information to indicate that this is a problem of major magnitude.

Venezuela reports six fish kills between 1982 and 1984 without saying whether human communities were affected or naming the chemical substance involved. Other countries, such as Saint Lucia and Brazil, have also reported fish kills.

Colombia reports three episodes of pesticide poisoning, with 121 cases and 32 deaths, between 1967 and 1985.

Between 1978 and 1985 the state of Sao Paulo, in Brazil, recorded a total of 90 episodes, 72% of which were caused by petroleum and petroleum products. Between 1984 and October 1985, Mexico recorded 34 episodes, the principal causative substances being pesticides and metals. Twenty-eight of those episodes caused 2,321 cases, of which 271 were fatal, for a lethality of 12%.

In Freeport, Bahamas, episodes have been detected of air pollution by mercaptan gas emission from a pharmaceutical plant, causing health problems, nausea and headaches in the children at a school nearby. It was established that these isolated incidents occur whenever the air pollution control equipment malfunctions.

The short- and long-term adverse effects of chemical accidents on the environment and ecology are very seldom investigated. In the town of Porto Feliz, Brazil, there was a spill of about 400 cubic meters of organic solvents on 31 May 1983. A research project will endeavor to determine during 1986-1987 the present extent of the groundwater pollution caused by that spill.

With rare exceptions, the methodologies for the evaluation of accident risks are not systematically applied. As a result, plans for preventive and corrective measures are inadequate or nonexistent, and, when accidents do occur, their consequences are severe.

2.2 Capability of the Countries to Deal with Problems of Chemical Safety

2.2.1 Substances of Interest to the Program

There was a consensus that the list of chemical substances considered in the Evaluation Study includes most of those of environmental and occupational concern in the Region. However, some countries have identified other chemicals of interest to them, including hydrofluoric acids and fluorides, benzene, xylene, dioxins, picloram, and arsenic pesticides.

The information obtained during the Study came from different sources, notably private industry, foreign trade agencies, economic statistics institutions. In all the countries the information on the production, imports and exports of chemical substances is widely dispersed and fragmented among a diversity of institutions. More information is available on imports and exports than that on production and handling, which is scarce and hard to come by. In Brazil, however, detailed information was found on both production and exports and imports. There are statistics on the country's annual imports of 56 chemical products and substances. Table 5 shows that information is available on the capacity to produce about 170 specific chemicals in seven different categories. In addition to the figures on the annual production capacity of these products, there are statistics on the quantities exported and used in the country.

In other countries, however, there are no disaggregated figures that clearly discriminate between the various substances as raw materials and as final and intermediate products. Because of this, no analysis could be made of the volumes of the different substances that were imported, produced and exported.

Of particular interest in all the countries is the quantities of pesticides produced and imported. Table 6 presents the statistics for Chile, Colombia and Venezuela as examples. Note the wide variety and quantities of pesticides involved. DDT, prohibited in several developed countries, is still used and produced in some countries of the Region.

2.2.2 Institutions and Programs

Table 7 sums up the information on institutions and sectors having chemical safety programs in the seven countries in which specific country studies were carried out.

2.2.2.1 In most of the countries the responsibility for the working environment is shared among the sectors of health, labor, social security, agriculture and mining. In some instances the large public and private enterprises also play an important part. The sectors with the greatest responsibility and coverage are health, labor and agriculture, but they are found to have done little in this area.

Responsibility for the health of the worker is shared among the sectors of labor, health and social security, particularly the two last-named sectors, with the participation of the large enterprises. It is important to mention that the predominant emphasis here is toward curative medicine. Concern for health problems deriving from exposure to chemical substances is insufficient even in the curative aspects.

