The Community Water Supply Program of the Agency for International Development

DEPARTMENT OF STATE
United States of America
February 1965

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by

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PREFACE

The writer was asked to serve as Chairman of an ad hoc Advisory Panel on Community Water Supply, appointed in September, 1964, by Philip R. Lee, M.D., Director, Health Service, Office of Technical Cooperation and Research of the Agency for International Development, to assist in a review of community water supply activities of A.I.D. Participation in the Panel meetings was solicited from the Bureaus and staff offices of the Agency; and each of the Missions was advised of the review and invited to submit comments. Other organizations with responsibilities in community water supply, and representatives from national and international organizations, consulting engineers, and professional organizations, and others, were invited to meet with the Panel. A list of those who participated and a summary of communications from the Missions are included in the appendix to this report.

The Panel addressed itself exclusively to the conduct of the community water supply program of A.I.D. Throughout this report the term, "water supply," includes the concomitant requirement for sewerage and wastewater disposal. No distinction is made between facilities for water supply and sewerage, and it is expected that in time the portion of funds invested in sewerage will increase. Although it did not consider other activities of A.I.D., the Panel recognized that the problems identified in the community water supply program would also be uncovered in an examination of other programs of assistance requiring technical and professional competence. A report to the Administrator on "The United States Program of Aviation Assistance to Less Developed Countries" of July, 1964, identifies many of the difficulties revealed to this Panel.

Members of this Panel were selected and served as individuals because of their qualifications in the field of community water supply and through the courtesy of the organizations by which they are employed. They met for eight full-day sessions, and I am grateful for their faithfulness in attendance and the enthusiasm they exhibited for the work of the Panel and particularly for the contribution made by the Executive Secretary of the Panel, Mr. Arthur H. Holloway, who performed the staff work both faithfully and intelligently.

Although this report reflects in general a consensus of the Panel members, the specific wording of the report and its recommendations are the responsibility of the writer alone, and are based upon conclusions drawn from comments of Panel members and invited participants.

I hope this report will assist in the prosecution of the global water supply program, as I believe that the role of A.I.D. in this program constitutes an important contribution by the United States to the health and advancement of the people of the world.

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Chapel Hill
February, 1965

A.I.D. COMMUNITY WATER SUPPLY PANEL

Chairman

Daniel A. Okun—Professor of Sanitary Engineering, University of North Carolina

Executive Secretary

Arthur H. Holloway—Regional Community Water Supply Advisor, Bureau for Near East and South Asia, A.I.D.

Board

Leonard M. Board—Office of International Health, Public Health Service, Department of Health, Education, and Welfare

James D. Caldwell—Community Water Supply Branch, Health Service, Office of Technical Cooperation and Research, A.I.D.

Clyde H. Emmons—Office of Engineering, A.I.D.

Wesley E. Gilbertson—Division of Environmental Engineering, Public Health Service, Department of Health, Education, and Welfare

Harold R. Shipman—International Bank for Reconstruction and Development (World Bank)

SUMMARY STATEMENT

In the words of the Administrator of A.I.D., ". . . we are seeking to help other countries establish themselves as independent self-supporting nations, able to make economic and social progress through free institutions. To accomplish this end—to establish a community of independent free countries—we believe to be in the deepest interest of the United States." Authorized by the first session of the 86th Congress, the Community Water Supply Program of A.I.D., with its strong emphasis on aided self-help, meets these objectives in exemplary fashion. Community water supplies are popular with people and their governments. Water is the key factor in the control of disease and is essential to the welfare and efficiency of the people of a nation and to the establishment of a sound economy. Community water supply stimulates utilization of local resources, and most importantly, it is a positive program, financially self-sustaining and self-generating.

In the five years since the initiation of the Community Water Supply Program, the investment in water supply in developing countries has increased to an average of $100 million per year, not including local contributions. The U. S., and U. S.-supported agencies, have already invested about $400 million in public water supply installations in the developing countries. Most major cities in the world are now either provided with water supply systems or have projects under way. However, many of these systems are inadequate. Further, more than 40 per cent of the urban population of the developing countries and a much higher percentage of the rural population are still without *any* adequate source of water supply, even from public taps, and the present rate of construction is too slow to close this gap and meet the needs of growing metropolitan areas. The inadequacy of urban water supply systems continues to constitute a danger to health, with about 100 million people incapacitated in varying degrees by water-borne diseases in the Middle East alone. Also, the insufficiency of water supply for industry and commerce is a further restriction to economic development.

In assessing the Community Water Supply Program of A.I.D., the Panel identified several problems which, in their over-all impact, reduce the effectiveness of the program as an instrument for accomplishing the objectives of A.I.D. The report contains specific recommendations calling for better utilization of professional personnel and more emphasis on technical assistance. If implemented, these recommendations would permit A.I.D. to leave a legacy of local technical and institutional resources capable of providing sound and continued fiscal management and engineering responsibility for water supply systems initiated with A.I.D. help.

The excellent reputation which public water supply activities in the United States enjoy is closely associated with the recognition that its practitioners are professional specialists. A.I.D. projects in water supply, on the other hand, are often executed without the benefit of specialized professional skills either from within the Agency, from other federal agencies, or from private consultants. The Panel particularly deplores the climate in A.I.D. which has encouraged the replacement of professional personnel of all types with generalists. Administrative practices have resulted in a corroding frustration on the part of dedicated professional personnel in the Agency and a consequent decline in morale. Water supply activities would be strengthened considerably if greater utilization were made of the specialized resources available in the Community Water Supply Branch of TCR and in the Office of Engineering, and if their responsibilities were more clearly established.

The emphasis, with the creation of A.I.D., on loans for capital development has been accompanied by a decrease in technical assistance. The Panel believes that capital development generates a need for technical assistance. This should be provided by A.I.D. with its own professional personnel and, where appropriate, through the use of federal agencies, such as the Public Health Service, international agencies, such as the World Health Organization, and international banks, universities, and private consulting engineering organizations. The ultimate success of the A.I.D. program, however, rests upon the dedication of a nucleus of A.I.D. professional personnel whose first obligation is to the mission of the Agency.

The problems revealed during this examination of the water supply program run through the entire fabric of the Agency and would be exposed by examination of any other technical program. The principal general recommendations are summarized as follows:

1. A.I.D. must make full use of specialized professional resources to ensure that costly capital development projects exemplify American competence and ingenuity and conserve scarce financial resources.
2. A.I.D. must provide adequate technical assistance to create the necessary institutions and organizations in developing countries for the establishment of continuing programs of construction and management of capital projects so that loans may be repaid and that the projects may represent a sound U. S. contribution to national development.

SUMMARY OF SIGNIFICANT RECOMMENDATIONS

1-1: A.I.D. should augment its activities in the field of community water supply at rates compatible with the developing countries' ability to absorb technical and financial assistance.

1-2: A.I.D. should place major emphasis on development of the host countries' capacities to handle their water supply activities with a decreasing input of outside technical, financial, and administrative assistance. Concentration must be on:

a—the development of agencies at the national, regional and local levels in the developing countries to plan, design, install, operate and manage community water supply facilities,

b—assistance to the developing countries in the preparation of sound fiscal plans for community water supply projects,

c—the development of financial institutions and sources of funds within the developing countries to support water supply activities, and

d—the development of the industrial capacity of these countries to provide water supply commodities.

2-1: Technical review by competent sanitary engineers and other specialized professional personnel should be provided in the development and execution of water supply projects.

2-2: The criteria for technical soundness should be interpreted with full recognition that accepted engineering standards and practices need to be modified for application in developing countries.

3-1: The activities of the capital assistance and technical assistance programs in the Bureaus and Missions should be better integrated for the purpose of rendering technical assistance to the host countries where needs exist in the preparation for, the implementation of, and supervision after completion of a loan project.

3-2: A.I.D. should expand technical assistance in association with capital loans. Plans for subsidiary loans should be processed in conjunction with capital development loans. Where these mechanisms are not feasible, means should be developed so that the Community Water Supply Branch of TCR might provide the necessary technical assistance.

4-1: A.I.D. should participate more actively in the selection of consulting engineering firms by the host government.

4-2: The method of selection of consulting firms and procedures for dealing with them should be uniform for all Bureaus of A.I.D. The selection committee should include technically qualified en-

gineers within A.I.D., and advice should be sought from the Office of Engineering and the Community Water Supply Branch.

5-1: The present trend of dissociating training activities from those responsible for and competent in the technical specialty of the trainees should be reversed.

5-2: A.I.D. should consider the training of participants in the United States one of its most important activities and provide for this in its loan-oriented program. Greater use should be made of Mission general training funds with a categorical programming of participants arranged through the technical units of A.I.D./W, especially the Community Water Supply Branch.

6-1: The Community Water Supply Branch of TCR and the Office of Engineering should be given responsibilities for providing professional services to the Bureaus, for improving coordination of water supply activities, and for providing better communications among units of A.I.D. These services should include evaluation of the technical aspects of A.I.D. programs, projects, loans, and similar activities.

6-2: The Office of Engineering, with the assistance of the Community Water Supply Branch of TCR, should continue to have responsibility for the development of criteria for the technical aspects of A.I.D.'s operations, and these staff organizations should review A.I.D. activities to determine the extent to which these criteria are being met and how A.I.D. operations in the water supply field might be improved.

