

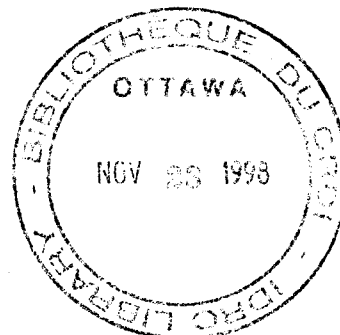
Water and Sanitation Information  
The Decade and Beyond

The Perspective of the Information Sciences Division

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"... it is directed to heat foul water by boiling and exposing to sunlight and by dipping seven times into it a piece of hot copper, then to filter and cool in an earthen vessel. The direction is given by the god who is the incarnation of medical sciences".

"Naghrund Bhuson". 2000 B.C.



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# ACRONYMS USED

AFEE	Association française pour l'étude des eaux
AGID	Association of Geoscientists for International Development
AHWG	Ad Hoc Working Group on Rural Potable Water Supply & Sanitation
AIT	Asian Institute of Technology
APPROTECH	Asian Alliance of Appropriate Technology Practitioners
CEFIGRE	International Training Centre for Water Resources Management
CEHA	Centre for Environmental Health
CEHANET	Information Network on Environmental Health
CEPIS	Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (Pan American Center for Sanitary Engineering & Environmental Sciences)
CESI	Country External Support Information system
CETESB	Companhia Estadual de Tecnologia de Saneamento Basico e de Defesa do Meio Ambiente
CIDA	Canadian International Development Agency
CIEH	Comité inter-africain d'études hydrauliques
CILSS	Comité inter-états pour la lutte contre la sécheresse au Sahel
ENSIC	Environmental Sciences Information Centre
ERIS	Escuela Regional de Ingenieria Sanitaria y Recursos Hidrolicos
FAO	Food and Agriculture Organization of the United Nations
IBRD	International Bank for Reconstruction and Development (World Bank)
IDRC	International Development Research Centre
ILO	International Labour Office of the United Nations
IDWSSD	International Drinking Water Supply and Sanitation Decade
INAA	Instituto Nicaraguense de Acueductos y Alcantarillados
INCYTH	Instituto Nacional de Ciencia y Tecnica Hidricas
IRC	International Reference Centre for Community Water Supply & Sanitation
ITDG	Intermediate Technology Development Group
ITPL	Intermediate Technology Publications Limited
MISCA	Microtesauro de Ingenieria Sanitaria y Ciencias del Ambiente
NEERI	National Environmental Engineering Research Institute
NGO	Non-Governmental Organization
NWRI	National Water Research Institute
NWS&DB	National Water Supply and Drainage Board
OECD	Organization for Economic Cooperation & Development
POETRI	Program on Exchange and Transfer of Information
PVC	polyvinyl chloride

REPIDISCA	Red Panamericana de Informacion y Documentacion en Ingenieria Sanitaria y Ciencias del Ambiente (Pan American Information Network on Sanitary Engineering and the Environmental Sciences)
RESADOC	Réseau sahélian d'information et de documentation scientifiques et techniques
SENAPA	Servicio Nacional de Abastecimiento de Agua Potable y Alcantarillado
UNDP	United Nations Development Programme
UNESCO	United Nations
UNICEF	United Nations Children's Fund
WASSDOC	Water Supply and Sanitation Documentation Centre
WHO	World Health Organization
WRC	Water Research Centre

## INTRODUCTION

Water, sanitation, health and information. Since about 2 000 B.C. and, if recorded knowledge permitted, probably into the millenniums before, civilizations have been aware of the linkages between pure water and good health. Water purification procedures known and used by Aryan and Indic priests and physicians until 400 A.D. have been found in Sanskrit records; practices of the Egyptians in the fifteenth and thirteenth centuries are recorded in drawings in the tombs of Amenophis II and Rameses II; Greek customs can be found in the writings of Plutarch, Herodotus, Socrates, Plato, Galen and others in the first century B.C. while those of the Romans are recorded in the writings of Hirtius, Pliny, Frontinus and others in the first century A.D.; the experiences of the Arabs are recorded in a treatise written by the alchemist Geber in the eighth century; and procedures used by the Persians are documented by the eleventh century physician, Avicenna.

Throughout civilization, considerable time, effort, and resources have been expended on the provision of water and the maintenance of water supplies. The ruins of the Roman Empire and the on-going cultural practices of the Middle Eastern and North African countries attest to the recognized linkages between clean water, sanitation and good health. But history has shown that while health standards in the Middle East continued to flourish due to religious influences, the systems and customs advanced by the Romans diminished after their fall and as a result water supply, sanitation and personal hygiene in Europe between 400-1800 A.D. gradually and continuously deteriorated. It has been postulated (15) that this deterioration in Europe was due in part to the loss of interest and knowledge about water supply and sewerage and its benefits to health.

Almost six thousand years after the first known symbols (Sumerian 4000 B.C.) concerning water laws and water use were written; more than two thousand years after the construction of the first Roman Aqueduct; and 180 years after the construction of the first public water supply system in the U.S.A., the United Nations, recognizing the importance of water and sanitation for health, established in 1980 the International Drinking Water Supply and Sanitation Decade (IDWSSD). Its objective was to provide all the world's people with clean water and adequate sanitation by 1990.

This paper attempts to review information activities carried out within the framework of the IDWSSD from the perspective of the Information Sciences Division of the International Development Research Centre (IDRC), the support given to water and sanitation information through its own program, some of the priorities of other agencies for the Decade and beyond, and draws upon this knowledge and experience to formulate a plan for Information Sciences for the forthcoming seven - twelve years.

## THE PROBLEM

As has been recognized since antiquity, "the provision of a safe and convenient water supply and basic sanitation services are of paramount importance to the health of people..." (16). Yet, in spite of the universal acceptability that an adequate supply of water for drinking, personal hygiene and other domestic purposes and an adequate means of waste disposal are essential to public health and well-being, vast numbers of people in the developing world are still deprived of these basic services.

As a consequence, diseases related to poor water supply or sanitation affecting man's health are relatively wide-spread and abundant, particularly in rural areas. These diseases can be subdivided into five groups: 1) waterborne diseases, including cholera, typhoid and infectious hepatitis; 2) water-washed diseases, including scabies, leprosy, and bacillary dysentery; 3) water-based diseases, including urinary and rectal schistosomiasis; 4) water-related vectors, including malaria, yellow fever, and dengue; and 5) faecal disposal diseases, including hookworm and paragonimiasis (See Appendix A for more detail) (18). To these can be added the numerous illnesses resulting from industrially and chemically polluted water.

While the incidence of these diseases is influenced by geography, culture, sanitary habits and facilities, the quantity and quality of the local water supply, and methods of waste disposal, they nevertheless account for 80 percent of all sickness and disease in the world, and the deaths of more than 12 million people, including 5 million children, annually (4).

## THE DECADE, ITS MISSION, AND THE ROLE OF INFORMATION

In 1976, the United Nations Conference on Human Settlements (HABITAT) in Vancouver identified water and sanitation as being of high priority. The following year, the United Nations Water Conference in Mar del Plata, Argentina passed a resolution promulgating that all people have the right to such "basic needs" services as access to drinking water supply and sanitary disposal of waste. It recommended, inter alia, "that where human needs have not yet been satisfied, national development policies and plans should give priority to the supplying of drinking water for the entire population and to the final disposal of waste water" (20).