Table 5

SUMMARY OF INSTALLED CAPACITY TO PRODUCE CHEMICAL SUBSTANCES IN BRAZIL

Product Group n products *	Production (tons/year)
Inorganic products 97 products	7,500,000
Basic organic substances 11 products	3,600,000
Intermediate products for detergents and surfactants 7 products	296,000,000
Intermediate products for fertilizers 9 products	5,350,000
Intermediary products for plastics 9 products	1,120,000
Agricultural protection substances 16 products	86,700
Plasticizers and their intermediates 14 products	373,000

* n products signifies the number of products for which specific information on the installed production capacity is available.

Source: Evaluation Study Report of Brazil.

Table 6

ANNUAL PRODUCTION AND IMPORTATION OF PESTICIDES IN CHILE, COLOMBIA AND VENEZUELA

Substance	Chile	Colombia		Venezuela
	Imports	Production	Imports	Imports
2,4-D	--	5,989,456*	199,960	959,570
2-4-5. T	--	--	--	100,000
Anilide and acetanilide herbicides	4,893*	--	--	--
Alachlor	--	--	--	180,000
Metalachlor	--	--	--	20,000
Butachlor	--	--	--	120,000
Organophosphorus compounds	851,647	4,710,770*	2,831,745	--
Chlorfenvinfos	--	--	--	60,000
Dichlorvos	7,957	37,703*	57,676	169,480
Dichrotofos	--	--	--	100,000
Dimethoate	--	--	--	15,000
Difolatan	--	--	--	90,000
Fenitrothion	30,063	--	--	66,600
Fenthion	--	--	--	62,500
Malation	--	--	--	200,000
Methyldemeton	--	--	--	955,000
Methyl parathion	--	--	--	358,000
Etil parathion	--	--	--	70,000
Metamidofos	--	--	--	470,000
Trichlorfon	3,572	209,155	70,000	208,000
Aldrin y dieldrin	180,282	3,648,729	163,800	220,000
DDT	19,830	272,598*	41,000	351,769
Dithiocarbamates	221,765	12,258,579	55,000	--
Zineb	--	--	--	434,000
Bentiocarb	--	--	--	400,000
Carbamates	40,560	--	--	--
Baygon	--	--	--	108,000
Carbaril	--	1,769,033	559,128	180,000
Methomil (nudrin)	--	--	--	496,000
Carbofuran (furradan)	--	--	--	50,000
Temix	--	--	--	663,600
Captan	--	--	--	143,000
Pyrethroides	--	1,061,284*	78,358	--
Alethrim	--	--	--	6,700
Cypermethrim	--	--	--	4,000
Methrim	--	--	--	50,000
Permethrim	--	--	--	52,000
Dimetamethrim	--	--	--	60,000
Phostoxin (fosfin)	--	--	--	42,500
Atracina	--	--	--	826,000
Benomil	--	--	--	50,000
Chlordane	--	45,042	27,338	--
Camphechlor	--	270,357*	225,000	--
Endrin	7,540	181,803*	40,775	--
Endosulfan	10,473	82,239*	20,050	--
Heptachlor	114,226	510,727	33,385	--
Hexaclorocyclohexane	22,984	89,666	9,000	--
Clorotalonil	263*	54,986*	33,000	--
Quintozone	--	19,108	13,000	--
Tetradifon	107,717*	31,606*	1,000	--
Chlordimeform	--	177,990	245,000	--
2,2 Dicholorofoxiacetic acid	113,726	--	--	--
Paraquat, diquat	43,580	1,362,311*	629,740	--
Pirithroides	19,939*	--	--	--
Propanil	--	3,122,601*	32,500	--
Hexachlorobenzene	8,047*	--	--	--

Sources: Evaluation Study Reports from Chile, Colombia and Venezuela.

Note: Production figures in kgs, except figures with *, which are liters.