7-1: A.I.D. should increase ceilings for direct hire of water supply personnel even as it makes greater use of other federal agencies and private contractors.

7-2: A.I.D. should establish a career program for professional personnel which would make the service attractive to qualified engineers and other professionals.

8-1: A.I.D., through the Community Water Supply Program of TCR, should continue to maintain a close liaison with other U. S. agencies which carry out water supply activities in the developing countries. The relationship between A.I.D. and the U. S. Public Health Service should be continued and USPHS facilities and services should be utilized to the greatest extent practicable.

9-1: A.I.D. should establish within the Health Service of TCR an "Associate Director for Sanitary Engineering," with responsibility for the activities of a "Water Supply and Sewerage Branch" and an "Environmental Sanitation Branch."

9-2: The Water Supply and Sewerage Branch should have assigned to it the following functions:

a—Development and promotion of special courses, conferences, and similar activities in the field of water supply and sewerage.

b—Provision of assistance in reviewing the technical aspects of all programs, projects, feasibility reports, plans and other documents concerning the design, management and operation of water supply and sewerage projects in cooperation with the Office of Engineering and Bureau engineers.

c—Provision of the services of qualified sanitary engineers to the Bureaus, Missions, and to the Office of Engineering and other units of A.I.D. for the evaluation of loan applications, contracts, reports and other activities for which the units do not have adequate specialized water supply personnel on their own staffs. Personnel so assigned would be responsible to the unit to which assigned during the period of assignment.

9-3: The Water Supply and Sewerage Branch would be staffed to provide expert advice and services in the planning, design, management, operation of water projects, and in the training of water supply personnel. The staff should include as a minimum one Chief, one Deputy Chief, and six sanitary engineers including three to be stationed regionally.

GLOBAL COMMUNITY WATER SUPPLY PROGRAM

David E. Bell, Administrator of A.I.D., stated at the Third National Conference on World Health, "Today . . . we are seeking to help other countries establish themselves as independent self-supporting nations, able to make economic and social progress through free institutions. To accomplish this end—to establish a community of independent free countries—we believe to be in the deepest interests of the United States.

"The second fundamental idea underlying our foreign aid program is the idea of aided self help. What we want to do is help other countires solve their own problems. We want to assist them temporarily while they are organizing themselves, training their people, learning to mobilize their own resources. Presently they will be able to proceed on their own and to achieve progress by themselves . . .

"These fundamental ideas about our foreign assistance programs have direct application in the health field. It should be our purpose in seeking to assist the people of underdeveloped countries with regard to health to do two main things:

"Help them act to meet their most immediate health problems—of which the most conspicuous are malaria and the water-borne diseases —and

"Help them create the trained personnel and the functioning institutions to enable them progressively to overcome their health problems . . ."

The Community Water Supply Program of A.I.D. stands near the top of the list of activities of the Agency in its contribution toward the objectives of helping other countries to establish themselves as independent, self-supporting nations, able to make economic and social progress through free institutions, with strong emphasis on aided self-help.

The program was initiated in 1960 and has had significant impact on water supply activities in developing countries. In coordination with a like program of the World Health Organization, it has brought water supply into public view and the need for safe community water supplies is now recognized at all levels of government in most developing countries. Loans in the hundreds of millions of dollars are now being made available specifically for public water supply and sewerage systems, both from sources within the developing countries and from bilateral and international lending agencies.

The favorable image now presented by water supply projects to the international lenders, such as the International Bank for Reconstruction and Development (World Bank), can be attributed in good

part to the successful efforts of A.I.D. and WHO sanitary engineers in promoting fiscal integrity for these potentially revenue-producing enterprises. Another factor helping to establish a good climate for such loans is the creation, with the help of A.I.D. and WHO engineers, of municipal and national institutions for water supply activities.

Representative of successful and dynamic A.I.D. efforts is Brazil, where for the first time a sizeable national revolving loan fund has been established which provides for financing water supply and sewerage system improvements. Over 200 cities, with 75 per cent of the urban population of Brazil, have shown an active interest and over 100 are making feasibility studies to support proposals for long term loans to improve and expand their water systems. Qualifications for a loan include a sound administrative structure, adequate rates to cover fixed and operating costs, and municipal participation up to 33 per cent of the construction costs. The loan fund is supported by a nationwide training and technical assistance program through federal, state, municipal, and private agencies. Personnel from all the federal and states agencies and more than 300 cities have benefited from training opportunities. All 28 engineering schools and 67 federal, state and municipal water and sewer departments are obtaining technical assistance from the program. By 1970 one of the objectives of Punta del Este—70 per cent of the urban population, 30 to 35 million people served with safe water—will have been met.

The earlier efforts of predecessor agencies of A.I.D., such as the Institute for Inter-American Affairs through to the International Cooperation Administration, have resulted in a situation today where more than 87 per cent of the urban population of Latin America is now served by public water supply systems with ⅔ of these people benefiting from household connections.

However, the progress on a world-wide basis has hardly kept pace with population increases. From 50 to 60 per cent of the urban populations in Asia and Africa have no access to any type of public water supply system, and urban populations in these countries are increasing at double the national rates.

This growth in urban population may be expected to continue with economic development and industrialization. Moves to reverse this trend are considered of little value, as the motivation for this migration is the inability of the agricultural sector of the economy to employ additional persons. It is concluded that urban requirements continue to be more pressing. Rural community water supply is important, particularly as an instrument for community development, as successfully demonstrated in Thailand, but the Panel believes that stimulus for rural water supply will be developed where urban needs are met.

Community water supply constitutes one of the largest areas of investment for A.I.D., and it is certainly the largest of the health programs. In addition, consideration of water supply and sewerage should be a facet of other A.I.D.-sponsored projects. For example, several housing projects have been unsuccessful because facilities for water supply were not provided.

FINANCE

Over the last four years, A.I.D. has loaned $92 million for construction of community water supply systems, with a small proportion of the money earmarked for sewerage systems. During this period, the Inter-American Development Bank has loaned $184 million to countries in Latin America, the World Bank has loaned $87 million and the Export-Import Bank $42 million, both on a world-wide basis. These funds have been matched by local and/or national funds and in addition substantial sums have been made available in the form of grants and loans from U.S.-owned local currencies.

However, these investments have not been sufficient to offset the existing backlog of need for water services, much less to meet the new demands created by population growth, migration from rural to urban communities and need for improved services. Present investment in facilities appears to be limited as much by the developing countries' capacity to utilize funds as by the lack of capital but the capacities to employ funds effectively would increase rapidly if adequate technical assistance were provided.

It is expected that the foreign exchange requirements for water supply will continue to increase for some time in the future because the capacity to utilize capital will increase at a greater rate than the production of commodities by local industry. In other words, even though the percent of total capital which is foreign exchange decreases, the increase in total capital requirements in water supply projects will create an increasing need for foreign exchange.

Repayment terms for development loans made by A.I.D. are based on the economic position of the country and its ability to generate the necessary foreign exchange, and are not directly related to the specific project. The government reloans these funds to the responsible agency in the form of foreign exchange credits expressed in terms of local currency. Thus, the transaction between the government and the water supply agency is carried out in local currency. The relending terms are unrelated to the terms of international loans and are based on local financial practices, ability of the project to produce income, and similar considerations.

In this instance, the foreign exchange repayment is not of direct concern to the local water agency. Nevertheless, much more attention

is given to the foreign exchange needs of a project, which may have little effect on the fiscal success of the project, than to the total financial plan for the project (expressed in local currency) which is of greater importance to its ultimate success. The financial arrangements for water supply projects are often made without regard to projected income of the project, life of the facilities, financial position of the agency or municipality, or other matters which are essential to good fiscal planning. As the requirements for local currency will increase substantially in the years to come and eventually be the primary source for water supply projects, greater efforts should be directed by A.I.D. and other interested agencies to the development of local financial resources.

In most cases funds are provided through the national or state budgets which entail annual appropriations, cumbersome administrative procedures, delays in disbursement and other undesirable features. Few of the developing countries have financial institutions which are capable of handling efficiently the financing of water supply and other public sector projects. Senator Gale W. McGee in his report to the Senate Committee on Appropriations ("Personnel Administration and Operations of A.I.D.," Doc. No. 57, 88th Congress, 2nd Session, November 29, 1963, pp. 37-38) was critical of A.I.D. local currency loan and grant procedures for these and others reasons.

It is RECOMMENDED that:

1-1: A.I.D. should augment its activities in the field of community water supply at rates compatible with the developing countries' ability to absorb technical and financial assistance.

1-2: A.I.D. should place major emphasis on development of the host countries' capacities to handle their water supply activities with a decreasing input of outside technical, financial, and administrative assistance. This is a long-range development process and plans should include the provision of assistance over a period of years. Concentration must be on:

a—the development of agencies at the national, regional, and local levels in the developing countries to plan, design, install, operate and manage community water supply facilities,

b—assistance to the developing countries in the preparation of sound fiscal plans for community water supply projects,

c—the development of financial institutions and sources of funds within the developing countries to support water supply activities, and

d—the development of the industrial capacity of these countries to provide water supply commodities.

1-3: A.I.D. criteria for loans or grants in U. S.-owned or controlled local currencies should be essentially the same as those for dollars.