Within the plan of action, it was recommended that "an effective clearing-house mechanism should be developed through international cooperation, by strengthening existing mechanisms if available, at the

national, regional and international levels, to provide for the communication of selected information concerning all elements of community water supply and sanitation" (20). Four years later, in 1980, the United Nations General Assembly at its thirty-fifth session, proclaimed the period 1981-90 as the International Drinking Water Supply and Sanitation Decade (IDWSSD).

#### INVOLVEMENT OF THE INFORMATION SCIENCES DIVISION

The Information Sciences Division's involvement in water and sanitation information activities preceded the establishment of the water decade by six years. In April 1974, an Ad Hoc Working Group on Rural Potable Water Supply and Sanitation (AHWG) was created to promote the improvement of water supplies and sanitation in the rural areas of developing countries. The original Group was comprised of the International Development Research Centre (IDRC), the World Health Organization (WHO), the United Nations Development Programme (UNDP), the International Bank for Reconstruction and Development (IBRD - World Bank), the United Nations Children's Fund (UNICEF) and the Organization for Economic Cooperation and Development (OECD). It was subsequently expanded to include the United Nations and the Food and Agriculture Organization of the United Nations (FAO) and at a meeting in November 1975, at which a draft International Programme for Rural Potable Water and Sanitation was discussed, the Group was expanded further to include governments, with relevant bilateral programmes, and other United Nations agencies.

One of the recommendations of the November meeting was that action towards the collection, storage, evaluation and dissemination of information should be initiated and that a network of information centres should be established at local, national and international levels to facilitate the exchange of information in this field. In February 1976 in New York, the AHWG agreed to initiate specific activities and IDRC accepted the task of lead agency for examining those related to information.

#### INFORMATION SCIENCES SUPPORT TO GLOBAL INITIATIVES

Over the years, interest and willingness to participate and cooperate in the development and execution of an information programme for rural potable water supply and sanitation has been expressed by various institutions concerned with the subject. In early 1976, the International Reference Centre for Community Water Supply and Sanitation (IRC) in the Hague approached IDRC to convene a joint IDRC/IRC workshop to bring key institutions together to address ways in how to proceed. This project identification workshop (3-A-76-4025),

held in The Hague in July 1976, did not result in a proposal leading to the establishment of a global, cooperative information network on water supply and sanitation using common standards and procedures. It did, however, reinforce the Information Sciences Division's recognition of the need for stronger information programs in the area of water and sanitation and led to its decision to entertain separate project proposals from the institutions that had been identified as being able to function as regional centres in an information program for water supply and sanitation: Comité inter-africain d'études hydrauliques (CIEH), in Ouagadougou; Companhia Estadual de Tecnologia de Saneamento Basico e de Defesa do Meio Ambiente (CETESB) in Sao Paulo; the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) in Lima; and the National Environmental Engineering Research Institute (NEERI) in Nagpur.

It was envisioned that each water and sanitation information program would build on the existing strengths of these institutions and would focus on a particular form of information service that could be seen as a pilot for subsequent broadening and global use. The Information Sciences Division believed that IRC could play a central role in setting common norms and building common resources and indicated its preparedness to consider requests for financial support, excluding core support, from it for specific program activities of this type.

In the meantime, the AHWG recommended inter alia that specific interim activities in the information area should begin, providing these were important in their own right and would not pre-empt decisions of its planning team which would be responsible for defining in detail a global information program as a primary component of the larger water and sanitation program. Coincidentally, the World Bank had initiated a major research program in rural water supplies and sanitation with the aim of identifying technologies for water supply and waste-water disposal and re-use that were both socially and environmentally acceptable. Discussions between staff of the World Bank and IDRC's Health Sciences Division emphasized that the full benefits of clean water could not be achieved without basic sanitation and the kind of health care that instructs the community in personal hygiene. They noted that conventional and western methods of waterborne sewerage were beyond the reach of developing-country communities and there was the need to identify worldwide the various intermediate technologies that could be considered by policy makers and engineers in charge of sewerage and sanitation programs. A project (3-P-76-0156) was proposed to the Information Sciences Division by Health Sciences to prepare a state-of-the-art review on community waste water and excreta disposal and its relationship to water supply with particular emphasis on the technical aspects of solutions to problems and of relevance to technologies appropriate to developing country institutions. The outcome was the publication of "Low-Cost Technology Options for Sanitation: A State-of-the-Art Review and Annotated Bibliography" - the Information Sciences Division's first water and sanitation information project.



At about the same time, the Association of Geoscientists for International Development (AGID) had recognized that increased attention was being given to the sub-surface water resources of arid and semi-arid regions of the developing world and to the large underdeveloped reserves of ground water that could be exploited for rural and urban water supplies as well as agriculture. AGID noted that in spite of the increasing efforts of national and international agencies to assess and develop this resource, little effort was being made to collect, collate and disseminate the results of this work and it therefore expressed an interest in beginning work in the field of information on sub-surface water resources in developing countries. Through a small DAP (3-A-76-4070), AGID compiled the bibliography "Groundwater Bibliography for Developing Countries, 1970-1976" containing 900 references.

As a follow-up, AGID carried out a survey (3-A-76-4178) of institutions and methods utilized for the management of groundwater information in developing countries. The result was a report entitled "On the Groundwater Information Capabilities and Needs of Developing Countries".

### Waterlines

Responding to the identification by the AHWG of the significant lack of information on water supply and sanitation, particularly on appropriate small scale technologies for rural and urban fringe areas, IDRC, in 1976, commissioned the Intermediate Technology Development Group (ITDG) in London, England to carry out a study (3-A-76-4191) on the need, scope and possible mechanisms for the production of a new international journal in this area. The feasibility study clearly showed the need for a regular publication and the Intermediate Technology Publications Limited (ITPL), a subsidiary of ITDG, was requested to produce a prototype issue called "Waterlines" (3-A-78-4132). The response to this issue was generally favourable and after unsuccessfully trying to identify a suitable Third World or Canadian publisher, IDRC invited ITPL to submit a proposal for starting the publication of "Waterlines". After some delay involving discussions on a broader information program called POETRI (Program on Exchange and Transfer of Information) coordinated by IRC, the proposal (3-P-78-0083) was approved by IDRC in January 1982.

The ensuing five years saw the publication of 22 issues of a high quality publication covering subjects of interest to its intended audience, the professional and technical staff engaged in water and sanitation programs in rural and urban fringe areas.

In spite of the passage of time and the attention given to the Decade activities, however, in 1987 "Waterlines" still remained the only magazine addressing the needs of developing countries in the area

of appropriate technologies for water supply and sanitation. Faced with difficulties in eliciting bulk subscriptions from major donor agencies to enable it to achieve self-sufficiency, ITPL approached IDRC for assistance to sustain the magazine to the end of the water decade. Acknowledgement within IDRC of the quality of "Waterlines" and the recognition that it addressed important program priorities of the Health Sciences, Communications and Information Sciences Divisions led to multidivisional support for a second phase (3-P-87-0081).

