THE INFORMATION SYSTEM AT CEPIS AND ITS RELATION
TO RESEARCH IN ENVIRONMENTAL HEALTH

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THE CEPIS INFORMATION SYSTEM AND ITS RELATIONSHIP TO RESEARCH ON ENVIRONMENTAL HEALTH

Dr. A. Héctor Sosa Padilla
Adviser in Technical Information
Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS)
Pan American Health Organization (PAHO)
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I. THE PROBLEM'S FRAMEWORK

One of the characteristics of our time in relation to decision-making on most problems -those related to health among them- seems to be, increasingly often, the need to choose among a growing number of possible alternatives within a technological universe that is continuously becoming more complex and unstable. It seems obvious that the exponential growth of technical and scientific knowledge -which in some way has determined the complex range of society models where we live and their apparent polarization into developing and developed societies- has so enriched man's approach -particularly that of whom is endowed with decisional power- to a fuller vision of the reality around us -whether material, spiritual or social- and of its intricate interrelationships that, in a way, it has also compelled him to create and improve instruments and methodologies to refine the precision of those decisions. It has been said that to govern is no more than to foresee how to act right. To do so, more developed societies have institutionalized centers of wilful decision -by delegation or, sometimes, by simple imposition of such authority- that may evaluate and even control the variables feeding political, economical, social and technological decisions. These must always take into account another center of unwilful, almost totally aleatory decision which is Nature, that is, the natural environment where man has introduced human environment, the fruit of his action as homo faber, of his thought as homo sapiens and of his need of rest and entertainment as homo ludens. This interrelationship of man and its environment, which is seldom planned and mostly obeys to the imperatives of survival and to the search for greater well-being, has destroyed the harmony and delicate balance between man and his environment which is one of the aims of what is called "environmental health". This environmental health that, as part of the individual's integral health, should better serve its human aspects than those for the health of the physical environment; as it is obvious that what "per se" might be "healthy" for a specific natural environment or for an ecological system might be unhealthy for man, who unhabits and changes it.

Even more complex -though better subject to control as decisions are then clearly human and wilful- is the relationship man-environment-health in the environment directly created by man -habitat, transportation means, study or working place, rest or entertainment site- as in these surroundings notice must be also taken of the characteristics specific to the activities developed between them, of the act of living with other human beings and therefore, of ergonomic, psychologic, social and even economic conditions that determine the type and grade of possible or desirable "environmental health".

The objectives and limits of "environmental health", and the decision-making necessary to obtain, keep and improve it, evidently require research that determines and defines more clearly the framework within which it must act; at the same time these studies and research activities require basic data and
information that quantify and describe, partially or tentatively, this reality; such as the starting points, goals and priority grades of these studies that, lastly, will provide again with new information and approaches to this reality to the inputs for the decisions that will optimize it as regards "environmental health". (1)

These brief notes intend to discuss some of the supporting functions that, for this type of activities, may offer an information system specialized in sanitary engineering and environmental sciences, as is that which PAHO, by its Environmental Health Division and through CEPIS, is presently furthering.

II. ENVIRONMENTAL HEALTH AND RESEARCH

The concept of "environmental health" is not a clearly defined one, as said before. For ecologists and environmentalists it will undoubtedly imply a natural balanced system, a "healthy" system. For doctors, for sanitary and environmental engineers, whose care is individual and public health in relation to the human environment, it will imply the care, control and protection of the environment's hygiene (and render it healthy for man) and the basic necessary sanitation that, together with the aspects of prevention, planning and integration of health services in the set of development's objectives and services with appropriate community participation, will gather the conditions pointed out by Vidal (2) as the objectives of integrated medicine:

"Integrated medicine considers man, subject of its action, as a being in his three dimensions, physical, psychical and social, in his interaction with his environment. Accordingly, it acts within the global and ecological context of the human being and of the health-disease phenomenon, and it is carried out through integrated health actions."