1-4: Efforts should continue to be directed primarily toward the provision of safe water for urban populations. However, when opportune, A.I.D. should provide assistance and encouragement in the development of reasonable programs for providing potable water to rural communities. In the same vein, A.I.D. should be alert to other sanitary engineering or environmental sanitation problems in the host country and provide assistance to the greatest extent possible. This is particularly true in regard to problems which could affect the success of A.I.D. loans in other fields, as for example in housing, and municipal and industrial development.

CWS LOAN EVALUATION

A.I.D. generally makes U. S. dollar development loans directly to the host government which, in turn, relends to the responsible agency. Basically the purpose of the loan is the development of the total economy of the country and the project must be evaluated on the basis of the contribution it will make to the total economy. This and other considerations, such as the over-all objectives of U. S. policy and host country desires, determine the relative priority of the project in the allocation of loan funds.

This evaluation in general requires that the project be economically sound and that it make a positive contribution to the economy. Economic soundness for non-profit revenue producing projects, the category of most water supply projects, is based on the following criteria: (1) Non-profit projects which produce revenue may or may not be completely self-liquidating. (2) The total revenue and other economic benefits which can be evaluated must exceed the total costs over the life of the projects. Water supply projects for nearly all urban communities can be self-liquidating and this is, in general, a basic requirement. The greater the added benefits the better chances the loan has for approval.

The substantial added benefits in the form of (1) better health and productivity of the people, (2) a more healthful environment for the community and (3) a necessary raw material for industry and commerce, are difficult to evaluate and even more difficult to express in monetary terms. The Community Water Supply Branch and others have sponsored research in this field but to date no applicable techniques have been developed nor have meaningful data been obtained. The need to bring the talents of qualified economists to bear on public investment for water supply has never been more evident.

The determination of economic soundness of water supply projects is complicated by requirements that they satisfy "Policies, Standards and Procedures in the Formulation, Evaluation and Review of Plans for Use and Development of Water and Related Land Resources." ("Feasibility Studies, Economic and Technical Soundness Analysis, Capital Projects," A.I.D. Off. of Eng., MO 1221.2, Oct. 1, 1964, B-1 to B-13). Of all capital development projects sponsored by AID, only water projects need pass this hurdle. This document, which has the intent of providing a means for the equitable distribution of available water resources to its various uses, has been interpreted as a requirement for establishing a ratio of cost to benefits by various means for the project in question, leading to futile exercises in project evaluation which, for practical purposes, are meaningless for water supply projects. (See Paragraph A, 4, p. 3, "Benefit-Cost

Evaluation as Applied to A.I.D. Financed Water or Related Land Use Projects," A.I.D. MO. 1221.3, May 31, 1963.)

Technical soundness is required of all projects receiving either loans or grants from A.I.D. A project is considered technically sound if:

"a. All pertinent technical aspects of the project have been taken into account in the analysis,

"b. The planned construction or procurement conform to accepted engineering standards and practices,

"c. the estimated cost of the project is as low as any other reasonably available alternate which would produce the intended results."

In addition the host government agencies must demonstrate that they have provided for the effective implementation of the project, and for the fiscally and technically sound operation of the completed facilities.

Water supply practice in the United States has resulted in a publicly accepted guarantee of an adequate and safe water supply for every resident in virtually every community in the country. One important factor in this development has been the requirement that all public water supplies meet certain public health standards, and that an independent agency, generally a sanitary engineering division in a health department, review and approve reports, plans and operations. However, water supply projects sponsored by A.I.D. need meet no specific minimum public health standards nor is there any requirement for review by qualified sanitary engineers. The Panel did not feel that Manual Order 1221.2, "Economic and Technical Soundness Analysis of Municipal Water and Sewage Projects," provides for adequate consideration of this most important aspect of community water supply projects.

With the exception above, the criteria are adequate to produce sound projects and difficulties encountered in the implementation of the projects and their successful operation after completion are not generally a result of inadequate criteria but rather of operational problems and interpretation of the criteria. One large water treatment plant, recently completed in Asia, is more heavily instrumented than many of the largest plants in the U. S. Another, in Asia, provides for automation and mechanization far beyond what is considered reasonable in the U. S. These are in countries where labor is plentiful and low-cost, and where machinery and instruments require "hard" currency and where the skills necessary to maintain them are not available. The limited loan funds available would have been better utilized had they been applied to extending the system to serve a larger portion of the population. Many of the problems have stemmed from:

a—use of engineering standards and practices drawn from United States experience and not directly applicable to developing countries.

b—use of consultants not qualified in the specialized water supply field.

c—inadequate A.I.D. sanitary engineering staff in the developing country before, during and following construction of a project.

d—inadequate review of the technical aspects of the projects by qualified sanitary engineering personnel.

It is RECOMMENDED that:

2-1: Technical review by competent sanitary engineers and other specialized professional personnel should be provided in the development and execution of water supply projects. This will require adequate staffing of the Missions and Bureaus of A.I.D. with sanitary engineers competent in the specialty of water supply.

2-2: The criteria for technical soundness should be interpreted with full recognition that accepted engineering standards and practices need to be modified for application in developing countries.

2-3: Manual Order No. 1221.2 should be reviewed and necessary revisions made to provide for adequate consideration of the public health aspects of water supply projects and a reinterpretation of the "Policies, Standards and Procedures in the Formulation, Evaluation and Review of Plans for Use and Development of Water and Related Land Resources" should be made to reflect the intent and purpose of the directive as applied to community water supplies.

2-4: A.I.D. and other agencies should intensify research in areas which will contribute to the establishment of methods for evaluating the benefits of urban and rural community water supplies.

COORDINATION OF TECHNICAL AND CAPITAL ASSISTANCE

As part of the creation of A.I.D. in 1961, the activities of the Development Loan Fund were incorporated into A.I.D., and a trend toward loan funding, as contrasted with grant funding, was introduced. Today, by far the greatest part of A.I.D. assistance is provided through loans. Although the transition from grant to loan funding is sound, it has created problems of some magnitude with community water supply programs. The most important of these is based on the misconception that a loan oriented program (known in A.I.D. parlance as "capital development") would curtail, if not eliminate, the need for technical assistance in the A.I.D. program. It is contended, on the contrary, that an increase in capital development actually generates a greater need for technical assistance.

Technical assistance is often incorporated into capital development loans. However, the total technical assistance effort of the Agency in water supply, including A.I.D. professionals stationed in the missions, and participants sent for training, has decreased while the total investment has grown. The use of other federal agencies or contractors for technical assistance is sound, but for effective use of such outside personnel, a nucleus of "direct-hire" A.I.D. professionals is necessary, with their number in some proportion to the total activity.

Failure to provide technical assistance has resulted in loan projects which have not functioned properly. In most instances, the difficulties could be traced to a combination of factors: the provision of a facility far more sophisticated than is necessary or practical and the inability of the host country to staff and operate such a facility; too little preparation in the country for the project together with inadequate follow-up on such problems as organization, management and fiscal operations; and failure to have A.I.D. professional personnel available to work with the contractors. These are problems which a reasonable amount of technical assistance and professional surveillance could have overcome.

It is also becoming apparent that some countries are reaching their capacity to use loan funds effectively, but not because of lack of need. An effective technical assistance program could do much to prepare a country to receive capital assistance which would fulfill the objectives of A.I.D.

A.I.D. describes Technical Assistance as follows in M.O. 1301.1:

"A. Technical Assistance is the process through which A.I.D. assists cooperating countries to develop human skills and attitudes

and to create and support the institutions necessary for social, economic and political growth and development.

"B. Technical Assistance most commonly takes the form of advisory services, including the provision of professional personnel (A.I.D., other U. S. Agency or contract personnel), and of training cooperating country nationals in U.S. or selected third countries. For administrative purposes, a Technical Assistance Activity is defined to include all A.I.D. dollar-supported project activities, loan or grant, except those within the adopted definition of a Capital Assistance Activity and except Special Activities. . . ."

A.I.D. limits "Capital Assistance" to projects in excess of $100,000 and thus projects costing less than $100,000 are automatically classified as "Technical Assistance." (M. O. 1221.2)

A.I.D. often separates "Technical Assistance" from "Capital Assistance" in its funding, programming, staffing and other functions. However, it is difficult in practice to separate these activities. Each project requires a certain amount of technical assistance if the objectives of a loan are to be fully met. This is based on the recognition that all facets of water supply in the country and its related institutions must be satisfactory if a loan is to be fully effective. The adequacy of host country agencies, training facilities, personnel, industries to produce suitable materials, and financial institutions contribute to the success of a loan project. In many cases provisions for assistance in these areas cannot readily be made through a capital project loan.

Following the theory that capital assistance is a self-sustaining activity, capital assistance operations in the Bureaus and Missions are staffed with loan officers versed in the banking, documentation and legal aspects of lending. These loan groups do not always have the professional staff qualified in the field of water supply to provide the specialized technical guidance required for such projects. A.I.D. has assumed that all technical services required for capital development projects would be provided by consulting firms engaged by the host country and financed through the loan; however, it is becoming more and more apparent that many technical tasks involved in the initiation, review and implementation of loans can only be handled by A.I.D. personnel. The host country is the firm's client and the first responsibility of the consulting firm is to the host country, not to A.I.D. Further, the host country's wishes do not always coincide with the objectives of A.I.D. For example, the host country may want the consulting engineer to provide elaborate, complex, automated and overly expensive installations, not consistent with its personnel or economic resources and where the long-term interest of the country would be better served by simple, lower-cost projects that reflect the availability of unskilled labor. A.I.D. has

an obligation to monitor capital development projects, and for this an adequate number of qualified professional engineers is required both in the field and in Washington.