Table 7

GOVERNMENTAL SECTORS HAVING RESPONSIBILITIES
IN RELATION TO CHEMICAL SUBSTANCES

	Agencies	ARG	BRA	CHI	COL	CUB	MEX	VEN
The working environment	Health	x	x	x	x	x	x	x
	Labor	x	x	x	x	x	x	x
	Social Security			x	x		x	x
	Agriculture	x	x		x	x	x	x
	Mining		x	x	x			
	Enterprises	x	x	x	x	x	x	x
	Other	x	x	x		x		x
Health of the worker	Health	x	x	x	x	x	x	x
	Labor		x	x		x	x	
	Social Security	x	x	x	x		x	x
	Enterprises	x	x	x	x	x	x	x
	Others	x	x			x		x
Food contamination control	Health	x	x	x	x	x	x	x
	Agriculture	x	x	x	x	x	x	x
	Enterprises	x	x	x	x	x	x	x
	Others	x	x	x	x	x		
Water pollution control	Health	x	x	x	x	x	x	x
	Environment	x	x				x	x
	Agriculture		x				x	x
	Enterprises	x	x		x	x	x	x
	Sanitary Works	x	x	x	x	x	x	x
	Others	x		x	x	x		
Air pollution control	Health	x	x	x	x	x		x
	Environment	x	x				x	x
	Enterprises	x	x	x	x	x	x	x
	Others	x	x	x		x		
Emergency plans for chemical accidents		NO	NO	NO	NO	SI	NO	NO

2.2.2.2 Program for Populations Exposed to Environmental Pollutants

Responsibility for the control of chemical contamination of foods is normally located in the agriculture and health sectors. The agriculture sector is particularly interested in, and takes measures in relation to, export products in particular. The health sector is concerned preferentially with ensuring the quality of industrially processed products, but the emphasis is on microbiology rather than on chemical toxicology.

In water quality control a distinction must be made between water for public consumption and that of surface and underground water bodies. In the former case the control is exercised by the water supply agencies, subject to regulation and surveillance by the health sector. In the latter case the responsibility is usually shared, most prominently by the environmental sector and with lesser contributions from the health and agriculture sectors. Where there is no independent environmental sector, the predominent sectors are health and agriculture.

In most of the countries air quality is controlled by the municipal governments and the health sector and in others by the environmental sector, where there is one.

In all the countries action on chemical problems is the shared responsibility of many sectors and agencies, and serious lack of coordination and overlapping of functions among them have been detected. Action is limited, among other reasons because the aspects of chemical safety are interjected into more general programs and because the level of enforcement and control is insufficient.

2.2.3 Availability of Human Resources

The comprehensive handling of chemical problems requires the coordinated participation of professionals, technicians and auxiliary personnel of many disciplines. The Study concludes that nothing is known in the Region about the numbers or quality of the human resources concerned with this problem or of the personnel that would be needed to address the salient problems.

Needs for the training of technical and professional personnel differ from one country to another. The university programs concerned with the subject of chemical substances seem to cluster around engineering, particularly chemical and sanitary engineering, pharmacy, chemistry and biology. The training falls short of requirements, and the different courses of study appear to persist in a traditional approach and to be unresponsive to the real problems of the individual countries. The traditional courses of study do provide a foundation for training in activities relating to chemical substances. There is evidence of a need

to include toxicology in them. The lack of personnel properly trained for teaching and research in environmental and health problems has limited the scope of the programs and the quality of the training of specialized personnel. The short courses offered in the different countries are responses to quite diverse needs in the different sectors, are generally sporadic and unsystematic, and fall short of constituting refresher training programs.

One problem observed in all the countries is the great frequency with which unqualified personnel are assigned in programs to the performance of functions requiring specific technical knowledge, which reduces the efficiency of the programs. Financial constraints sometimes make it impossible to employ highly qualified personnel already available.

2.2.4 Laboratories

It was found that all countries have chemical and toxicological analysis laboratories, but that they are not always properly equipped or staffed with properly qualified professional personnel. The laboratories generally function in isolation, in response to institutional interests and subject to no regionwide or nationwide coordinating program. The result is that problems are inadequately dealt with and human and material resources misused.

Venezuela has six important national level laboratories which together amount to a limited analytical capability. On the other hand, the state of Sao Paulo, Brazil, has four important laboratories well equipped to identify a large number of substances.