On the other hand, human environment may be considered "as comprising those external physical, chemical, biological, and social influences that have a significant and detectable effect on the health and well-being of the individual or of communities of people." (3) The World Health Organization (WHO), the Pan American Health Organization (PAHO) and the Pan American Sanitary Bureau (PASB), as the WHO Regional Office for the Americas, have been actively concerned since their creation with environmental factors and their effects on human health. "This concern is largely based on the simple fact that poor sanitary conditions and the accompanying communicable diseases are the greatest causes of morbidity and mortality in the developing countries, where the majority of the world's people live. Such conditions are characterized by water supplies that are inadequate in both quality and quantity, poor or non-existent waste disposal systems, abundant insect and animal reservoirs and vectors of disease agents, and insufficient health education, to which is often added the resistance-sapping factor of malnutrition." (3)

From this is inferred that the needs and priorities of health problems related to the environment should have, in developing countries, clear and
defined goals as regards the urgent provision, improvement or expansion of the infrastructures for basic sanitation services. However, as has repeatedly been pointed out, the increasing rate of industrialization that, together with internal migration from country to urban and fringe zones, has brought massive and uncontrolled urban growth, the augmenting mechanization of farm work and the use of herbicides, pesticides and artificial fertilizers that has become evident in the last decades in developing countries, and particularly in Latin America and in Caribbean Region, have not only aggravated the problems in matters of basic sanitation but they have created other environmental situations which were only known till short time ago in the industrialized countries. Thus, the spectrum of the unknowns and variables to be considered in the process of planning and decision-making to prevent, amend and control the health hazards for the human environment has been considerably widened. Should we add the proliferation of technologies developed for such ends, particularly in highly industrialized countries which were the first to face these problems, and the need to adopt or adapt only those more adequate to conditions and possibilities in the developing countries, it would seem obvious how critical are the studies and research activities conducted in order to point out quantitatively and qualitatively the real dimension of the problems, so as to adopt the right and more fruitful decisions; the space-time, socioeconomical and political framework within which decision-making must be taken, and the scientific and technological alternatives more appropriate for the solution of the problems. On the other hand and due to the fact that environmental problems do never arise in the same order or grade and situations change constantly so as does knowledge, and the technologies to handle them, inputs for decision-making must spring from a continuous and updated flow of information, product of research, so that they permit to create programs for the fight against environmental pollution or damage in a flexible, adaptable and innovative way.

But it is also clear that the execution of research permitting to obtain these inputs for decision does require not only becoming aware of its need but also the infrastructure and resources that allow to perform it with effectiveness and scientific precision which makes its contribution a valid one. A correct identification of the problems subject to research and the willingness of academic, governmental or professional institutions to carry out these studies do not suffice when resources -human, financial, scientific and technological- have not reached enough critical mass as to perform research with an appropriate quality level. Before the almost chronical scarcity of these research resources in developing countries, exploration of other schemes permitting to optimize them is a must. We shall try to summarize two of these possible schemes, such as the new concept of technical cooperation and the transfer of technology among developing countries, and the establishment and expansion of cooperative systems for transfer and exchange of scientific and technological information not only among developing countries, but also between these and industrialized ones.
III. RESEARCH AND TECHNICAL COOPERATION

As a result of furthering the establishment of a new international economic order that permits more equitave game rules in the commercial relations between rich and poor nations, the Third World countries have sought through international forums the creation of new cooperation formulas that transcend more efficaciously the old paternalistic and philanthropist mould of traditional technical assistance that, as Ferreira points out (4) "conditioned technology transfer to the application of programs planned and executed according to pre-established standards and models, entirely foreign to the reality in needful areas... From the idea of "help" or "aid" inherent to the concept of technical assistance another of "cooperation" has risen, and it implies the decision to deploy joint efforts in the achievement of a common objective... A system of actions predetermined at international level has changed into the consideration to every country's needs and specific objectives; a stereotyped development model has given way to the application of indigenous formulas; the simple technology transfer has become the development of appropriate technologies and -maybe even more important- planning by resources needs has changed into planning by desired results."

The same writer indicates: "International technical cooperation may further a development based on local possibilities and on exchange among countries of similar technological ability, by the following means:

- the elaboration of development plans and strategies, the practice of viability studies and of research prior to technology transfer, and the gathering of information and basic data;
- the attainment, adaptation and diffusion of appropriate technologies;
- the creation of institutional infrastructures;
- the formulation and execution of experimental programs, by means of new, multidisciplinary methods."

