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BACKGROUND AND SUPPORTING INFORMATION

1. Introduction

The recent past has seen the growth of enormous metropolitan areas, accelerating industrial development, and a concomitant increase in the potential for health problems of environmental origin throughout the American Region. The Pan American Health Organization and its Governing Bodies have maintained cognizance of these developments and their implications for the health of the peoples of the Americas.

In October 1971, the XX Meeting of the Directing Council of PAHO reviewed comprehensively man-environment relationships and, in Resolution XXXI, urged Member Countries to strengthen their capabilities to cope with health-related problems of the changing human environment. The Council also requested the Director to explore means for the establishment of a center for human ecology and health.

In response to Resolution XXXI, a preliminary document was prepared covering environmental problems and trends as well as the concept and objectives of such a Center. In July-August 1972 a mission visited Mexico City to discuss the requirements for the Center with the Government of Mexico and to obtain information on the resources available for support and collaboration with the Center.

This document has been prepared by the Organization on the basis of the information obtained by the mission mentioned above and from the preliminary documentation prepared for the Directing Council under reference. This proposal for the Center has been drafted with consideration of budget implications and full recognition that decisions on national issues of public policy rest with the respective Member Governments.

The Center would function to support PAHO programs of assistance to Member Governments; would collaborate closely with the Organization's existing

network of centers; and would, particularly, complement--as a resource in the biological sciences and medicine--the physical sciences and engineering activities of the Pan American Center for Engineering and Environmental Sciences in Lima. Its education and research function would be an integral part of the PAHO programs.

The Center for Human Ecology and Health would play a major role in the program for development of environmental health criteria. It would provide inputs to the global program and would serve as the focal point in the Hemisphere for such criteria. It would engage in collection and review of appropriate data and would assist countries of the Region in the development of programs for the application of environmental health criteria and in establishing standards and guides for environmental protection.

## 2. Global Trends and Interests

The protection of man through the implementation of practical programs for the control of the quality of air, water, food, and the working environment was reemphasized in a resolution of the Twenty-fourth World Health Assembly in 1971 which endorsed the Director-General's proposal for a long-term program in environmental health, stressing inter alia the need:

...to establish and promote international agreement on criteria, guides and codes of practice with respect to known environmental influences on health, with particular emphasis on occupational exposure, and water, food, air and waste, and to obtain further information on levels and trends of these;

...to stimulate the development and coordination of epidemiological health surveillance by methods including environmental monitoring systems, in collaboration with other national and international efforts, in order to provide basic information on actual and suspected adverse effects on human health attributable to the environment.

The significance of food as a major source of man's exposure to potentially harmful chemicals was noted in World Health Assembly Resolution 25.59, which requested the Director-General to promote research on health effects of modern food technology, as well as international agreement on the criteria for and acceptability of levels of the biological, physical, and chemical contaminants in food; and to intensify WHO participation in the joint FAO/WHO Codex Alimentarius Commission.

The United Nations Conference on the Human Environment held in Stockholm in June 1972 also pointed out the need for a major effort in research--both epidemiological and experimental--to provide better data for early warning and prevention of harmful effects of environmental agents, including occupational exposure, and for the assessment of their potential risks to human health, as well as development and implementation of an

appropriate international collection and dissemination system to correlate medical, environmental, and family history data (Recommendation 76).

The Stockholm Conference also emphasized the importance of criteria and standards as one of the tools in environmental pollution control. The conference report contains specific recommendations on the establishment of primary standards for the protection of the human organism, particularly those pollutants common to air, water, and food (Recommendation 81); on the increased support to the Codex Alimentarius Commission to develop international standards for restricting pollutants in food (Recommendation 82); and on the development of agreed-on procedures for setting derived working limits for common air and water contaminants (Recommendation 83).

### 3. Regional Considerations

The Americas embrace a wide variety of cultures and social patterns, as well as economic and political structures. There are urban centers with chemical and metallurgic complexes, networks of public transportation, electrical grids, and related facilities--while other urban centers are only partially served by such basic facilities as water supply and waste-disposal systems. There are rural areas comprised of well-housed populations having power, water, and related services; however, by and large, rural areas have few such amenities. The population growth rate in Latin America and the Caribbean region is approximately 3 per cent per year, the highest of all continents. Urban population growth rates are especially high, about 5 per cent per year.

