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THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

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THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

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Editors

1981-1990

Papers presented at Plenary Session
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AMERICAN SOCIETY OF CIVIL ENGINEERS

ENVIRONMENTAL IMPACT ANALYSIS

Research Council

FOREWORD

The International Drinking Water Supply and Sanitation Decade offers opportunities and presents challenges to engineers, governments, and international agencies alike. Engineers must apply their skills and adapt technologies to serve those in developing countries now without water supply and sanitation services. Governments participating in technical cooperation activities need to establish policies and means to implement them which are effective in promoting sector development and lead to long-term improvements. International agencies must encourage an acceleration in sector investments and ensure their effectiveness through the use of technologies which are more cost effective and the financing of auxiliary necessary training programs and health measures designed to increase the impact of sector investments.

The program committee for the International Conference of the American Society of Civil Engineers elected to participate in this process by highlighting the International Drinking Water Supply and Sanitation Decade, devoting the Plenary Session to the Decade. The program of the Plenary Session provides history and background useful both to the professional with a casual interest, and those who exercise the science of civil engineering in providing the services so widely and desperately needed in the developing world. The papers presented range from an explanation of human needs, and the opportunity to satisfy them, to explanations of Decade organization and participation by national and international organizations to specific examples of national program implementation and project development.

A companion session [1] is devoted to the specialists interested in the review and development of water supply and sanitation projects.

This volume contains papers of the Plenary Session.

John M. Kalbermatten
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1. *Session 40 of the Technical Council on Research: Environmental Impact Analysis Research Council, explores "Project Monitoring and Reappraisal in the U.N. Water Decade"*

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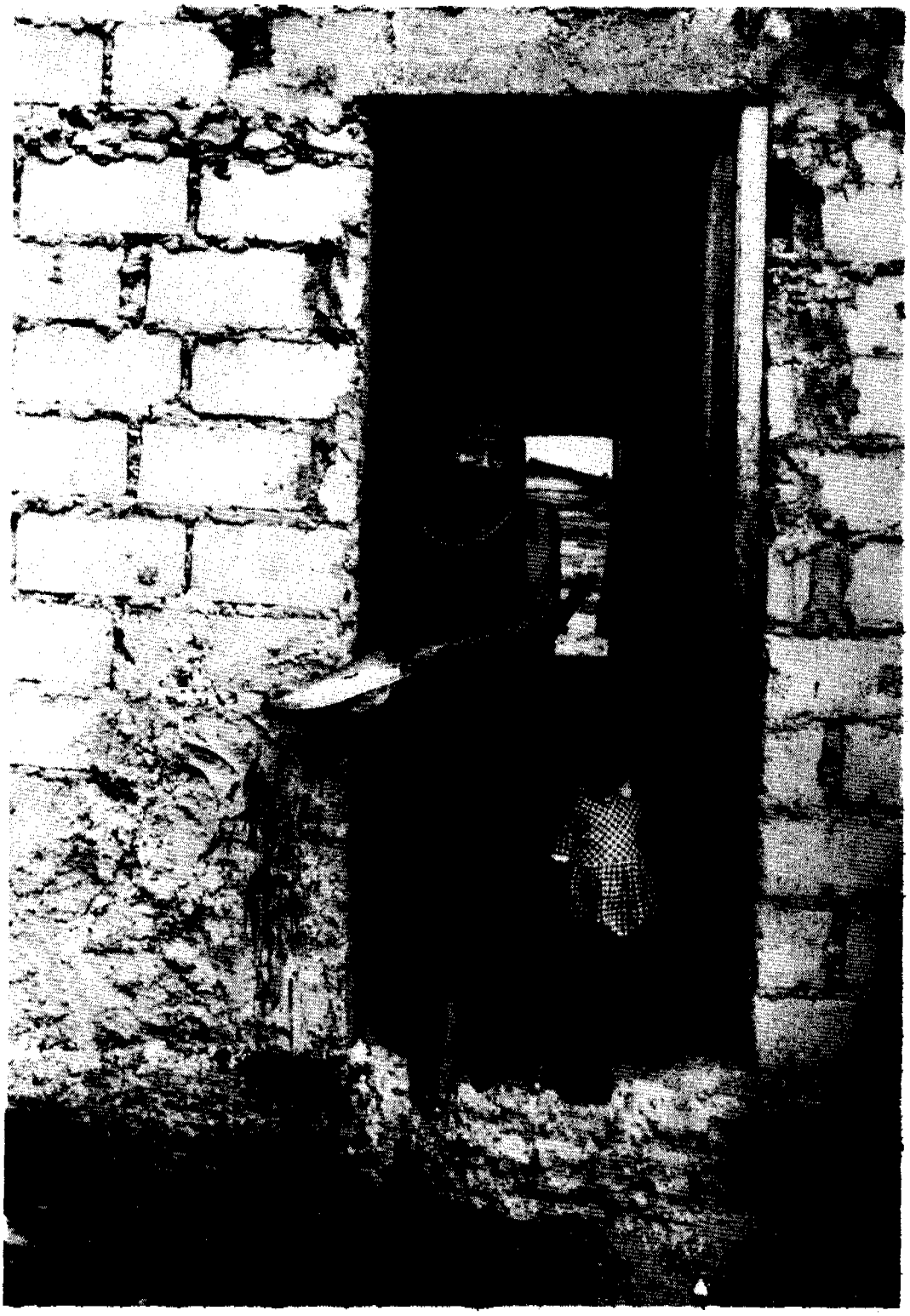

NO MAN IS AN ISLAND ENTIRE OF ITSELF

by

Abel Wolman [1]

ABSTRACT

The world situation in water supply and sanitation is described. The correction of a dismal lack of facilities in urban and rural populations of developing countries is the agreed objective in the proposed International Water Supply and Sanitation Decade of 1981 to 1990. The size and nature of such a major public works undertaking are delineated. Constraints in accomplishments are recognized. Proposals are developed to alleviate or eliminate such constraints. The obligations of ASCE are emphasized.

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NO MAN IS AN ISLAND ENTIRE OF ITSELF

INTRODUCTION

A few years ago, the American Society of Civil Engineers celebrated its 125 anniversary by editorially asking "why study our roots and what's so important about history"? It rediscovered the heritage of engineering as an instrument of civilization. Strangely enough, Karl Marx affirmed years ago that the basic forces underlying civilization's evolution are provided by man's technology. If, in that evolution, engineering has transgressed, correctives lie only in a wiser technology use and not in its destruction.

The profession is now confronted with a bold and exciting opportunity to apply its art on a global stage. Some may well raise the perennial question as to whether this opportunity is really our obligation. More than a decade ago, this same question was addressed to me by a group of young medical practitioners in the United States. Each individual can answer only for himself, but the Society, in this instance, has already replied in the hard look at its own history. It accepted the aphorism of a wise man that the past is our heritage, the present our responsibility and the future our challenge. My own view is that the challenge global problems pose must be

accepted philosophically, not only for purely selfish practical reasons, but because the world is bound in bacterial, as well as in human, bonds. John Donne, more than a century ago, put the matter simply, when he said "no man is an island entire of itself."

Biologists remind us, in an even deeper sense, that "There are no solitary, free living creatures; every form of life is dependent on other forms." [1] And this is true of all people, of whatever culture, religion, or political ideology. Of greater importance is the additional biologic precept, so relevant to engineering, that our immense array of genes drives us forever to be helpful and to be useful. What we shall now be discussing is an acceptance of these obligations, so eminently fitting for the descendants of the Leonardo da Vincis of centuries ago!

The Present Scene

Dr. Mahler, the Director General of the World Health Organization, recently pointed out that the number of water faucets per 1000 inhabitants is a better measure of health than the number of hospital beds. Tested by that index, the world is in a sorry state. Unfortunately, other indicators of the status of less favored countries likewise give no cause for gratification. Compared to the developed regions of North America, Western and Eastern Europe, and the U.S.S.R., the so-called developing countries suffer generally from more rapid population growth, much lower gross national product per capita, far higher infant mortality, and much lower expectation of life at birth. In over-simplified terms, far too great a part of the world's people is half-starved, half-housed, and devoid of hope.

Long-term students of health problems in the countries at major risk are unanimous in their judgement that, in general, improvements in water supply, sanitation, and housing can reduce materially the incidence of disease and, in turn, affect mortality. While life expectancy has improved in most countries over the past three decades, it is still less than 50 years, in comparison with over 70 in the western world. Of greater importance, however, the rate of improvement is unfortunately declining. As is so often the case, small children pay the greatest toll.

Their major killers are too often the gastrointestinal infections. Herein lies the real challenge to engineers, because water supply and human excreta removal offer the significant means of disease prevention.

If the decade program succeeds, we may look for a drastic reduction or complete elimination of water-borne diseases and a great increase in the use of effective sanitary methods for the disposal of wastes. A natural consequence should be a sharp decline in infant mortality and of general gastrointestinal diseases caused by polluted waters.

Basic Water Supply and Sanitation

It is not my purpose to deluge you with statistical data. A few facts are essential to establish the setting within which this conference has its deliberations. Many estimates have been made, over the years, as to how people fare with respect to available water and basic sanitation. The World Health Organization estimates are perhaps the most reliable, even though they are still not as complete as purists might wish. The developing universe with which we deal encompasses over 2 billion people, exclusive of nearly one billion in China.

The most recent survey (circa 1975) indicates that some 1,230 million are without adequate, safe water supply and 1,350 million without sanitary facilities. Seventy percent live in rural areas and the rest in cities. As is so often the case, people in rural areas are short changed -- only 22 percent had access to safe water and only 15 had available sanitary latrines. WHO suggests, perhaps with some exaggeration, that as much as 80 percent of all disease in the world is associated with water-borne, water-related, and water-bred vectors.

Stripped of the dull statistical evidence, the global facts[2] are that:

(a) people need and want water

(b) the pace of providing it is miserably slow

(c) the prospect of speeding up the pace over the next five years or ten years is not promising

(d) where installations have been provided, their maintenance and operation have been so defective that too many facilities have been left in disrepair and disuse.

Many of us have been concerned about this dismal situation for almost half a century. Although our voices have been heard to some extent, and real progress in extending facilities has occurred, explosive population growth has outstripped installations. Awareness that these efforts were playing a losing game became abundantly clear at the Habitat Conference in Vancouver in 1976. There, the remarkable goal was announced -- "fresh water for all by 1990."

The goal was confirmed with unusual speed in international actions, by the U. N. Conference at Mar del Plata, Argentine, in 1977. Shortly thereafter, the 1978 Alma-Ata Conference, in the U.S.S.R., on Primary Health Care, gave the 1980-1990 objective a high priority in the public health arena. These

actions were topped by the official launching of the International Drinking Water Supply and Sanitation Decade (1981-1990) on November 10, 1980, in a special one day meeting of the United Nations General Assembly. Historians may be more perceptive than I in determining why this sudden universal concern for an old deficiency materialized in the last few years. Regardless of ultimate diagnoses of present purpose, the fact remains that the world now places the onus for fulfillment of its obligation to no small extent upon the engineering profession. Successful implementation has long been our art.

The Largest Public Works Program

The sheer size of the contemplated assignment should entice our interest. Coupled with its health and safety aspects, one should not escape the social and humanitarian stakes confronting us. What is the job description and specification? Can the clarion calls of all the conferences actually be met?

Ten years ago WHO sought some preliminary answers from 88 countries. Their replies are still relevant. Forty-eight listed lack of internal finances as the first problem, although in other surveys this lack was low in priority. Ten cited a deficiency of external resources, while eleven had little appropriate administrative structure. In 19 countries, the chief concern was the lack of trained personnel. In this last category, I would suggest that the deficiency is greater and more widely distributed than the reports indicate. In any event, the project is a heroic one, demanding an unprecedented allocation of world-wide forces in planning, finance, design, construction, and management.

In round numbers, what is required in money? The World Bank indicated that about $140 billion would be required to reach the proposed target. For water alone, urban areas would use $53 billion and rural needs call for $42 billion. Urban sanitation facilities require $33 billion, and rural $10 billion. With inflation what it is, one should contemplate, with no exactitude, that in the ensuing ten year period, we may well need about $170 billion.

The figure should not intimidate us, since expenditures would be spread over ten years -- if we are fortunate in meeting the challenge. Before this present drive, annual expenditures were 50 percent or less of foreseeable requirements.

Experience makes clear that the constraint is not simply a question of money. The real issue is whether the global resolutions will be supported by political will and actual priorities in governmental policy. A major opportunity for ASCE expertise lies in exploring the possibilities of changing technology mix in order to develop lower-cost solutions.

One of the most difficult assignments is in mobilizing community-based resources. I do not exaggerate when I charge that we must develop far more original approaches, than are now on hand, in order to assure maximum participation of beneficiaries, as well as ingenuity in the production and use of local materials. Projects must be so well defined and planned that both internal and external funds will be forthcoming. All of these efforts may well go by the board, if early infra-structure-building and manpower and management development programs are not consummated. The historical record is too replete with failures and under-utilization of facilities, because operation and maintenance were non-existent.