### Interwater Thesaurus

By the mid-1980's, perhaps as a result of Decade activities, more and more countries, were recognizing the importance of having control of their own information and the benefits that could be derived from collaborative regional efforts and the use of international and regional information standards and tools. One of the essential tools for facilitating the exchange and transfer of information is a controlled vocabulary or thesaurus. At the outset of the Decade, although related thesauri did exist, there was no specialized publication that included terms from both the drinking water supply and sanitation fields, addressed the social and cultural aspects related to the technical subjects, and could be used by small and middle scale information and documentation systems in developing countries. Those that did exist included the "Intermediate Thesaurus on Community Water Supply and Sanitation for Developing Countries", which had been compiled by the IRC in 1980 in collaboration with the Water Research Centre (WRC) in the United Kingdom, and the "Microtesauro de Ingenieria Sanitaria y Ciencias del Ambiente (MISCA)", which had been completed in Spanish by CEPIS/REPIDISCA at about the same time. After undergoing several drafts the "Intermediate Thesaurus" was translated by the International Training Centre for Water Resources Management (CEFIGRE) in France in 1983 and was subsequently used by CIEH in combination with a thesaurus of the Association française pour l'étude des eaux (AFEE), to compile its own.

Due to the emergence of these related activities, and considering the recommendations of a 1983 meeting of Information Specialists held at IRC, it was recognized that a common indexing tool was required. The IRC, therefore, approached IDRC for assistance to enable it to produce a common multilingual thesaurus (English, French and Spanish) (3-P-84-0323) in the field of rural water supply and sanitation in order to facilitate the exchange and transfer of information among centres working in the area. As a result of the collaborative effort of the Association française pour l'étude des eaux (AFEE), the Water Research Centre (WRC), the Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS), the Comité interafricain d'études hydrauliques (CIEH) and the Environmental Sciences Information Centre

(ENSIC) of the Asian Institute of Technology, under the guidance and coordination of IRC, two volumes of the "Interwater Thesaurus" have now been produced. The first volume, in separate English, French and Spanish editions, provides the terminology itself as well as a list of main terms by category; the second volume is a list of the main terms in the three languages.

In September 1987, the IRC convened a working meeting in The Hague on information exchange in water supply and sanitation. Thirty-five representatives from seven developing countries, including Thailand and Indonesia financed by IDRC (3-A-87-4107), three UN agencies, six bilateral donor agencies, as well as four regional and five international information, research and training centres participated. Almost ten years after the efforts of the AHWG, the importance of information exchange in facilitating and enhancing the efficiency and effectiveness of water supply and sanitation projects was again emphasized.

#### INFORMATION SCIENCES SUPPORT IN LATIN AMERICA

In 1974, the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), in response to concerns expressed within Latin America that national efforts to improve the handling of information on sanitary engineering services, community water supplies and environmental health were developing in isolation, and after discussions with IDRC, undertook to design a master plan for a regional information system on sanitary engineering and environmental sciences with special emphasis on rural potable water and sanitation (3-P-75-0022). The resulting master plan was based on the international cooperative information system model which places responsibility for controlling national literature upon national centres, and is coordinated regionally by the most appropriate centre, which is recognized as such by the national centres, is funded (theoretically) by national contributions and is competent in the information field. The study phase also resulted in the definition of subject scope, the compilation of a thesaurus, an operating manual, an inventory of institutional information resources, and the identification of the proposed network as REPIDISCA (the Pan American Information Network on Sanitary Engineering and the Environmental Sciences).

The next step in IDRC's support to Latin America in this area was a grant (3-P-79-0117) to assist CEPIS to establish a pilot operation in which the tools designed during the first grant were tested and exchanged among a small group of participating institutions. This phase enabled CEPIS to actively involve national cooperating centres in the network and provide them with training to facilitate participation in the preparation of the network's abstract journal, "REPINDEX"; produce six issues of the journal; and compile a data base comprising about 9 500 records. Eight years after the first project began, the network comprised 30 active input centres in the Latin American region.

The rapid growth of the REPIDISCA network was reflected in an increasing demand for technical assistance for institutional development and training for local staff. While previous emphasis had been placed on the input functions of the national centres, CEPIS believed that with the network's growth there was the need to consolidate operations, enhance the service functions of the cooperating centres, and plan a more orderly growth of the network over the forthcoming years. It was this in mind that IDRC supported its third project (3-P-83-0152) with REPIDISCA.

As the REPIDISCA network developed, several national cooperating centres approached IDRC for assistance to ensure their effective participation. Since REPIDISCA was modelled on the international cooperative systems design, IDRC agreed to entertain a limited number of requests to test, at the national level, the methodologies and procedures developed. The Division has since provided support to the Servicio Nacional de Abastecimiento de Agua Potable y Alcantarillado (SENAPA) in Lima, Peru (REPIDISCA - Peru: 3-P-84-0322); the Instituto Nacional de Ciencia y Tecnica Hidricas (INCYTH) in Buenos Aires, Argentina (REPIDISCA - Argentina: 3-P-85-0297); Escuela Regional de Ingenieria Sanitaria y Recursos Hidrolicos (ERIS) in Guatemala City, Guatemala (REPIDISCA - Guatemala: 3-P-86-0321); and the Instituto Nicaraguense de Acueductos y Alcantarillados (INAA) in Managua, Nicaragua (REPIDISCA - Nicaragua: 3-P-87-0047).

All of these projects have as their main objective to improve the collection, processing and dissemination of water and sanitation information in their respective countries. In this effort they have modelled their activities according to the regional REPIDISCA's procedures and standards.

In 1984, CEPIS, as the regional institution responsible for information and technology transfer in the area of water supply and sanitation and environmental health, recognized that few countries in Latin America had articulated a coherent research policy in water supply and sanitation that could serve to link research plans with the needs of executing agencies in the sector and the populations to be served. CEPIS, therefore, approached IDRC for assistance to develop a survey methodology to evaluate the present situation and trends of water supply and sanitation research in Latin America, demonstrate its application in identifying priority research areas and programs and stimulating research in selected countries, and establish national and regional research information systems. This project was viewed by both the Information Sciences and Health Sciences Divisions as being highly beneficial to the region and they jointly supported it (3-P-84-0067).

## INFORMATION SCIENCES SUPPORT IN ASIA

The first project to be supported by Information Sciences in the Asian region was a direct outgrowth of the joint IS/HS activity on the "Low Cost Technology Options for Sanitation" report and bibliography. During the collection and compilation of this literature, it became obvious that existing information sources in developed and developing countries inadequately covered the sanitation problems and solutions of the developing countries and a permanent service to fill this gap was needed. The Asian Institute of Technology (AIT) in Bangkok, Thailand having considerable experience, particularly in areas related to environmental engineering and sanitation, and recognizing that information was one of the major components of its program expressed the desire to establish an information centre on sanitation. Using the information compiled for the "Low Cost Technology Options" bibliography as its foundation, the project (3-P-78-0010) established an international information centre covering non-conventional and conventional methods of collecting, treating, reusing and disposing of waste-water and human excreta to provide support to engineers, scientists and technologists working in the field of sanitation. The Environmental Sanitation Information Centre (ENSIC), as it came to be called, is one of the specialized information centres of AIT and through two subsequent projects (3-P-82-0072, 3-P-84-0147) played an important part not only in building a solid information collection but in reinforcing AIT's reputation as one of the best information centres in Asia. Recognition of the contribution that ENSIC could make to global efforts on information exchange led to IDRC's support for its director to participate at a technical meeting convened by IRC in 1982 within the framework of POETRI (3-A-82-4248).