In practice, where capital development and technical assistance responsibilities are separated administratively, professional engineering services for capital development projects in missions are obtained from the technical assistance units, if available. Such services include the review of loan applications, development of scopes of work and contracts, supervision of the contract implementation, and follow-up of the project after completion. Any technical assistance provided for institutional support where the loan is made is also from the technical assistance unit. Technical assistance units at both the Mission and Bureau levels, however, do not, in most cases, have available engineering specialists in the water supply field.

The programming of technical assistance, both in regard to A.I.D. staff and projects, is not always directly related to the capital development program and, as the program process requires approximately two years to reach implementation, is not very flexible. Staff ceilings are also determined on a long-range basis and, as the number of positions today is very limited, reserve staff or positions are not practical. On the other hand, staff requirements for activities in capital development are dependent on the receipt of loan applications and approval of loans which cannot be predicted with any degree of accuracy. Therefore, technical servicing of loan projects with adequate numbers of professional specialists is most difficult under present operational procedure.

One of the most critical periods in a community water supply project is that immediately following completion of construction of the facilities. At this time the host government staff, which is usually inexperienced, must start to operate the facilities. The time to plan for this competence is at the inception of the project. A plan for initial operation should be included in all capital projects and provision made where needed for engineering and operational services following completion. Again, although Manual Order No. 1222.1 provides for this, inadequate staff has not always permitted its execution.

A.I.D. should continue to review the operation of a community water supply facility throughout the life of a loan and take necessary action when problems appear. The World Bank follows this procedure and in fact assigns a sanitary engineer to every water supply project. He is responsible for the project throughout the period of the loan.

It is RECOMMENDED that:

3-1: The activities of the capital assistance and technical assistance

programs in the Bureaus and Missions should be better integrated for the purpose of rendering technical assistance to the host countries where needs exist in the preparation for, the implementation of, and supervision after completion of a loan project.

3-2: A.I.D. should expand technical assistance in association with capital loans. Grants or subsidiary loans should be processed in conjunction with capital development loans and where these mechanisms are not feasible, means should be developed so that the CWS Branch of TCR might provide the necessary technical assistance.

3-3: Planning for initial and continuing operation of community water supply facilities should be required as a part of loan applications and provision should be made for providing necessary services during this period.

3-4: A.I.D. should review completed projects during the life of the loans. Immediately following the completion of a project this review should be fairly intensive tapering off to occasional inspections as operations become routine.

EMPLOYMENT AND UTILIZATION OF CONSULTING ENGINEERING FIRMS

The selection of consulting firms by A.I.D. for grant-financed projects appears to be a laborious, and oft-times, unsatisfactory procedure. The Contractors Index, which is prepared rather mechanically, yields the names of many firms unsuitable for a particular project while some firms known to be well qualified are not even listed. The method of selection of firms from the Index varies from one Bureau to another but is generally based on a weighted rating scheme which considers experience in water supply, experience in the country or region, size of contracts in the past and other factors. The information available is in many cases out of date or otherwise incomplete. The Selection Committee often does not have personnel qualified to assess the competence and experience of consultants offering their services.

Except for the relatively few grant-financed projects, consulting firms are selected and contracts are negotiated by the host country. A.I.D. holds that such employment is solely a host country responsibility and A.I.D. should not become involved. However, the firm and the contract are both subject to A.I.D. approval, and the project carries the U. S. A.I.D. label, and thus the U. S. and A.I.D. are, indeed, very much involved. In actual practice close cooperation with the host country in the development of the scope of service contracts and selection of suitable firms has been beneficial. The more closely the A.I.D. staff works with the host government the better the finished job and the better the relations between the host government, A.I.D. and the contractor.

The same is true during the implementation period. When A.I.D. personnel maintain close liaison with the host government and the consultant, serious misunderstandings are avoided and final reports, plans, specifications and designs are approved with less difficulty.

When the host country selects the consulting engineer, an engineering firm with representation in the country is likely to be given priority. Such firms, however, are often speculators, or "brokers" in engineering. Only after getting a job do they begin to assemble a staff. This type of staff is not likely to be comprised of highly qualified engineers, let alone specialists in water supply. Specialist professional consulting engineers active in the U. S. have no need to speculate by having men abroad "drumming-up" business.

In the U. S. and in the developed areas of the world, the planning and design of community water supply and sewerage projects is recognized as a specialty area of civil engineering. The necessary knowledge of the chemistry, biology and public health aspects of

water supply is not generally available to the civil engineer specializing in structures, highways, etc. Graduate work in sanitary engineering is being recognized increasingly as essential for proficiency in this field, with more than eighty educational institutions in the U. S. offering such programs. A.I.D. has itself supported the creation of sanitary engineering programs in developing countries. The American Society of Civil Engineers authorized the creation of the Sanitary Engineering Division in 1922, when its first technical divisions were formed. The American Sanitary Engineering Inter-society Board, which is sponsored by ASCE, The American Water Works Association and five other professional organizations, certifies registered professional engineers as specialists in sanitary engineering.

The U. S. has been the acknowledged leader throughout the world in the field of municipal water supply and wastewater disposal. Many aspects of American life and culture may be criticized but the dependability of our water supplies and the excellence of our sanitary engineering practices are admired and emulated everywhere. It has been somewhat disconcerting, therefore, to learn that our professional emissaries in developing countries are often engineers with little experience in municipal water supply activities in the U. S.

Competence in this specialty is generally required by municipal agencies in the U. S. in the selection of engineers for community water supply projects. However, in the evaluation of consulting engineering firms for such projects in developing countries, A.I.D. often fails to give adequate consideration to qualifications in sanitary engineering.

The many reputable consulting engineers who have served and are serving the U. S. abroad are to be commended. The vagaries of work in developing countries often entail financial sacrifice, but because of their high ethical and professional standards, these engineers represent the U. S. with distinction.

It is RECOMMENDED that:

4-1: A.I.D. should participate more actively in the selection of consulting engineering firms by the host government. Qualified A.I.D. professional personnel should be available in the host country for this purpose. Informal preapproval of firms with whom the host country plans to negotiate and assistance to the host government in the preparation of contracts should be provided.

4-2: The method of selection of consulting firms, and procedures for dealing with them should be uniform for all Bureaus of A.I.D. The Selection Committee should include technically qualified engineers within A.I.D., and advice should be sought from the Office of Engineering and the CWSB. Full use should be made of directories of qualified engineers in the community water supply and sewerage

fields, such as those prepared by AWWA and the American Sanitary Engineering Inter-society Board. A.I.D. should recognize that qualified engineers in the water supply field are heavily committed to projects in the U. S., and if they are to be attracted to work in developing countries, their relationships with A.I.D. should be expeditiously handled.

4-3: Greatest weight should be placed on a record of satisfactory experience of a firm in the design and construction of community water supply and sewerage projects. Of almost equal weight should be the ability of the firm to provide personnel for the project from its own regular staff of principals.

4-4: A.I.D. should establish close liaison with the host government agency and the consulting engineer and the progress of the work should be followed closely. It is also recommended that all reports, designs, plans and specifications prepared by the consultant be carefully and promptly reviewed by qualified A.I.D. professional staff.

TECHNICAL TRAINING REQUIREMENTS IN DEVELOPING COUNTRIES

The success of community water supply activities in a developing country is largely dependent on the man-power available to carry on the work. In the past the adequacy of personnel has been based primarily on the availability of sanitary engineers with water supply experience. As the programs are implemented and more water supplies are ready for operation it becomes apparent that other categories of personnel are also required. Principally among these are administrative staff, including personnel managers, bookkeepers, procurement officers; plant operators, and skilled workmen. The sanitary engineer is still key but attention must be given to these auxiliary personnel.

At present, the staffing for community water supply activities in the developing countries is on an ad hoc basis. Generally, no uniform system is available for designating positions, describing duties and establishing qualifications for personnel in the community water supply field, except occasionally for the engineers. As a result little information is available in regard to staff requirements for new facilities or activities, nor for the training program required to man the programs. Without these data, estimates of installation and operating costs are often inaccurate, operations are hampered by lack of trained personnel and training plans are unrealistic. These data should be gathered on a world-wide basis to be fully useful. WHO is a logical agency to conduct these studies.

The training of participants in the U. S. is a most important function of A.I.D. in that it provides developing countries with the nucleus of highly qualified personnel from which the local agencies necessary for community water supply development can be developed. In addition to the technical assistance aspects of this activity, the U. S. makes political gains in such firm support as the returned participant gives to the U. S. The need for U. S.-based training will not decrease with the development of local education facilities. Water supply programs are expanding and are becoming more sophisticated and the need for specialized training is increasing. At present an area which needs special attention is the training of teachers of sanitary engineering and other water supply disciplines, both professional and sub-professional. For these reasons, the Panel was concerned about the sharp decrease in the number of participants in water supply and related fields being sent to the U. S.