Various approaches to meet the issues here exposed are presented in the papers describing successful country experiences. The methods used are, as they should be, of highly varied character. They reflect the spectra of culture, religion, ideology, and resources of highly individualized countries and regions. An expanded charter for ASCE, in participating in this global responsibility, is implicit in these presentations.

The opportunities of which I speak are so often more dramatically expressed by the poet than by the earthy engineer. I close therefore with these words from our own Walt Whitman:

"All the past we leave behind,
We debouch upon a newer mightier
world, varied world,
Fresh and strong the world we seize,
World of labor and the march,
Pioneers! O pioneers!"

APPENDIX 1.--REFERENCES

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THE UNITED NATIONS INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

by

Peter G. Bourne, M.D. 1/

ABSTRACT

The history and reasons for the United Nations Axiliary Water and Sanitation Decade are given. It offers possibility for achieving as great a change in the quality of human life in the world as any program ever launched by the United Nations. The UN role through its various agencies is discribed with the principal management responsibility assigned to the United Nations Development Programme (UNDP). The broad impact of water and sanitation services extends far beyond health. The single most important element will be the training of adequate manpower. The need for community participation and political will is noted. The technology is simple and available.

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1. Assistant Secretary General, United Nations Development Programme and Coordinator International Water Decade.

THE UNITED NATIONS INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

Half of the infants that die in the world each year die from water borne diseases. Last year 13.6 million children under five died, of these 13.1 million were in the developing world, and mostly died from water borne disease. Eighty per cent of all diseases in the world are water related, and at any given time 400 million human beings have gastroenteritis, 200 million have schistosomiasis (bilharzia or snail fever) and 30 million have river blindness. Half of all the hospital beds in the world are occupied by people with water borne diseases. Yet these figures represent only a small part of the total picture of death, suffering, compromised economic development, and lost human potential which result from the lack of clear and accessible water. In many rural parts of the world women spend hours everyday walking often several miles to get the minimum supply of water necessary for their families' survival.

The International Drinking Water Supply and Sanitation Decade despite its pedestrian title offers the possibility for achieving as great a change in the quality of human life in the world as any program ever launched by the United Nations. Growing out of the World Water Conference in Mar del Plata, Argentina in March 1977, the Decade was created with the general intent of providing clean drinking water and sanitation for all by 1990. Recognizing that this might not be a totally realistic goal in every instance the resolution called for each country to establish actual goals on an individual basis. However, if the overall goal of the Decade

is achieved, and we can provide clean accessible drinking water and sanitation for all it would by some estimates cut infant mortality in half, it would revolutionize the role of women in rural areas throughout the world and it would have a dramatic impact on the economic status of the world's billion people who live in absolute poverty. Healthy people are productive people and productivity is the key to economic development. This is even more true if they are not burdened down all day by the simple chores necessary to survive.

The Decade was formally launched at a one day Special Session of the United Nations General Assembly on November 10, 1980. In preparation for the Decade each developing country has been asked to establish a ministerial level National Action Committee to plan and implement their country's involvement. In addition each country is being asked to prepare a National Action Plan - a blueprint for their program to reach the Decade's goals.

At the international level the United Nations system as a whole seeks to provide the overall framework, the technical support, the momentum, and the visibility and promotion necessary for the program's success. Individually each of the United Nations agencies has a special contribution to make to the overall effort. The World Health Organization is the lead technical agency, the World Bank provides both technical assistance and more important major financial backing for projects and UNICEF focusses on the grass roots implementation of the programs and the stimulation of community involvement. The Food and Agriculture Organization, the International Labor Organization, UNIESCO, as well as other

technical offices of the United Nations carry out projects or advise governments in their own areas of expertise.

To maximize the coordination and effectiveness of the United Nations role in the Water Decade, a Steering Committee for Cooperative Action has been created, chaired by the United Nations Development Programme and including WHO, the World Bank, UNESCO, UNICEF, the International Labor Organization, the Food and Agriculture Organization and the United Nations itself. This group meets every three months to plan and coordinate the overall strategy and to divide between the various agencies the actions necessary to move the program.

The United Nations Development Programme is the development arm of the United Nations system. Its primary responsibility is the mobilization of voluntary financial support from governments worldwide, and the conversion of that funding into effective development services. With a budget last year in the region of a half billion dollars UNDP is the world's largest channel for international technical cooperation. It serves both as a vital catalyst for collaboration between the industrialized and developing nations and among the developing countries themselves. At national and regional levels UNDP supports the efforts of developing countries to educate and train their people, to inventory their latent natural resources and mobilize capital needed to activate them, enlarge their technological capabilities and plan the most effective use of all of their potential for progress.

At the global level UNDP works for structural changes in the world economic order that are essential if the developing countries

are to receive their fair share of trade, reap the benefits of modern research, and make an increasing contribution to international economic growth.

At the country level the United Nations Development Programme Resident Representative serves in effect as the Ambassador of the United Nations and as the personal representative of the Secretary General. With regard to the Water Decade he has been designated as the focal point responsible for coordinating all activities in connection with the programme. First he is responsible for coordinating the activities of the various agencies of the United Nations system. The representatives in the country from WHO, UNICEF, and other agencies serve as a committee or technical support team to assist him in advising the government on their program for the Decade. Second, it is his responsibility to stimulate the government's interest in the overall importance of providing clean drinking water and sanitation in general and in the Decade in particular. The leaders of many developing countries already recognize the economic, social and health reasons for supporting the Decade program. In many instances they are also often very aware of the political benefits they gain from providing water to poor rural communities. The Resident Representative must not only stimulate the government's interest and particularly that of the head of state, he must also advise the government on the creation of the appropriate internal mechanisms for coordinating Decade activities and provide the necessary technical assistance to plan a ten year program. This frequently involves identifying international experts. Finally, he must work with the diplomatic community, especially the representatives of the industrialized nations to stimulate their interest

in providing financial support for the countries' programs for the Decade.

While many people might see the Decade as primarily a health initiative, and certainly its potential impact can most visibly be seen in altering the health of the people in the developing world, its impact is really very much broader, touching every aspect of development. Every day women throughout the developing world walk miles to carry the water necessary for the barest survival. The provision of clean and accessible water would do more than anything else to revolutionize the role of women in the world. At the recent Mid-Decade Conference on Women in Copenhagen a strong resolution was passed endorsing the Water Decade and calling on member states to participate to the fullest extent.

From a programmatic standpoint the single most important element in insuring the Decade's success will be the training of adequate manpower. The worldwide need for skilled and competent people in this field probably exceeds a half million. This includes village level technicians to repair and maintain pumps, government administrators and planners, and Ph.D. hydrological experts. In many countries there is an almost total absence of trained personnel, and often pumps and wells lie unused becuase no one in the community has even the basic knowledge to maintain them in operating order. Creating cadres of trained personnel especially at the lower levels must be the highest priority. Even if the goals of the Decade are not met in a specific country within the next ten years, if adequate people are trained during this period of time it should insure

that ultimately that country will move towards clean drinking water and sanitation for all.

Clean water alone will not significantly alter health status if it is not accompanied by an intensive educational programme. In Thailand, for instance, in many villages after bore holes were drilled providing copious clean water people continued to get their drinking water from the village ponds where the water buffalo lived. They complained that the water from the bore holes had no taste, and only an extensive education programme convinced them that deaths of their children and their recurrent diarrhea was the result of contamination of their traditional water source. Intensive health education programmes must therefore be an integral part of the Decade's strategy. In those countries where there is already an initiative to develop primary health care programmes the health education can be made an integral part of that effort. Where there is not, then it will be necessary to rely on whatever strategies or organizations exist in the society to reach people at the community level and teach them about the importance of clean water and hygienic practices.

Often the failure of water and sanitation projects can be traced to a lack of adequate community involvement. When the central government sends a team into a village for a day or so to sink a bore hole and attach a pump, then leave, the villagers feel very little sense of involvement. When the bore hole becomes silted up, or the pump breaks down they feel it is not their responsibility and wait for the government workers to return to mend it. The most successful programmes, on the

other hand, are those where the community is involved from the start, where they have participated in the choosing of the site for the bore hole or well, where they have contributed labor to the project, often over many months as they do in Malawi's gravity fed water system, and where there is not only a sense of local involvement and ownership but where individuals in the community have been trained to carry out all routine maintenance. Community involvement is also more likely to result in the use of appropriate or local resource technology that can be more easily repaired or replaced rather than importing complex, expensive high technology equipment that can not easily be maintained. The involvement of communities in the development of water and sanitation programmes requires very careful planning and a major investment of time and energy by those responsible for the projects. However, there is no substitute in terms of the long range effectiveness of such programmes.

Much is made of what the total cost will be for reaching the Decade's goals on a global basis with estimates from twenty billion to a hundred billion dollars or even higher being cited. Although financing is important and I will return to this issue in a minute, it is the consideration that should come after all others. The building and strengthening of national institutions and the creation of appropriate institutional arrangements within a government are far more important. In addition the political commitment and will must be generated to give water and sanitation programmes adequate attention and priority. It is only after all other considerations that the matter of financing should be addressed.

This is a time of austerity for many donor countries, yet there are many obvious reasons why we hope to be able to build support for the Decade. The humanitarian arguments are overwhelming. In addition it is a field in which the technology is relatively simple and readily available, the cost effectiveness is very high and the results are quickly and clearly visible.

No matter how great the support from the donor countries, the U.N. system, or the other multilateral financial institutions the success or failure of the Decade rests primarily with the developing countries themselves. The costs are high and the external financial support represents only a small percentage of the total cost compared to what the countries themselves must contribute. In addition the key element in the entire Decade is the necessary political will to make the program succeed. By far the single greatest responsibility the Resident Representative has is to convince governments of the priority they should attach to this program, the need to place it ahead of other government initiatives, and to believe that it is possible to achieve the goal of providing clean drinking water and sanitation for all by 1990.

A consultative meeting of donors was recently held in Geneva, at which strong support for the Decade was expressed. In particular special interest was shown in support for training programmes both in developing countries, and in providing training at institutions in developed countries.

It has been recently estimated that last year non-governmental organizations spent in excess of $150 million on water projects. Many of them have expressed interest in playing an active co-

ordinated role in the Decade. I recently have held meetings in New York and Geneva with groups of NGOs from the North American and European communities respectively and anticipate this Fall having more extensive meetings which will be operationally and programmatically oriented. In the next few months we will be sending to all the Resident Representatives a package outlining what specific NGOs may be able to contribute to the program in each country and we hope the result will be to encourage governments to incorporate them in the overall strategy for the Decade.

I also believe that professional organizations have an important role to play in the Decade. You have the technology to make the Decade a success. We do not need dramatic scientific breakthroughs or discoveries. The key lies in transferring the knowledge and expertise that you and other professionals in this field possess to those areas of the world where the need is greatest. I hope as an organization you will rise to this challenge.

In 1967 a number of experts in the United States and at WHO began to discuss the prospects for eradicating smallpox. Many cynics laughed at the implausibility of the idea and said that it was hopeless to consider that one could ever totally eradicate a disease that was so widespread in the world. Now, thirteen years later, there has not been a case of smallpox anywhere in the world for more than two years. It was not because of any dramatic scientific breakthrough that this was accomplished but merely because we applied ourselves, created the political will, marshalled our management resources, and made a global decision that

smallpox could and would be eradicated.

One hundred and fifty years ago cholera was rampant in Europe and in many parts of America. Life expectancy in the industrialized cities of northern England was seventeen years. What revolutionized the health of people in this part of the world and banished those diseases that we now see as only something existing in developing countries was the development of clean water and sanitation systems. Within our life time we can achieve the same advances for the entire world. But it will only happen if we have the will to make it so.

THE UNITED NATIONS INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE - U.S. ROLE

by

John W. McDonald [1/]

ABSTRACT

Background and statistics are given to support the need for the Decade. The history of the program and accomplishments of the UN and developing nations to date are outlined. Progress faster in America is used as an example of achievement. Roles of women and the communities affected are noted.

The challenges to find ways to support the Decade are given. Interest and support of the private sector and associations such as ASCE, AWWA, APWA, AIDIS, and others are described.

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1. United States Coordinator for the International Drinking Water and Sanitation Decade.

THE UNITED NATIONS INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE -- U.S. ROLE

The statistics are stark;

-- Over half of the peoples of the Third World do not have safe water to drink.

-- Three quarters of the peoples of the Third World have no sanitation facilities at all.

-- Eighty percent of all sickness and disease in the world is attributable to unsafe water or sanitation.

-- One billion cases of diarrhea a year occur in the developing world.

-- Twenty-five thousand people a day die from unclean water.

These numbers stagger the mind, but they should not numb our response or our responsibility to act.

. . . . . .

We commend the Delegates to HABITAT who met in 1976 and the Delegates to the 1977 Water Conference at Mar del Plata for their insight and their courage:

-- First, to recognize the magnitude of the problems and to state that:

-- "All peoples . . . have the right to have access to drinking water in quantities and of a quality equal to their basic needs," and

-- Second, to call on the United Nations and the world to take action by declaring the 1980s the Decade for Drinking Water and Sanitation.

The United States participated in those global conferences and supported their goals. We have also actively participated in the various United Nations meetings over the past 18 months in which the ECOSOC, the WHO, the UNDP, and the General Assembly, in follow-up actions, agreed to structure the UN so it could more effectively participate in the Decade and then actually launch the Decade at a special one day session of the General Assembly of the United Nations on November 10, 1980.