In Asia, however, national efforts have evolved in a very different manner from those in Latin America. With no functioning regional information centre with the mandate to coordinate information activities, water and sanitation information efforts have evolved independently.

### Sri Lanka

The first national-level project submitted to IDRC from Asia was from the National Water Supply and Drainage Board (NWS&DB) of Sri Lanka. A workshop in Colombo in November 1983 to review the country's action plan for the water decade stressed the importance and urgent need for adequate access to technical information and encouraged the implementation of a proper information system. It wasn't until 1985 at meetings convened by NWS&DB in April and August, however, that sufficient momentum was achieved to realize the formal establishment of a water and sanitation information network comprising the libraries of nine major institutions plus the NGO Council for Sri Lanka representing

the interests of 30 of the country's NGO's. As the network's coordinator, the NWS&DB submitted the proposal (3-P-86-0108) to establish a Water Supply and Sanitation Documentation Centre (WASSDOC).

Linkages to ENSIC (3-P-82-0072) were established from the outset with short-term training at AIT for WASSDOC staff included in the project. Linkages to international efforts were also promoted through the adoption of the "Interwater Thesaurus" (3-P-84-0323) for indexing purposes. Linkages to other Divisional- supported activities (e.g., DEVINSA (3-P-85-0119) were also undertaken.

### Indonesia

In 1983, about two-thirds of the urban and three-quarters of the rural population in Indonesia, which is the fifth largest country in the world, did not have access to safe drinking water nor proper sanitation. The Directorate General of Human Settlements (Cipta Karya), recognizing the need to disseminate information to planners, engineers, researchers and community workers in support of the country's efforts to achieve its targets of the IDWSSD, requested IDRC's assistance to investigate the status of information activities in Indonesia in the area of water and sanitation, provide guidance in the design of a national network, and assist in the formulation of a project proposal. The knowledge and expertise of the head of the Environmental Sanitation Information Centre (ENSIC) was enlisted (3-A-84-4311) to undertake this task.

The findings of the consultancy, which included the identification of the large number of agencies working in the water and sanitation sector, the fragmentation of responsibilities and resources, inadequate priority assigned to information, insufficient coordination and the desire to improve and develop information facilities, laid the foundation for subsequent discussions between IDRC/IS and representatives of the major institutions in the water and sanitation sector. As a result, a project (3-P-87-0096) was approved to assist the Directorate General of Human Settlements, which has responsibility for water supply and sanitation programmes in the urban areas, and the Directorate General of Communicable Diseases Control and Environmental Health, Ministry of Health, which has the responsibility in rural areas, to strengthen their respective technical capabilities in information handling and to put in place the procedures for the establishment of a national documentation and information network on water supply and sanitation. Some of the first activities, which involve the strengthening of the relevant human resources in modern information and documentation procedures, are reinforcing linkages between the Indonesian network and AIT/ENSIC where training has been carried out.

### Regional NGO's

The role of non-governmental organizations (NGO's), in activities related to the water and sanitation decade has been recognized as significant. They produce a notable amount of information and gather an equally significant amount from external sources because of their relevance. Yet most NGO's lack well-organized and effective storage and retrieval systems making access by others very difficult. The Asian Alliance of Appropriate Technology Practitioners (Approtech Asia) with 38 NGO member institutions from eight countries in the region, and headquartered in Manila, following up on the recommendations of an NGO forum on water development in September 1983 in Yogyakarta (financed by the Health Sciences Division 3-A-83-4069), submitted a proposal (3-P-86-0106) to establish an information service to support the water and sanitation activities of NGO's in Asia.

### Malaysia

In Malaysia, support for water and sanitation information activities has been of a different nature. Through the Health Sciences Division, IDRC supported two phases of a project to determine the technical viability of a new handpump design incorporating plastic (PVC) below-ground components and to show that these pumps are easily adapted to varying social and environmental conditions, are affordable, and can be mass-produced in the country itself. A third phase (3-P-87-0084) had as its objectives to develop and test a strategy for introducing self-sustaining indigenous manufacturing capability with a sub-component to establish a telematics network. This component, supported by the Information Sciences Division, was to implement, test and evaluate the use of computer-based communications techniques for facilitating timely dissemination and sharing of technical information among four of the participating institutions in the water pump technology phase III project.

A second information-related project in Malaysia (3-P-88-1051) has as its objective to develop and test a user-friendly computer software package for the management and analysis of data related to drinking water quality, incorporating a classification system for categorizing rural water supply sources according to "relative risk" to the consumer. This Cooperative Programs project between the University of Malaya and the National Water Research Institute (NWRI) of Canada was funded by Health Sciences and developed in collaboration with Information Sciences, which provided its technical expertise on software-related aspects. Because of the interest of Information Sciences in microcomputer-based systems, which can help developing countries effectively organize and manage development-related information and provide easy access to it to researchers, planners and policy makers, this project is considered to be a joint effort.

## INFORMATION SCIENCES SUPPORT IN AFRICA SOUTH OF THE SAHARA

Although the Division had had exploratory discussions with several institutions in West Africa, it was not until 1982 that anything substantive in the region was supported. The Comité Interafricain d'études hydrauliques (CIEH), in Ougadougou, Burkino Faso had, since its creation, placed considerable importance on the collection and systematization of information. It was bearing this in mind that CIEH was seen as playing a major role in Africa within the framework of the international POETRI program. In order to define a coherent and global policy in support of the national and regional documentation programs of the water decade in the eight CIEH member states, CIEH convened a regional workshop and sought the assistance of both IRC and IDRC in its financing. IDRC supported the participation of 11 national representatives, two observers and a REPIDISCA representative (3-P-81-4193) at the workshop. The principal conclusions of the meeting were that CIEH should be responsible for the organization and management of the POETRI network for West and Central Africa; that CIEH, designated as the regional focal point, be entrusted with elaborating the corresponding project and seeking financing for it; and that national workshops should be organized with CIEH and donor assistance by the national focal points designated by the member states.

In 1983, CIEH submitted a preliminary request to IDRC for assistance in getting the network established. To assist CIEH in defining its program while benefitting from the experiences of REPIDISCA and ENSIC, IDRC hired the head of the Environmental Sanitation Information Centre (ENSIC) (3-P-83-4259) to provide guidance.

At about the same time, the Canadian International Development Agency (CIDA) received a proposal from the Comité inter-états pour la lutte contre la sécheresse au Sahel (CILSS) in Ougadougou to finance the compilation and publication of a bibliography on hydraulics in the countries of the Sahel. After some preliminary efforts by a CIDA consultant and following discussions between IDRC and CIDA staff, CIDA decided to take advantage of IDRC's experience in the field of information sciences and requested that it assume responsibility for ensuring that the needs of CILSS were addressed through the project being developed with CIEH and allocated funds to address this. A meeting in September 1985 of representatives of CIEH, IDRC and RESADOC enabled a new action plan to be defined and a proposal to IDRC to be developed. The revised project (3-P-86-0109) is to strengthen the capacities of the CIEH documentation centre to enable it to collect, process and distribute relevant information to its users, to set up a sub-regional information system on water and sanitation in West and Central Africa, and to serve as the coordinating centre for the future network.