The application of these means to the problem of health services coverage expansion is the objective unanimously pointed out as a priority one in the 1977 meeting of the Health Ministers from the Latin American and Caribbean countries, and it could -or should- start with the indispensable reinforcement of its indispensable basis, that is, the provision of more and better basic sanitation and environmental hygiene services that constitute the preliminary, preventive stage of the healing and health rehabilitation aspects. Thus, in the realization of the expressed exchange means, the opportunity would arise to demonstrate in praxis the multiplying benefits of this new concept of international cooperation in a basic aspect of integral health, as environmental health is, on which consensus has been reached as being, undoubtedly, a common problem in the majority of the developing countries. As pointed out by Dr. Haldan Mahler, WHO General Director, in his report of the 1974 World Health Assembly "no matter how modest the improvement in basic sanitation in developing countries is, it will always mean an step towards the reduction in the incidence of parasitic and other transmissible diseases, specially enteric diseases, including cholera." (5)
Additionally, if we want to achieve the main objective proposed at the 1977 World Health Assembly, that is, to orientate the actions of WHO and its Member Countries in the next decades in order to achieve that worldwide population enjoys by the year 2000 a health status permitting high social and economic productivity, it seems obvious that the majority of the developing countries will only attain this aim by a general reorientation of activities towards the best possible utilization of resources, whether national or international, and by means of their redistribution from traditional therapeutic programs centered in diseases treatment to preventive programs directed to the majority of the community insufficiently attended, which will lower high incidence of morbidity and death rate of the health hazards of the human environment by means of better and larger basic sanitation programs that will also help decreasing high child mortality rate, so that the primary health attention services might be reduced into economically feasible terms. This also implies the optimization of resources from international cooperation, particularly orientated towards research of the problems' real terms of reference, in order to optimize decisions and the utilization of resources; towards the transfer, creation or adaptation of appropriate technologies among developing countries, less costly than those from developed countries; towards the establishment of better channels for communication, data exchange, informations and knowledge, between developed and developing countries, that will make feasible the continuous training of human resources, the preparation of needed specialists and the training of health auxiliary personnel to integrate multidisciplinary work teams, and the active participation and furtherance of self-sufficiency in the community in order to contribute to, and benefit from, the health programs designed with such criteria.

As regards the contribution that an organism like PAHO could make for the achievement of these health goals for the Americas, its Director, Dr. Héctor R. Acuña, raised some possible alternatives for orientating its action at the service of its Member Governments in the next decades, in the opportunity of the first 75 years of PAHO's life, in 1977. Dr. Acuña said: (6) "... it is the consensus of the PAHO Member Governments that the extension of coverage of health services is the most urging problem they collectively have before them. At the same time, it is a field about which comparatively little is known, where nations would venture into unknown land. For this reason, an international organism would be the ideal mechanism for contributing to channel and further innovating approaches coming from the nations in the Hemisphere and outside the Region... It might well happen [Dr. Acuña points out later referring to another possible PAHO role in the elaboration of new technologies] that PAHO, as an international organism, plays the indispensable role of transmitting these ideas acting as coordinator of an international information system... Should PAHO keep on carrying out all phases of planning and execution of a program or should it centralize its collaboration in specific areas?... Maybe PAHO could adopt a more theoretical function, acting as an international organism for research... In this regard, PAHO depends directly from its Member Countries. PAHO exists to service them but cannot efficiently carry out its functions without receiving a good dosis of stimulus and advice. In this context of frank and open discussion our next 75 years will be truly significant."
IV. RESEARCH AND INFORMATION

Let us briefly ponder over two of the concepts expressed by Dr. Acuña: that of PAHO as an international organism for research and that of the Organization as coordinator of an international information system.

The close relationship between research and information is obvious as it can be said that, in essence, research is the systematic handling of known data and the scientific and methodologically strict exploration into the sphere of other data or information, whether assumed or to be known, in order to structure systematically the results into new data, information and knowledge about a specific reality or a portion of reality. Even if considerable advances have been reached in the creation of instruments and mechanisms that allow the researcher a more deep and precise exploration of data sprung from the same reality and also if, thanks to an unbelievable accumulation of knowledge, scientists are much better prepared to extract data and relevant conclusions from their observations and experiences, it is a well known fact that these very informative richness and the exponential rate of its increase and renewal make speedily obsolete specific bodies of knowledge, compel the professionals to a continuous training and updating and create large economic and technical problems in the attainment of the appropriate gathering, handling, dissemination and efficient utilization possibilities of that information. It is also undoubtful that, from a financial —an also technical— point of view, it is very costly for the developing countries to repeat or even attempt research activities that have already been performed in industrialized countries or in those becoming industrialized, and more costly than to try using, after adaptation to their possibilities and needs—if feasible and convenient— the results obtained elsewhere. The elaboration of technologies appropriate to developing countries can, no doubt, never be generated in the void and though it implies prior knowledge of which are the actual parameters of our needs and possibilities, it also implies to avoid unnecessary duplication of the previous stages of research and development other countries have had to go through in order to produce more sophisticated and costly technologies. Even the more simple and economic technologies and those called intermediate technologies require also an informative basis that permits to utilize previous thoughts and experiences, whether in developed or in developing countries, so as the optimal utilization of resources before common problems or situations, using the benefits of technical exchange and cooperation. The very possibility of these cooperation and exchange activities, not only in the field of research and of practical "know-how" applications but in all other cooperative aspects of the health programs, requires communication channels and information transfer infrastructures that make feasible its introduction, evaluation and feed-back in a continuous cycle generating economies of scale and obtaining a multiplying effect on resources and investments.