That day will prove to be a landmark in the 35 year history of the United Nations. Some 40 governments spoke in support of the Decade and dedicated themselves to its goals.

One of the most impressive speeches made during the course of that Special Session was by Dr. Mahler, Director General of the World Health Organization. He said:

> "I am utterly convinced that the number of water taps per 1000 population will be an infinitely more meaningful health indicator than the number of hospital beds per 1000 population."

You Delegates assembled here today, far more than most, will recognize the importance of a medical doctor, head of the World Health Organization, making this dramatic, practical, and hard-hitting comparison. It flies in the face of the beliefs of a large number of medical practitioners across the world. It is a statement that I fully support.

We have been impressed with the drive and the enthusiasm shown by the leaders of the UN system.

-- As chairman of the Interagency Steering Committee, the UNDP has assumed a major role in the Decade. We commend in particular the UNDP Resident Representatives who have coordinated the UN input at the national level and have helped to provide expertise to those national governments who are prepared to give the Decade goals a high priority.

-- We commend WHO for the major reallocation of its technical field staff to help carry out the Decade's goals.

-- We commend UNICEF for allocating 28 percent of its total budget to safe water and sanitation.

-- We commend the World Bank for allocating approximately one billion dollars a year, or nine percent of its funding, for water and sanitation projects.

-- We commend the Inter American Development Bank for its long-time leadership in Latin America in this field and its allocating of some fourteen percent in its funding for water and sanitation projects.

It is actions like these, on the part of the UN family of agencies, which will make the attainment of the goals of the Decade possible. We encourage them to do more and would urge other UN agencies to become more deeply involved. The UN volunteers, for example, could play an important role.

We understand that many developing nations are giving the goals of the Decade top priority in their own development strategy. We congratulate those governments who have established national action committees at the Inter Ministerial level and who are cooperating with the UNDP Resident Representative and his technical support teams. We also congratulate the more than ninety countries who have prepared national strategies for the Decade and have taken, and are taking, specific action to allocate resources in support of the Decade.

We understand, for example, that Malawi, Benin, Niger, Tanzania, Upper Volta, and Angola, in Africa, Peru and Argentina, in Latin America, and Malaysia, Nepal, Sri Lanka, India, Cyprus, and Egypt, in Asia, have each given the Decade top priority in their development plans.

Some cynics argue that the Decade's global goals are impossible of achievement and, perhaps they are, within the timeframe given. However, these same cynics, argued 15 years ago that it was impossible to eradicate smallpox from the world. Last year, they were proven wrong.

Even continents can be moved by political will. From 1960 to 1978 the number of people in Latin America and the Caribbean increased from 209 million to 325 million. Access to safe water during this period jumped from 32 percent of total population to 61 percent - a dramatic doubling!

I believe we are right to establish international goals of this nature. I believe we must strive toward those goals and then achieve them.

The concept of -- safe water for all -- is really a fundamental part of the development process and interacts with so many other aspects of development.

Take the role of women, for example. They are the recognized water carriers of the world. When water is not readily assessible, they endure special hardships which are debilitating and time-consuming, since many women in the developing world spend six to eight hours a day carrying water.

Just imagine how great an increase in village productivity occurs when the women of the village have access to safe water and can then use their time in more constructive patterns. UNICEF estimates, for example, that when they dug 300 wells in Sudan, some 300,000 women hours per day were saved.

Someone said "focus on the drinker not the well." This brief statement highlights the fact that the provision of pipes and wells is only one step that must be taken in providing an effective water network. Great care must be taken:

-- To involve the community, the users, in the entire project, from the very beginning of the planning process;

-- To ensure that the users understand and are trained to maintain the completed system in good order;

-- To clarify, through education, how to use clean water and the relationship between clean water and sanitation and better health and productivity;

-- It is only with this across-the-board involvement that successful programs can be installed and maintained.

. . . . . .

Let us take a brief look at what the United States is doing in this field. First of all, we have pledged to promote global development, development which is rapid and broad-based enough to improve living standards among today's poor, development far-sighted enough to protect the environment and resource base on which our future depends and development grounded in basic needs that nurture the human spirit.

We are urging the Congress to complement the work of the multilateral community and the bilateral donors through innovative steps aimed at developing more effective and less costly ways of providing new, and maintaining existing, basic water and sanitation systems in rural and urban areas. We believe it is important to combine clean water and sanitation with community development, education and primary health care.

We recognize that water supply and sanitation activities cut across a number of sectors, such as food production, housing, population, health, rural development, and the environment. Successful water and sanitation projects are difficult to achieve because of this intersectoral relationship. The overall impact on economic and social development, however, cannot be questioned and must be supported.

I believe that the role of the private sector in this field is enormously important. Organizations such as The ASCE, the American Water Works Association, the American Public Works Association, the Inter American Association of Sanitary Engineers, the National Council for International Health among others, have passed resolutions and done good, solid work in support of the Decade's goals.

I believe that much more can and should be done by the private sector. I am thinking particularly of stimulating American political will and of involving yourselves in the whole field of training of developing country personnel. If your organization can work out ways to assist in either of these key problem areas, you and this gathering will have made an enormous contribution to the achievement of the goals of the Decade.

We need your continuing support and involvement.

HOW BRAZIL PLANNED AND CARRIED OUT ITS PLANASA

by

Dr. Alberto Klumb 1/

ABSTRACT

Brazil's establishment of a national plan and program to deal with the water supply and sanitation needs are described. Background and baseline conditions when PLANASA was put into operation in 1968 are given. Goals and the significant progress to date are detailed. Special emphasis is given to the financial arrangements and the extensive manpower development activity. Institutional development provides the framework for the program. Applicability to the Decade activities is offered.

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1. President, Inter-American Savings and Loan Bank, Caracas, Venezuela.

HOW BRAZIL PLANNED AND CARRIED OUT ITS PLANASA

1. INTRODUCTION

One of the objectives of the Inter-American Savings and Loan Bank (BIAPE) is the financing of urban and sub-urban development in order to contribute for better conditions of the human settlements in the American countries, and as in this field it is not possible to dissociate the housing and urban development sectors from basic sanitation, we are really interested in water supply and sewerage programs.

So as a former member of the Board of Directors of BNH from Brasil and now as Executive President of BIAPE I have accepted to talk in this International Convention about the historical objects of PLANASA and the well succeeded Brazilian efforts, especially in the last ten years, to solve the problems of deficiencies in basic sanitation.

2. MAIN REASONS FOR POTABLE WATER SUPPLY DEFICIENCIES

In Brazil, as most probably in any other countries, the main reasons for potable water supply and sewerage deficiencies has been:

a) Lack of financial resources;

b) Application of resources without return;

c) Uncoordinated action and multiplicity of municipal, state and federal agencies;

d) Absence of overall planning;

e) Absence of adequate and realistic system of rates;

f) Excesive construction time.

3. HISTORICAL NOTES

Facing such a diagnosis, the Brazilian Government established, in 1968, the Sanitation Financial System (SFS), whose central agency is the National Housing Bank and, in 1971, the PLANASA (National Sanitation Plan), as its

instruments of action aimed at mobilizing and applying resources for basic sanitation purposes.

4. PERMANENT OBJECTIVES

a) Elimination of the basic deficiencies within the shortest possible time and at minimum cost; and

b) the maintenance of the balance attained, on the basis of systematic planning, programs and control;

c) attainment of financial self-support in the basic sanitation sector at the state level, through the revolving resources of the water and sewage financing funds (FAE);

d) adjustment of rate levels to the users paying capacity, with no risk to the balance between the revenue and the overall costs, in basic sanitation services, taking in consideration the productivity of capital and work;

e) establishment of the institutional development of the state sanitation companies through training programs and technical assistance;

f) development of technological research programs if the field of basic sanitation.

5.- G O A L S

At the end of 1980, a total of 3,700 municipalities among 3,964 had running water in Brazil, 2,600 of which covered by PLANASA. The population served was of 63 million persons, corresponding to 80.4% of the urban population, that represents 2/3 of the total population of Brazil.

The priority has been given to water supply while sewerage programs are following at a slower pace. However, the benefits of sewerage services are being carried to 190 urban nuclei, represented by large towns, where pollution and public health problems are more serious. In the period 1968-1980,the population served with sanitary sewerage incresead in 19 million.

In the large nuclei the existing systems designed only for sewerage collection have being redesigned and are being adjusted to appropriate systems of sewerage disposal, so as to protect the enviroment from pollution.

In view of the high investments required, conventional systems of sanitary sewerage are destined for areas where there is a risk to public health and the enviroment. For other areas, simplified systems are adopted, provided that they do not harm the enviroment.

The PLANASA objects are set up periodically, following the appraisal of the results of the previous stage. For the period 1980-1985, they are as follows:

Water Supply:

- To reach 5,700 of a total of 7,902 urban nuclei and extend existing systems.

Sanitary Sewerage:

- to serve all coastal urban nuclei of more than 100,000 inhabitants, where pollution is endangering the enviroment;
- to serve urban nuclei adjacent to hydrographic basins, where pollution is endangering the enviroment and where priority scales have been set up, in accordance with the national policy of urban development;
- to serve with simplified systems the urban nuclei that to all evidence are not endangering the enviroment.

6. SANITATION FINANCING SYSTEM (SFS)

The operational and financial devices set up for the execution if the PLANASA is integrated in the Sanitation Financing System (SFS) which includes the National Housing Bank (BNH), that is the central organ of the System; state governments, that contribute for the execution of its company's programs by means of providing financial resources to the respective water and

Sewerage Financing Fund (FAE); financial agents, that are banks authorized to transfer to the state sanitation companies the loans obtained from the BNH and the state funds; management organs, the banks entrusted with the administration of the FAE resources; promoter agents and executive organs represented by state sanitation authority, responsible for the state's sanitation policy, for setting up, extending, improving, operating and maintaining the water supply and sanitary sewerage systems; technical organs, under contract with the BNH for the appraisal of projects and inspection of works; private enterprises, represented by projecting firms, consultants, industry and entrepreneurs.

The resources of the Sanitation Financing System are generated from:

a) L o a n s

The BNH contributes with 50% of the amounts lent to the state sanitation authorities. In addition,the Bank finances the constitution by the state governments of the resources which are earmarked for investment in the state funds (FAE) and in setting up water supply systems in small communities. This financial support proceeds basically from resources of domestic origin managed by the BNH. In a few cases loans have been obtained from external sources.

FAE - Made up of resources from the state budget and supplementary BNH allocations to the state government, each FAE contributes with the remaining 50% of the amount of the loan. A FAE is a revolving fund since the returns of its applications are re-applied. This ensures a permanent source of currency solely aimed at meeting the present and future requirements of expansion in the sector. One such fund was created in each state, by means of a contract between the BNH and the state government. General norms for the use of FAE resources are set up by the BNH so as to guarantee control over the evolution and exclusive operation of the fund in the field of basic sanitation.

b) G r a n t s:

Normally of federal origin, resources released on a non-returns basis sre added to the loans, in order to set in motion the programs specifically designed for the less developed areas of the country.

The financial scheme mounted for the implementation of the PLANASA already yields evidence of a strengthening in the basic sanitation sector,in Brasil. There follows a table of investments released and projected, that include 4% of loans from external sources.

US$ 1,000,000

	1968-1979	1980-1982	TOTAL
Water Supply	2,411	1,573	3,984
Sanitary Sewerage	933	1,333	2,266
Total	3,344	2,906	6,250

1 US$ - Cr$ 50.00

An important role is played by the FAE in the financial working of the PLANASA. Considering the allocations made by the FAE in the period 1968-1980, assets reached the figure of 87 billion cruzeiros (US$ 1,740,000,000.00).

Another fact to consider is that the proceeds returning from the state sanitation authorities to the FAEs for re-application shall correspond in the period 1980-1982 to an overage 16% of the investments projected. This percentage shall increase progressively up to a point that it will be the main source of financing to the state sanitation companies. By then financial self-support shall have been reached in the sector of basic sanitation by each state and, consequently, by the whole country.

7. PLANNING AND FEASIBILITY MODELS

The geographic, political and administrative basis of feasibility for the execution of the PLANASA are the federative units of Brasil. Consequently, PLANASA integrated the State Sanitation Authorities.

The operations of the State Sanitation Authority extend to all the municipalities within its geographical boundaries. The authorities are charged with the implementation of services, inventories, diagnosis, evaluation of alternatives, analysis of costs, mounting of programs long, medium and short-term ones - surveys and projects. They are also responsible for the operation and maintenance of the systems installed.

Measures for adjusting the local conditions are followed by the launching of programs, which are appraised according to established models of economic and financial global feasibility studies. Each authority prepares its feasibility study, by basically relating the variable factors intervening in the investment and in the social, operational, economic and financial elements involved.

It is noteworthy that the concern with the feasibility of isolated projects gave way to the study of global feasibility of the state sanitation authority.

Isolated feasibility studies, adopted in the past in an attempt to score positive return rates, led to the obvious result that economic and financial feasibility was to be attained only by the larger cities. Consequently, smaller and poorer urban nuclei would be condemned to a permanent incapacity to return the investment made.