The countries of the Americas are experiencing not only unprecedented increases in population, but also in resource exploitation and in technological development. In Latin America, where more than half the population is still living in rural areas, some of the largest urban complexes in the world may arise within the coming decade. The sheer magnitude of this continued growth of major cities, especially with respect to population density and industrial development, creates problems of environmental degradation, with adverse effects on human health, economic development, and disruption of ecological balances similar to those now being experienced by most highly industrialized nations. Ecological problems are so highly complex that uninformed interference with ecological balances may become critical, not only in economic and esthetic values but also in terms of human survival.

Throughout our Hemisphere, peoples aspire to acceptable housing, sufficient diet, and pleasant surroundings; to jobs and health services; to effective systems of transportation and communications; or, in other words, to the achievement of a level of life that is in harmony with man's innate sense of human dignity. Economic growth can substantially contribute to the realization of these worthy aspirations; however, such fulfillment will depend in large measure on how the economic growth takes place.

It is significant to note that, in the Third World countries, industrial development is estimated to have reached only 10 per cent of its potential. In Latin America, where more progress has been made, about 80 per cent of industrial growth is yet to come. Thus, there is a great opportunity to plan industrial development, with proper regard for the relationship between technological and economic advancements and environmental values. Damage to the environment and human health can be prevented only if reliable information on the environmental impact of development projects is available in the planning stage of such projects or before consumation.

The countries of the Region have been moving aggressively to improve environmental conditions important to man's health. Goals were set at the beginning of the 1960 decade for such basic services as water supply and sewerage. For urban water supply, unprecedented progress was made in the decade. Less spectacular but very encouraging progress was made in the provision of urban sewerage services and rural water supplies.

At the same time, new programs to control and improve the working and living environment were developed and initiated. Occupational health protection services were expanded. Air pollution programs were initiated and a Pan American Air Pollution Monitoring Network, now numbering about 100 stations, established. Water pollution laws were enacted and control programs begun. A water quality network, similar to that for air pollution, is in process of development. Solid waste collection and disposal services have been improved in many cities. Noise, congestion, and other stresses of urban life are receiving new attention.

The relationship between animal health and human well-being is evident, not only with respect to disease transmission but also regarding nutritional and economic aspects. With the purpose of collaborating with the Member Governments in the establishment of programs directed to prevent and combat environmental hazards associated with human animal health relationships, the Pan American Zoonoses Center was established in Argentina, and the Pan American Foot-and-Mouth Disease Center in Brazil.

Among the elements earlier recognized as being important components of the ecological concept of health is malnutrition or undernourishment. In 1949, the PAHO-administered Institute of Nutrition of Central America and Panama and, in 1963, the Caribbean Food and Nutrition Institute, were established with the purpose of studying the nutritional problems of the Region, finding ways to solve them and, with the Member Countries, putting into effect the solutions. The preparation of staff is an important responsibility of these institutions.

Integral health planning has been a constant preoccupation of the Organization. In 1970 the Center for Health Planning became a reality. It was established in Santiago, Chile, with the purpose of training national

health planning staffs, carrying out investigations on the methodology of planning, developing planning models, and diffusing scientific information on planning. The need to transmit information on health, in its broadest sense, rapidly and efficiently, resulted in the establishment of the Regional Library of Medicine in São Paulo, Brazil. The countries of the Region provide valuable support to the Library.

The Pan American Center for Engineering and Environmental Sciences was established in Lima, Peru, at the close of the 1960 decade in order to provide better services to the countries, especially with relation to the engineering aspects of environmental problems produced by the newer environmental stresses. Foremost among these are air, water and soil pollution, noise, occupational health, and physical planning of rural settlements. At the same time, it is working to improve and lower the cost of the traditional services such as provision of water supply and disposal of liquid and solid wastes. This Center is also providing information and technical assistance on environmental problems requiring physical sciences and engineering expertise, and collaborating with the countries in the development of training and research programs.