Existing laboratories were found to suffer from operational problems stemming from difficulties in maintaining an adequate supply of inputs, and of quality reagents in particular.

There are problems relating to the quality of the analytical data produced by the laboratories, and it was noted that programs for intercalibration and quality control were needed.

In 1983 an evaluation was made of the capability for the chemical analysis of trace metals in water involving 44 laboratories in the Region that are participants in the GEMS/WATER Project (Global Environment Monitoring System/Water) conducted by PAHO/WHO. Of the 383 measurements made by the laboratories, 222 (61%) fell outside acceptable limits of dependability.

Despite the usefulness of toxicological analyses in clinical medicine and epidemiological surveillance, capabilities for these analyses are in very short supply, and there is obviously very little interest in and resources for programming them. It may be mentioned that little use is made of simple analytical techniques for evaluating the adverse effects of chemical substances on health.

There is a greater number of laboratories that analyze liquid residues and the quality of water and foods. Those that evaluate the quality of air and workplaces are few in number.

2.2.5 Legislation

Most of the countries have no specific legislation dealing with all the substances considered in this study, though some of them are covered in standards for the natural and occupational environments.

Most of the countries have provisions on permissible limits in the occupational environment and are generally adopted and adapted from foreign legislation. In regard to the natural environment, there tends to be more legislation on water quality and liquid effluents than on air quality and gaseous emissions. There is almost none on hazardous chemical residues, whether solid, liquid or gaseous.

There was also an obvious lack of legislation, and of revision of legislation, on grading, packaging, labeling and standards for importation, manufacturing, transporation and marketing.

When the existing legislation is adequate to deal with particular problems, it is generally not accompanied by regulations and standards or by the human and financial resources needed for effective control.

2.2.6 Access to technical information

This study brought to light a number of problems in the access of professionals to up-to-date technical information. In most of the countries this constraint stems from ignorance of existing sources of information, a lack of funds to acquire it, and limited access to data banks.

The information available is generated for the most part in English-speaking countries and is therefore inaccessible to readers in Spanish-speaking countries, and it was noted that there was need of a bibliography in the Spanish language.

The information available in the countries is dispersed among different institutions, which limits the extent to which it can be used.

With notable exceptions, most of the countries have no national information systems in the environmental and health sciences. Although most of them have centers for the treatment of poisonings, these centers have no access to information on the entire spectrum of poisonous substances.

In addition to lack of coordination, there is the problem of ignorance of the results of research and studies done at the national and regional level.

Most of the countries replied that they were unacquainted with much of the basic bibliography compiled in the "Lista de fuentes de información sobre sustancias tóxicas y riesgos asociados" (List of Sources of Information on Toxic Substances and Associated Risks) prepared by ECO, and those who did know of it had no copy.

3. Conclusions and Recommendations

3.1 Conclusions

The conclusions of the Evaluation Study are as follows:

1) It is recognized that the harm done to the health of the population and the ecology and the social and economic effects on development in the Region in the last decades from improper use of chemical substances constitute a grave situation that compromises the development of the countries in general and public health in particular.

2) The situation is being progressively evaluated in the countries and the Region as a whole, and the emerging picture, though highly diverse, is unfavorable everywhere.

3) Not enough is known about the magnitude and nature of the effects on the environment and health from the use, manufacture and handling of chemicals.

4) The situation of the developing countries suggests that a sizable proportion of the diseases and deaths is associated with chemicals.

5) The primary impediment to the implementation of effective national programs is a lack of political will.

6) In most of the countries there are no clear-cut policies under which to harmonize the activities of the different sectors and the objectives of the planning and development sectors, are best placed to deal with the preventive aspects.

7) In some countries the capability to act has diminished relative to the disproportionate growth of the problems in the wake of administrative and structural changes in the countries that have reduced the standing of the technical units responsible for environmental health and curtailed the manpower employed in this area.