The PLANASA model consolidated the principle of economic and financial self-support in the basic sanitation sector; brought the entreprenurial character to the exploration of the related services and introduced the means for reaching a balance between revenues and expenditures. The latter was made pos-

sible by the adoption of a selective rate system, adjustable to each authority and graded according to the social aspects involved in the prices composition, so as to guarantee the return of the investment. Such system favors the establishment of distinct rate increases, according to the classes of users and levels of consumption. Subsidies for users of lower income and for small consumers are paid in by those of higher spending and consuming power. Likewise, richer municipalities pay subsidies for poorer ones, within the same state.

All these points are taken into consideration in the feasibility study authority that it is not concerned with solving the problems of an isolated area; it is led to display a broad sense of administration involving the integration of a number of systems and the adoption of new management principles, through which an efficacious handling of the overall situation is attained with no risk to the quality of the services privided to each urban nucleus.

The BNH examines and approves the feasibility study of each authority and the periodic updating thereof. The authority's results are set against the PLANASA goals, for proper evaluation. The appraisal and controlling actions are consistent with a system of dynamic planning. This allows for the periodic launching and revision of programs and the indication of corrective measures required in the pursuit of the proposed goals. These, then,are set up according to political, technical, operational, economic and financial criteria, so as to guarantee the achievement of the social objectives,within a priority scale.

The adoption of the economic and financial global feasibility studies of the state sanitation authorities was the touchstone of the dynamic planning system and of the general feasibility of the PLANASA itself.

The referred points of global feasibility, matched to the industrial approach and entreprenurial line in the exploration of the services have per-

mitted, as indicated above, to attain an extraordinary mobilization of loan resources, from BNH and state funds (FAE). On the other hand, grant resources were earmarked for application in those sectors which are not financially feasible.

Indeed, the loans awarded within the financial structure thus mounted clear the way for an increase in the offer, to counterbalance the standing deficit of past years, and cope with the demographic urban growth. It is obvious that the award of a loan is restricted to the guarantee of return and this is previously shown by the feasibility study. The use of grant resources is limited to the amounts required in reducing the installments of the loan, so as to make it more tolerable to the state sanitation authority.

8. INSTITUTIONAL DEVELOPMENT

The integration of actions with the state sanitation authority's capacity of planning, programming and controlling its operational, commercial, financial and administrative methods is known as institutional development and it is carried on through the establishment and updating of entreprenurial systems and techniques; shaping and improvement of the technical and professional resources.

Each authority organizes its Directing Plan for Institutional Development, establishing the general lines and strategies to be adopted in coping with the obstacles to the full improvement of the institution. This is to be achieved by the implementation or updating of the entreprenurial systems and techniques as well as the development of human resources, through planned actions which are directly linked to the economic and financial global feasibility studies.

The directing plans, programs and projects for the institutional develop-

ment are submitted by the companies to the BNH for approval. The Bank finances the execution thereof through specific lines of credit and non-return based investments (grants).

9. MATERIALS AND EQUIPMENT

Another aspect taken in consideration is to guarantee the supply of materials and equipment required for the development of the PLANASA. The measures taken aimed at establishing suitable investment programs, so as to prevent breaks in the supply rhythm and, consequently, in the demand.

This requires a permanent updating of inventories, detailing the demand of materials, and its distribution in a lenght of time. Lines of credit are opened by the BNH for the industry of materials, enabling them to increase production.

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THE PROCESS OF PROJECT PREPARATION

by

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ABSTRACT

Shortages of trained manpower will continue to be a critical constraint in the planning of water supply and sanitation projects in the developing countries. The available personnel can be more effectively utilized if the process by which projects are prepared can be more or less standardized in the light of the procedures and requirements of the international development agencies who help to finance such projects. This paper explains the pre-investment planning stages in project development and offers insights into the process of preparing water supply and sanitation projects for support by international agencies. Guidance is provided on the preparation of the conceptual outline, master plan and feasibility study required at the identification, reconnaissance and feasibility stages respectively.

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1. Director, R.L. Walker and Partners Ltd.

THE PROCESS OF PROJECT PREPARATION

Introduction

The basic goal for the International Drinking Water and Sanitation Decade is deceptively simple: to provide access for all to safe drinking water and adequate sanitation by the year 1990.

The challenge presented by this goal is colossal. The World Bank has estimated that basic water supply and sanitation services need to be provided to more than two billion people in the developing countries by 1990. The target population is almost ten times the total population of the USA. This indicates the level of effort required is comparable to providing these services to a population almost equivalent to that of the entire USA in each and every year of the Decade.

International agencies have expressed their willingness to assist the developing countries to meet the Decade's goal. We should realize, however, that most of the efforts to provide these services will come from the developing countries themselves. In terms of money, the international agencies will probably provide several billion dollars annually in loans and grants but this will likely represent of the order of 10% of the total sums to be invested in water and sanitation systems in the developing countries. The rest of the money must come from the developing countries themselves.

The critical resource in providing these essential services will probably not be money. More likely it will be the technical manpower to plan, build and operate the necessary facilities. Strenuous efforts are needed to develop the manpower in the developing countries for these tasks. At the same time there is a need to make the best possible use of the human resources already available.

One area where improvements are possible concerns the pre-investment planning of water supply and sanitation projects. A common complaint of developing country planners is that the various international agencies which support this sector seem to have separate requirements and procedures for supporting projects. This implies that a planning agency has to prepare a proposed project in a certain manner if seeking assistance from USAID, but in a somewhat different manner if assistance is to be sought from another agency such as an international development bank or a different bilateral agency. Essentially this involves the inefficient utilization of scarce manpower. Accordingly the international agencies have been encouraged to standardize, to the extent practicable, their requirements for considering projects in order to minimize the efforts of the developing countries in preparing such projects.

The World Bank, the largest single source of international assistance for water supply and sanitation projects, has undertaken to produce a handbook to guide the planners in the developing countries who are responsible for preparing these projects. This handbook, currently under development, attempts to outline the common requirements of all the relevant international agencies so that developing country planners need not spend unnecessary and unproductive efforts in project preparation.

The primary audience for the handbook are the proponents of water supply and sanitation projects in the developing countries. Frequently these proponents seek expertise in project preparation from consultants from countries regarded as more developed. However, the processes by which projects are prepared and approved in these more prosperous countries, particularly in North America, are seldom as rigorous as those endorsed by international financial agencies. This probably indicates that North American consultants wishing to work in developing countries have to modify their domestic procedures considerably for such assignments.

The purpose of this paper is to discuss the principles and the process of project preparation so that all who are involved can operate within a common framework and can interpret consistently the jargon used by planners in this sector. Those interested in more information on this topic are encouraged to obtain a copy of the Project Preparation Handbook from the World Bank.

Water supply and sanitation projects in developing countries are strongly oriented towards health benefits, in contrast to similar projects in more developed countries where the primary emphasis is on convenience and aesthetics. Several recent publications which focus on water and sanitation projects in developing countries are listed in the Appendix.

Water supply and sanitation systems are so obviously related that it is not sensible to plan either in isolation. This paper, and the related handbook, attempt to focus equally on the planning of projects for water supply and for sanitation.

The exercise of producing the handbook is proceeding in the context of preparing projects in developing countries for support by international funding agencies. Nevertheless the logic involved does not depend on the project location or on the source of investment funds. The planning process discussed hereafter should apply equally to projects in developed countries and to those in developing countries which proceed without any support from external agencies. A clear understanding of efficient procedures for preparing water supply and sanitation projects should make better use of the technical manpower which seems to be in short supply everywhere.

Stages in Project Development

It may be helpful to agree on what constitutes a project. In this paper the word "project" refers to a set of actions, including the bringing into operation of physical facilities for water supply and sanitation, to meet certain specified objectives within a given time frame. Project components cannot be determined until the objectives are specified, preferably in terms of the proposed impact on a predetermined group of people. A project generally includes a combination of physical facilities (hardware) and complementary activities (software) such as institutional improvements, hygiene education, manpower development, etc.

The word "program" is used herein to refer to a group of projects, usually to provide services to several different target populations. The preparation of a sector investment program is the aggregation of planning activities for several projects.

Each project goes through several distinct stages as it is transformed from an idea to an operation providing service. The stages by which a project is developed and the roles of the various participants, are illustrated in Figure 1.

Project preparation generally refers to the activities up to the point that the project is approved and funded. The pre-investment planning activities up to the point of project approval can be summarized as follows:

Pre-Investment Planning for Projects	
Stage	Essential Activity
Identification	Conceptual Outline
Reconnaissance	Master Plan
Feasibility	Feasibility Study

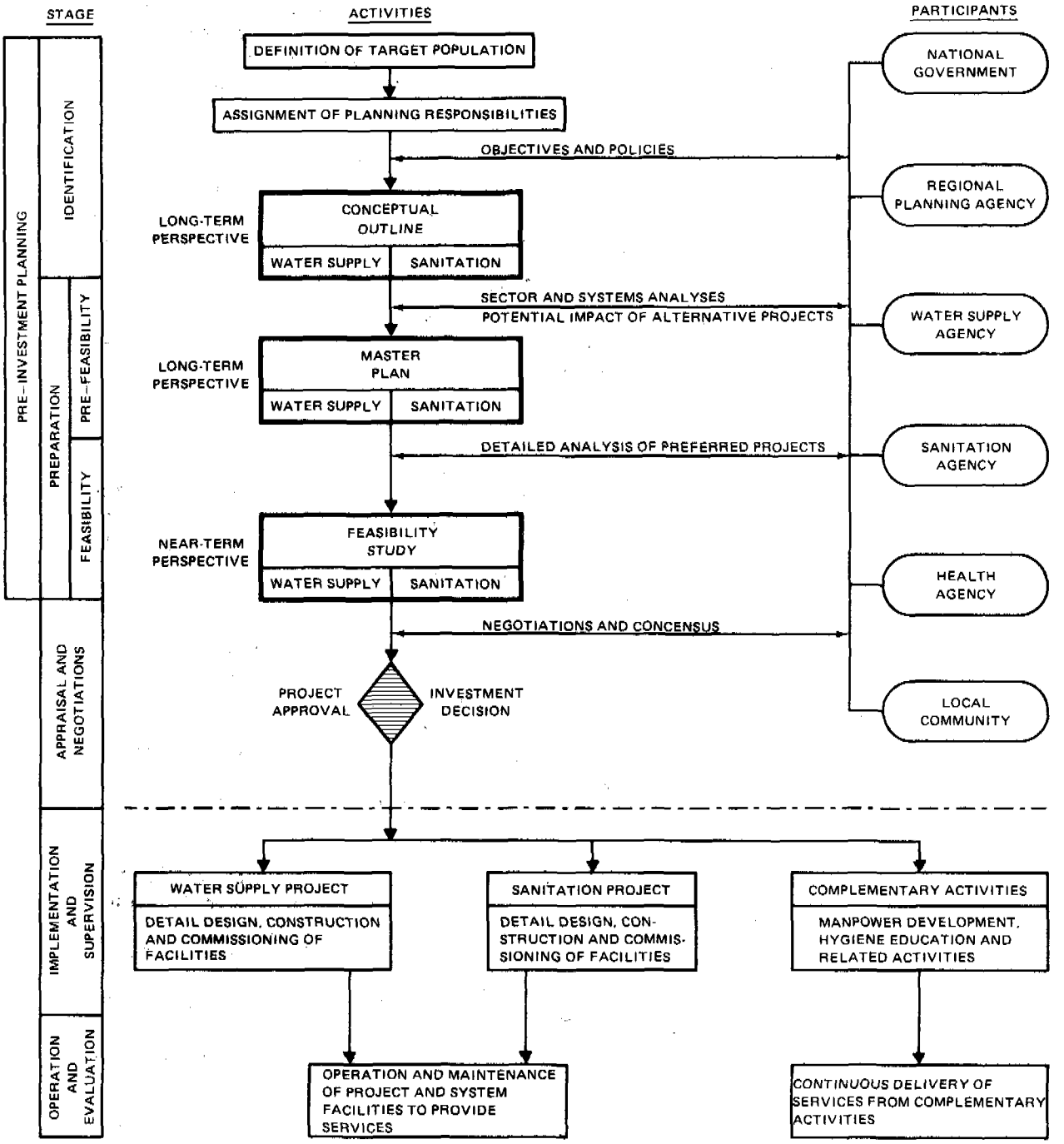
Several points can to be observed concerning the planning process:

1. The basic rationale for water and sanitation systems is to provide services to people. The first step in project planning is to identify the population to be served. The target population may be modifed somewhat as planning proceeds. It is possible that the people to be served by one water supply system may require several separate sanitation systems.

2. Water supply and sanitation projects should be planned together, even when separate agencies are responsible for providing these services. The crucial health objectives of water supply projects cannot be achieved unless sanitation receives equal attention. Also the standards of service for water supply affect the technological choices for sanitation, and vice-versa.

Figure 1

DEVELOPMENT STAGES FOR WATER SUPPLY AND SANITATION PROJECTS



World Bank – 22780

3. People everywhere already rely on one or more systems for their water supply and sanitation, even if existing systems are inadequate. These existing facilities and systems need to be thoroughly understood at the outset of any planning exercise. Frequently they can be fixed up to provide improved service. Proposed project facilities must be assessed in the context of already existing systems.