At the same time, there has developed an increasingly greater awareness of the significance of environment, especially new and rapid environmental change, to man's health and well-being. Of great concern to health authorities is the lack of organized and conveniently available information on human health effects of environmental influences. Such information is of critical importance to planning and other official agencies in order to place development and the human health consequences in proper perspective. The Center for Human Ecology and Health would be a major source of expert assistance and a reservoir of authoritative information on human health effects of environmental influences. The consequence of industrial and other development projects on human life could be assessed and taken into realistic account utilizing the knowledge available through the Center. Thus costly mistakes could be avoided and major long-term damage to the human environment prevented.

An especially close relationship is expected to exist between the Center for Human Ecology and Health and the Center for Engineering and Environmental Sciences in Lima, Peru. The specialists in biology and medicine at the Center for Human Ecology and Health, in collaboration with other biomedical programs of the Organization, will be expected to identify significant environmental impacts on man's health and to elucidate the corresponding cause and effect relationships. These relationships, preferably quantitated, provide the basis for developing preventive and control measures. The specialists in physical sciences and engineering at the Lima Center will be expected to design the mechanisms for prevention and control based on these relationships. They will also be expected to develop methods for measuring the effectiveness of such mechanisms in preventing and controlling

environmental hazards. At the same time, biomedical methods developed by the Center for Human Ecology and Health will be employed to measure the reduction or elimination of damage to human health. This symbiotic relationship between the two Centers provides a sound foundation for the establishment and development of environmental health protection programs.

The Center for Human Ecology and Health would provide important inputs into the WHO program for environmental health criteria, drawing on the research, investigations, and experience within the Region. Likewise it would serve as the regional focus for the global environmental health monitoring network. As the regional center for environmental health effects, it would have the collaboration and support of the Pan American system of centers and associated scientific and educational institutions.

#### 4. Environment and Development

The dilemma which was given world recognition at the Stockholm Conference on the Human Environment revolves around the unquestioned need to proceed rapidly with development and, concurrently, to find lasting solutions to avoid deteriorations in the quality of life.

Industrial development is imperative to raise the standard of living and to remove the multiple threats of poverty and disease from an ever-increasing number of people in the world. The task is to strike a reasonable balance between the immediate need to develop and the long-term need to preserve the environment for future generations.

Much of the technical and other information required for sound planning to avoid adverse environmental conditions is available in institutions throughout the world. The characteristics of industrial processes which produce offending contaminants and cause damage to environment and human health are, in large measure, quite well known. Likewise, measures for preventing damage from such industrial processes have been developed. Much more information on preventive and control measures is available than is actually being utilized. In some instances, there may be need for adaptation to local conditions; in other cases, the preventive and control techniques may be improved by further study and investigation. A valuable service can be provided to the countries of the world by collecting, analyzing, and translating known information for application to actual control programs.

#### 5. Human Ecology and Health

In considering the environment in relation to development, the primary focus must always be on people, on their health, and on their well-being. It is this focus which distinguishes health-oriented agencies from others which also operate in the environmental universe. Public health considerations are the basic criteria in the definition of environmental quality.

Beyond the traditional concerns for infectious agents, health authorities must now consider the subtle and long-range effects on mankind of such stresses as chemical contaminants, vibrations, energy exchanges, tensions, congestion, and noise. Social effects, like addiction, delinquency, and some kinds of mental breakdowns, become in turn additional stresses with self-perpetuating effects.

Interactions between environmental agents and human beings take place against the particular background of the social, cultural, economic, and political factors existing in a community; thus, community characteristics, mores, traditions, motivations, and practices influence the pattern and the intensity of interactions between environmental agents and people. An early understanding of the complex web of community characteristics may be fundamental in achieving successful environmental health plans. It is important, therefore, to start to collect information on the various aspects of community life which may promote or impede the implementation of national environmental plans.

The primary responsibility for health criteria and standards rests with the health agencies. Also, they have a key role in evaluating compliance, and in surveillance and monitoring of the environment. In carrying out this mission, health agencies must work with other environmental agencies. This interagency collaboration becomes increasingly important as environmental problems increase in complexity and magnitude and change in character. Environmental determinants are so all-inclusive, are so important to the biosphere, that it becomes necessary to move beyond the health orbit into the sphere of public works, natural resources, education, agriculture, planning, and other agencies.

In carrying out its responsibilities within this broader environmental framework, a basic challenge faces the health agencies: it is to close the gaps in the knowledge and understanding of the changing environment and its overall significance to the health and well-being of man and, what is more important and more difficult, to predict the health consequences of environmental change.

