

GLOBAL COMMUNITY WATER SUPPLY  
DEVELOPMENT PROGRAM SUMMARY--

A Background Document

Community Water Supply Branch  
Health Service  
Office of Technical Cooperation and Research  
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SUBJECT: GLOBAL COMMUNITY WATER SUPPLY  
PROGRAM -- A Background Document

Attached is a brief resume of the activities of the world-wide community water supply program and the participation of the Community Water Supply Branch, Health Service, TCR, in that program.

  
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## A. INTRODUCTION

### 1. HISTORICAL BACKGROUND

One of the major causes of sickness and death in the less developed countries are those filth-borne diseases for which water plays a prominent role in transmission and prevention. These enteric diseases include those in which impure water may be the transmitting agent (e.g., water-borne diseases such as typhoid fever, bacillary dysentery and infectious hepatitis), or in which sheer lack of water on the premises may account for failure to interrupt transmission by hygienic measures of infection primarily accomplished by contact (e.g., water-related diseases such as gastroenteritis). In either case, water is directly or indirectly involved in the short cut from the anus of one person to the mouth of another. Of these two groups of water-connected diseases, gastroenteritis, predominantly in infants and young children, exacts the greatest toll of illness and death. The ready availability of water also contributes substantially to the reduction of scabies and human lice infestation.

A potable water supply is not only a key element in the control of these diseases but is also a basic factor in overall community socio-economic development. A water system is a tangible demonstration of accomplishment; it is essential to economic progress. Water is an essential raw material for industry and in its absence, economic development is curtailed. In its health aspects, an adequate supply of readily available safe water is mandatory for a healthy citizenry to meet its maximum potential and to benefit from a higher living standard. (For further particulars, see Attachment A.)

Ever since the start of technical assistance in 1942, emphasis has been placed on improving the design and construction of potable water supply systems, but early efforts were on an individual project-by-project basis. This was unsatisfactory in terms of progress and results, so the worldwide Community Water Supply Development Program (CWSDP), backstopped by the Community Water Supply Branch (CWSB), was established in FY 1960. For the first time an effective total approach became possible which was able to take advantage of the depth of U.S. professional knowledge through the use of short-term consultants and the multi-country approach. With a new central unit, A.I.D. was able to assist countries to approach the problem on a systematic and well-planned basis and systematic collection and examination of experience was undertaken on a world-wide basis, including both failures and successes, to attempt to analyze the common denominator of these experiences. Both U.S. and third-country research and training facilities are now being utilized to develop solutions for specific problems of water supply and sewage disposal in less-developed countries.

Vast deficiencies exist in the community water supplies of the developing countries with an increasing backlog in spite of aroused recognition of the problem and increased construction rates in recent years. This growing shortfall is due to the combined effects of a major backlog plus urban population growth which adds to the net problem each year.

Although provision of capital resources for water system construction is an essential element toward correcting problems and satisfying needs, the solution is multi-faceted with the other essential elements falling under the headings of technical assistance and institution-building. They involve the creation, rehabilitation, and augmentation of institutions related in one way or another to viable water system needs at national, provincial and local levels to insure providing for community water supply needs with attention given to the areas of legislation, economic planning, effective water system management and operation and adequate water rate structures compatible with the economic levels of various classes of water consumers. These elements are spelled out further in Attachment B.

Because capital development, technical assistance, and institution-building needs are interrelated, the major expansion which is taking place in capital development expenditures for community water supplies has, in turn, created commensurate need for expanded back-stopping by CWSB along institution-building lines and in expanded technical services within A.I.D. Missions by sanitary engineers and other community water supply specialists.

An incomplete list of capital commitments for community water supply development over the past several years amounts to over U.S. \$1 billion, including a small amount of related community sewerage system improvements. These commitments are in the form of international loans, local contributions to international loan projects and domestically financed projects. Because data on local contributions and on domestically financed projects are available for only one Region (Latin America), the actual total amount is materially greater than stated. (In Latin America, for example, more than 50% of the capital expenditures have been from domestic resources.)