The decrease in the number of participants may be attributed, in part, to the development of sanitary engineering curricula in local institutions, which permits training to be conducted locally. However, the greatest single factor appears to be the decrease in technical

assistance projects. Without these, the recruiting, selection, funding and training of participants become very difficult. Participants for specialized training programs in the U. S. are generally mature engineers with family and professional responsibilities at home, and consistent effort is required to encourage them to come to the U. S.

The nature of the training required is also changing as the programs develop and local educational institutions establish programs of study in sanitary engineering and related fields. From World War II up to a few years ago, participants were enrolled in conventional graduate sanitary engineering programs in U. S. universities with a limited amount of special activity. Today, a majority of the participants receive special training tailored to their individual needs.

The Community Water Supply Branch is making a substantial contribution to participant training through the development of special training courses in the U. S. and abroad in collaboration with U. S. universities and other institutions in the fields of ground water, management, operation and design. Observation of U. S. practices and working experience in the U. S. constitute an important phase of this training.

The success of the specialized training depends heavily on careful planning for the participant based on his needs and the training resources available. Greater participation on the part of A.I.D. specialized professional personnel is essential. However, A.I.D. procedures are apparently moving toward a more standardized handling of participants which at times seems to approach a clerical operation. Particularly unsatisfactory, not only for engineers, but all professionals, is the administration of technical training on the basis of geographical area of origin of the participant by training officers who are not knowledgeable in the technical field of the participant. Arrangements which A.I.D. has had with the U. S. PHS to provide support in depth for water supply activities are often not utilized by the A.I.D. Office of International Training.

The administration of participant training is not consistent, and the existing facilities for training available to A.I.D. are frequently not fully utilized. Specialized training, which is now becoming more and more important in the field of water supply, requires that a great number of outside contacts be made with universities, consulting firms, manufacturers and others. A centralized subject-oriented operation is desirable, but four training sections representing geographical areas and operating separately in dealing with the same training resources are cumbersome, expensive and unsatisfactory for both A.I.D. and the agencies involved.

The responsibility for the follow-up of the participants after their return home is not clearly established and long range evaluation of training does not appear to be adequate.

With the growth of community water supply activities in the developing countries the need for sanitary engineers is increasing. Local institutions abroad are beginning to provide sanitary engineering preparation as a part of their civil engineering curricula and through graduate programs in sanitary engineering. However, this is a rather recent development and at present is inadequate to fill the needs in quality or quantity. The Education and Human Resources Development Service of TCR provides for assistance to engineering institutions abroad and many of these might be useful in the water supply program, but coordination appears to be poor. Data with regard to curricula, capacity for students, laboratory facilities, etc., that are required to develop realistic programs for the development of sanitary engineering training in local institutions are not available.

The training of ancillary water supply personnel in addition to sanitary engineers is now a recognized and chronic need. As new water supply facilities are completed more and more people are needed for operations, management and maintenance. As this is a relatively new activity, a reservoir of persons qualified for the positions must be developed and nearly all such positions require a certain amount of specialized training.

Institutions and training facilities for sub-professional water supply personnel are practically non-existent and must be created. Because of language difficulties, and the need for training to be related to local conditions, this training should be provided locally. The Peace Corps is beginning to provide assistance at this level.

It is RECOMMENDED that:

5-1: The present trend of dissociating training activities from those responsible for and competent in the technical specialty of the trainees should be reversed. Training is conducted to accomplish community water supply objectives and is an important component of programs in the field, and therefore the coordination of training with other CWS activities is essential.

5-2: A.I.D. should consider the training of participants in the U. S. one of its most important activities and provide for this in its loan-oriented program. Greater use should be made of Mission general training funds, with the categorical programming of participants arranged through technical units of A.I.D./W, especially the CWS Branch.

5-3: The follow-up of participants after their return home should be routinized to provide a better means of evaluating the training program.

5-4: A.I.D. should provide and encourage others to provide technical assistance to the universities of the developing countries in the establishment of sanitary engineering and related programs.

5-5: A.I.D. should request WHO to conduct man-power studies in the field of community water supply and A.I.D. should provide WHO with assistance in carrying out the activity in countries where it has resources.

5-6: WHO should be encouraged to collect and evaluate data pertaining to the training of sanitary engineers on a world-wide basis and A.I.D. should assist in this project.

5-7: A.I.D. and the other international agencies should cooperate in the development of training facilities for ancillary water works personnel within the developing countries.

ORGANIZATIONAL STRUCTURE OF A.I.D.

The reorganization of A.I.D. into geographical Bureaus has had a substantial adverse impact on the effectiveness of the community water supply activities of the Agency. An organization as large as A.I.D., with field operations throughout the world, does require substantial decentralization and an orderly delegation of authority from the Administrator through the organization to the Missions must be maintained. The Bureau arrangement may be well suited for A.I.D. needs and this pattern may remain for some time to come.

However, the Bureau structure, as it is now operating, has resulted in frustrations and conditions just short of chaotic, particularly where concerned with technical services. Some examples of the problems now being faced in the execution of the A.I.D. program are cited below:

1. Decentralization has fragmented an already highly dispersed agency. This is particularly damaging to professional and technical personnel as no "home base" can be identified.

2. The division of the agency into four operating Bureaus has limited the availability of scarce specialized professional staff. The Bureau often is faced with technical responsibilities for which specialized staff is either not available or inadequate in number within the Bureau. Several of the Bureaus, for example, have no sanitary engineers to service water supply projects. Such projects therefore may be expeditiously administered, but technically they leave much to be desired. Accomplishment of the A.I.D. mission is dependent on the technical excellence of the project and not the administrative ease with which it was executed.

3. A.I.D. practices in dealing with other agencies vary from Bureau to Bureau. Relationships with other U. S. government agencies, international agencies, consulting engineering firms, professional societies, and universities are often confusing. The result is a distorted image of A.I.D. particularly on the part of contractors and consultants, and a reluctance of many to collaborate with A.I.D. on activities of mutual interest and essential to A.I.D.'s mission.

4. Professional personnel are not readily exchanged among the Bureaus, which limits the career opportunities of the professional employees, complicates the expeditious filling of positions and results in poor utilization of the few professional personnel available.

Most difficulties are a result of inadequate coordination of activities and the lack of communication among the Bureaus. (Some Bureau representatives, all concerned with water supply, met for the first time at Panel sessions.) A.I.D. has established staff organizations

in Washington, such as TCR and the Office of Engineering, which should provide technical support for all A.I.D. activities, but these resources are not now being fully utilized. For example, Bureau engineers revealed that they were not aware of the specialized training facilities provided by the Community Water Supply Branch and thus the use of these facilities is not included in contracts prepared by Bureaus. These staff organizations have specialized professional personnel who should provide much of the needed specialized talent not usually available within the Bureaus.

Failure to utilize specialized professional personnel during the processing of water supply loan projects was attributed by Bureau personnel to the fact that, because of the small amount of water supply work relative to the total amount of engineering work, a specialized group could not be retained by the Bureau. The same could be said for any specialized technical projects such as airports and power plants. (This problem is fully explored in the Loy report, "The U. S. Program of Aviation Assistance to Less Developed Countries.") The lack of specialized staff on such large technical projects deleteriously affects accomplishment of the mission of A.I.D. Some mechanism must be found to bring the appropriate professional resources within A.I.D. to bear on every project. For this purpose A.I.D. direct-hire professional personnel are the key to the successful utilization of contract personnel.

The intent of the recommendations below is not to modify the responsibilities of the Bureaus, but rather to increase the technical and professional resources available to the Bureaus in the execution of water supply projects.

It is RECOMMENDED that:

6-1: The Community Water Supply Branch of TCR and the Office of Engineering should be given responsibilities for providing professional services to the Bureaus, for improving coordination of water supply activities, and for providing better communications among units of A.I.D. These services should include evaluation of the technical aspects of A.I.D. programs, projects, loans and similar activities. Pertinent reports, correspondence and documents concerning water supply projects should be routed to these staff organizations in a routine manner in ample time for review.

6-2: The Office of Engineering, with the assistance of the CWS Branch of TCR, should continue to have responsibility for the development of criteria for the technical aspects of A.I.D.'s operations, and these staff organizations should review A.I.D. activities to determine the extent to which these criteria are being met and how A.I.D. operations in the water supply field might be improved.

6-3: Professional personnel matters should be handled by the Office of Personnel Administration in close collaboration with Bureau engineers to facilitate recruitment, assignment to posts, transfers and other personnel matters in order to assure the fullest utilization of scarce professional resources. The staff organizations should participate in the technical and professional aspects of these activities.

6-4: The Bureaus should make greater use of TCR as the designated liaison between A.I.D. and other U. S. government agencies, international agencies, professional societies, and other groups on technical matters in the water supply field.

PROFESSIONAL STAFFING

The organization of A.I.D. into the Bureau structure and the redirection of foreign aid activity from grant to loan funding have in general been accompanied by a deterioration in the status of professional personnel within the Agency. The uncertainty of retention of professional staff by A.I.D., uncertainty in the nature of future employment, and lack of clear professional career opportunities have led to a situation where better qualified professionals are reluctant to take A.I.D. positions and many well qualified professionals have left A.I.D. Even when compared with other federal agencies, professional personnel in A.I.D. are treated with a singular lack of the dignity consonant with the importance and sensitivity of the mission of the Agency. These practices have led to use of generalists and administrative personnel in place of specialists, a process which inevitably results in mediocrity in professional activities. In turn, this poor professional setting makes the attraction of well qualified professionals to A.I.D. even more difficult. The writer concurs in the observations on personnel administration reported by Senator McGee throughout his report on "Personnel Administration and Operations of A.I.D.," but is not as sanguine concerning an improvement in the situation. Many personnel problems can be ameliorated within the present organizational framework of A.I.D., but certain changes in policies and practices are required.