8) In some countries the environmental agencies are doing important but insufficient work for the control of chemical substances.

9) The health ministries have not shouldered their due responsibilities in connection with the problem.

10) Most of the countries do not have specific programs for the prevention and control of the hazards that chemicals pose to health and the environment.

11) This problem is multisectoral in its analysis and solution, and not a responsibility of the health sector alone. Institutional development is poor in many of the countries.

12) In most of the countries this subject has prompted little research, and that of limited scope.

13) The countries have limited access to technical information on the subject.

14) The legislation in the countries on this subject is inadequate.

15) The chemical and toxicological analysis laboratories are underdeveloped in terms of equipment and qualified personnel.

16) On the whole, the population is ignorant of the substances to which it is exposed, including modes of exposure and the associated risks.

17) The countries have not devised any arrangements for the evaluation of probable risks of chemical emergencies, nor have any proper contingency plans been made.

3.2 Recommendations

Analysis of the Evaluation Study has yielded the following recommendations:

3.2.1 Development of the Program

1) That a national chemical safety program be promoted and implemented in each country, or at least that effective coordination and joint work be promoted among sectors and agencies involved in order to integrate and facilitate the conduct of programs and use of resources.

2) That the countries be encouraged to organize and maintain continually updated records on priority chemicals, including data on production, imports and exports.

3) To contribute to the dissemination of information on chemical substances whose production or use has been discontinued or is restricted in other countries.

4) To improve and augment the financial, human, information and laboratory resources, particularly in the health and environmental sectors, with a view to a real increase in response capabilities.

5) That country authorities be motivated to take decisions that will give the problem of chemical substances the priority it really deserves.

3.2.2 Public Health Problems Associated with Exposure to Chemicals

1) To gather, organize, analyze and interpret the information existing in the countries on:

   - The quality of the environment, including data on the presence of pollutants in air, water, soils and foods;

   - Adverse effects on health associated with exposure to chemicals.

2) To support the development of research projects that will shed more light on the magnitude of the problem.

3) To set up, and improve where they exist, health information systems on exposure to chemicals and their acute and long-term effects.

4) To review the existing classification of diseases and seek a more appropriate classification with a view to finding more specific cause-and-effect relationships.

5) To adapt epidemiological surveillance for the study of the possible adverse effects of chemical substances on health, and introduce and implement such surveillance.

6) Epidemiological surveillance must be a government function implemented through the ministry of health in flexible programs suited to circumstances in the country and locality.

7) Te set up at the regional level--perhaps with headquarters in ECO--a system for the registry of chemical accidents and a warning system for accidents that could affect several countries.

8) That the information handling procedures in the different countries of the Region be made mutually compatible to permit productive exchanges among them.

9) That a preventive program be developed that includes the evaluation of exposure to and control of toxic chemicals in local situations and at specific sites.

10) To adopt, introduce and implement the basic concepts of risk evaluation and risk control in relation to exposure to hazardous substances as a basic strategy for the promotion of public health.

3.2.3 Technical Information

1) That the scope of the Pan American Information and Documentation Network on Sanitary Engineering and Environmental Sciences (REPIDISCA) be extended to embrace the subjects of the RPCS. That the Pan American Center for Human Ecology and Health (ECO) coordinate the activities for this extension Network.

2) That ECO, as the Network Coordination Center, have the following functions:

- To develop a data bank on the results of epidemiological and toxicological studies and environmental impact evaluations in participating countries, and of reports on chemical accidents.

- To selectively re-commence the translation into Spanish of the Environmental Health Criteria Series and the Executive Summaries of WHO/ILO/UNEP.

- To obtain funds from WHO and other international agencies participating in the IPCS with which to provide to the coordinating institutions in the countries a collection of the sources of information figuring on the Basic List, which was sent in connection with the performance of this Study.

- To step up communication with other programs connected with the RPCS, such as the IRPTC, the IPCS (Geneva) and INFOTERRA, so that the participating institutions in the countries may receive the publications of those programs and have access to their data banks.