4. Many participants need to be involved in the planning process. These specific institutions vary from country to country but in general should include the National Government, Regional Planning Agency, Water Supply Agency, Sanitation Agency, Health Agency, and the Local Community. There is no general prescription which can be used to guide the involvement of the various participants in preparing projects in different countries. The appropriate method of organizing the various inputs has to be designed separately in each case and the particular agencies or institutions actually involved may vary somewhat.

5. Project planning should not be left entirely in the hands of bureaucrats, either in the water and/or sanitation agency or in another planning agency. The potential users of the service, the residents in the project area, have to be formally involved or the project risks being partially or totally irrelevant. Arranging the participation of the local community in project planning may be difficult but is essential.

6. Interaction between the planning participants is required at each stage in the process. They need to react to the available documentation (conceptual outline, master plan or feasibility study) and provide inputs to the next planning stage, as illustrated in Figure 1. Such interaction certainly takes time, but such time has to be allowed in the interest of improving the effectiveness of the planning process and collapsing the total time between the conception and the operation of a project.

7. Responsibilities for undertaking each stage of project development need to be clearly assigned and understood by all participants. Normally a particular agency is given primary responsibility for each stage but this responsibility can be shifted at different stages. A regional planning agency, for example, might be assigned the responsibility for managing all pre-investment planning for water supply and sanitation systems up to the point where projects are approved. Thereafter the technical agencies providing the services could take charge.

8. There is frequently a role for other agencies in the planning process and their inputs need to be obtained correctly if the project is to proceed effectively. Water resources questions (withdrawals of surface or ground water and discharge of effluents) can involve environmental and other agencies, for example. Recommendations for contracting procedures may be affected by foreign exchange controls and/or local procurement regulations. Project planners need to factor these considerations into realistic plans in order to avoid problems and delays in subsequent stages.

9. The three stages of pre-investment planning (identification, reconnaisssance and feasibility) require an increasing level of effort, with the feasibility study being the most intensive stage in project preparation. Each stage should be concluded and a formal decision required before the next stage commences.

10. Project planning generally concentrates on actions to be taken in the near term, typically up to five years ahead. But major investments in water supply and sanitation facilities cannot be justified until seen in the perspective of the long term development of these systems, typically some twenty years ahead. The identification and reconnaissance stages of project preparation accordingly should focus on the long term development of the systems, whereas the more intensive feasibility stage concentrates mainly on actions for the near term.

11. The objectives of project planning should be the eventual implementation and operation of projects to provide services to the target population. Project approvals by the agencies providing funding for project implementation are a critical step in the process. The requirements of these funding agencies, local and/or international, ought to be understood at the outset. Similarly the timetable under which those authorities operate who have to approve the project should be understood and factored into the planning exercise. There are countries where long term plans (typically five year plans) affect government budgets, and therefore the project approval process, significantly.

Preparing the Conceptual Outline

Identification, the first stage in developing a project, starts with an overview of the long term needs for services for a population group in a specific area. Definition of project objectives is essentially the definition of the target population and their needs. Alternative projects which might satisfy these needs are identified and subjected to very preliminary analysis, including the preparation of provisional cost estimates.

Consideration should also be given at the identification stage to the objectives and policies of the various participants in the planning process. Issues likely to affect project preparation should be addressed, particularly standards of service, institutional responsibilities and potential sources of finance.

A wide range of alternative projects should be identified as possible solutions for the water supply and sanitation systems over the years ahead. Those projects which are demonstrably not sensible can be eliminated at this stage but more analytical comparison of contending alternatives can await subsequent stages.

The conceptual outline can be prepared relatively quickly by creative and imaginative planners. The analyses at this stage should be based primarily on existing data. However, comprehensive efforts are required to collect and review all available information. The preliminary analyses at the identification stage must be suitably qualified and attention drawn to the data limitations.

The identification stage can serve several useful purposes:

- initial search for and screening of the widest possible array of potential projects;

- alerting planners to major constraints re water and sanitation services for a given area, so that special measures can be taken, such as encouraging development elsewhere in water-scarce areas or accelerating larger regional projects where appropriate;

- definition of data requirements for further project preparation;

- basis for preliminary discussions with potential financing sources concerning subsequent preparation of project and prospective funding of implementation.

The conceptual outline to be produced at the identification stage should include recommendations for future action, including terms of reference for the reconnaissance stage and a schedule of all future activities up to the operation of the project facilities.

Preparing the Master Plan

The reconnaissance stage in project preparation is essentially a survey stage, between the initial identification of a project and the detailed assessment of its feasibility. Water supply and sanitation systems are invariably dynamic systems, like the populations they serve, so it is necessary to consider the longer term development of any particular system when selecting the near term development which comprises the project considered for implementation. This longer term perspective is necessary to ensure that a rational system can be developed, without incompatible elements, and to plan for system development (as well as project development) at the minimum cost.

The term 'master plan' is commonly used to designate the preliminary planning of system developments over a long term period, typically twenty years ahead. Such an exercise can also be referred to as a pre-feasibility study, to distinguish it from the more comprehensive analysis of the subsequent feasibility stage in project development.

Frequently the reconnaissance and feasibility stages proceed in one step in order to minimize the time required for these pre-investment stages. Nevertheless it is advisable to distinguish between them conceptually and to ensure that the feasibility stage does not proceed until an acceptable master plan exists.

A minimum amount of basic data needs to be obtained for reconnaissance level planning. However, planners need to exercise judgement and be prepared to make estimates on the basis of limited data, acknowledging the uncertainties introduced into the conclusions. Qualitative assessments can be as important as quantitative ones at this stage.

A main aim at the reconnaissance stage should be to compare and contrast the alternative projects which might possibly be developed to provide sector services over the years ahead. The relative advantages and disadvantages of alternative projects are as important as any estimates in absolute terms.

The primary output of the reconnaissance stage should be strategic development plans for water supply and sanitation systems over the longer term plus recommendations concerning those projects which ought to be implemented in the near term. Where the reconnaissance level analyses cannot distinguish between contending projects which appear equally attractive, it may be necessary to study two or more projects in more detail in the subsequent feasibility stage.

Topics to be covered in the master plan would normally include the following:

1. Overview of the Water Supply and Sanitation Sector

   International financing agencies normally require general information on how the sector is organized throughout the country, on how effectively services are currently provided and on national goals concerning water supply and sanitation services. This sectoral overview provides perspectives for evaluating existing and proposed systems in the project area.

   The sectoral overview would be expected to provide information on the following topics on a country-wide basis:

   - total urban and rural populations and growth rates;
   - natural resources and economic conditions;
   - public health indicators and health services;
   - water resources and control;
   - organizational responsibilities concerning water supply and sanitation;
   - existing standards of service for water supply and sanitation;
   - sector objectives and service level goals, including prospects for meeting the goals of the International Drinking Water and Sanitation Decade.

2. The Need for a Project

The rationale for proceeding to develop a project has to be carefully explained. Fairly detailed analysis of the probable future requirements for services should be undertaken when the feasibility stage is expected to follow shortly. Topics to be covered include:

- location and description of the project area;
- population statistics and projections;
- water and sanitation related diseases in the project area;
- regional development prospects;
- existing and future land use patterns;
- role and performance of all institutions concerned with water supply and sanitation systems;
- assessment of all existing water supply and sanitation systems and the service provided by each system to all people in the project area;
- estimates of future demands for water supply and sanitation, disaggregated by zones for each future year;
- requirements for improvements in water supply and sanitation services throughout the planning period.

3. Strategic Plans for Water Supply and Sanitation System Developments

Separate plans should be prepared for the phased development of water supply and sanitation systems to meet projected needs in the project area throughout the planning period. Subjects to be included in the strategic plans include:

- quantified objectives for service improvements;
- social practices and preferences of the local population concerning water supply and sanitation facilities;
- review and analysis of alternative service standards and technical solutions for water supply and sanitation systems;
- criteria for determining priorities re service improvements;
- prospects for rehabilitating existing systems;
- pre-feasibility designs and cost estimates for alternative projects, with costs established within an accuracy of plus or minus 30%;

- cost effectiveness of alternative system developments (using discounted cash flow analyses of future capital and operating costs);

- affordability of alternative developments in terms of service charges and income levels of project area residents;

- local impacts of alternative projects and system developments on public health and the local environment;

- recommendations for phased development of projects over the planning period;

- institutional implications for implementing strategic plans;

- required complementary activities, including manpower development and hygiene education;

- projections of annual capital requirements and recurrent costs for recommended strategic plans.

4. Conclusions and Recommendations

The reconnaissance stage should reach certain conclusions and recommend future actions, including the preparation of selected projects in a comprehensive feasibility study. Issues which need to be resolved ought to be identified. Future data requirements should be clearly specified. Terms of reference for the feasibility stage should be drafted, along with a suggested timetable for future activities and an estimate of the costs of completing the pre-investment planning.

The master plans for water supply and sanitation systems should be circulated widely for review and comment, particularly from potential financing sources.

Preparing the Feasibility Study

The last stage before a project is approved and funds committed is the feasibility stage. Whereas a master plan or pre-feasibility study proceeds at the reconnaissance stage and can be based on survey techniques using minimal data, the feasibility study requires much more intensive study of the project and needs to be based on fairly reliable information. Sufficient data collection and analysis needs to be completed to confirm that the project is feasible from all aspects: social, economical, technical, financial, environmental and institutional.

In order to reduce the time required for the pre-investment stages in project development, the feasibility study is frequently carried out in conjunction with a master plan, effectively coupling the reconnaissance and feasibility stages together. This is acceptable provided that the master plan which evaluates alternative long term development programs is completed and used to select the proposed project before extensive effort is devoted to a comprehensive feasibility study.

Where there is a significant interval between the master plan and feasibility study, further review of the need for a project and the conclusions of the original master plan may be required.

The feasibility study generally concentrates on a specific project option which has been selected on the basis of a previous master plan. There may be cases, however, where two separate but competing project options appear at the reconnaissance stage to be equally attractive for initial implementation. In such a case, both alternative projects should be assessed up to the point where one is clearly superior, at which time preparation of the inferior alternative is halted.

Project planners should appreciate that a legitimate outcome of a proper feasibility study is that the proposed project is not feasible when reviewed in detail. Such a negative conclusion should be announced as soon as it can be confirmed confidently so that an alternative project can be prepared with minimal loss of time and resources.

Previous planning at the identification and reconnaissance stages proceeded with a long term perspective on system developments and screened out alternative projects. At the feasibility stage the emphasis shifts to a more thorough analysis of near term actions to improve services, including the construction and operation of specific facilities.

If the financial agencies can be persuaded that the proposed project is indeed feasible, the next stage would be the implementation or bringing into operation of all the various components of the project. This means that the feasibility stage must advance all planning for the project so that implementation can begin as soon as funding is provided. It also means that costs must be reasonably well established (so that actual costs would generally be within 15% of the estimates).

Various financing agencies have slightly different views on how much detail is required in the feasibility study. In general, however, the feasibility study would be expected to provide information on the following topics concerning recommended water supply and sanitation projects:

1. The Proposed Project

All elements of the proposed project should be described in detail, including:

- quantified objectives and target population;
- description of all components, including design criteria and drawings for physical facilities;
- detailed estimates of financial costs for each component, by years, with allowances for contingencies and price increases;
- description of required complementary activities (manpower development, hygiene education, etc.), including cost estimates;
- implementation schedule;
- responsibilities for implementation of all project components;
- integration of project components in existing and future systems;
- requirements and costs for future operation and maintenance;

2. Institututional and Financial Aspects

The agency or agencies to be responsible for project implementation and subsequent operation should be reviewed, along with the financial implications. Topics to be covered should include:

- detailed description of existing and proposed organizations;
- relationships between users of project services and operating organizations;
- management systems of operating organizations;
- management and personnel requirements;
- manpower development programs for operating organizations;
- financial history of operating organizations;
- objectives and levels of tariffs for services;
- financing plan for project implementation;
- future financial situation of operating organizations.

3. Project Impacts and Justification

The results expected from the proposed project should be described and analyzed, including:

- proposed beneficiaries and their perspectives;
- economic and social benefits expected in future years, quantified to the extent practicable;
- economic and social costs, by years;
- anticipated health impacts;
- anticipated environmental impacts;
- project justification.

Resources for Project Preparation

Project preparation necessarily involves a wide range of interest groups and perspectives. The organization of these participants and the assignment of responsibility for completing each stage of the planning process are crucial ingredients for the successful preparation of a project. Delays in project approval and implementation are more often due to basic deficiencies in the process of project preparation than to technical or financial problems associated with the specific project.

A wide range of skills is required to develop a project properly, including expertise in engineering, human behaviour, regional development, communications, epidemiology, economics, education and financial analysis. This multi-disciplinary approach requires inputs from planners with considerable training and practical experience. Project identification, reconnaissance and preparation are not tasks to be assigned primarily to inexperienced staff since considerable judgement must be applied and bad judgement at these planning stages of a project can have very costly consequences.