CWSB institution-building also provides benefits to people served by existing systems in the absence of new construction. Improved water quality and water conservation achieved by better operation and maintenance can provide more water and safer water to more people.

In its technical support role, CWSB wears two hats. One hat pertains to activities of A.I.D. per se as an organizational entity; the other hat applies to its coordinating and liaison functions with outside agencies participating in the overall community water supply program in developing countries and with domestic water supply interests in the U.S. from a technical and manpower resources standpoint. In the Washington area, for example, official agencies with which technical liaison in the community water supply area is maintained include: WHO/PAHO, USPHS, LDB, IDA of IDRB, USGS, and the U.S. Commerce Department.

Within the AID/W orbit CWSB reports to Health Services and has technical support responsibilities primarily with the Bureaus and, secondarily, although importantly, with staff offices such as the Office of Engineering. CWSB is now participating in the overall A.I.D. support of the Hydrological Decade which started January 1, 1965.

## 2. FINANCIAL SUMMARY

Since the inception of the CWSDF in 1960, the following funds have been specifically allotted to the program:

	<u>FY 1960-63</u>		<u>FY 1964</u>	<u>FY 1965</u>
	<u>Total</u>	<u>Avg. Ann.</u>		
Technical Consultation and Support <sup>1/</sup>	\$559,938	\$139,984	\$41,801	\$23,442
Professional Development <sup>2/</sup>	692,984	173,246	22,387	323,503
Country Project Support <sup>3/</sup>	<u>745,153</u>	<u>372,576</u>	---	---
Total	\$1,998,075	\$685,806	\$64,188	\$346,945

<sup>1/</sup> For regional advisors, short-term consultants, and travel.

<sup>2/</sup> For seminars, short courses, university contracts, etc.

<sup>3/</sup> Allotted only in FY 1960 and 1961.

These funds are in addition to program funds allotted to A.I.D. Missions in individual countries for direct-hire technicians, participant training, etc. Commencing in FY 1962 all country project funding was shifted to the country programs. Also, a substantial number of foreign trainees in the U.S. are sponsored by WHO and other multilateral agencies.

No capital developments costs are included. In addition to A.I.D. Capital Development Loans, capital development resources for water supply improvements were provided from A.I.D. Capital Development Grants and P.L. 480 funds and by: (1) economic assistance programs of other developed countries, (2) UN, (3) IDB, (4) IDA of IDRB, (5) Ex-Im Bank, and (6) local, provincial and national domestic resources of the developing countries themselves.

## 3. STAFF

At the present time, there are seventeen sanitary engineers (or civil engineers specializing in community water supply) and twelve sanitarians assigned as direct-hire A.I.D. staff members to USAID Missions in fourteen countries, most of whom are working on some aspect of the CWSD program. Five are on loan from the USPHS. The figure of twenty-nine represents a major reduction of direct-hire personnel from the level of fifty-nine in 1962 and from higher levels in some earlier years.

CWSB in AID/W presently has three sanitary engineers and two secretaries supplemented from time to time by short-term consultants working on special assignments.

## B. SERVICES RENDERED

### 1. MAJOR TYPES OF SERVICES

Services rendered come under three principal categories, two containing several subclassifications, as follows: (A more detailed description of same is given later.)

- a. AID/W general staff functions, including liaison with other agencies and recruitment of water supply specialists for direct-hire and for contract service in the field. (Previously described.)
- b. Technical consultation and support.
  - (1) Advisory services
  - (2) Economic feasibility studies
  - (3) Technical design studies
  - (4) Socioeconomic studies
- c. Professional development.
  - (1) Short-term training courses and seminars
  - (2) Long-term university training contracts
  - (3) Other training participation and support

### 2. DESCRIPTION OF SERVICES.

- a. General staff functions (previously described)
- b. Technical consultation and support

The numerous and diversified advisory and consultative services provided by the Community Water Supply Branch and the short-term expert consultants available to it are divided into five principal categories, namely:

- (1) Advisory services relating to USAID community water supply programs; to the functions, organization and training of personnel of indigenous or cooperative services handling community water supply activities; and to the mobilization of domestic resources.
- (2) Economic feasibility studies of specific water supply projects; formulation of recommended project structures; preparation of economic reports and guidance in the preparation of formal loan applications to the various international lending agencies.
- (3) Technical design studies; preliminary engineering surveys, planning studies; technical feasibility studies; advice relative to operation and maintenance problems, etc.