#### PROPOSAL FOR THE ESTABLISHMENT OF A CENTER FOR HUMAN ECOLOGY AND HEALTH

The countries of Latin America and the Caribbean region are aware that they can avoid to a considerable degree the environmental damage that has accompanied industrialization and urbanization in developed countries by applying the knowledge and experience gained by the latter. They also realize that a deeper understanding of the man-environment relationship is necessary to better safeguard human health.

Recognition of this need is to be found in the extensive deliberations of the Governing Bodies of the Pan American Health Organization, and more

recently it is clearly expressed in Resolution XXXI of the 1971 Meeting of the Directing Council. This resolution cites the need for a center for human ecology and health sciences and requests the Director to explore the means for its establishment (see Appendix I).

The Pan American Health Organization has a well-established record of collaboration with Member Governments in the health field, and current developments within WHO and PAHO make this a particularly opportune time to establish a center, the primary thrust of which will be concerned with the effects of the environment on human health. The Director-General of WHO, in November 1972, stressed the vital need to expand activities in this area. PAHO/WHO, in adjusting the thrust of its activities for the next decade to the goals established by the Ministers of Health of the Region at their October 1972 meeting in Santiago, Chile, has proposed to develop and apply a methodology for the formulation of national environmental plans to achieve the goals set by the countries. Information and data on environment-health relationships will be a primary need in developing these national environmental plans.

A. Objectives of the Center

Five major roles are visualized for the Center in collaboration with the governments:

1. Develop biomedical and epidemiological methodology to identify, define and monitor health problems of environmental origin.
  2. Advise governments on programs and actions to minimize the adverse effects of environment on health.
  3. Conduct and support training of environmental health specialists.
  4. Conduct, support and promote studies and research, including development of epidemiological indices and preventive techniques.
  5. Provide information for national and global assessment of health problems of environmental origin, including the formulation and dissemination of environmental health criteria and guidelines which will facilitate the preparation and application of environmental standards by the countries.
1. Develop Biomedical and Epidemiological Methodology to Identify, Define, and Monitor Health Problems of Environmental Origin

Reliable and up-to-date information on environmental conditions within a country is an essential prerequisite to the development of national environmental plans. At the present time, all the countries of the Region are deficient in basic environmental data. Only recently has significant attention been directed toward the development of policies for the protection and preservation of the environment under urban and industrial conditions.



Environmental health problems in the Region encompass an enormous range: acute gastroenteric infections caused by the consumption of contaminated water and food; chronic parasitic diseases; long-term effects of exposure to chemical contaminants; synergistic effects of multiple chemical exposures; effects of noise, increased tempo, and other stresses of city life. The increasing mobility of populations, with consequent variety of exposures in a lifetime, together with the continuous addition of new synthetic substances to the environment, adds to the complexity of environmental health problems.

All countries in the Region seek to develop their industrial capacity. At present, particularly in the metal-working, mining, and chemical industries, there are known instances of adverse health effects on the workers. Such problems will multiply as countries develop industrially. Agricultural workers are also exposed more and more to hazardous chemical pesticides. Ingestion of pesticide-contaminated food is already a problem of unknown magnitude in several countries. The countries of the Region will benefit from additional assistance in identifying environmental agents which have health effects. To decide on priorities, a government needs to have a practical definition and a methodology for assessing the nature and scope of its environmental health problems.

Many countries have begun to implement large-scale projects involving major highways, colonization, resource exploitation, and river-basin development. These projects introduce environmental changes, some on a massive scale, with repercussions on the health of the peoples. Major migrations from high to low altitude with extreme change in pressure, temperature, humidity, nutrition and life style, as well as rural-urban migrations, illustrate the problems of human settlements and resettlements. Methodology to assess the health effects of these environmental changes is needed. The Center could provide an essential service to Member Governments by critically analyzing current methodology for the evaluation of the effects on health and by distributing the results of this analysis.

Additionally the participation of Governments of the Region would be sought to provide information and data useful in the formulation of environmental health criteria as part of the regional contribution to the global effort. Similar participation would be sought in the matter of establishing monitoring and surveillance systems for environmental health effects. This activity would be linked with and form an integral part of the global system for detection and early warning of environmental hazards.