Information and research are two fundamental components of this circuit and all efforts directed to develop their interaction ability will undoubtedly lead to the system's greater efficiency and productivity.
V. THE CEPIS INFORMATION SYSTEM

As a result of the concern expressed by PAHO and WHO to help establishing the ground basis permitting the development of true integrated information systems on and for health, several efforts are presently carried out with the consensus and cooperation of their Member Countries.

At the LXI WHO Executive Council meeting, held in Geneva, January 1978, where the common denominator was the new direction to be given to policy and strategies within the Organization in the next decades, an analysis was made, among other important matters of interest for the Member Countries, of the mechanisms to make technical cooperation more efficient. Among them, sanitary planning by countries and centralized financing of technical cooperation; greater participation of national resources in WHO activities; proposals for a new orientation of strategies in the fight against paludism and cancer and for the eradication of smallpox, and three other programs of innovating character, such as those for appropriate health technology, for the evaluation of health programs and for sanitary information systems; as regards this last program, approval was reached on the strategy followed up to the present moment to establish and apply the new WHO information system, pointing out the need that this and those of the countries be developed in close contact and count with the participation of local resources in its ulterior development. (7)

PAHO has adopted a similar strategy for the Region of the Americas in several activities it furthers in this sense: in accordance with the objectives and priorities of their own programs, the active participation of the countries in sanitary information systems which aims, structure and mechanisms have been subject to prior consensus, and the support offered by PAHO, through one of its divisions, centers or technical units, to act as the focal point for promotion and coordination of the project, counting also with the cooperation of other national or international agencies. Such is the case of the regional system of statistical information on health, of the biomedical information system carried out through BIREME (Biblioteca Regional de Medicina) in São Paulo, Brazil, with the support of the United States National Library of Medicine and the system sponsored by the PAHO Environmental Health Division, developed through CEPIS with the cooperation of the International Development Research Centre, of Canada, for the design and establishment of a Pan American Network for Information and Documentation in Sanitary Engineering and Environmental Sciences (REPIDISCA).

The global conception of this Network aims at the supply, to the countries of the Region, of bibliographic and documentary information that will be added to data on the environment from other two regional networks that PAHO also sponsors through CEPIS: that of REDPANAIRE on air pollution monitoring and the PRELAB, Regional Program for Analytical Quality Control in Water and Wastewater Analysis Laboratories.

This way, it is intended to eventually integrate data, information and documents relevant to tasks of research, planning, programming and execution of activities, of evaluation, training and updating of human resources, of transfer
and exchange of appropriate technology and of motivation and development of community participation in environmental health programs in the countries of Latin America and the Caribbean Region.

As regards REPIDISCA, these objectives, so as the possible structure, mechanisms and necessary instruments for the development of the Network, have recently been analyzed, in November 1977, by some leading authorities and technicians in data processing from the Region's main institutions and from international organisms linked to problems of this field of specialization, in a meeting of the Consultation Group on Information in Sanitary Engineering and Environmental Sciences, held at CEPIS under the auspices of PAHO and the IDRC, and the collaboration of UNEP (United Nations Environmental Program). Participants to the meeting were 25 professionals from institutions in the countries and 25 representatives from international organisms; among these, from the sponsoring organizations, from WHO, ECLA, AIDIS and the IDB.