In East Africa, recognition of the importance of information in assisting countries to reach their water and sanitation goals is only now materializing. Tanzania, Kenya and Zimbabwe have expressed their need for financial and technical assistance and a formal request for support in establishing a national water and sanitation information system now has been submitted by the Government of Tanzania.

#### INFORMATION SCIENCES SUPPORT IN THE MIDDLE EAST AND NORTH AFRICA

In spite of the significant problems related to water and sanitation facing the countries of the Middle East and North Africa and in spite of the hygienic practices and customs introduced eons ago in this region, only in recent years has the importance of compiling up-to-date information in support of water and sanitation related activities been recognized. The establishment of the Centre for Environmental Health (CEHA) of the Regional Office for the Eastern Mediterranean of the World Health Organization in Amman in 1985 was the impetus required for the initiation of a regional water and sanitation information network. The successful experiences of REPIDISCA in Latin America were instrumental in guiding the formulation of the regional Information Network on Environmental Health (CEHANET). A project (3-P-87-0108) to help lay the foundations for CEHANET, assist CEHA in establishing a small coordinating centre, strengthening its human resource capability, developing and adapting appropriate information tools such as the "Interwater Thesaurus" and extending training and information services to the region is now underway.

#### ACTIVITIES OF OTHER AGENCIES

##### For the Decade

A comprehensive look at all the information-related activities of national and international agencies within the framework of the Decade is beyond the scope of this document. A glance at some of the efforts of the major agencies, however, is in order.

With the commencement of the IDWSSD, several agencies of the United Nations family, including UNICEF, UNDP, WHO, IBRD, U.N., Unesco and ILO, combined their efforts towards cooperative action. It established a Steering Committee, convened consultative meetings, and organized special task forces.

At its consultative meeting in June 1980, the Steering Committee (22) noted that the need for a more systematic exchange of information on experiences and technology of water and sanitation development between countries and internationally was an urgent requirement and a system for information dissemination should be implemented during the Decade.

Representatives endorsed the Programme on Exchange and Transfer of Information (POETRI), the information programme of the International Reference Centre for Community Water Supply and Sanitation (IRC), and the establishment of a Task Force on Information Exchange, which had as its main terms of reference to review current and planned information support activities for the Decade; promote their further development; and suggest ways to promote support to finance them.

Two Task Force meetings, in The Hague in January 1981 and in Geneva in 1983, resulted in recommendations inter alia to place more emphasis on the identification, organization and distribution of documentation relevant to Decade approaches already available; and to use the UNDP and WHO communication network to identify potential users of this information.

#### World Health Organization

A major aim of the International Drinking Water Supply and Sanitation Decade was the improvement of people's health within the framework of the global programme of "Health for All by the Year 2000". WHO adopted the approach that: the Decade must contribute to implementing primary health care; water supply and sanitation should be complementary and should be jointly associated with other health development; policies and programmes should be focused on rural and urban underserved populations; full coverage should be achieved through reproducible self-reliant and self-sustaining programmes; ...and the Decade should be a matter of collaboration between all contributing sectors. WHO also recognized that if programmes were to be self-reliant and self-sustaining a new approach would have to be taken to the role of community-based manpower and that community workers would have to be provided with information and logistic and operational support from the appropriate government services.

WHO recognized also that without the monitoring of progress at national, regional and global levels, the establishment of programmes and targets was of limited value. It therefore gave high priority to the collection and analysis of data provided by countries and to the dissemination of this information as a promotional tool and support to governments in their efforts to stimulate the sector. A system, therefore, was devised to standardize the data collection format and procedures and thereby improve the comparability of data over time and among countries and regions (25).

Responding to requests from external support agencies to provide periodic updated information on external support to countries, WHO's Community Water Supply and Sanitation Sector of its Environmental Health Division, in September 1985, began development of the Country External Support Information (CESI) system. CESI was developed to improve coordination of aid efforts in the water supply and sanitation sector among external support agencies, and between those agencies and government ministries and departments in developing countries. It contains information on proposed, ongoing, completed and discontinued projects, as well as projects and programmes in countries funded by external support. It is limited to information on drinking water supply and sanitation projects or those in water-related areas such as irrigation or sector areas such as health and hygiene education when they contain components of drinking water supply and sanitation.

#### UNDP/World Bank

Aside from the many documents, including manuals and guides, produced as a result of research and development projects, one of the major efforts of the UNDP/World Bank Water and Sanitation Programme in the area of information has been the International Training Network for Water and Waste Management (ITN). This network has as its goal to promote improvement in the effectiveness of water sector investments and the extension of service to low-income populations in developing countries through training, information dissemination and research on low-cost technologies. It has prepared an extensive set of training materials for key sector audiences, established training network centres in India, Indonesia and Kenya with preparatory activities underway in Zimbabwe, Ghana, Burkina Faso and others, and convened instructors workshops on the use of the training materials as well as orientation meetings for consultants and multilateral agency staff.

#### International Reference Centre for Community Water Supply and Sanitation (IRC)

From the beginning of the water and sanitation Decade, the International Reference Centre for Community Water Supply and Sanitation (IRC) in The Hague, The Netherlands, has been one of the organizations most involved in information-related activities. Established in 1968 by agreement between The Netherlands government and WHO, it is funded primarily by the Dutch government. Its objective is to underpin information and technology support programs in the developing countries in the field of community water supply and sanitation with emphasis on rural and urban fringe areas and to promote international cooperation.

IRC, in addressing the information needs of the Decade, devised the Programme on Exchange and Transfer of Information (POETRI). Its objectives were to strengthen national capacities to absorb and utilize technical information, develop information tool for use by the sector and provide a framework for the improvement of information exchange between countries and regions.

In response to the need for a list of basic publications and commonly used expressions in community water supply and sanitation expressed by the Decade Steering Committee, IRC on behalf of WHO and within the framework of a UNDP Interregional project, prepared a list of basic publications and a glossary of terms. The list was designed to assist professional staff to retrieve technical information relevant to their needs. The glossary was designed to record commonly used jargon and expressions used by professionals of different cultural background and not readily understood or used in the same way by others. The publication was titled "List of Basic Publications on Community Water Supply and Sanitation. A Selected Bibliography and Glossary of Expressions".

#### BEYOND THE DECADE

With 1990 rapidly approaching, major agencies involved in activities related to the International Water Supply and Sanitation Decade have been reviewing their efforts in an attempt to determine the progress that has been made in the provision of potable water and basic sanitation to the people of the world as well as their own future programs.

#### CIDA

Canada, in its publication "Sharing our Future" (2), noted that the primary and overriding objective of its development assistance program is in meeting the needs of the poorest countries and people of the world. The development of human resources is seen as the key to the development process and the first priority toward this goal is the provision of the basics of health: clean water, sanitation and adequate nutrition. CIDA, therefore, regards health-oriented water and sanitation services "as a fundamental and basic prerequisite for all other development" (3).