(4) Socioeconomic studies--general studies--on a nation-wide basis, of the various agencies involved in water supply planning, construction, financing, operation, maintenance and/or management; recommendations relative to legal delineation of responsibilities, consolidation and/or organization of an appropriate agency; study of existing revenues, their relation to the general cost of living, methods of collection, adequacy; recommendations on maximum use of local materials, men and facilities, etc.

## C. ACCOMPLISHMENTS

### 1. TRAINING COURSES

#### a. Short-term

Short-term training courses under contract have been carried out at the University of Minnesota, the University of Akron, and the Water and Sewerage Technical School at Neosho, Missouri.

Short-term instruction at the University of Minnesota for students from the developing nations comprises a course of relatively long standing in ground water development. Initiated in 1959 through efforts of CWSB, it was attended in its first year by 43 participants from 27 countries. This 12-weeks course of academic and field work has been continued each year, with the exception of 1963, and through 1964 had been attended by 166 students from 53 countries.

In order to make the course more available and more useful to non-English speaking participants from Latin America, it was presented in Spanish in Costa Rica in 1961 and 1963, and in 1963 and 1964 at the University of Colombia in Bogota, where it is now a permanent part of the Engineering School curriculum.

Presentation of the ground water training course at a location in South Asia or the Far East is currently being planned by CWSB.

Through a contract with the Neosho Water and Sewerage Technical School, which has a continuing program of training in water and sewage plant operation, a 4-weeks course in operation was given for supervisors in Jamaica, W.I., and a 12-weeks course was given for operators at the same location, both in 1965.

There is a continuing contract with the University of Akron for presentation of courses in Engineering Management of Water Supply Systems. Inaugurated in 1961, a total of eight 11-weeks courses had been held through the first half of 1965, with attendance by students from 25 developing countries located in all four A.I.D. Regions. Each presentation of this semi-annual course is attended by eight to fourteen participants.

A similar course has also been established at the University of Colombia in Bogota, as a continuing operation, with instruction in Spanish.

#### b. Long-term

Contracts have been made with two U.S. universities for long-term continuing training in various aspects of water supply engineering.

In 1963, the Pennsylvania State University inaugurated the first of five A.I.D. contract correspondence courses in water supply engineering. These courses are available to engineers in all A.I.D. developing countries, and course graduates are given academic credit. A total of 127 engineers from 26 countries had been enrolled as of January 1965.

In 1962, A.I.D. and the University of North Carolina cooperatively established a continuing International Program in Sanitary Engineering Design, for students in residence, with sponsorship by the CWSB. This program, which is specifically planned to fit the needs of engineers from developing countries, consists of three months of study and research at the University, followed by one month of training and observation at a water and/or waste treatment plant, and, finally, five to eight months of experience in the office of a consulting engineering organization. A new session of the program begins twice annually, with about ten students attending a typical session. A total of 16 countries were represented in the first three sessions.

## 2. REGIONAL SEMINARS

Continuing its past practice of holding regional water supply seminars for engineers, CWSB sponsored two 9-day meetings and participated in a third during the past fiscal year. All three seminars were devoted to the topic of water supply development for small communities and rural areas and were arranged in collaboration with WHO. The two meetings directly sponsored by A.I.D. were held at Addis Ababa, Ethiopia, and at Songkhla, Thailand, and were scheduled to permit attendance by U.S. water supply experts representing CWSB, as well as participants from countries in those regions. Over a hundred national engineers attended the two CWSB-sponsored seminars, in addition to Mission and WHO staffs and U.S. experts.

The third meeting was held at Bogota, Colombia, and was sponsored by WHO/PAHO with CWSB participation.