The conclusions and recommendations attained, presently disseminated in the Final Report of the Meeting, reassert and expand the Network's initial technical conception, inspired in the new PAHO/WHO policy and strategy orientation: widespread institutional participation of the countries around the concept of technical cooperation, and the generation, transfer and exchange of appropriate technology between developing countries and regions that will be based, among other aspects, in the transfer and exchange of technical and scientific information; consensus on a general objective, the central thematic scope and the instruments and technical standards common to all the Network's participants, but specific objectives and priorities defined by the own environmental health programs in the countries, as the local user, particularly the one least attended to, will be the ultimate receiver of the Network cooperative efforts; orientation of the technical cooperation programs, with all feasible international collaboration, towards the motivation and training of human resources, minimal equipment and production of cooperative services among the Network units with a view on the development of national self-sufficiency, through the progressive establishment, should there be none, of national information centers in this field of specialization in charge of supplying data entries for its centralized processing at CEPIS and of channelling the system outputs to local users until, with necessary international cooperation and self-effort, the establishment be attained of national specialized information and documentation systems that satisfy local demand and can supply, with the regional focal center's help, besides the national information, information produced throughout the Region, and the selection of more relevant information being produced at an international level.

The development of the system's technical design is foreseen in the first stage of the project (that began in September 1977, and will be completed by December 1978). This includes the preparation and trial of some of the instruments and technical standards to be used at the Network, in consultation with the countries institutions, with the cooperation of the CEPIS consultants and the support of other Region professionals to act as short term consultants: one element to intend ensuring the utilization of a common terminology in the description of contents of the documents incoming to the system, such as the Microthesaurus of terms in Sanitary Engineering and Environmental Sciences (MISCA) that has been
advanced; a series of technical manuals, including one describing the objectives, structure and functions of REPIDISCA with directions for the organization of an information and reference center that may later become a center for coordination and promotion at national, subregional or sectorial level; another manual on the Network's processes and technical standards (selection, acquisition, registration, cataloging and classification, indexing and elaboration of abstracts, dissemination, exchange, etc. of bibliographic and documentary materials); another manual on the utilization and continuous updating of MISCA; and, lastly, it is foreseen to publish manuals on simple, low cost systems for storage and retrieval of information, such as uniterms cards, edge notched cards, optical coincidence cards and, for those institutions with sufficient workload to require them, automatized information retrieval systems in minicomputers. As it can be observed, within the minimal standards allowing to obtain compatibility in the inputs, processes and outputs of the system (to make feasible the exchange of products and services), it is also intended to offer technological alternatives within a varied range of simplicity or sophistication, in order that each institution may adopt the more appropriate one to its needs and capabilities.

With the aim to define more exactly these needs, the existing infrastructure in the main specialized institutions of the Region, and the best way to optimize the utilization of these resources for covering those needs in the system's general economy, the project contemplates as well, as other components, the execution of a sample survey, that should be representative enough as to get institutional profiles of the main information sources and users in the Region. The exercise, hopefully to be carried out with collaboration from the PAHO Representative Offices in the countries and with the cooperation from the institutions and from other professional associations, such as AIDIS (Asociación Interamericana de Ingeniería Sanitaria y Ambiental) and its national centers, will then also permit to add the results of data analysis, as situational diagnosis, to the REPIDISCA final design.

In order to evaluate these results and the behaviour of the instruments prepared for the Network, the institutions participating in the Consultation Group Meeting proposed the realization of an experimental trial of such elements between CEPIS and the existing centers for documentation and reference, and the analysis of both exercises in a new regional meeting to take place by the end of the year or at the onset of 1979; INCYTH/CARIS, in Argentina, has offered its headquarters for the realization of the meeting and UNEP has contemplated to give collaboration to that end, within the concept of TCDC (Technical Cooperation among Developing Countries).

On the other hand, it must be noted that the guidelines of the REPIDISCA project are being inserted, technically and practically, in the development of the CEPIS own information system, so complying with the mandate of CEPIS to serve as a regional center of reference in this field of specialization and this also agreeing with its role as a WHO Collaborating Center on Community Water Supply for the Region of the Americas, as a WHO Collaborating Center for Wastewater and Solid Wastes Disposal and as a participant of the UNEP/WHO Air and Water Quality Monitoring Program in the Region.
VI. DEVELOPMENT OF THE CEPIS INFORMATION SECTOR (8)

One of the CEPIS basic functions, as has been said before, is to serve as regional center for information and reference in sanitary engineering and environmental sciences in order to contribute to the improvement of the communication process between the institutions and professionals of the American countries and between these and similar agencies and colleagues from other continents. To accomplish this mission, CEPIS initially organized a specialized library where some of the main publications on this field were gathered. Almost simultaneously, actions were carried out in respect of technical publications, in a limited way at first while the equipment for the printing shop was being completed, and in a more intensive manner when this was totally acquired. This was the beginning of the CEPIS information sector.