In its development issues paper on water and sanitation published in May 1988 (3), CIDA identified its overall goals in the sector as:

- improvement of people's health and living standards through the provision of basic services for water supplies, sanitation, drainage, solid wastes management and multi-purpose water projects; and
- assistance to people and institutions in developing countries to manage, conserve and protect water resources for sustained economic development.

Its six specific development objectives for the sector are to:

- Increase Support for Health-Oriented Water Supply and Sanitation Services;
- Improve the Management, Conservation and Protection of Water Resources;
- Strengthen Sector Institutions;
- Improve the Planning and Implementation of Water and Sanitation Projects;
- Enhance the Use of Canadian Resources; and
- Develop and Implement a Communications Strategy for the Water and Sanitation Sector.

#### The United Nations Agencies

The four United Nations agencies most actively involved in water and sanitation (UNICEF, UNDP, World Bank and WHO) have also been reviewing their programs.

#### UNICEF

At the Executive Board of the United Nations Children's Fund (UNICEF) in April 1988, members adopted the recommendation that efforts towards the International Drinking Water Supply and Sanitation Decade goals should be extended beyond 1990 to the year 2000 in concert with the goal of "Health for All" by the turn of the century.

#### UNDP/World Bank

The UNDP and World Bank since the outset of the Decade have played a lead role in developing and testing new approaches in the area of water and sanitation combined with effective delivery systems. Initially their programs were focussed on the development of technologies but were reoriented to the development and demonstration of effective delivery systems, information dissemination and human

resources development. In its strategy (May 1988) for the remainder of the Decade and beyond, the UNDP/World Bank noted that the global program over the next three to five years would have as its major elements applied research, promotion, dissemination and information exchange, and management and donor coordination. Promotion, dissemination and information exchange, the report noted, "respond to the growing demand for knowledge and information on low-cost water supply and sanitation". "This documentation will include technical reports, manuals, guidelines for sector professionals; short articles for technical journals and the mass media; and more frequent and readable reports to the Program's partners in the international community."

"The written word will be augmented by the organization of international meetings and national workshops, participation in meetings organized by others and collaboration with other institutions such as the International Reference Center in The Hague." (12)

#### WHO

The Resolution of the Thirty-Ninth World Health Assembly of the World Health Organization in 1986 noted that progress with the Decade programme so far has fallen short of expectations in spite of the considerable efforts by Member States to improve water supply and sanitation services since it began and urged inter alia external support agencies "to continue their efforts to improve their coordination and exchange of information at country and international levels with the national and other external agencies concerned (WHO)". Moreover, the Assembly requested the Director General to "implement the proposals contained in his mid-Decade report, giving particular emphasis to the fullest possible advocacy of health, intersectoral action, promotion of research in health aspects of water and sanitation programmes, exchange of relevant information..." (26).

In the area of information, creating regular updates of CESI with information from the key ministries in the developing countries, UN agencies and bilateral agencies is planned.

#### External Support Agencies

During an international meeting on the Decade in October 1987 in Switzerland, bilateral, multilateral, governmental and non-governmental organizations agreed to foster a framework for global cooperation to increase and extend Decade activities through joint action. At a consultation of external support agencies (ESA's), in November 1988, it was agreed that an ESA Collaborative Council should be established to raise international awareness of the need for intensified efforts to

expand water and sanitation coverage during the 1990's. To assist in the development of relevant strategies, the Collaborative Council called on WHO to organize periodic meetings of a temporary committee, known as the 1990 Committee, comprising representatives of multilateral agencies, bilateral agencies, non-governmental organizations, and invited members from developing countries. Several working group meetings were scheduled to address specific issues, including information exchange, with the reports to be submitted to the 1990 Committee in late May 1989 for consideration and the development of a work program for the Council for the 1990's.

As one of the main headings to be addressed by the 1990 Committee was the Communication of Information, a Temporary Working Group (TWG) was established to develop a relevant strategy in the sector, making optimum use of existing information resources and opportunities. The TWG was asked to look at information under four headings - public information, technical information exchange, project/sector information, and management information systems.(29) Two meetings of the TWG were convened by IRC in February and April 1989; the first to draw up preliminary recommendations and the second, at which representatives of developing countries participated, to review these recommendations, identify constraints, as well as ongoing activities in the relevant fields, and make recommendations for an action plan.(5)

The major outcome of the TWG was the confirmation that communication of information was a matter of priority importance in any efforts for hastening the provision of water supply and sanitation programs in developing countries and avoiding duplication of effort. It noted that the first priority is to the development of a global strategy for the 1990s, which would draw upon the expertise of professional marketing/promotion specialists to develop an appropriate campaign. It supported the adoption of the Technical Information Exchange Framework for establishing effective collection and dissemination of technical information, which was developed in 1987 at meetings held at IRC. It proposed specific activities to assist developing countries to generate and update national project and sector information and to develop standardized procedures for the collection and exchange of this information, taking fully into account the CESI initiative. The TWG also recommended that support for management information systems at the national level should focus on awareness raising of policy makers to the value of their own information, in whatever form, in support of their own management efforts.(5)

### IRC

In addition to taking the lead role regarding the TWG on Communication of Information, the IRC is also compiling a Review of IDWSSD activities in Technical Information Exchange. Responding to a request from the IDWSSD Steering Committee, it initiated efforts to

establish a future strategy for technical information exchange identified as INFO-IMPACT. This strategy encourages the inclusion of a technical information exchange component in individual water and sanitation projects implemented by a particular agency. Its main elements are the assessment of needs and resources, product development, capacity building, and promotion. IRC is now in the process of identifying pilot projects to test the strategy.

#### ASSESSMENT OF PAST INITIATIVES

A capsule review of the support to water and sanitation efforts by the Information Sciences Division shows that with limited resources, commitment to a philosophy of trying to build regional information activities that can serve as the resource base for national level initiatives, and promotion of common standards and procedures, our efforts have been worthwhile. Although in some cases, the results have not been as successful as we would want, something has remained, albeit a bibliography, a manual, or trained human resources, after our support has ended.

In Latin America, CEPIS/REPIDISCA successfully laid the groundwork for many of the water and sanitation information activities that were to follow both nationally, regionally, and internationally. It defined a subject scope that proved to be reflective of the information needs of the region; it developed guidelines and procedures for systematizing information on water and sanitation; it developed a thesaurus on the subject that proved to be a sound basis on which to build the "Interwater Thesaurus"; it provided training to staff of national water and sanitation centres; and it built a network throughout the region. Its efforts, however, have not been without difficulties. Managerial, staffing, and financial difficulties have hounded REPIDISCA. PAHO regulations have blocked CEPIS efforts to subsidize its REPIDISCA publications through the provision of complimentary copies financed by large water agencies. But efforts continue to be made to find support from other donor agencies, the most recent of which is the GTZ.

Activities at the national level do not appear to be as successful. The REPIDISCA national projects in Argentina, Guatemala, Nicaragua, and Peru seem to have had greater difficulties in establishing a solid basis. Project completion reports on these activities will shed light on the nature of these difficulties which no doubt go beyond the economic problems of the institutions and countries concerned.