Project proponents should be aware that project preparation makes considerable demands in terms of human and financial resources, making it essential to clarify project objectives at the outset and to proceed to prepare only those alternative projects which have good prospects of being implemented. Competing projects should be screened continuously in order to concentrate only on the superior alternatives. The iterative nature of the process can hardly be overemphasized.

The level of effort required increases with each pre-investment stage. No rigid breakdown of the necessary inputs at each stage is possible. Experience suggests that the relative levels of effort at the various stages, which depend o the scale of a project as well as its complexities, might be as follows:

Pre-investment Stage	Percentage of Effort
Identification	1% - 5%
Reconnaissance	30% - 60%
Feasibility	40% - 70%
Total	100%

Project development to the standards expected by international financing agencies can be an expensive process, although such front end expenditures are usually well justified by the comprehensive planning effort which facilitates effective implementation of the project. The level of effort required to complete the pre-investment stages of a project for appraisal by an international agency, so that implementation can commence as soon as the sources of funding are assured, requires planning inputs with typical costs from 2% to 5% of the final cost of the completed project.

Thorough preparation of a project up to the implementation stage usually needs not less than one or two years. More time is required when considerable data need to be collected or when inadequate manpower is devoted to the pre-investment planning stages, including the interim decision points.

Project proponents in developing countries should be aware that the international financial agencies are frequently willing to provide money for the detailed preparation of projects. Sometimes such assistance can be in the form of a grant. The conceptual report, prepared at the identification stage, can be used to discuss the prospects of financial and/or technical assistance for subsequent stages of project preparation.

Project Approval and the Investment Decision

Project planners seldom have the sole authority to authorize project implementation. The basic decision to proceed with a project generally depends on the consensus of several interest groups, particularly those who control the required funds. The project proponent has to be committed to the project and also has to gain the support of the local community (the intended beneficiaries), various public sector agencies (at local and national levels) and one or more sources of capital funds (including possibly one or more international financial agencies).

The process of obtaining project approval is not simple, as any experienced project proponent can attest. The complexity of this process depends on the number of interest groups whose support is required.

There are two basic principles to be followed in project preparation to ensure that the interval between pre-investment planning and project implementation is kept to a minimum. These related principles are:

1. Understand the entire decision-making process.
   This requires a careful analysis to determine all the steps to be followed in approving a water supply or sanitation project. The requirements of each interest group should be ascertained as early as possible in the planning process, as well as the linkages between them. The sequence of project approvals has also to be determined.

2. Attempt to involve the decision makers in planning the project.
   The inputs of those who have to approve a project should be sought and utilized at all stages in the pre-investment planning. Their involvement may take some time but it will probably expedite the overall process of bringing the project into operation. The risk of delay is greatest when decision makers are asked to endorse final proposals which they have not previously helped to prepare or at least review.

   Involving potential financing agencies in planning the project can produce more than tactical benefits. Such agencies, particularly the larger international ones, can bring considerable technical and financial expertise to the process. The World Bank, for example, has more than fifty engineers, financial analysts and economists who specialize in assessing water supply and sanitation projects. Their experience on such projects enables them to provide valuable guidance to planners of future projects, assistance which is separate from any financial involvement by their agency.

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HOW PROJECTS COME INTO BEING

THE FINAL HURDLE - PROJECT APPRAISAL

by

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ABSTRACT

The process of project appraisal used by the World Bank to evaluate the suitability of water and wastewater projects for financial assistance is described. The purpose of the appraisal is to systematically review every aspect of the proposed project and bring together the conclusions of feasibility into a single statement. Four major aspects of the project, technical, institutional, economic, and financial are covered. The appraisal process must answer the following basic questions:

(i) Is the project needed and justified?

(ii) Does the project fit into the country's economic and social development plans?

(iii) Is the proposed project technically, financially, and socially viable?

(iv) Will all resources be available to efficiently execute and subsequently operate and maintain the facilities provided; and

(v) Will the borrower be able to generate funds to repay the loan?

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HOW PROJECTS COME INTO BEING

THE FINAL HURDLE - PROJECT APPRAISAL

INTRODUCTION

The process of Project Appraisal described in this paper is essentially the process used by the World Bank today to evaluate the suitability of Water Supply/Waste Disposal projects for financial assistance. This process has evolved and was refined over the years from 1961 when the first World Bank loan was made for water supply. The principal functions and methodologies of the process are governed by manuals and guidelines[2/]. Although the process may appear to be tailored for the particular requirements of the World Bank there is no reason why it should not, with possible specific modifications, be used by anyone, anywhere. In its details the process may be considered excessive in some cases, perhaps inadequate in others but its principles seem to have withstood the test of time over some 143 projects in 72 countries whether applied to the simplest community water supply or a highly sophisticated waste disposal project.

I. The Final Hurdle

1.01 As the preparatory activities crystalize into a well defined project the appraisal of the project is scheduled. The appraisal, as part

of the project cycle, is the World Bank's responsibility, and it is done by a team consisting of World Bank staff members plus specialized consultants. The purpose of the appraisal is to systematically review every aspect of the proposed project and bring together into a comprehensive statement the conclusions of the feasibility and preparatory activities, the social and economic justifications of the project, the technical feasibility of its components, the financial viability of its execution and subsequent operation, the institutional capability of its executors and the benefits which are expected to accrue to its users.

1.02 The decision to appraise should not be made with undue haste. Misplaced optimism on availability of reliable data, acceptance of "almost complete" preparatory work can and will pay bitter dividends. The appraisal process is a major investment of resources. A highly qualified World Bank team of an engineer, a financial analyst, an economist and often one or more specialist consultants will spend three to five weeks on a mission in the field followed by report writing. This is not a process that can or should be repeated although brief follow-up missions are often required to clarify specific issues. Apart from the investment in the mission itself the agency or unit carrying out the appraisal will have, with the dispatching of the mission, committed itself to a work program extending several months the culmination of which is, in the case of the World Bank, the presentation of the proposed loan for the approval of the Bank's Executive Directors. Interruption or delaying of this program may well effect the processing of other projects.

1.03 It would be impossible to set hard and fast rules to establish the prerequisits for a successful appraisal. No two sets of circumstances will be the same. A "first in the country" project may require an inordinate amount of time to introduce the concepts of appraisal or to unravel institutional and procedural issues. A repeater project may appear simple on these fronts but increased complexities and higher level objectives can still introduce problems not previously encountered. Above all, however, there is no substitute for thorough and painstakingly systematic project preparation. It is essential, prior to appraisal, to have determined that the proposed project fits into the social and economic objectives and priorities of the country. Technical evaluations should have identified the least cost solution to meet the targeted needs. Design of components should be sufficiently advanced to permit the presentation of reliable cost estimates. Sources of all required funds should be known with reasonable certainty. The institutional responsibility for the execution of the project must be clear cut. There is no hope for a successful appraisal when the appraisal team is not 100% sure where the decision making authority lies. In some countries the entity operating the water supply systems is different from the planning/executing agency. In such a case it is vital to ensure that both organizations are fully involved in the appraisal as the appraising team has to be satisfied that not only can the project be successfully implemented but that there is sound basis for the future efficient operation and maintenance of the facilities to be constructed.

1.04 Under the normal project preparation process of the World Bank a number of missions will have visited the country prior to appraisal of the project to monitor progress, exchange views on a wide range of issues,

to review design work, agree on criteria and further processing procedures. In other words a continuous dialogue will have been established with the prospective borrower and, barring unforeseen events the appraisal team should not need to confront last minute surprises. However, this by no means implies that it is all plain sailing. On the contrary, most appraisals turn out to be three to four weeks of very hard and concentrated work. As the title of this section states the appraisal is meant to be the "Final Hurdle" and we can not afford to trip over it. The multitude of details to be checked (as we see later), the first formulation of and the reaching of (at least) tentative agreements over what in due course will become legally binding conditions and covenants of the proposed loan require an intensive effort and dedicated perserverance from the appraisal team.

1.05 It should be well noted that the World Bank (and any other similar agency for that matter) stands or falls by the competence and reliability of its professionals carrying out this work. As a rule, rather than the exception, the judgements of the appraisal team will not be "second guessed" by their superiors. During the review process leading to loan approval policy or other considerations may dictate certain modifications in the project proposals, they can add to or subtract from the proposed conditions or even the project components but there will not be pressures to change the considered and collective judgement of the appraisal team.

II. The Appraisal Process

2.01 The appraisal work covers four major aspects of the project - technical, institutional, economic and financial. Each of these aspects will, on close examination, assume equal importance although they may not each demand the same intensity of treatment for any given project.

This equality, if duly granted, is quite likely to make the difference between a so-so and a truly successful project. On the face of it, in a project including a magnificent dam, costing hundreds of millions of dollars, it may appear something of a come-down to worry about the borrowers training program. This picture will change if one visualizes the spillway gates stuck in five years time due to lack of maintenance. In the following we will examine each of these aspects in some detail.

Technical

2.02 It is probably most easily understood and accepted by any borrower that any agency providing financing assistance for a project must be satisfied that the project is designed in accordance with sound practice and that it is appropriately engineered to meet all its objectives. To achieve this the technical appraisal examines the technical alternatives considered, the proposed solution and the predicted output of the facilities to be constructed.

2.03 The detailed review will encompass the entire spectrum of the project planning, design, proposed implementation methods and time schedules, procedures for procuring materials, equipment and services and the planned arrangements for operating and maintaining the facilities. Not withstanding similar reviews already carried out during the preparation/preappraisal stage a final review and verification takes place of all the basic design parameters such as population and demand forecasts, proposed service levels and of the recommended production, transmission, storage and distribution capacities. A careful assessment is made of the appropriateness of the recommended technologies, the equipment and materials to be used and whether maximum use is made of the available local materials and construction capabilities. The review

will examine whether the proposed new facilities are compatible with those already existing and whether the operating skills required are within the capabilities of the local work force. The appraisal team will look for the correct balance between labor and capital intensive construction and operating techniques.

2.04 One of the critical items of the appraisal will be the realistic evaluation of the proposed project implementation schedule. This schedule as finally agreed by all parties during appraisal will assume multiple importance. It not only sets out the expected sequence and timing of the design (if not yet complete), construction and commissioning of each component and thereby establish a target date by which the service should be available to the consumers, but it also represents the program of expenditures according to which the necessary funds will have to be made available. Furthermore, the schedule will, in due course, become the bench mark for the subsequent evaluation of the performance of the project management, contractors, consultants and suppliers and, from the World Bank's point of view, of the validity of the assumptions and judgements made by the appraisal team. Insofar as the implementation schedule also establishes the time when the facilities are to be put into service and start producing revenues, it will also become the basic determinant of the financial forecasts which we will discuss later in this paper. In the preparation of the schedule it is vital to make realistic allowances for local conditions and practices. Procedures for bid advertisements, evaluations and awards may, in some cases, require the approval of a succession of government bodies, review boards, ministries, etc. Some of these may meet only (say) once a month. A much too optimistic, tight schedule will often result in delays, with

expiring bid validity dates and subsequent increase in prices. Construction schedules must make due allowances for local communication and transport constraints and applicable licensing and custom clearance requirements.

2.05 Another critical area of the technical appraisal is the review of the project cost estimates, the unit prices and engineering and other data on which they are based. The appraisal cost estimates will form the basis of determination of the financing plan for the project, the World Bank (and any other co-financing) loan amount and the funds to be provided by the borrower. A World Bank loan will normally cover all or part of the foreign exchange cost of the project. Since developing countries often find it difficult to provide foreign currency and the Bank, as a rule, does not provide supplementary financing for cost overruns the correct estimation of project costs is of major importance. The allowances for physical contingencies and expected price increases during implementation must be adequate. The engineer must assess the sufficiency of the design details, soil investigations and the like. The team economist would review the forecasts for foreign and local inflation and potentials for exchange rate adjustments. The projected man month cost of consulting services for construction supervision and further studies to be executed will be carefully reviewed. Cost estimates will be prepared in detail for each component of the project as well as in the form of annual expenditures required during the project execution including the customary maintenance period. In addition to the capital expenditures the cost of operating the project facilities (over a reasonable period) will be assessed together with the requirements for chemicals, energy and manpower. Commonly, part of the required investment

funds will be generated internally by the entity implementing the project. To forecast the revenues required to generate these funds as well as to meet operating, debt repayment and other expenses the financial analyst appraising the project will also require accurate capital and operating cost estimates.

2.06 The World Bank and most other lending agencies have specific requirements with regard to the manner in which the procurement of goods and services under a project takes place. The appraisal team will provide the borrower with full details of the Bank's requirements and ensure that the procedures to be followed are fully understood. In general, international competitive bidding will be required for all major contracts but satisfactory local procurement is acceptable for bids not likely to attract international attention. In bids for Bank financed contracts only member countries of the World Bank and Switzerland will be permitted to participate. It is particularly important to note that contract documents for all major bids will be reviewed by the Bank prior to issue and appropriate allowance must be made in the implementation schedule for the time required for this review.