During 1972, through the PAHO Central Office in Washington, negotiations were advanced in relation to the designation of CEPIS as a Regional Reference Center of the system of WHO Reference Centers on Community Water Supply and on Air Pollution. In March 1973, CEPIS was formally designated a WHO Regional Reference Center on Community Water Supply and actions were immediately started for active information exchange, being thus in charge of forwarding regional news on community water supply to the WHO International Reference Centre (IRC) in The Hague, and providing material to the news issued in the IRC monthly Newsletter which is also translated by CEPIS into Spanish and distributed to Latin America.

In the course of that year, CEPIS was represented at the Meeting of Directors of Collaborating Institutions of the WHO International Reference Centre for Wastes Disposal, held in Dübendorf, Switzerland, where information was presented on special research projects to be carried out in the Region of the Americas.

In 1974, contact was established with the Canadian Centre for Inland Waters with a view to develop technical information exchange, and during 1975 the first cooperation activities between both institutions took place.

In 1975 negotiations were advanced before the International Development Research Centre (IDRC) and UNEP, in order to obtain financing support to increase the CEPIS information sector resources; observation visits were paid to four centers of the United States Environmental Protection Agency (EPA) and information was gathered on microfiche equipment.

At the onset of 1976, with the advisory services of a short term consultant and in coordination with the CEPIS professional staff, the general guidelines were prepared for the execution of an expansion plan of the information sector. During the first week of February of that year a meeting was held at CEPIS of the Consultation Group on Technical Information, made up by representatives from CETESB, IDRC, IRC, EH, the short term consultant in technical information and officers of the CEPIS information sector. At this meeting discussions were held on the general guidelines of the expansion plan and its possible links to international programs such as those projected by the "Ad-Hoc Working Group for Rural Water Supply and Sanitation."
During the second semester of 1976, with the collaboration of a short term consultant, the sector planned the implementation of the initial activities for the information services expansion plan. The general guidelines were prepared for the organization and operation of REPIDISCA (Pan American Network for Information and Documentation in Sanitary Engineering and Environmental Sciences); a first draft of the basic scheme for the CEPIS Microthesaurus, with identification of ten semantic fields, general thematic structure of each field, and a detail of the semantic field "Water"; a tentative information flow chart and the first general rough draft for the feasibility study to choose the processing system to be used at CEPIS. During the period from 19 September to 9 October, the short term consultant collaborated with the AIDIS authorities in Rio de Janeiro in a possible PAHO/AIDIS technical cooperation program, especially in matters of technical information.

Also during the second half of 1976, the visit took place of a specialist in information from the Batelle Memorial Institute, who discussed the plans for the expansion of the CEPIS information services. Two consultants in library sciences and information, under contract by the Central Office in Washington, visited the Center too, in order to discuss the coordination of the Organization information services.

In the first months of 1976 a proposal was prepared and sent to the IDRC requesting that Centre's financial collaboration for the design and establishment of a new classification and retrieval system for sanitary and environmental information, to be gradually implemented at regional level and, in November, a new version of the proposal was prepared, including the IDRC's recommendations. The proposal was approved by the Centre's Governing Board in March 1977, and the agreement letter granting the requested aid was signed by PAHO and the IDRC in April 1977.

In September 1977 the new human resources for the development of the project joined the Center and the project began its activities which first stage is now completed; this includes the presentation of the preliminary design, and the conception of the thesaurus and an inventory of sources and users, to a Consultation Group at regional level. Their conclusions and recommendations are in the stage of incorporation to the preliminary design, so as the suggestions given for the development of the thesaurus and the gathering of sources and users. At the same time, advances have been made in the preparation of the Network technical manuals and in the studies necessary for the development of the system's data base. While the methodologies and mechanisms are prepared to incorporate the contributions from the Region's national institutions to the data base, experimental work is being done in the trial of such means, based on the documentation gathered by the CEPIS information sector.
VII. GATHERING, CLASSIFICATION, STORAGE, RECOVERY AND EXCHANGE OF INFORMATION

The CEPIS documentary fund has been gradually increased in the years by acquisition, donation and exchange. As regards periodical publications, 39 subscriptions were renewed and seven were ordered in 1973; the library holdings included 99 journals, of which 53 came as donations from institutions in America, Asia and Europe. The number of subscriptions to journals increased in 1974 to 106; in 1975 a total of 1,106 fascicles of periodical publications were received, of which 243 were issues from previous years; in 1976, the journals titles were 147 and in 1977, 165, reaching about 200 during the first quarter of 1978; the titles include the main periodical publications in sanitary and environmental engineering and related topics and they are regularly received by the library.