2. Advise Governments on Programs and Actions to Minimize Adverse Effected Environment on Health

In its initial phase the Center would collaborate with the governments in the definition of their important environmental health problems,

especially as related to the ten-year goals adopted by the countries of the Region. Subsequently, the Center would provide expert assistance to assess information obtained from surveys, studies, and other sources, and would cooperate with the Member Governments to set priorities for action. Longer term goals would be to provide Member Governments with a set of alternatives, with suggested preferences, to implement the actions which have been given high priority. These actions would all tend towards the goal of reducing the adverse environmental impacts on health. They might take the form of, for example, legislation, infrastructure, health criteria, monitoring systems, control measures, training programs, laboratory operations, or research.

There is an urgent need for practical techniques to assess the state of the environment and to define the existing conditions and trends regarding environment and health. The basic methods of the Pan American Air Pollution Monitoring Network give information on the sulfur dioxide and suspended and settled dust levels in the air to show present conditions and also trends that indicate when the air in a given city is likely to reach levels of these contaminants harmful to health. Additional necessary information will be obtained through monitoring stations which will measure carbon monoxide, ozone, oxidants, hydrocarbons, metals, and other parameters. PAHO/WHO is collaborating with several countries in the installation of such types of stations. Data obtained through the use of such methods can be applied to the planning of development, including industrial siting, design of transportation systems, and other facilities and arrangements which significantly affect the environment.

Quite simple techniques, such as those involving rubber-cracking for indicating oxidant concentration, may be satisfactory for monitoring or surveying the air environment. Studies of raw material use and distribution, for example of heavy metals, can be very useful in identifying the likely location and significance of environmental health problems related to such materials. It is precisely through the assembly of data, and of information on a variety of techniques, and by analyzing these critically, that environmental health problems can be characterized and approaches to their control developed. The study of various population groups utilizing epidemiological indices of health conditions will serve further to elucidate man-environment relationships enabling application of protective measures. The Center can fill an immediate and real need in these respects.

### 3. Conduct and Support Training of Environmental Health Specialists

An important function of international collaboration is the transfer and adaptation of knowledge and technology to the developing countries for the solution of their problems. Presently, such knowledge is dispersed in governmental, educational and other institutions in the countries of the Region and over the world in general. The Pan American Center for Human Ecology and Health proposes as one of its activities the identification of centers of excellence in the field of human ecology and the health sciences

and, on the basis of these, to develop mechanisms for the preparation of professionals. The development of education and research programs, adapted to the requirements of the new problems of the countries and to practical goals, would provide better conditions for study and would make the process of learning more productive. The Center for Human Ecology and Health, as an integral part of the mechanisms of the Pan American Health Organization, would have the benefit of its total program and would also contribute to improve the total system.

Utilizing the varied facilities of the Pan American Health Organization, the Center would develop courses and seminars emphasizing the human ecological aspects of its programs; would encourage and support interchange of scientists between institutions; and would develop educational technologies adapted to modern requirements of professional formation, and residencies for post-graduate candidates in the environmental sciences.

The Pan American Health Organization has an extensive established program for assistance to medical and environmental academic institutions. This assistance is for the purpose of improving, especially, the graduate frameworks for teaching and research through fellowships for both long- and short-term study; sponsorship of short-term technical training courses, seminars and conferences; and the elaboration of manuals and textbooks. Thus, the Organization is in an excellent position to contribute to the preparation of environmental health specialists.

#### 4. Conduct, Promote, and Support Studies and Research

There is little doubt that a considerable research need will become apparent as the information, data collection, and analysis process progress. The Center, in collaboration with specialized institutions in the Region, would be in an advantageous position to identify research needs and to stimulate research in institutions having the best capabilities; to arrange for collaboration among institutions; and to disseminate results of research in the manner most useful to Member Governments.

In close collaboration with the Pan American Center for Sanitary Engineering and Environmental Sciences, the Nutrition Centers, the Aftosa and Zoonoses Centers, the Regional Library of Medicine, and other centers and programs of the Organization, predictive techniques, utilizing information from bacteriology, toxicology, virology, clinical research, and epidemiology, together with environmental monitoring data, would be developed. The Pan American Center for Sanitary Engineering and Environmental Sciences is already taking steps to broaden the existing Air Pollution Monitoring Network to include additional parameters and to establish a water quality monitoring network.