In Asia, the situation is somewhat different. ENSIC has perhaps been the most successful in achieving its goals and attaining self-reliance. Seed funding from IDRC was supplemented and followed by



support from the Australian Government and CIDA. Promotional materials have been disseminated and the development of a regional network called ENSICNET and the establishment of national participating centres has resulted in financial support being forthcoming from the Asian Development Bank. The projects in Sri Lanka and the Philippines appear to be encountering some difficulties.

In Africa, the project at CIEH is off to a slow start. This is due to a large extent to the need to train staff in the methods of information handling. It is hoped that the groundwork laid will ensure continued service.

In the Middle East, CEHANET is also in the developmental stages and an accurate assessment is still premature, although there is a strong indication that progress is being made.

Assessment of the information efforts of other agencies is at best scanty. IRC recognized that its efforts with the POETRI programme were less than originally hoped with only Indonesia, Sri Lanka and Thailand making progress toward the establishment of national networks with the financial assistance of IDRC. Its Interwater information tools, such as the "Interwater Thesaurus", however, have seen greater success with translations into Bahasa Indonesian and Arabic underway.

#### TO THE END AND BEYOND THE DECADE - PROPOSALS FOR INFORMATION SERVICES

From the outset, support to water and sanitation information activities has taken into account the fact that the economic progress of the developing world often involves several disciplines at the same time: that development work is interdisciplinary. To reflect this, an information system in this area should correspond to the "mission" of providing potable water and basic sanitation services to the world's people and not to the "discipline" of hydrology, hydropathy, hydrography etc. Whether a given piece of information is or is not entered into these systems depends, not on the discipline from which the information came but the purpose for which it was created. It belongs in the system if it was created with the purpose of promoting the mission that the information system is designed to serve.

The primary purpose of a water and sanitation information system is the identification and delivery of information that can be useful in planning and in decision-making related to the development of a country. Hence, not only is the social and economic information required but also the scientific and technical and cultural and political.

It is bearing this in mind that we address the mission of information systems, services and networks for the water sector in the years that lie ahead to the beginning of a new century.

## Global

Over the past 14 years, Information Sciences has supported 30 projects and DAPs in the water and sanitation information sector amounting to an expenditure of about CAD 3.2 million. Over this period, individuals from regional centres have had the opportunity to interact with colleagues of other regional centres at meetings, primarily convened by IRC, to address global issues; and national centres have had the opportunity to meet at regional meetings. Unfortunately, to date, there has been no occasion of a global meeting on water and sanitation information directed at the technical staff, rather than the policy makers, to deal with technical issues.

IT IS RECOMMENDED that in fiscal year 89/90, IDRC convene a water and sanitation information workshop comprising representatives of all IDRC-supported projects (past, current and under development) to address technical issues such as experiences in the use of the "Interwater Thesaurus", the use of CDS micro/ISIS, marketing of information, and the use of new communications technologies.

## Interwater Thesaurus

The "Interwater Thesaurus" is an essential tool for the indexing, retrieval and exchange of information in the area of water and sanitation. But like every information tool, its value can only be measured by its usefulness. Furthermore, a thesaurus is not a static reference source but must be continually modified to reflect the needs of its users. At present, no organization has been assigned the main responsibility for maintaining the "Interwater Thesaurus" although by virtue of its role in its development, this task has de facto fallen to the IRC. This, however, needs to be formalized.

IT IS RECOMMENDED that IDRC play a catalytic role in the identification of a coordinating agency for the maintenance of the "Interwater Thesaurus".

IT IS RECOMMENDED that IDRC consider providing IRC with financial support to convene over the next three years, three thesaurus maintenance meetings to include representatives from developing country institutions.

## Africa

Initiatives in Africa are very much in the embryonic stage and as such must be nurtured carefully. In West Africa, the regional information actively at CIEH has only recently begun and it will be necessary to give it time to develop and mature.

To ensure a viable regional network, it will also be necessary to provide support to national centres which are representative of the CIEH member states.

IT IS RECOMMENDED that support to CIEH to establish a strong and viable regional water and sanitation information centre for the CIEH member states be continued through subsequent phases.

IT IS RECOMMENDED that support to four or five national centres belonging to the CIEH member states that are active producers/consumers of information, be provided to facilitate the establishment of a regional network for francophone Africa.

Efforts in Eastern and Southern Africa are evolving in a manner somewhat different to West Africa. Since no organization with a regional mandate exists, activities are evolving independently. We must try to ensure, however, that in whatever way possible these efforts are coordinated to ensure maximum benefits for all concerned. Although it does not have a regional mandate, AMREF has a high profile in the region and could play a very influential role.

IT IS RECOMMENDED that IDRC provide sustained support to Kenya, Tanzania and Zimbabwe, in the first instance and if requested, to enable them to establish and develop their national water and sanitation information activities.

IT IS RECOMMENDED that IDRC provide AMREF with financial support to convene a regional water and sanitation information workshop for the English speaking countries who have or are in the process of establishing a water and sanitation information centre.

## Latin America

REPIDISCA has proven to be a valuable information network in Latin America not only from the efforts it has expended in the control of water and sanitation information but also in its attempts to utilize and strengthen human resources and expertise in the region.

But the network can only become stronger if its national focal points and network are strengthened. Therefore,

IT IS RECOMMENDED that support for the second phases of REPIDISCA-Peru, Guatemala, Nicaragua, and Argentina be considered in light of their progress and our budgetary situation. Support for these projects would definitely end after the second phase.

### CONCLUSION

The importance of potable water has not diminished over time. In fact, its access becomes more and more important every day with the world's increasing population putting more and more demands on this natural resource everyday. If helping to improve access to available information for those who strive to make water accessible to the people of the developing world is considered to be a worthwhile activity, then we should continue our support. If we decide not to, I believe we have already made a contribution to the Decade of which we can be proud.

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APPENDIX A

Diseases Related to Poor Water Supply or Sanitation

<u>Group</u>	<u>Diseases</u>
Waterborne diseases	Cholera Typhoid Leptospirosis Giardiasis Amoebiasis Infectious hepatitis
Water-washed diseases	Scabies Skin sepsis Yaws Leprosy Lice and Typhus Trachoma Conjunctivitis Bacillary dysentery Salmonellosis Enterovirus diarrheas Paratyphoid fever Ascariasis Trichuriasis Whipworm (Enterobius) Hookworm (Ankylostoma)
Water-based diseases	Urinary schistosomiasis Rectal schistosomiasis Dracunculosis (guinea worm)
Water-related vectors	Yellow fever Dengue plus dengue hemorrhagic fever West-Nile and Rift Valley fever Arbovirus encephalitides Bancroftian filariasis Malaria Onchocerciasis Sleeping sickness
Fecal disposal diseases	Hookworm (Necator) Clonorchiasis Diphyllobothriasis Fasciolopsiasis Paragonimiasis

"Village Water Supply"  
Saunders, R.J. Warford, J.J.