The books collection augmented in 1973 with 581 new titles and in 1974 with 753 new ones. Also in 1973, 1,250 microfiche documents were received by agreement with the U.S. Environmental Protection Agency (EPA), who designated CEPIS as depositary of their publications and technical reports collection. In 1974, 2,043 EPA technical reports microfiches were received, and in 1975 the collection reached a total of 7,466 titles.

In 1975 the library moved to its present location in the new CEPIS building and acquired new modern furniture, including shelves, file cabinets, microfiche files, tables and study desks, etc., in a 150 m² area. The Center's bibliographic holdings grew with 1,012 new titles and 4,053 EPA technical reports. In 1976 a total of 701 books and 2,056 EPA microfiche reports were received; this collection grew up to 9,527 reports and the total bibliographic and documentary holdings of the Center went up to 14,448 documents. In 1977 this number reached 17,843, with the receipt of 814 books and 2,463 microfiches. Lastly, in the first quarter of 1978, 144 new books and 358 microfiches were received and the total number of documents at the Center reached the amount of 18,345, thus surpassing the established 18,000 goal for the year.

Services rendered to the Center's internal and external users have also grown together with the development of the documentary holdings, though their demand is spontaneous and no promotion will be made until capability for full attention has been developed.

From a short number of readers attended at the onset of the library's activities, and in spite of the scarcity of public transportation reaching the new CEPIS building, the Center has extended this service to some three hundred users who—in 1976—came from some 30 institutions, among them 10 universities (two from the Provinces outside Lima), one librarians' school, five ministries and 11 governmental institutions.

In 1977, in consultation with or under the direction of the respective CEPIS consultants, the library prepared 17 specialized bibliographies with a total of 346 references, free photocopies of 21 articles from periodical publications were given out, and 3,899 photocopies were provided at cost. The Center's information sector attended also 19 information requests and 117 requests for
publications; 533 publications were sent after direct requests, 453 through the Area and Country Representatives and 761 were forwarded to the countries for its further sale or donation. During the year, attention was given to 16 requests for collaboration from institutional libraries, one of them to give an in-service training to a librarian from a governmental institution, and 1,778 fascicles from journals and various publications were transferred, at the request of libraries from seven institutions. The library received 709 documents as donation or exchange, and 5 inter-library loans were carried out.

As regards the CEPIS consultants, in 1977 they reviewed and/or commented 17 technical documents, prepared 60 answers to technical information requests with the eventual collaboration of the sector and wrote 15 technical reports and 90 technical communications.

VIII. DISSEMINATION OF TECHNICAL INFORMATION

This is a very important activity to accelerate the process of technology transfer and to further applied research. CEPIS carries it out through the preparation, translation and/or revision of technical documents and the publication of technical dissemination media. With the product of the sale of some of its publications CEPIS has created, since 1974, a rotating fund generating more than 1,200 dollars, which has financed a sizeable portion of the costs for printing the CEPIS technical documents. It is expected that in the near future this rotating fund permits the self-supported operation of the Center's publications program.

1. Preparation, translation and/or revision of technical documents

CEPIS prepares three kinds of documents: The EH Technical Series manuals, the CEPIS "Technical Documents" and other documents not belonging to any particular series. As regards translation and revision, this task is usually performed at the request of WHO, EH and, occasionally, of the authors concerned.

Among the documents or technical papers prepared, reviewed or translated, there are eight EH Technical Series manuals and four of the CEPIS Technical Documents series, 41 various documents having been prepared, and eight other having been translated and published.