## 3. COUNTRIES BENEFITTED

Nearly every country with an A.I.D. Mission has been benefitted by CWSB activities of some type at one time or another. In many cases the genesis of continuing activities antedates the establishment of CWSB and, in many cases, even goes back as far as the original Inter-American Affairs program in the 1940's. The following is a culled list of countries in which there has been sufficient construction work on installations and sufficient institutional development to warrant the designation of "Water Supply Program." Because development of an effective water supply program requires concerted effort from within-country sources, it is not implied that CWSB and Mission activities were necessarily the major factor responsible for the program status of a particular country, even though in many cases they have had a catalytic effect.

A.I.D. "WATER SUPPLY PROGRAM" COUNTRIES BY REGIONS

Latin America

Bolivia  
Brazil  
Chile  
Colombia  
El Salvador  
Honduras  
Jamaica  
Nicaragua  
Panama  
Paraguay  
Peru  
Venezuela

Africa

Malagasy  
W. Cameroun  
Ghana  
Kenya  
Nigeria  
Somolia  
Tanzania

Far East

Burma  
Korea  
Philippines  
Taiwan  
Thailand  
Vietnam

NESA

India  
Iran  
Jordan  
Lebanon  
Pakistan  
Turkey  
Yeman

#### 4. CONTRACT CONSULTANTS

Use of consultants on personal services contracts in the CWSDP has been substantial in recent years. A roster of consultants has been built up and CWSB maintains records on their specialities, previous assignments, availability for future assignments and preferences. As requests are received from Missions and AID/W regional bureaus for professional services, CWSB is able to recommend qualified consultants to make preliminary arrangements for the short-term assignments.

Records of the Contract Services Division, Office of Material Resources, show obligations amounting to \$3.3 million incurred to date for personal services contracts and training contracts with U.S. universities relating to water supply and sewerage development. A number of personal services contracts executed directly by USAID Missions are not included in this figure.

#### 5. P.L. 480 FUNDS FOR WATER SUPPLY

P.L. 480 Funds have been made available for water supply program activities to a variable degree in several developing countries. The use of these funds in Brazil is offered as an example of how they can be put to work for both technical assistance and water supply construction.

The first phase of the utilization of P.L. 480 national currency resources for water supply program development in Brazil was in 1962-64 when grants aggregating 3.1 billion cruzeiros were released to 18 water projects of various types. Within this period, the free exchange value of the cruzeiro ranged from around 400 to 1000 per dollar and assuming an average rate of 600 per dollar, these cruzeiro grants amounted to around U.S. \$5 million. The purpose of these projects was varied and included the development of a national sanitary engineering organization (FSESP) which is to provide training, engineering equipment, financial planning, demonstrations, etc., to municipal organizations for the construction of water supply facilities. During this same period, an additional \$2.1 million in dollar grants were made available to finance the cost of water supply materials and equipment imported from the U.S. and for payment of stipends to participants being trained in the U.S.

In April 1965, an additional cruzeiro loan agreement was executed for a water supply development fund in the maximum amount of 8 billion cruzeiros, to be matched at a 1:2 ratio by the Government of Brazil. These funds of up to 12 billion cruzeiros have a dollar equivalent value of about \$6.5 million and are to be subloaned to selected eligible municipalities for water supply construction. Administration of the loan program will be by the National Department of Sanitary Works (DNOS).

Institution-building features of the subloans to be made to the recipient municipalities include requirements that each water system be placed in the hands of an autonomous water authority (generally a local authority), that adequate water rates be established toward insuring a viable system and that a procedure for adjustment to provide maintenance of value be built into both the water rate structure and the loan repayment schedule. The program also contains a revolving fund feature in that the repayment period of the subloans will be materially shorter than that of the main loan, permitting new subloans to be made through reuse of the funds.

A local contribution of at least one-third of the gross project cost is required in the subloan agreement; thus the total domestic contribution will exceed the amount derived from the P.L. 480 loan.