The major responsibility for personnel administration has been delegated to the Bureaus which has imposed limitations on both movement of personnel to fill Agency needs and the employment opportunities for the professional staff. Personnel are terminated or placed in positions outside their specialty as appropriate positions may not exist in a Bureau, while at the same time another Bureau has needs which are being met by substitute personnel or are not being met pending recruitment. It is noted that the Community Water Supply Branch has rendered outstanding service in providing assistance to the Bureaus and Missions on an ad hoc basis in the filling of positions and placement of sanitary engineers and other specialists in the water supply field.

With a trend toward loan funding, the technical aspects of A.I.D. programs were expected to decrease substantially and those that remain were expected to be handled by contract personnel on a temporary basis. To employ contractors intelligently requires a nucleus of A.I.D. direct-hire personnel. Nevertheless, career opportunities with the foreign aid program previously offered to engineers and other professionals have been virtually eliminated. If a vital technical professional staff is to be maintained in the Agency, and if the Agency is to have a reasonably long-term life, then some form of career program is necessary to infuse new blood into the organization. An ar-

rangement with another federal agency that has a career program, such as the Public Health Service, might be developed.

The redirection of the program has, in fact, generated a greater need for A.I.D. engineers and professional staff. The gravity of the situation with regard to the water supply program is revealed by the following data. In 1955, before any substantial investment was being made in water supply in our foreign aid program, 60 sanitary engineers were employed overseas by I.C.A. In 1963, on the other hand, with substantial and increasing water supply activity, only 39 sanitary engineers were stationed overseas by A.I.D. It is clear that the technical backstopping for water supply projects is not always adequate and huge investments are being made without sufficient professional resources being brought to bear on the projects on behalf of the interests of A.I.D.

A further complication is that each Mission determines its own staffing pattern on the basis of its projected program, which by necessity requires planning well in advance of activities. The number of professionals is determined largely on the basis of technical assistance programs, which are at present quite limited, while substantial workloads, particularly for engineers, are generated by the capital assistance activities.

The Panel deplored the replacement of professional and technical staff with administrative types, one of the trends criticized in the McGee report. The present technical staffing is inadequate to meet A.I.D. responsibilities, particularly with regard to the engineering aspects of capital development and more particularly in the specialized field of water supply. The management of scarce professional personnel is not sufficiently flexible for the dynamic program which A.I.D. is embarked upon, and the trend toward the use of administrators and generalists rather than specially qualified personnel has resulted in projects which do not represent the quality of water supply activity for which the United States is noted.

It is RECOMMENDED that:

7-1: A.I.D. should increase ceilings for direct-hire water supply personnel even as it makes greater use of other federal agencies and private contractors. Ceilings for engineers and other professional personnel should be determined on an Agency-wide basis with consideration for the technical assistance needs created by capital development activities. It is urgent that additional sanitary engineers be made available to Missions and in regions where water works activity is currently under way or where such activity is anticipated.

7-2: A.I.D. should establish a career program for professional personnel which would make the service attractive to qualified engineers and other professionals.

7-3: Where it is inappropriate to employ private consultants, such as in the management of contracts with private consultants, or to use resources of other governmental agencies, A.I.D. should utilize the services of specialists by:

a. The assignment of personnel from staff organizations of A.I.D. to Bureaus to carry out specific technical tasks under the supervision of and responsible to the Bureaus.

b. The establishment of an effective mechanism by which specialized personnel assigned to A.I.D./Washington or to a Mission could be made available for temporary duty assignments in other Missions whether within or outside the Bureau.

LIAISON WITH OTHER AGENCIES

The Panel found, during its meetings with representatives of other organizations, that many organizations have considerable interest in community water supply and several currently have activities in this field. CWSB of TCR has served A.I.D. well by coordinating activities with these organizations and drawing upon them for the better accomplishment of the A.I.D. mission.

WHO has been carrying out a world-wide Community Water Supply Programme since 1960. This program has many activities similar to those of A.I.D. and because of joint efforts at coordination, the activities have been collaborative. This coordination has been accomplished through annual meetings, frequent visits between personnel of the two agencies, correspondence and close contact at the country level. WHO is in a position to carry out some activities more effectively than A.I.D. Among these are the collection of data on a world-wide basis, establishment of international standards, and other activities involving a number of countries.

The U. S. Department of Commerce has direct interest in water supply activities in regard to its responsibilities for the promotion of the use of U. S. goods and services and has a unit for foreign activities. Their principal activities is the collecting of information which assists private enterprise in the U. S., providing information through manuals, catalogs, and other publications, and encouragement to the developing countries to adopt or use U. S. standards and specifications. These activities are transmitted to the field through the embassies and consulates. It appears that the total U. S. interest benefits through coordination of these activities with those of A.I.D.

The USPHS of the Department of Health, Education, and Welfare has collaborated with A.I.D. in the field of environmental sanitation and community water supplies for a number of years and an inter-agency agreement exists to provide for PHS participation in A.I.D. activities. The USPHS has provided A.I.D. with professional personnel on both a personal services and team basis, carried out participant training, and provided support in depth for technical matters through its facilities, such as the Robert A. Taft Sanitary Engineering Center. This relationship has been fruitful, and the PHS deserves much credit for the success of many A.I.D. projects. These services are restricted to a type which cannot be readily provided by private consulting firms.

Other U. S. government agencies are also of importance to the program. The Department of Defense, through the U. S. Army Special Forces, carries out assistance in a number of countries through Civic Action projects involving the countries' armed forces, often in

collaboration with the U. S. A.I.D. Mission. Other agencies, such as the Farmers Home Agency, have programs in the U.S. which might serve as training areas and sources of technical information.

The professional societies, such as ASCE; AWWA, and others, are interested in assisting the engineers in the developing countries by exchange of publications, assistance in arranging visits to engineering operations in the U. S. and encouraging the establishment of professional societies in the developing countries. UNESCO coupons for the acquisition of technical manuals and literature, which permit purchase without the need for foreign exchange, are not used as widely as they might be.

It is RECOMMENDED that:

8-1: A.I.D., through the CWS program of TCR, should continue to maintain a close liaison with other U. S. agencies which carry out water supply activities in the developing countries. The relationship between A.I.D. and USPHS should be continued and USPHS facilities and services should be utilized to the greatest extent practicable.

8-2: A.I.D. and WHO/PAHO should continue to coordinate their activities in the field of community water supply and, in cases where it appears that WHO is particularly well equipped to handle an activity, WHO should be requested to carry out the activity with A.I.D. assistance.

8-3: Liaison should be maintained with the professional societies and they should be encouraged to participate more actively in community water supply projects. It is suggested that greater use be made of the offices of the societies in the planning of observation trips of participants and a means should be developed to notify both the national and local chapters of proposed visits by engineers of the developing countries.

ORGANIZATION, FUNCTION AND RESPONSIBILITY FOR WATER SUPPLY ACTIVITIES IN TCR

Since the beginning of technical assistance in 1942, the high incidence of preventable, water-borne diseases in the developing countries, constituting an unnecessary deterrent to economic, political and social progress through the loss of human capital, has led to emphasis on the construction of water supply systems. Handled on an individual project-by-project basis, this approach was effective but far too slow. Accordingly, Congress appropriated $1,000,000 in 1960 to start an expanded world-wide Community Water Supply Development Program, backstopped by the Community Water Supply Branch (CWSB) in the Health Service of the Office of Technical Cooperation and Research. 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 professional consultants and the multi-country approach. With a new central unit, A.I.D. was able to assist countries on a systematic basis, with the object of developing national programs. To date, more than $2.5 million dollars have been appropriated for this A.I.D. program.

The Community Water Supply Branch serves as a focal point within A.I.D. for the water supply program and provides guidance to the Administrator in policy and technical matters. In addition to its present authorized staff of three sanitary engineers, the Branch supplements its resources frequently by the employment of regional and short-term technical consultants who are specialists in the public water supply field and who have had experience both in the United States and in developing countries. Such services were rendered in some 50 countries in the last five years. The Branch provides assistance to Missions in obtaining services in five principal categories: a) advisory services relating to the function and organization of water supply facilities; b) economic feasibility studies for specific water supply projects, including recommendations for rate structures and the preparation of loan applications; c) technical design studies including engineering surveys, planning studies and technical operation and maintenance; d) socio-economic studies to assist in national and regional water supply planning and institutional support; and e) training through the use of seminars, short courses and workshops in the developing countries.

The significant role that the CWS Branch has played in the Missions is revealed in the airgrams from the Mission Directors, abstracted in the Appendix, which call for more services from the Branch.

The Branch assists in the development of professional personnel from developing countries through the use of training courses set

up at educational institutions in the United States and abroad. One of the most successful, for example, has been an annual ground-water development course at the University of Minnesota which is now being offered in Spanish in Colombia for the Latin American region. The University of North Carolina provides an International Program in Sanitary Engineering Design, where participants take work at the University, at operating water supply facilities, and have assignments in the offices of consulting engineers. A special short course in Engineering Management of Water Supply Systems has been established at the University of Akron, and is also being offered in Spanish in Colombia. A course for waterworks operators has been established at Neosho, Missouri. Altogether about 250 participants have been in the U. S. for these courses, with more than this number involved in specialized courses set up for them by the CWSB in their own countries. In addition, correspondence courses in water supply have been established at Pennsylvania State University.