The Center for Human Ecology and Health would provide information on measurement techniques and instrumentation for assessing human health effects.

The Center staff would collaborate with countries in the design and conduct of environmental health investigations.

Ultimately, it would be expected that some research facilities would be provided at the Center, to permit investigative work by the staff and to strengthen the educative role of the Center.

5. Provide Information on National and Global Assessment of Health Problems of Environmental Origin

The preparation and application of environmental health criteria is an area where assistance to the developing countries especially is needed. Developed countries, however, can also benefit from improved health criteria information.

In contrast to the industrialized countries, in which environmental contamination has increased to the point that large investments of manpower and money are now being made to control pollution, the developing countries of the world are, in general, just beginning to experience adverse effects due to environmental contamination. Most of the problems are confined to the relatively few heavily industrialized urban areas. The major portion of development is yet to come in Latin America. Judicious use of preventive methods, instead of costly corrective measures, can prevent illness and death and save large sums of money.

For governments to plan development and avoid, to whatever extent is feasible, the expensive control problems currently confronting the industrial nations, they need to know what the adoption of a particular criterion will mean in terms of health and economics. An informed judgement can then be made on the adoption of a suitable working level for a particular contaminant in a given set of environmental conditions. A thermal or other working environment for an industry at sea level, for example, may be quite unacceptable for that same industry at a high altitude.

It is not enough to adopt standards elaborated in and by the developed industrial nations themselves. What is needed is a critical appraisal of information collected from all available sources, with an analysis of the advantages and disadvantages of accepting or modifying certain criteria or suggested levels for environmental contaminants, in terms of health effects on the population of the country involved. The short-term goal, in such cases, would be to assist governments to establish an acceptable level upon which protective measures and regulatory actions can be currently based.

To assist governments in this endeavor, the role of the Center would be: to collect, collate, analyze, adapt, interpret, and disseminate currently available information on the health effects of environmental agents--whether physical, chemical, or biological--in a form suitable for application by governments. The criteria and suggested working levels which are analyzed

and distributed in such manner will provide governments with basic tools for planning contaminant prevention and control programs as they become necessary, for the establishment of national standards, and for the evaluation of regulatory programs.

An important goal for the Center would be to provide information on new environmental agents and periodically to appraise information available on existing ones--particularly with respect to proposed new industrial and other developments--in order to characterize their environmental impact and their human health significance.

The development, and especially the application, of environmental health criteria requires a mechanism designed for this purpose. The World Health Organization's Environmental Health Criteria Program provides a basis for the development of such criteria. For the Region of the Americas the Center for Human Ecology would be an important contributor of information, both directly and through the identification of other sources of information and stimulation of their contribution to the WHO criteria program.

The application of health criteria to the protection of the human environment depends on many factors, important among which are participation in the development and adoption of the criteria, understanding of their implications, and technical assistance in their application. With an established headquarters and field structure the Pan American Health Organization can be very effective in the development, distribution and application of information on health problems of environmental origin. Through its publications, its well-established relationships with health and other environmental institutions, through its centers, through its programs and its staff, the Organization can reinforce greatly the activities of the Center for Human Ecology and Health toward the use of scientific information as a compelling basis for action.

## B. Proposed Organization of the Center

The Center would begin modestly, with a small professional staff. Much of the first year would be spent in becoming familiar with the environmental health problems of the countries in the Region and in developing a work plan. Subsequently, the Center staff would gradually be expanded according to the work plan. This plan would include the gathering of basic data on environmental health problems, the design of solutions to such problems, and the conduct of training and research. From an initial staff of about six professionals, the Center would comprise approximately 20 professionals by the end of five years.

### 1. General

The administrative structure of the Center will follow, in general, the principles established by the Organization for its other centers. Its

internal structure will conform to the objectives and specific functions of the Center. In view of the increasing complexity of the health problems, the use of multidisciplinary task forces for the study of specific problems is suggested as a useful administrative device. For some problems of broad scope, the task force may include permanent consultants for relatively long periods of time, while for other problems only short-term consultants under the coordination of a permanent staff member of the Center might be needed. Staff members normally would serve on more than one task force. With this approach, the development of methodologies, the provision of advice to governments, and the planning and conduct of training and other tasks of the Center would have inputs from various professions within and outside the health field.