## 6. PUBLICATIONS AND TRANSLATIONS

The need for a clear and complete account of the relationship between water and health was recognized by CWSB and a personal service contract was arranged with Mr. Arthur P. Miller, formerly a sanitary engineer of the U.S.P.H.S., to prepare such a document. The result was a 100 page booklet entitled, "Water and Man's Health." This booklet has been printed in English and distributed to A.I.D. personnel, host country sanitary engineers and other public health personnel, and others both in the U.S. and abroad. Due to its wide acceptance, it has been translated and printed in the French language and is now being translated for publication in the Spanish language.

A number (see attached list) of manuals prepared by the AWWA and the P.H.S. have been translated, printed, and distributed in the Spanish and French languages. These manuals have been prepared by leaders of the water works and sanitary engineering fields and are widely accepted in the U.S. as guides for engineers, plant operators, and others in the water and sewage work. It is expected that they will serve a like purpose in the developing countries.

CWSB has for several years reviewed technical publications and data developed by manufacturers and forwarded those considered pertinent to the Missions for use by A.I.D. and host country personnel. In addition, numerous publications, data and other information in the field of water supply, sewage, and environmental health are collected and forwarded in answer to requests by field personnel.

D. FUTURE PROGRAM

During Fiscal Year 1965, an ad hoc Advisory Panel of Consultants on Community Water Supply was appointed to review the Community Water Supply Program of A.I.D. A report of the panel's findings and recommendations was published in February 1965 under the authorship of Professor Daniel A. Okun of the University of North Carolina who served as Chairman of the Panel. Such action as may be taken by A.I.D. with respect to the Panel's recommendations could have a major bearing on the future course of the Community Water Supply activities of the Agency.

## ATTACHMENT A

### STATEMENT ON COMMUNITY WATER SUPPLY DEVELOPMENT

BY ABEL WOLMAN, DR. ENG.

(Consulting Sanitary Engineer; Chairman Emeritus, Dept. of Sanitary Engineering, Johns Hopkins University; President, American Public Health Assoc., 1938; President, American Water Works Assoc., 1942; Special Consultant, WHO, PAHO, ICA, AEC.)

The development of community water systems to be piped into the house or immediately adjacent thereto represents one of the most promising of global efforts. The provision of water to aggregates of people now without this amenity assumes increasing importance because of the impact of such an effort upon public health, industrialization, tourism, and housing.

One of the greatest causes of death and illness in most parts of the world outside of the Western Hemisphere is in the diarrheal diseases. A considerable reduction in these enteric diseases is to be expected when people have easy access to safe water for drinking and ample water for personal cleanliness.

The expansion of industry, almost without exception, is contingent upon the availability of water. Without water, industry cannot exist. If it is not provided, industry will not come into an area.

The housing requirements of the world are enormous. They cannot be met by buildings alone. Housing projects have been built into which people cannot move because water has not been provided.

The tourist everywhere encounters either water unsafe to drink or none at all at various times of the day.

All of these deficiencies take their toll of life, curtail economic development, and restrain the growth of higher standards of living. All are correctible if a militant program for community water systems is pursued with maximum utilization of local resources of manpower, materials, and money.

To make such a program effective requires a new and imaginative approach to fiscal support by means of maximum local funds, expansion of the availability of national and international loans at low interest rates and long amortization, judicious use for stimulation purposes of grants-in-aid, and the rapid development of the principle and the reality of partial or complete financial reimbursability and self-support of water systems.

Faith in the practicability of such a program is a first requisite for a world-wide attack. That such a faith is realistic is supported by the great number of examples of self-supporting water systems throughout the world. The lessons derived from this vast experience should be applied in whole or in part to the remaining areas, after continuing adjustment to local practices, cultures, and fiscal attitudes. It should not be assumed that a world-wide program must await the existence of vast amounts of international aid.

The next five to ten years can be used with great profit to expand water facilities in many areas by converting public and private groups to the acceptance of the feasibility of such rapid expansion with local and national resources, supplemented by bilateral and international funds. The latter sources of money are often of minimum necessity for the success of the program.

Literally, millions of people are within reach of the goal of community water in or at the house, of safe quality and ample quantity, if the technologic and fiscal processes of providing them are made known to their governing bodies. For such a program, fixed charges on capital rather than the staggering capital itself should be the area of emphasis and disclosure. Water is cheap and can well pay for itself.