The Branch sponsors seminars which bring together engineers from developing countries in the various regions of the world. During the summer of 1964, for example, three seminars on community water supply were held in Thailand, Ethiopia and Colombia, the last sponsored by the Pan American Health Organization. The Branch arranges for reprints and translations of important waterworks manuals to be made available to technical personnel in developing countries. Up to now more than 20,000 reprints and other manuals have been distributed, and more than 15,000 copies of translations into Spanish and French have been produced.

In summary, efforts in the Community Water Supply program are directed primarily toward assisting countries to develop or strengthen self-sustaining business-like institutions capable of planning, financing, constructing, managing, operating and maintaining community water supply systems. The technical assistance provided includes such activities as reconnaissance and feasibility studies, training, specialized advisory services, and distribution of technical material.

Although the Communty Water Supply Branch has been one of the major activities of the Health Service, the utilization of its technical and professional resources, and the effectiveness of A.I.D. community water supply operations have all been deleteriously affected by the poor "visibility" of the Branch within the Agency. Many water supply enterprises, originally initiated with the help of personnel from the Community Water Supply Branch, are now undertaken by A.I.D. without even the routing of routine airgrams to the Branch or an invitation to the Branch to participate in deliberations concerning the project.

Inasmuch as its activities are primarily engineering and its staff is composed of engineers, the Panel seriously considered recommenda-

tions for shifting the Branch to the Office of Engineering. However, one of the important purposes of water supply systems in developing countries is the elimination of disease and the success with water supplies in the United States has resulted in part from the responsibility of health agencies in the stimulation and regulation of community water supply systems. Therefore, maintenance of a close relationship with the Health Service of TCR is essential. Furthermore, the Public Health Service and the World Health Organization have major responsibilities for water supply development throughout the United States and the world and liaison with these agencies requires that channels through the Health Service be maintained within A.I.D.

Consideration was given to recommending that the CWS Branch become a separate division within TCR, which would make the Branch more accessible to the rest of the Agency. However, implementation of the other recommendations should strengthen the Branch and provide it with the necessary visibility and accessibility to the operating units of A.I.D.

It is RECOMMENDED that:

9-1: AID should establish within the Health Service of TCR an "Associate Director for Sanitary Engineering," with responsibility for the activities of two branches, a "Water Supply and Sewerage Branch" and an "Environmental Sanitation Branch." The Associate Director would act for the Director of the Health Service in all matters relating to projects in the water supply field.

9-2: The Water Supply and Sewerage Branch should be assigned the following functions:

a. The development and promotion of special courses, conferences and similar activities in the field of water supply and sewerage through U. S. educational and other institutions, including the establishment of these activities overseas. In cooperation with the Division of Education of TCR, the Branch should utilize the services of the U. S. universities serving A.I.D. as contractors in engineering education.

b. Provide assistance in reviewing the technical aspects of all programs, projects, feasibility reports, plans and other documents concerning the design, management and operations of water supply and sewerage projects in cooperation with the Office of Engineering and Bureau engineers.

c. Provide the services of qualified sanitary engineers to Bureaus, Missions and to the Office of Engineering and other units of A.I.D. for the evaluation of loan applications, contracts, reports and other activities for which the units do not have adequate

specialized water supply personnel on their own staffs. Personnel so assigned would be responsible to the unit to which assigned during the period of assignment.

d. Provide the Bureaus and Missions with technical services on special problems by correspondence, short-term consultation and other means.

e. Assist with recruitment and employment of consultants and other contractors in the water supply field by A.I.D. in collaboration with the Office of Engineering.

f. The preparation, translation, collection and distribution of literature in the fields of water supply and sewerage in collaboration with other units of TCR.

g. Provide technical support to all participants coming to the United States for training in water supply and sewerage.

h. Provide technical support to the Office of Personnel Administration in the recruitment, placement, transfer, evaluation, and other personnel matters involving sanitary engineers and allied personnel in cooperation with the Office of Engineering and Bureau engineers.

i. Collect, evaluate, and disseminate data from the field and conduct special studies and develop special projects pertaining to water supply activities and initiate research with the help of the Office of Research and Analysis of TCR.

j. Plan the CWS program of A.I.D., participate in making of CWS policy, and assist in evaluation of CWS programs.

k. Coordinate activities and provide liaison for A.I.D. water supply and sewerage activities with:

1. The Public Health Service in regard to participant training, and the utilization of PHS personnel and teams through PASAS when it is concluded that private enterprise cannot perform the needed services satisfactorily.

2. The World Health Organization and the Pan American Health Organization, including the funding of projects to be carried out by international agencies where they are uniquely suited to provide such services and where the operation can be more economical and efficient for the U. S. than by A.I.D. or other U. S. public or private organizations performing these services.

3. Department of Commerce in regard to the distribution of periodicals, U. S. standards, catalog data and other information through U. S. Embassies and Consulates; consulting firms and

manufacturers in the water supply and related fields and other matters of mutual interest.

4. Other U. S. government agencies, such as the U. S. Geological Survey, in areas of common interest particularly participant training.

5. Professional societies such as the American Society of Civil Engineers, American Water Works Association, American Sanitary Engineering Inter-society Board, Water Pollution Control Federation, and others with interest in the water supply and sewerage field, and the encouragement of these groups to provide assistance such as the distribution of professional literature, assistance to participants in the U. S., sponsoring of professional societies in the developing countries and other activities.

9-3: The Water Supply and Sewerage Branch should be staffed to provide a reservoir of specialists who can provide expert advice and services in the planning, design, management and operation of water supply projects and in the training of water supply personnel for all units of A.I.D. The staff should include as a minimum:

a. One Chief, who would serve as Associate Director for Sanitary Engineering of the Division of Health Services, who is a qualified sanitary engineer with overseas experience, preferably with A.I.D., in water supply and sewerage. The tenure of this position should be of a permanent nature, not necessarily subject to the requirements of the "rotation system".

b. One Deputy Chief, who is also a qualified sanitary engineer in water supply and sewerage, who is fully qualified to serve as Acting Chief for extended periods.

c. Two qualified sanitary engineers to carry out tasks assigned to the Branch and for service on Bureau and Mission staffs when needs arise for sanitary engineering consultation which is otherwise not available. These engineers should have had experience in the design, operation or management of water supply works.

d. Two sanitary engineers qualified as above to serve overseas as regional consultants to Missions in NESA, Far East and Africa.

e. One sanitary engineer qualified as above and stationed in Washington to serve the Missions in Latin America. He would serve also as liaison with inter-American organizations, such as PAHO.

f. One sanitary engineer to serve as education and training consultant to the water supply and sewerage program. He would maintain close liaison with the Office of International Training, and in addition would be responsible for special training programs established by A.I.D.

9-4: The Water Supply and Sewerage Branch would continue its utilization of WAE consultants. The Branch should make use of consulting engineering firms with special qualifications in water supply and sewerage and with experience in developing countries under contract to the Office of Engineering to provide assistance to AID on an ad hoc basis.

9-5: The Environmental Sanitation Branch would provide staff assistance to all offices, Bureaus and Missions of A.I.D. in matters pertaining to technical aspects of environmental health programs of the Agency not specifically within the community water supply field.

APPENDIX A

Participants in Panel Sessions

AGENCY FOR INTERNATIONAL DEVELOPMENT

Office of Technical Cooperation and Research

Dr. Philip R. Lee, Director, Health Service
Mr. Joseph Haratani, Community Water Supply Branch, Health Service
Mr. Alfred Wieters, WAE Consultant to Community Water Supply Branch, Health Service
Mr. Myron Vent, Education and Human Resources, Development Service
Dr. Harold Frederickson, Office of Research and Analysis
Mr. Stephen W. Bergen, Office of Research and Analysis
Mr. George Lawson, Public Administration Service
Mr. Louis Gill, Rural and Community Development Service

Office of Engineering

Mr. Fred Davis
Mr. Ted Moody

Bureau for Near East and South Asia

Miss Lucille Chaffin
Mr. Richard C. Parsons
Mr. Melvin Pehl
Mr. Kenneth F. Vernon

Bureau for Africa

Mr. Scott Brandon
Mr. Carl E. Ferguson
Mr. Thomas V. Leahy

Bureau for Far East

Mr. Bernard E. Donnelly
Dr. William Schaffrath
Mr. Quentin J. Wildman

Bureau for Latin America

Dr. Jonathan Fine
Mr. George A. Krumm

Office of International Training

Mr. Jack Gilmore

Other U. S. Government Agencies

Mr. Bernard B. Berger, Division of Water Supply and Pollution Control, Public Health Service, Department of Health, Education, and Welfare

Mr. James Bozek, Office of International Health, Public Health Service

Mr. Cecil Rose, Farmers Home Agency, Department of Agriculture

Col. Converse Lewis, Department of the Army

Mr. Konstantine Kollar, Department of Commerce

Mr. A. T. McPherson, Bureau of Standards, Department of Commerce

Mr. Leroy Wyman, Bureau of Standards, Department of Commerce

International Agencies

Mr. Paul Bierstein, Community Water Supply Programme, World Health Organization

Mr. Mark Hollis, Pan American Health Organization

Mr. Charles S. Pineo, PAHO (Formerly Chief, CWSB, TCR/HS)

Others

Mr. Peter Callejas, International Bank for Reconstruction and Development (World Bank)

Mr. Robert D. Mitchell, Malcolm Pirnie Engineers, Consulting Engineers, representing American Sanitary Engineering Intersociety Board

Dr. Ralph Fuhrman, Water Pollution Control Federation

Mr. Milton Lunch, National Society of Professional Engineers

Mr. Donald D. King, American Society of Civil Engineers

Mr. Daniel Ventris, American Society of Civil Engineers

Mr. Gerald F. Briggs, Edward E. Johnson, Inc., St. Paul, Minnesota

Mr. Bernard Last, Rockwell Manufacturing Co., representing Water and Sewage Works Manufacturers Association

Dr. Jerome Milliman, University of Indiana

APPENDIX B

Communications From Missions

Below are reproduced abstracts from airgrams from the Missions pertinent to this report.