## 2. Information Services

Extensive, efficient, and continuous dissemination of knowledge is essential for the development of research, teaching, and the practice of the health sciences. It is especially important to improve the systems of statistical and technical information. An international system of collection, analysis, evaluation, and dissemination would provide the governments of the Region not only with information on the effects of environmental pollution on human health and the ecosystems, but also on legislation, standards, practices and experiences, and on technological advancements for their control. The information system of the Center for Human Ecology and Health would function in coordination with the PAHO Regional Library of Medicine (which is developing a system of international communications to facilitate the interchanges of scientific biomedical information), the Pan American Center for Sanitary Engineering and Environmental Sciences in Lima, and other centers of information of the Organization.

## C. Personnel Requirements

The precise composition of the Center staff will depend on the priorities in the work plan. The staff proposed in the various phases is illustrative of the kinds of specialists that are expected to be needed as the program of the Center develops.

### 1. Phase I

#### (a) Proposed Staff:

- Director
- Epidemiologist (1)
- Ecologist (1)
- Environmental Engineer (1)
- Medical Toxicologist (1)
- Statistician (1)
- Communications Specialist (1)

- Research Assistants (2)
- Administrative Assistant (1)
- Secretaries (4)
- Consultants (6 m/m.)

(b) Responsibilities of Staff:

- Develop detailed work plan for the Center
- Plan information and data systems
- Establish priorities for information collection
- Conduct literature surveys and prepare summaries of knowledge on pertinent subjects
- Collect, collate, and assess information and data in selected high-priority areas
- Develop relationships with universities, research institutions, government agencies, etc.
- Initiate methodology studies for early warning systems and for defining environmental health problems
- Seminar on Work Plan and Collaborative Arrangements

2. Phase II

(a) Proposed Additional Staff:

- Medical Physiologist (1)
- Environmental Specialist, Monitoring (1)
- Systems Analyst-Mathematician (1)
- Librarian (1)
- Technical Writer (1)
- Translator (1)
- Additional Secretaries (4)
- Consultants (12 m/m.)

(b) Responsibilities (in addition to Phase I activities):

- Complete methodology studies
- Initiate health criteria evaluation
- Conduct seminar on early warning systems
- Develop systems for monitoring human health effects
- Initiate advisory services for governments
- Incorporate computerization into the information system, in collaboration with the Regional Library of Medicine and other centers of information of the Region
- Prepare technical information manuals in priority areas
- Develop printing and distribution facilities

3. Phase III

(a) Proposed Additional Staff:

- Epidemiologist (1)
- Research Specialist (1)
- Economist (1)
- Consultants (12 m/m.)

(b) Responsibilities (in addition to Phase I and Phase II activities):

- Prepare and distribute environmental health criteria information
- Conduct studies of health aspects of industrial developments
- Identify research needs and initiate collaborative programs with research institutions
- Render advisory services to governments
- Assist in establishing systems for monitoring human health effects

D. Facilities

Starting the Center with a small staff of personnel in 1974 would require a relatively small amount of space. Its gradual development would permit it to plan and construct the building required for Phase III in late 1975 or 1976. The major facilities needed are listed below:

1. 1974

The office space required for the first phase would be approximately 300 m<sup>2</sup>; this would include 10 to 15 offices.

2. 1975

For 1975 a small expansion is expected. This would require an increase in the number of offices to 18 or 20. The total space would be about 550 m<sup>2</sup>.

3. 1976...

It is expected that at the end of 1975 the center building would be completed. Some of the requirements would be:

- Location near good quality library and conference facilities
- Access to medium-size computer

It is considered that the center building should be located on an appropriate site. The building would contain approximately 1,500 m<sup>2</sup> of



usable surface area, including offices, conference room, auditorium, library, computer room, archives, printing press, and other services.

E. Funding

Financing for the installation and operation of the Center may come from different sources but will have to include provision for professional and secretarial staff, administrative personnel, library, supplies, printing and computer services, furniture, equipment, transportation, and others. In addition, funds for training activities, for dissemination of information, and for meetings of experts and short-term consultants, will be required.

The following table summarizes the main items.