Such a global program should be accompanied by a well-integrated division of responsibilities among national and international agencies. It may be suggested that WHO have a major responsibility in the whole complex of leadership in education of officials in the administrative requirements; ICA in the technology and finance features; the national and international banking units in the development of credit; and the national and local political units in execution of projects. Sharp divisions of responsibility are impractical. Essentially, however, WHO would be most active in the research, development, and education field, while ICA would have both technical and fiscal opportunities to implement action programs. The lending or banking agencies have fairly well defined functions historically. The strengthening of interrelationships among all of these is essential.

## TRANSLATIONS AND PUBLICATIONS

In the French and Spanish Languages:

AWWA Manual M-1, "Water Rates Manual"  
AWWA Manual M-5, "A Training Course in Water  
Utility Management"  
AWWA Manual M-6, "Water Meters"  
AWWA - "Silent Service Is Not Enough"  
Arthur P. Miller - "Water and Man's Health"

In the Spanish Language:

U.S.PHS Manual of Recommended Water Sanitation Practice

## ATTACHMENT B

Excerpt from WHO Public Health Papers No. 23 "Urban Water Supply Conditions and Needs in Seventy-Five Developing Countries," 1963, By Dieterich, B. H. and Henderson, J. M.

"The very considerable shortages in urban water supply reported for nearly every country in this study are obviously a result of a complex set of conditions--among them urban trends, limited national economic resources, shortage of investment capital, inept and inadequate operation and management, lack of training facilities, inadequate financial support of water systems and, in some cases, insufficient action on the part of governments.

"On the whole, the individual factors in this complex cannot readily be separated in view of the intimate interrelationship existing between many of them. To the extent that they can be treated individually, the factors that exert the greatest effect on urban water deficiencies in most developing countries may be identified as follows:

"(1) Although water supply systems are best operated by local agencies, the improvement of water supplies in developing countries depends largely on governmental support. Many governments realize the need for action, but in most countries community water supply has not yet become a matter of governmental policy. Experience proves that the establishment of a governmental policy not only speeds preparatory work in administration but creates confidence and public understanding.

"(2) In developing countries where government planning is accepted as an important factor in national development, schemes for community water supply are often not included in national development plans. In many of these countries, therefore, major portions of the available financial resources are channelled into projects seemingly more productive than water supply, and water agencies vainly compete with other agencies for the limited funds.

"(3) Undue competition exists in many developing countries even within the framework of specific water resources activities. Frequently urban water supply needs are insufficiently represented in the general development of water resources because no priority policies have been established and no general master plans are in effect in most of the developing nations.

"(4) The factor which is probably the most significant cause of world-wide deficiencies in community water supply is inadequate financial support. An urban water scheme without adequate revenues even for effective operation and maintenance (as is the case in many cities in the countries covered in this report) necessarily will also lack financial resources for expansion, and the physical condition of the existing system will inevitably deteriorate. Revenues, in this sense, means all financial resources directly or indirectly available to meet the costs of operation and capital investment.

"(5) Inept and inadequate operation and management, and lack of an effective administrative machinery and of technical staff to promote and design new urban water supplies or to improve existing schemes, are other factors to be added to the handicaps already listed. These result mainly from a lack of training facilities but they are frequently due to the influence of conflicting local interests and politics. Without independent and self-sufficient management most water supplies cannot be maintained.

"(6) Inadequate legislation, poorly defined water rights and failure clearly to delegate responsibilities are additional drawbacks in urban water supply. In many developing countries outmoded water laws hamper or even obstruct practical measures, create uncertainty and sometimes prevent positive action. Also, old-fashioned organizational structures fail to meet modern demands for efficient licensing, supervision, and, possibly, financial support.

"(7) Among the common organizational deficiencies is the fact that the role of ministries of health in community water supply development is not always clearly defined. In a few countries ministries of health are responsible for water supply but in others the responsibility is laid on ministries of public works or other government departments. Although it is not essential that ministries of health assume complete responsibility for water supply, their role in this field must certainly be clearly defined because of the immense influence of water supply on public health."