1. Accra, Ghana—Foley

It is hoped that in the future the budget will permit more frequent visits to the field by members of the staff of the Community Water Supply Branch, the U. S. Public Health Service, and other interested agencies.

Since the Water Supplies Division, Ministry of Works and Housing of the GOG is currently organizing a Training School for Waterworks Operators in which USAID/Ghana already has an established participating interest, a considerable amount of technical advice and assistance will be required. It is hoped that the Community Water Supply Branch will be able to assist in providing visual aids and instruction material for this new school, which is the first of its kind to be established in Africa.

2. Addis Ababa, Ethiopia—Korry

In the past, there has been some question in my mind and that of my engineering staff as to the exact functioning of the Community Water Supply Branch with respect to Mission activities. As Mr. Agnano says, "Now, with the review in process, one thing I would like to see come out of it would be a spelling out, under one cover, of the proposed organization, staff, activities, services and resources available *to the Mission* concerning community water supply activities."

I agree with Mr. Agnano's comment and hope that clarification of these points will be one of the major agenda items for the panel's consideration.

3. Ankara, Turkey—Hare

"CWSB provides very effective technical support for AID field staff and has been alert to the changes in the requirements for support brought about by shifts in emphasis of host country and mission programs. CWSB and its staff should be especially commended for their establishment of special training institutions and correspondence training programs at the Universities of Akron, Minnesota, North Carolina, and Pennsylvania State. The regional symposiums and seminars which it has sponsored and the support it has given to regional and national professional organizations have been of much assistance to the field staffs in their efforts to develop institutions which will survive.

In my opinion, CWSB has been effective because its staff is made up of experienced foreign service people.

"Many of the countries in which AID is providing technical assistance are now following national development plans which more or less divide their water supply activities between two development sectors. Rural and small community supplies fall under the social sector and generally have among their objectives, improved health, community development, and political stability. These activities are heavily subsidized by local governments and repayment criteria are usually modest or not rigidly followed. The requirements of this sector's programs for technical assistance are less those of engineering advice than assistance in organization, staff training, development of procedures, development of manuals, logistic support, public relations, or propaganda.

"Water supplies for the larger urban areas, however, most often fall under the economic development sector of the plan in which they should be considered as a public utility rather than a social service. Technical assistance needs include those listed above for the rural program, but more urgent needs are for assistance in the technical services which determine economic and technical feasibility and assure rational planning. The concept of urban water supply as a public utility is not broadly understood as yet, but is becoming more acceptable as examples occur of industries, power plants, touristic developments which are delayed in start up through lack or inadequacy of urban industrial water utilities.

"*There is no nation that is more capable than the USA* to advise on the development of urban water supplies. Technical assistance in this field, which assures achievement of other economic goals, is an activity for which AID should be reluctant to abdicate responsibility. In general, the need for technical assistance is long-term and in operational matters that are not well served by itinerant technicians of varying nationalities and backgrounds.

"The phase-out of USAID programs in Community Water Supplies will probably increase the responsibilities of the CWSB or AID/W unit which evolves from it, since many nations will still look to the USA for help. More short-term consultants will be required, feasibility studies and loan applications must be reviewed, contracts will be negotiated, support may be required for Food for Peace programs, participant training will require close scrutiny, and support for host country and regional institutions and staff may have to be intensified in those cases where USAID programs have been terminated too soon.

It can be concluded then, that CWSB must continue to maintain a staff of experienced foreign service professionals to provide AID/W and Missions with an adequate technical service arm in this segment of economic development."

4. Asuncion, Paraguay—Snow

This Mission looks forward to receiving copy of the ad hoc panel's report and would like to recommend that necessary resources be provided for Community Water Supply Branch staff to visit Missions engaged in community water supply activities minimum of once a year. This is no reflection on the backstopping presently provided but opportunity to discuss progress of programs and exchange ideas in the field can strengthen operations.

5. Kingston, Jamaica—Klosson

a. The Community Water Supply Branch, although definitely understaffed and servicing a Global program, has done an excellent job in providing technical backstopping for the community water supply development project in Jamaica. In fact, this is the only project in this Mission that has received adequate technical backstopping from AID/W.

b. It is suggested that the Community Water Supply Branch be given more responsibility in the selection, review, approval and implementation of Capital Development loans for water supply development and waste water disposal.

c. The Community Water Supply Branch might consider establishing an orientation-type program for AID personnel regarding water supply development and waste water disposal. With the present emphasis on loans, there appears to be a general thinking that money alone will solve all of the water supply problems in the developing countries. In order for these programs to be successful, community water supply projects must have adequate people with technical and management skills to carry out the investigations, long range planning, designing, construction, operation and management of the water supply systems.

d. The USAID Sanitary Engineer does not believe that in general the U.S. Public Health Service and other U. S. Government agencies can provide the type of talent and technical competence required in solving the water supply needs of the developing countries. Personnel from operating water utilities, statutory authorities and consulting engineering firms specializing in sanitary engineering are more suitable for this type of program.

e. This USAID suggests that the Community Water Supply Branch be expanded in order that it can provide even more technical backstopping to the USAID Missions in regard to water supply development and waste water disposal.

6. Lima, Peru—Schmukler

This Mission has greatly benefitted by the work carried out by the CWSB during the past four years. Its efforts have done much to strengthen the Ministry of Public Health and Social Assistance; the Ministry of Development and Public Works; the National Development Fund, and the National University's School of Sanitary Engineering. The CWSB has served to backstop A.I.D. Sanitary Engineers. Indirectly, this assistance has also served to strengthen Peru's National Planning Institute.

However, this Mission at the present time has an overall interest in urban and rural community development with emphasis on public utilities in general, such as safe water supplies, electric power, sewerage systems, etc.

7. Manila, Philippines—Blair

Community water systems are one of the most useful, felt needs of villages and towns. However, experience has revealed that, once attained, proper maintenance of the systems is often a serious problem. Deeper involvement of the community in planning and implementation of the project can result in better maintenance. Selected individuals of the community should undergo rudimentary training in maintenance if a sense of project ownership and consequent responsibility is to be created.

It is recognized that a "self-help" approach, whose reliance is placed on volunteer labor and local community organization, complicates the scheduling of engineering resources. This may be justified, however, if better maintenance and efficient utilization of the water system can be achieved.

A useful and major by-product of such an approach will be an increased capacity for local groups to focus on additional community problems. This USAID, therefore, recommends that the panel consider the maximum involvement of the communities to be served.

8. Mogadiscio, Somalia—Torbert

The most important phases of community water supply development in the Republic of Somalia are:

1. Public Administration
2. Water Works Management
3. Operation and Maintenance

If the above three disciplines are not provided for in a project or by statute in the Host Country, all commodities furnished by the A.I.D. program will be of small benefit to the country.

The principle that safe water, under pressure, should be provided at each residence is not applicable in most townships of Somalia and will not be for many years. Town planning will have to be implemented before expensive distribution systems can be installed.

9. Saigon, South Viet Nam—Taylor, Killen

The panel should evaluate the advisability of reestablishing regional Sanitary Engineers in Areas where AID does not have sufficient personnel of this category. The panel should investigate the current use of non-engineering personnel in attempting to carry out engineering projects.

10. Tegucigalpa, Honduras—Burrows

In Honduras the basic solution to remedying many of its health problems, including removal of the greatest cause of death, parasitic causes, (according to the statistics) is the installation of good drinking water. The Inter-American Development Bank through the Social Progress Trust Fund has made a start and AID is now implementing a loan of $1,050,000 to supply water to 26 small communities of under 1,000 persons each. Mr. Walter Read, on loan from the Community Development Foundation (CDF) to PAHO, is actively working in Honduras with the SANAA representatives in the crystallizing of definitive plans for introduction of potable water to 26 communities mentioned above. The GOH has made an administrative reservation of $200,000 as its contribution to this activity.

The above is but a beginning and this Mission believes that a concentrated program should be instituted at once. At the same time the Mission would rather see the Inter-American Development Bank continue this task, working through SANAA, an institution which IDB has fomented and helped to create for the specific purpose of providing potable water to the entire country through one national institution.

The Mission trusts that these thoughts may be of value to you upon reviewing Honduras.