2.07 The technical appraisal examines the potential impact of the proposed facilities on the human and physical environment to ensure that adverse effects (if any) will be controlled or minimized. The impact on public health of providing safe water supplies and adequate sanitation has long been recognized, and with the advent of the "new style" projects since the early 70s which specifically target the urban and rural poor, this aspect has become the primary justification for some water and sanitation projects. The enhancement of the health/hygiene focus brought into the projects new areas of consideration such as basic needs standards.

hygiene education requirements, new low-cost technology approaches, the need for community participation and the like. Depending on the need the appraisal team may include one or more specialists to ensure an adequate review of these aspects of the project.

Institutional

2.08 As experience accumulates in assisting developing countries meeting their long term social and economic growth targets it is increasingly recognized that "institution building" can, in the long run, be more important than the transfer of financial resources and the construction of physical facilities. In recent years institution building has become, perhaps, the World Bank's most important purpose in lending. Institution building, in the broadest sense, not only implies the creation of a sound viable local institution covering the borrowing entity but a wide spectrum of government policies which will establish and maintain an environment within which the project entity can operate efficiently.

2.09 Experience indicates that insufficient attention to institutional matters inevitably results in problems during implementation and operation. The appraisal review in this field has to address a wide variety of issues. Is the entity in question properly organized, are its management and staffing adequate? Are the available human and physical resources used effectively? What, if any, changes, improvements and reinforcements are required to ensure efficient project implementation and subsequent operation? The legislative and policy instruments governing the entity's operations will be reviewed. The adequacy of these instruments in granting sufficient operating autonomy

and in spelling out the obligations, rights and powers of the entity will be examined and, if necessary, changes would be recommended.

2.10 In many cases the proposed project will represent a degree of expansion which multiplies the size and responsibility of the existing organization requiring (perhaps) a completely new structure. Detailed studies and extensive discussions with government bodies will be needed to ensure the correct solution and the timing of these activities may well be critical to the progress of the project.

2.11 In most developing countries the greatest constraint in the rapid development of the water and sanitation sectors is the lack of skilled manpower. With the growing importance of institution building the necessity for adequate training programs to meet future manpower requirements has also received proper recognition and most appraisal teams will now days include a training specialist to advise on the most suitable training program(s).

2.12 The questions arising on institutional requirements are important for traditional water supply entities but they are even more difficult and elusive in the case of entities which are responsible (or to be responsible) for preparing and implementing the (relatively) new style projects intended to provide services primarily for the urban and rural poor. Few developing countries have established institutions for such services and there are not many patterns to follow. The appraisal team often has to review many possible approaches and be ready to give full consideration to such hitherto seldom considered aspects as community, cultural and social acceptability of the proposed solutions.

2.13 Of all aspects of a project the institution building is,

perhaps, the most difficult to deal with. There are seldom any firm standards which can be applied and success will very much depend on the full understanding of the social, political and cultural environment of the country. Contrary to common belief, the World Bank has no standard requirement as to the type of organization to be set up to execute and operate the project. There is only one requirement: whatever it is called, it should work.

Economic

2.14 The World Bank believes that it is in the best interest of the country of the project as well as of the Bank as a development and lending institution that every project must have a satisfactory economic rate of return. An exhaustive analysis of costs and benefits of the project is carried out during appraisal and the usual expression of the results of this analysis is the economic rate of return. Cost benefit analysis of alternative project designs is carried out at the successive stages of project preparation in order to select the least cost solution and the one that contributes most to the development objectives of the country. However the final review and assessment is made at the time of appraisal.

2.15 Over the years the World Bank kept in close touch with the development and refinement of the methodologies of economic project appraisal. "Shadow" prices are now routinely used when true economic values of costs and benefits are not reflected in market prices due to various distortions such as trade restrictions, taxes or subsidies. These shadow price adjustments are most frequently required in exchange rate and labor cost calculations. A relatively new approach which is

still not in widespread use is the considerations of "social" prices. The purpose of these adjustments is to give proper weight to the governments' objectives of improved income distribution and increased public savings in the course of examining the distribution of the benefits of the projects and its fiscal impact.

2.16 In any economic analysis there may be elements of costs and benefits which may defy precise quantification. Water supply and waste disposal projects are particularly prone to such problems. The benefits of improved water supplies and/or waste disposal services in improving the health and well being of the individual consumer as well as the community at large cannot, as yet, be satisfactorily measured. It is equally difficult to fully assess the cost of water pollution to the economy. A qualitative assessment of the unquantifiable benefits is, therefore, also necessary. Whether qualitative or quantitative, the economic analysis always aims at assessing the contribution of the project to the countries economy and this remains the basic criterion in the World Bank for project selection and appraisal.

2.17 Since the estimates of the costs and benefits of the project are always subject to margins of error an analysis is made of the sensitivity of the rate of return to variations in some of the key assumptions made in the calculations. With major uncertainties present, a risk/probability analysis may be carried out but, in any case, all potential risks to successful project execution are highlighted and examined.

2.18 Economic appraisal always studies the project in its sectoral setting with close attention to the investment program for the sector, the strength and weaknesses of the sectoral institutions and to the

relevant government policies.

Financial

2.19 Financial appraisal in the quantitative and qualitative examination of the entity's financial operations executed by collecting, assembling and reassembling numerical data relating to development planning and programming, investments and operations. Financial appraisal will cover several distinct aspects. In order to ensure that adequate funds will be available to cover the cost of implementing the project a detailed financing plan will be required. As we already mentioned, the World Bank will typically finance all or part of the foreign exchange costs and expects the borrower or the government to provide the funds for the local costs. In many cases other international, bilateral and (more recently) commercial lending agencies will cofinance major projects. The financing plan will identify in detail the various amounts and sources of funds. If the government is known to have difficulties in raising local funds specific arrangements may need to be made for advanced budgetary allocations, to create revolving funds or to earmark tax proceeds for the project. Whatever the sources the appraisal team must be satisfied that the committments for the respective contributions are firm and irrevocable.

2.20 One of the World Bank's primary concerns is the financial viability of the water supply/sewerage enterprize responsible for the project. Water supply entities, as a rule, are revenue earning enterprizes (whether public or private) and the Bank must be satisfied that the entity will be able to meet its financial obligations not the least of which will be the repayment of the Bank loan. The entity will require adequate working capital, it should earn a satisfactory return on its

assets and make a reasonable contribution to its future capital requirements. The financial appraisal will closely review the entity's finances through projections of balance sheets, income and cash flow statements and prepare sources and application of fund schedules. In most developing countries reliable statistical data is scarce and the financial field is no exception. Often accounting practices are inadequate or inappropriate, qualified accounting and financial management staff are few and far between. The financial analyst on the appraisal team will seldom find the information he requires available. He will many times be faced with the necessity of assisting in the construction of accounts, balance sheets etc. The Bank, as a rule, requires commercial, accrual form of accounting as opposed to simple cash accounting which is common to governmental organizations. Where such accounting systems are not used the necessary steps will have to be taken to establish the system which may include the employment of special consultants to design the system and to assist in its implementation. This type of action mostly represents a longer term program of improving financial management and the appraisal team is still faced with providing the best possible analysis of the entity's past, present and (projected) future financial situation. Inadequate basic data will have to be supplemented by "best estimates" (which may have been built up during project preparation) based on a series of qualified assumptions.

2.21 The revenue earning nature of water supply entities requires a close scrutiny of the level and structure of the prices charged by the entity for the services provided. In order to achieve the financial viability referred to above and, inter alia, to ensure adequate project financing and subsequent efficient operations through adequate revenues

it may be necessary to adjust the level and/or structure of these prices and even establish a program for systematic future adjustments. This most frequently turns out to be one of the most controversial issues of the appraisal. Governments are generally reluctant to authorize price increases whether as a matter of policy to subsidize the consuming public or to avoid the political consequences of unpopular actions even if these are demonstrated to be in the best interest of the country. Whatever the case, it has to be ensured that the entity can meet its financial obligation and that the output of the enterprise is efficiently utilized. Adequate prices, therefore, are "sine qua non" of Bank lending to revenue earning enterprizes.

2.22 The financial appraisal will closely review the methods used for recovering the investment and operating costs from the project beneficiaries. Plans and projections for such cost recoveries will take into account a variety of factors such as income distribution, the ability of the poor to pay even minimum charges. The difficulties of administering a particular system of charges for water collected at standpipes and, possibly, charging a higher rate on Bank financed projects than elsewhere for similar services etc. The appraisal team, therefore, will try to strike a balance among the need to use resources efficiently, considerations of social and economic equity and the need to generate additional funds for future investments to reach even larger numbers of beneficiaries. To achieve this it may be necessary to start with a compromize solution but initiate further studies to determine the most appropriate solution.

2.23 In the course of the financial appraisal a series of targets will have been agreed with the borrower ranging from sales and revenue

projections to expenditure and investment controls, tariff adjustments and actions to improve financial management. The achieving or otherwise of these targets will determine the future financial viability of the enterprize and probably of the project itself. In order to ensure that the appropriate course is followed to secure these achievements the World Bank usually sets certain conditions in the form of financial covenants. These are generally formulated during the financial appraisal and may take a variety of forms. The most commonly used revenue covenant is the setting of a series of financial rate of returns to be achieved over certain periods. The financial rate of return normally relates the entity's net operating income to its revalued net fixed assets. In circumstances where such targets are not appropriate specific cash generation requirements related to annual investment requirements may be set. Other conditions may include debt and investment limitation. Many of such covenants require actions to be taken (such as increases in water tariffs) by a specific date and may therefore be a condition of further project processing (negotiation) or loan effectiveness or further disbursement. The financial appraisal will have to pay particular attention to the formulation of these conditions as they almost inevitably raise sensitive issues. Governments are generally reluctant to accept conditions which appear to impose limitations on their rights to make decisions they consider expeditious. Conflicts certainly do occur but rare indeed is the occassion when mutually acceptable solutions cannot be found.

2.24 In addition to the legally binding covenants the financial appraisal normally formulates a set of key indicators through which the more significant areas of the borrowing entity's financial health

can be routinely monitored. These indicators usually consist of annual sales figures, receivables, the more significant accounting ratios, rate of return and debt service coverage figures. The emphasis must be on key figures which will permit a quick judgement rather than on volumes of information which is not likely to be produced in a timely and accurate fashion anyway.

2.25 One of the fundamental requirements of the Bank is the annual production of independently audited accounts of the borrowing entity. The appraisal team has to be satisfied that appropriate arrangements exist for submitting such accounts to the World Bank (usually) not later than six months after the closing of the financial year and that such audits are performed by properly qualified, independent auditors.

III The Appraisal Report

3.01 The findings conclusions and recommendations of the project appraisal are presented in the (Staff) Appraisal Report which becomes the basic document for the processing of the proposed loan through the World Bank machinery. The report will also serve as the basis for the preparation of the appropriate legal documents such as the loan agreement. During project execution the Appraisal Report provides the yardstick for monitoring of project progress and for the numerous targets and requirements which the project entity is expected to meet. Finally the report will become the benchmark for the evaluation of the project on completion, that is whether it was implemented in accordance with the original time and cost schedules and whether it has achieved its stated objectives.

3.02 The many years of experience in the World Bank has resulted in the evolution of a fairly standard report format. Within the water

supply sector, an "Appraisal Handbook"[2/] provides detailed guidelines for the preparation of the Appraisal Report. Within its limited length the Appraisal Report must provide clear and concise details of all aspects of the project. The reader must be able to place the projects in its correct country and sector setting, understand its origin and preparation history and have a clear picture of its size, cost, proposed schedule of implementation and of its anticipated benefits. Technical and financial details must be adequate so that an "outsider" be able to asses the viability of the enterprise.

3.03 Immediately on the return of the appraisal mission outstanding issues (if any) are presented to the Bank's management for resolution prior to the drafting of the Appraisal Report. The report itself will go through a well-established review process to the point where senior management of the Bank is satisfied that all aspects are sufficiently clear so that the proposed terms and conditions of the loan may be satisfactorily negotiated with the borrower.

3.04 Experience clearly indicates that when the appraisal was thorough and efficient and was conducted in a cooperative atmosphere and when the report is clear and concise, the loan negotiations with the borrower tend to be smooth and trouble free.

3.05 When the negotiations are concluded, the Appraisal Report and the legal documents are finalized and the loan, in due course, is presented for approval to the World Bank Executive Directors.

3.06 The process described in the paragraphs above, while specifically applicable to the World Bank, need not and generally is not substantially different in any other lending agency. Indeed the Bank has, in the past, carried out appraisals and prepared the Reports on behalf of other

financing agencies. There might be administrative or methodological changes but the basic principle remains the same, that is, the appraisal process must provide all the quantitative, qualitative and descriptive material which the management of any funding agency may require to answer the following basic questions:

(i) Is the project needed and justified?

(ii) Does the project fit into the country's economic and social development plans?

(iii) Is the proposed project technically, financially and socially viable?

(iv) Will all resources be available to efficiently execute and subsequently operate and maintain the facilities provided; and

(v) Will the borrower be able to generate adequate funds to repay the loan.