BUDGET FOR THE ESTABLISHMENT AND OPERATION  
FOR FIVE YEARS OF THE CENTER FOR HUMAN ECOLOGY AND HEALTH

(In U.S. Dollars)

	<u>Total</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
<u>Professional Staff</u>	1,682,100	47,500	277,500	410,000	451,000	496,100
<u>Consultants</u>	144,300	15,000	30,000	30,000	33,000	36,300
<u>Auxiliary and Administrative Staff</u>	575,350	20,000	105,250	136,000	149,600	164,500
<u>Training</u>						
Seminar on work plan and collaborative arrangements	30,000	30,000	-	-	-	-
Seminar on early warning systems	30,000	30,000	-	-	-	-
Short courses and fellowships will be provided under the regular programs of the Organization	-	-	-	-	-	-
<u>Library</u>	80,000	10,000	15,000	15,000	20,000	20,000
<u>Supplies and Furniture</u>	75,000	20,000	30,000	10,000	10,000	5,000
<u>Printing Press and Equipment</u>	80,000	10,000	15,000	15,000	20,000	20,000
<u>Common Services</u>	<u>125,000</u>	<u>10,000</u>	<u>20,000</u>	<u>30,000</u>	<u>30,000</u>	<u>35,000</u>
Total	<u>2,821,750</u>	<u>162,500</u>	<u>522,750</u>	<u>646,000</u>	<u>713,600</u>	<u>776,900</u>

Building

- The host country will provide the office space required to initiate the activities of the Center and subsequently (1975) a building of 1,500 m<sup>2</sup> of usable surface area with the necessary equipment. It will also contribute towards defraying local operation costs.

XX Meeting of the Directing Council

**Resolution XXXI**

**Man-Environment Relationships and  
Goals for 1971-1980**

*The Directing Council,*

Having considered the Director's report on man-environment relationships (Document CD20/7)<sup>39</sup> including suggested goals for 1971-1980, submitted pursuant to Resolution XXXIV<sup>40</sup> of the XVIII Pan American Sanitary Conference,

Recognizing that population growth and accelerating technological advances in urbanizing societies are producing unprecedented changes and a host of new stresses having in totality ill-defined impacts on the health and well-being of peoples;

Recognizing the need for appropriate diagnostic mechanisms to identify and predict the physiological, toxicological, epidemiological, and sociological consequences of rapid environmental change;

Bearing in mind that the continental and global dimensions of environmental pollution require international collaboration in order to understand and evaluate impacts on health;

Recognizing the need for continental and global networks for the monitoring and surveillance of environmental impacts on man, and the importance of the Organization's existing centers as a part of those continental and global networks; and

Noting the unprecedented advances in traditional sanitation achieved over the past decade by Member Governments, especially in providing water supply and sewerage services; in strengthening national institutions essential to environmental-quality controls, in establishing the Pan American Center for Sanitary Engineering and Environmental Sciences, and in initiating continental networks for monitoring and for continuing education, research, and graduate study,

*Resolves*

1. To commend the Director for his report and for his effective support in collaborating with Governments in order to provide basic sanitation services, and for his vision and initiatives toward meeting emerging environmental challenges

2. To urge ministries of health that, in the course of economic development, they expand and strengthen their capabilities to cope with health-related problems of the changing human environment

3. To reaffirm Resolution XXXIV of the XVIII Pan American Sanitary Conference, requesting that ministries of health continue to emphasize the provision of basic sanitation services to urban and rural peoples, with special attention to community organization, self-help concepts, and revolving-fund mechanisms to support mass-approach techniques.

4. To thank the international lending agencies for their support to Governments in projects to improve sanitation and health and to request them to continue their collaboration.

5. To suggest that the Director reassess the Organization's total resources with a view toward strengthening the Region's total capabilities to meet the problems related to environmental health, including programs to promote the understanding, diagnosis, and assessment of environmental impacts on health, to monitor trends, and to provide educational and other support for environmental programs.

6. To request that the Director explore means for the establishment of a center for human ecology and health sciences, as a supplement to existing centers, keeping in mind the potential value of a regional center that will serve as a prototype in a global network for the study of human ecology

7. To suggest that the Director arrange for liaison and collaboration with appropriate national and international agencies to exchange information, evaluate trends, and improve understanding of hemispheric and global environmental changes.

*(Approved at the fifteenth plenary session,  
7 October 1971)*