APPENDIX B

WATER AND SANITATION INFORMATION  
PROJECTS SUPPORTED BY INFORMATION SCIENCES DIVISION

<u>REGION/COUNTRY</u>	<u>PROJECT NAME</u>	<u>RECIPIENT</u>	<u>PROJECT</u>	<u>BUDGET</u>	<u>MONTHS</u>
<u>GLOBAL</u>					
	Wastewater Disposal: State-of-the-Art Review	-	3-P-76-0156	39 150	6
	Potable Water Supplies and Sanitation Journal	Intermediate Technology Publications Ltd. (ITPL) (London, England)	3-P-78-0083	262 146	42(59)
	Waterlines - Phase II	Intermediate Technology Publications Ltd. (ITPL) (London, England)	3-P-87-0081	95 000 30/30/35 (IS/HS/COMM)	36
	Interwater Thesaurus	International Reference Centre for Community Water Supply & Sanitation (IRC) (The Hague, Netherlands)	3-P-84-0323	92 800 (2353(S1))	12
			Sub-total CAD	491 449	
<u>AFRICA</u>	Système Africain d'Information sur l'eau et l'assainissement - (CIEH)	Comité Interafricain d'études hydrauliques (CIEH) (Ougadougou, Burkina Faso)	3-P-86-0109	137 350	24
			Sub-total CAD	137 350	
<u>ASIA</u>	Information Centre on Sanitation	Asian Institute of Technology (AIT) (Bangkok, Thailand)	3-P-78-0010	121 700 33 315(S1) 155 015	36

APPENDIX B

WATER AND SANITATION INFORMATION  
PROJECTS SUPPORTED BY INFORMATION SCIENCES DIVISION

<u>REGION/COUNTRY</u>	<u>PROJECT NAME</u>	<u>RECIPIENT</u>	<u>PROJECT</u>	<u>BUDGET</u>	<u>MONTHS</u>
	Environmental Sanitation Information Centre (ENSIC) - Phase II	Asian Institute of Technology (AIT) (Bangkok, Thailand)	3-P-82-0072	98 730	36
Philippines	Approtech Asia Information System on Water & Sanitation	The Asian Alliance of Appropriate Technology Practitioners. (Manila, Philippines)	3-P-86-0106	109 000	24
Sri Lanka	WASSDOC - Sri Lanka	National Water Supply and Drainage Board. (Ratmalana, Sri Lanka)	3-P-86-0108	142 550	36
Indonesia	Water & Sanitation Information Network - Indonesia	Ministry of Public Works. Directorate General of Human Settlements (Cipta Karya). (Jakarta, Indonesia)	3-P-87-0096	306 225	36
<b>Sub-total</b>				<b>CAD 811 520</b>	
<u>LATIN AMERICA</u>	CEPIS Information System Design	Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS). (Lima, Peru)	3-P-75-0022	141 900	20
	Pan American Sanitary Engineering Information System (REPIDISCA) - Phase II	Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS). (Lima, Peru)	3-P-79-0117	344 380	24
	REPIDISCA Consolidation - Phase III	Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS). (Lima, Peru)	3-P-83-0152	538 900	24

APPENDIX B

WATER AND SANITATION INFORMATION  
PROJECTS SUPPORTED BY INFORMATION SCIENCES DIVISION

<u>REGION/COUNTRY</u>	<u>PROJECT NAME</u>	<u>RECIPIENT</u>	<u>PROJECT</u>	<u>BUDGET</u>	<u>MONTHS</u>
Peru	Water Supply and Sanitation Research Information System - Latin America	Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente (CEPIS). (Lima, Peru)	3-P-84-0067	140 000 (50/50) (IS/HS)	2
	REPIDISCA - Peru Water & Sanitation Information Network - Indonesia	Servicio Nacional de Abastecimiento de Agua Potable y Alcantarillado (SENAPA) (Lima, Peru)	3-P-84-0322	59 800	36
Argentina	REPIDISCA - Argentina	Instituto Nacional de Ciencia y Técnica Hídricas (INCYTH) (Buenos Aires, Argentina)	3-P-85-0297	87 575	24
Guatemala	REPIDISCA - Guatemala	Universidad de San Carlos de Guatemala/Escuela Regional de Ingeniería Sanitaria y Recursos Hidráulicos (ERIS) (Guatemala City, Guatemala)	3-P-86-0321	49 415	24
Nicaragua	REPIDISCA - Nicaragua	Instituto Nicaraguense de Acueductos y Alcantarillados (INAA)	3-P-87-0047	43 945	24
<u>MIDDLE EAST</u>	CEHANET		Sub-total CAD	1 405 915	
			3-P-87-0108	252 000	24
			Sub-total CAD	252 000	
		TOTAL	CAD	3 098 234	

APPENDIX C

WATER AND SANITATION INFORMATION  
DAPS SUPPORTED BY INFORMATION SCIENCES DIVISION

<u>REGION/COUNTRY</u>	<u>PROJECT NAME</u>	<u>RECIPIENT</u>	<u>PROJECT</u>	<u>BUDGET</u>
<u>GLOBAL</u>				
	Information Exchange for Water Supply & Sanitation Meeting The Hague, 22-24 September 1987	International Reference Centre for Community Water Supply & Sanitation (IRC) (The Hague, Netherlands)	3-A-87-4107	5 035
	Prototype of a Water and Sanitation Journal	Intermediate Technology Publications Ltd. (London, England)	3-A-78-4132	3 000
	Project Identification Workshop for Information in Rural Potable Water & Sanitation	International Reference Centre for Community Water Supply & Sanitation (IRC) (The Hague, Netherlands)	3-A-76-4025	10 160
	Sub-Surface Water Resources of Developing Countries	Association of Geoscientists for International Development (AGID) (St. John's, Newfoundland)	3-A-76-4070	3 290
	Sub-Surface Water Resources of Developing Countries: Phase II	Association of Geoscientists for International Development (St. John's, Newfoundland)	3-A-76-4178	16 500
			Sub-total	CAD 37 985
<u>ASIA</u>				
Thailand	National Water Supply & Sanitation Information Centre (Thailand) - Pre-Project Consultancy	Chula UNISEARCH Chulalongkorn University	3-A-87-5120 (IS/ROF 9 000/3 535)	12 535

APPENDIX C

WATER AND SANITATION INFORMATION  
DAPS SUPPORTED BY INFORMATION SCIENCES DIVISION

<u>REGION/COUNTRY</u>	<u>PROJECT NAME</u>	<u>RECIPIENT</u>	<u>PROJECT</u>	<u>BUDGET</u>
Indonesia	Water Supply & Sanitation Information - Indonesia Consultancy	Dr. J. Valls Asian Institute of Technology Mr. Hernandono National Scientific Documentation Centre	3-A-84-4311	8 070
	POETRI Meeting - ENSIC Participation	Dr. J. Valls	3-A-82-4248	3 905
			Sub-total CAD	24 510
<u>AFRICA</u>	CIEH Project Development Valls Consultancy	Dr. J. Valls Asian Institute of Technology	3-A-83-4259	13 955
	Réunion régionale de POETRI pour l'Afrique à l'intention des États-membres du CIEH. Avril 1982. Ougadougou, Haute Volta.	-	3-A-81-4198	19 587
			Sub-total CAD	33 542
<u>LATIN AMERICA</u>	CIRISCA Systems Analysis Study	Comision Economica para America Latina (CEPAL) (Santiago, Chile)	3-A-84-4127	2 543
			Sub-total CAD	2 543
			TOTAL	98 580