As an example we can mention that, in 1973, collaboration was given to the ECLA Natural Resources and Environment Division in the preparation of the first draft of the document "Los recursos hidráulicos de América Latina en el II Decenio de las Naciones Unidas para el Desarrollo", writing the chapter on aspects of sanitary engineering. CEPIS prepared and printed papers on the application of systems analysis to problems of sanitary engineering, for their presentation in technical meetings; some 150 copies were distributed of "Sistema de control hidráulico para filtración en rata constante y declinante"; a technical document on sludge anaerobic digestion was prepared and another one on the economic period of design, and collaboration was given in the preparation of a document for the study on water pollution and resources in the Paraíba do Sul river.
In 1977 the Technical Series Manual No. 20 "Polución de agua: Modelos y control" was distributed, and it has registered heavy demand; the second issue was printed of the technical Series Manual No. 14 "Nuevos métodos de tratamiento de agua"; the Technical Document No. 4 "Guía para la evaluación de laboratorios Físico-químicos de análisis de aguas", in English and Spanish, was reviewed and prepared: documents "El agua como problema del futuro" and "Experiencia Latinoamericana en modelos de calidad de agua" were prepared for the CONPAGUA meetings in Argentina; at the request of the organizers of the XXIII TIMS Conference (Athens, 25-27 July 1977) the paper "Planning and policy for water quality management: Experiences in Latin America" was prepared. A limited issue, for revision, was published of the manual prepared for the CIFCA/CEPIS course on design of wastewater treatment plants for developing countries, and of the "Programa generalizado de computación SIMOX-II: Manual para usuarios." Five documents were also published for the meeting of the Consultation Group on Information in Sanitary Engineering and Environmental Sciences (CEPIS, 14-16 November 1977): one document gave information on the objectives and agenda of the meeting, one on the procedures suggested for its development and three documents described the components of the first stage of the REPIDISCA project (basis for the Network, for the thesaurus and for the inventory).

2. Publication of technical dissemination media

In September 1974 the first issue was published of the Bibliographic Bulletin, a regular quarterly publication and, by the end of 1977, 14 issues have been distributed. Each issue includes a bibliography on a CEPIS specialization area.

The first issue of the quarterly CEPIS newsletter "Noticias sobre ingeniería sanitaria y ciencias del ambiente" appeared in June 1975 and it has been published regularly with a pressrun of 6,300, being distributed in all Latin American countries. By the end of 1977, 11 issues had been disseminated among the countries.

In October 1975, the first issue was published of the PRELAB Bulletin, in English and Spanish, and five issues had been distributed by the end of 1977, mainly among the participants to this Regional Program of Laboratories of Water Analitical Quality.

The first "Hoja de Divulgación Técnica" was published in November 1976. This dissemination medium (non periodical) will serve to quickly spread knowledge of scientific developments that should be of interest among the professionals, even the PAHO field personnel. It may be considered the technical-scientific complement of "Noticias". Two issues of this document have been published.

On the other hand, since January 1973, CEPIS translates into Spanish, and distributes in Latin America the IRC Newsletter, with a pressrun reaching now 6,300. In 1977 ten issues (No. 70 to 79) of the "Noticiero" were translated, printed and distributed.
IX. RELATIONSHIP WITH SOURCES AND USERS OF TECHNICAL INFORMATION

These activities have been generated from the spontaneous demand of requests on technical information and this service has not been promoted, as present search conditions require a somehow long time span for reply.

With a view to establishing a first approach to the universe of users to be eventually covered by the CEPIIS information system, in 1975 a card for the registration of people interested in receiving publications and technical information began to be used on an experimental basis. During the implementation period and in spite of having done no promotion of these services, the Center has received requests for publications and information not only from Latin America but also from Africa, Asia, Australia, Europe and, naturally, from the WHO international centers.

The sample survey gathering information of the main sources and users of the Region in matters of water supply and basic sanitation in rural, fringe and urban areas, that is included in the REPIDISCA project, will no doubt provide a better approximation to that objective.

X. TOWARDS AN INTEGRATED SYSTEM OF INFORMATION FOR HEALTH

The development of information systems by sectors, linked to partial aspects of health, should eventually be integrated into a global sanitary information system reuniting the specialized inputs of each sector into a large reference center that, in the manner of a clearing house, could on the one hand direct the users to the corresponding sector or system, and, on the other hand, serve as a centralized focal point for all information on and for health. The advances on the projects of several information systems on partial or complementary aspects of health problems (as for instance, data and information of socioeconomic, demographic, institutional, or human resources type) would require an immediate effort for its coordination at central level by the interested organisms, before the systems are more solidly established and it becomes impossible to achieve compatibility in an early stage among types of inputs, processes and outputs, products and services, etc.

The savings reached through avoidance of efforts duplication, a better utilization of resources and greater and better productivity of such services would be good enough reason, under the spirit of true technical cooperation for development, to intend facing the problem at the shortest possible notice.
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