- To collaborate with the countries in obtaining information from data banks on toxic substances.

- To promote the establishment in the countries of information systems on the environmental sciences and health.

- To keep current the "Basic List of Sources of Information on Toxic Substances and Associated Risks," and to distribute them to the coordinating institutions in the countries.

3.2.4 Manpower Training

1) That manpower needs be evaluated in proper studies as are done in traditional areas of health.

2) That funds be assigned so that personnel training programs may be conducted, and that specialization courses, inservice training and exchanges within and among countries be included in them.

3.2.5 Legislation

1) That legislation be promoted on permissible levels of chemicals in the natural and working environments and on biological exposure limits for human beings.

2) That legislation be enacted on the conditions of transportation, storage, handling and final disposal of chemical substances and their wastes.

3) That legal machinery be established to enable competent authorities to control the importation and production of highly hazardous chemicals.

3.2.6 Laboratory Services

1) That machinery be established for the integration and coordination of laboratory facilities in chemical and toxicological analysis "laboratory networks."

2) That programs be promoted for controlling the quality of those analyses.

3) That systems be set up to ensure and permit the uniform interpretation of analytical results, and their registration and dissemination to interested quarters.

4) That appropriate analytical methods be assimilated for the evaluation of problems associated with priority chemical substances.

3.2.7 Community Participation

1) That community education programs be developed which are oriented toward the recognition and prevention of problems.

2) That information be disseminated to the community on chemical risks to health and the environment.

3) That the groups in the community most exposed to chemicals be identified together with their organizations, and that their experiences in dealing with accidental and ongoing exposures to chemicals be studied and that the best arrangements be proposed for their participation and integration.

4) That support be provided in efforts to awaken the population to the environmental degradation problems caused by chemical substances and to enlist its participation in solving them.

5) That government institutions be encouraged to inform the community about their programs.

6) That the countries be encouraged to promote the participation of interested groups, including industrialists, workers and the population at large.

APPENDIX

LIST OF CHEMICAL SUBSTANCES

Acrylamide
Acrylonitrile
Aldrin and dieldrin
Ammonia
Anilide and acetanilide herbicides
Aniline and its derivatives
Anionic detergents
Aquatic biotoxins
Arsenic
Asbestos
Beryllium
Cadmium
Camphechlor
Carbamate insecticides
Carbon monoxide
Carbon tetrachloride
Chlordecone
Chlorine and hydrogen chloride
Chlorofluorocarbons
Chloroform
Chlorotalonil
Chromium
Cobalt
DDT and its derivatives
2-4 Diamenotoluene
1,2-Dichloroethylene
2,4-Dichlorophenoxyacetic acid
Dichlorvos
Dimethylformamide
Dimethyl sulfate
Dioxins
Dithiocarbamates
Endosulfan
Endrin
Epichlorohydrin
Esters of phthalic acid
Ethylene oxides
Ethyl ether
Fenitrothion
Fluorine and fluorides
Heptachlor
Hexachlorobenzene
Hexachlorocyclohexane
Hydrazenes
Hydrocyanic acid and cyanides
Hydrogen sulfide
Isobenzab
Kelevan
Lead
Manganese
Mercury
Methylene chloride
Methyl ethyl ketone
Mycotoxins
Mirex
Nickel
Nitric acid
Nitrogen oxides
Organophosphorus
Pentachlorophenol
Paraquat and Diquat
Phenol
Phosphoric acid
Photochemical oxidants
Picloram
Polychlorinated biphenyls and terphenyls
Polynuclear aromatic hydrocarbons
Propylene oxides
Pyrethroids
Quintozene
Selenium
Styrene
Sulfuric acid
Sulfur oxides
Tecnazene
Tetrachloroethylene
Tetradifon
Tin
Titanium
Toluene, benzeno-yleno
Trichlor
Trichloroethylene