These "headline" questions encompass a vast multitude of details which the appraisal process will have to generate. The process is not easy, it is certainly not a few days affair. On average from the departure of the appraisal mission to loan approval in the World Bank a period of about nine months will elapse. Many people say this is far too long and it may be so but we have not yet found the magic wand which will shorten it without sacrificing the principles which govern the process. There are a few simple guidelines which one can set to shorten the process; we must have better project preparation, we must have better and closer understanding with the borrowing countries and these countries must assume a much greater responsibility and participation for project preparation and appraisal. Some countries have made major advances in the last of these

requirements, others do not yet have the skilled manpower resources and it has to be the part of project development to increase these resources by improved training. If development targets such as those set by the International Drinking Water Supply and Sanitation Decade program are to be achieved in the future, the "Final Hurdle" will have to be scaled more and more frequently by the developing countries themselves.

Reference

2/ a. Operational Manual Statement

b. Water Supply and Waste Disposal Sector Appraisal Handbook

c. Presentation of Financial Analysis in Staff Appraisal Reports
- Interim Guidance Note No. 3.01 -

WHERE THE MONEY AND TECHNICAL ASSISTANCE COME FROM

Multilateral Agencies: Inter-American Development Bank

by

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ABSTRACT

The Inter-American Development Bank established in 1959 to evaluate economic and social development of member countries in Latin America is described. Its activities and role in financing social projects to improve the quality of life of lower income sections are outlined. Programs with emphasis on the water and sanitation sector provide the background for understanding how the Bank operates, how loans are processed and how the technical assistance is provided. The way in which the Bank evaluates the execution of projects is summarized.

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WHERE THE MONEY AND TECHNICAL ASSISTANCE COME FROM

Multilateral Agencies: Inter-American Development Bank

I. INTRODUCTION

Institutional Arrangements

The Inter-American Development Bank is an international financial institution established in 1959 to help accelerate the process of economic and social development of its member countries in Latin America. Its headquarters are in Washington, D. C. with field offices in every capital city of Latin America.

The Bank, which currently has 41 member countries, is today the principal source of external public financing for most of the countries of the Latin American region. Its cumulative lending and technical cooperation for development projects and programs exceeded $18 billion at the end of 1980.

The Bank also serves as a catalyst for mobilizing external private and public capital for Latin America's development through the sale of its own bonds and by promoting complementary financing and co-financing arrangements with other financial institutions for development projects in the region.

The Bank's functions are:

To promote the investment of public and private capital in Latin America for development purposes.

To use its own capital, funds raised by it in financial markets, and other available resources for financing high-priority economic and social projects in the region.

To encourage private investment in projects, enterprises and activities contributing to economic development and to supplement private investment when private capital is not available on reasonable terms and conditions.

To cooperate with the member countries in orienting their development policies toward a better use of their resources, while fostering greater complementarity of their economies and the orderly growth of their foreign trade.

To provide technical cooperation for the preparation, financing and execution of development plans and projects, including the study of priorities and formulation of specific project proposals.

The Bank is owned by its member countries - currently 41. Twenty-six of these countries - known as the regional members - are located in the Western Hemisphere, and 15 - known as the non-regional members - are in Europe, Asia and the Middle East. The latter group was admitted to membership beginning in July 1976.

The recent expansion in Bank membership reflects the dramatic changes that have taken place in the international economic system over the past two decades. As world trade and financial relations have multiplied, the different regions of the world have become increasingly interdependent. For the industrial countries of Europe, Israel and Japan, Latin America has become a steadily growing export market, an investment partner and a source of many commodities and resources needed by their economies. Conversely, for Latin America, the "old continent" and Japan represent a market second only to the United States in size, as well as a major source of development capital and technology.

Since the early 1960s, the Bank has actively promoted the transfer of development capital from the highly industrialized countries to Latin America. Prior to 1976, the Bank had mobilized more than $1 billion in resources in countries outside of the Western Hemisphere for Latin America's development. A full-fledged membership in the Bank was the next step: it afforded the nonregional countries the opportunity to add a special multilateral dimension to their expanding bilateral relations with the region, while strengthening their people-to-people bonds with Latin America.

Volume of Aid

The Bank has played a major role in supporting Latin America's social and economic development along four fronts:

It has served as a catalyst for the mobilization of resources, helping to provide, secure and organize financing for projects and programs which, in the 1961-80 period, involved a total investment of more than $63 billion. In terms of lending from its own resources or funds otherwise entrusted to it, the Bank has contributed approximately $16 billion in loans to help finance these projects.

The Bank has fostered a more equitable distribution of the benefits of development, particularly through its pioneering role in financing social projects designed to improve the quality of life of the lower income sectors of Latin America.

Through its technical cooperation, it has contributed to the strengthening of the institutional base of its lesser-developed member countries, thereby improving the quality and efficiency of their development efforts.

Also noteworthy is the Bank's steady support of Latin America's economic integration efforts, regionally and subregionally.

Type of Aid

The Bank works closely with the governments of Latin America in helping them to achieve a balanced social and economic development of their countries. A substantial part of the Bank's resources has been devoted to the development of the rural areas of the region - to increasing food production and improving the quality of life of the rural population. At the same time, the Bank's lending and technical cooperation programs have contributed significantly to the development of the region's energy and other natural resources, to the diversification and expansion of its industrial base, to the creation of employment opportunities, and to the elimination of many "bottlenecks" to economic and social progress.

In terms of the sectorial categories used by the Bank, the distribution of its cumulative lending through 1979 was as follows: energy, $3,922 million, 25 percent; agriculture and fisheries, $3,631 million, or 23 percent; industry and mining, $2,578 million, 16 percent; transportation and communications, $2,292 million, 15 percent; sanitation, $1,455 million, 9 per cent; urban development, $523 million, 3 percent; education $741 million, 5 percent; export financing, $299 million, 2 percent; preinvestment, $176 million, 1 percent; and tourism, $169 million, 1 percent.

Main Recipient Countries and Criteria for Country Selection

Of the $15,856 million in total Bank lending in the 1961-79 period, $8,300 million, or 52 percent, was extended from the capital resources - the conventional loan "window". The Bank's concessional loan "windows" - the Fund for Special Operations and the Social Progress Trust Fund - accounted for $6.4 billion and $539 million, respectively, or 44 percent of the total lending. Loans from the Venezuelan Trust Fund, which carry conventional terms, amounted to $471 million, or 3 percent of the total. The remaining $146 million represented loans from other funds under the Bank's administration, extended mostly on concessional terms.

Programme and Project Selection and Sector Priorities

In 1972 the Board of Governors directed that the Bank accord preferential treatment in lending from the fund for Special Operations - its soft loan "window" to the member countries classified as economically less-developed and to those considered to have limited markets. The countries which, at the end of 1978, were classified as economically less-developed include Bolivia, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haití, Honduras, Nicaragua and Paraguay. Those considered of limited market are Bahamas, Barbados, Costa Rica, Jamaica, Panama, Trinidad and Tobago, and Uruguay.

Progressive implementation of this policy has resulted in the channeling of a rising volume of concessional resources to these 17 countries. In 1978, they received 91 per cent of the $558 million in concessional loans extended by the Bank in freely convertible currencies.

The Bank's policies give priority to the financing of projects oriented to helping people - particularly undertakings that directly benefit disadvantaged groups in rural and urban areas - as well as to essential economic investments, such as hydroelectric plants, highways and factories, that yield benefits to a country as a whole.

The Bank's efforts to stimulate a broad distribution of the benefits of development are reflected in its lending pattern in the 1961-78 period. Almost one-third of the Bank's development financing - loans totaling $4.3 billion - went for projects to improve the quality of life and productivity in Latin America's rural sector, benefiting millions of poor and lower income families. These projects include farm credit, irrigation, land settlement, integrated rural development, fishing, water supply, health, housing and education facilities, construction of access and farm-to-market roads, and rural electrification and communications programs. Not only individuals, but also cooperatives and other rural associations, as well as entire communities, have benefited from these projects.

Low-income families in urban areas have benefited directly from loans totaling $1.6 billion approved by the Bank for financing water supply, sewerage, health, housing and urban renewal projects in the cities of Latin America. The youth in many Latin American cities have also benefited through advanced, technical and vocational education projects financed in urban areas with loans totaling $542 million.

The remaining $7.7 billion in Bank lending went to finance manufacturing projects, particularly the expansion of small and medium-sized private enterprises, and infrastructure facilities - hydroelectric plants, major highways, gas pipelines, port improvements and telecommunications systems - which are vital for the attainment of increased employment, higher income levels and better living standards in the region.

II. WATER AND SANITATION SECTOR

Assistance to the Sector Since 1960.

From the beginning the Bank was wholly identified with environmental sanitation needs in Latin America. It is no coincidence that the first loan, made in February 1961, was intended to assist in financing the expansion and improvement of the water supply and sewage disposal systems of the city of Arequipa in Perú.

Perhaps the IDB's most important achievement in this field is the financing of drinking water supply programs in rural areas. More than 4,000 communities have benefited from these programs up to the present time. The setting of minimum design standards, the incorporation of technologies appropriate to the degree of development of the countries, and the active participation of the local community in the construction work and in the operation of the systems themselves are the salient features of programs financed by the Bank.

In the 1960's the Bank accounted for 26% of the total investment made in water and sanitation facilities - 2.5 times the contribution of other agencies - and for 16% of the investment in drinking water facilities in rural areas, for which the IDB continued to be the only external source of financing.

At the end of 1980 the Bank had financed more than 1,400 million dollars, of which 75% were for drinking water supply programs and 25% for sewage disposal programs. The total number of operations was more than 140, of which 25% were for water supply system programs in rural areas. Total investment in programs financed by the Bank exceeds 3,000 million dollars. This has made it possible to extend these services to more than 80 million persons living in more than 6,000 cities and towns in the region.

It is estimated that in the period 1961-1979, the total investment in current terms made by the countries themselves and international organizations other than the IDB was more than 8,800 million dollars, of which 26% was external financing. The Bank contributed more than 50% of all external investment. See Table in Annex I.

The tables in Annex II give details on loans and technical cooperation granted by the Bank, classified by country and type of funds used, from the inception of IDB operations in 1961 up until December 31, 1979.

Terms of Assistance

The Bank acts as a catalyst for mobilizing resources for Latin America's development and normally finances no more than 50 percent of the cost of a given project. The borrower finances the remainder with local resources and, when necessary, the Bank tries to help in arranging other external financing. In the case of its least developed member countries, however, it may finance up to 90 percent of the cost of a project from its concessional resources.

On the whole, every dollar lent by the Bank has helped to mobilize an additional $3 for development projects - primarily from the borrowing countries' internal savings.

The terms and conditions of the loans depend on the resources used. The foreign exchange portion of loans from the capital resources normally is amortized over periods of up to 25 years, including grace periods, and bears an interest rate which, in 1980, was set at 8.25 per cent per annum. This rate is adjusted periodically by the Bank's Board of Executive Directors in the light of the cost of funds borrowed by the Bank and of the spread necessary to cover these and other costs. The local currency portion of loans from the capital resources is repayable over the same period as the foreign exchange portion, but bears lower interest rates.

Loans from the Fund for Special Operations have amortization periods of up to 40 years, including grace periods, and bear interest rates which vary from 1 to 4 per cent per annum, depending on the nature of the project and the level of development of the borrowing country.

Loans made from the various funds under Bank administration are made under terms and conditions stipulated in the agreements between the respective donor countries and the Bank.

The Bank has been carrying out technical cooperation activities in tandem with the lending program. It has thus being able to place resources at the disposal of the countries to complement and enhance national and local technical capabilities. These activities have included preinvestment studies, programs of institution strengthening of the agencies involved in the plans, and tasks associated with the preparation of investment projects and the training of personnel to carry them out.

In urban areas the Bank has promoted the creation of autonomous or semiautonomous agencies to manage the systems, and it has furnished technical cooperation for the organization thereof. In rural areas, allowance made for the limited ability to pay of the users of the services, the systems are managed by boards made up of people living in the community. In creating these boards, community participation in the work is encouraged, starting with the construction work and then charging the community with the operation and maintenance of the systems.

The Bank works together with its member countries in such a way that urban systems shall be managed by financially sound organizations that shall keep suitable controls, determine their costs and calculate their rates according to social criteria, thus making it possible to supply the demand of the lowest income groups who lack the ability to pay the rates that would otherwise apply from strictly economic point of view. In determining the applicable rates in work measures financed with its loans, the Bank uses flexible criteria which, depending on the income level of the community benefitting from the new services, would range from requiring an economic return sufficient to pay back the investment up to paying only the cost of management, operation and maintenance.

Bank procurement policies stress the principle of competition in order to achieve maximum economy and efficiency in the execution of projects. The Bank's loan contracts specify that procurement for projects in the public sector must be effected through public competitive bidding when the value of goods and services exceeds $100,000. For private sector projects, the Bank uses a competitive bidding system which consists of soliciting tenders from several sources.

In some cases, private sector norms are used for public enterprises when the project characteristics make it advisable.

In the hiring of professional and technical services, the borrower is responsible for the selection and contracting of a qualified firm, subject to the requirements established in the agreement with the Bank and subject to Bank approval of the selection.

The Bank's resources can be used only for procurement of goods and services in its member countries.

Procedures for Approval of Assistance

Periodically, the Bank sends teams of specialists from its staff on programming missions to the various Latin American member countries. Together with relevant government officials and specialists, these experts review the country's development plans and priorities, analyze social and economic trends, help to identify priority projects and programs which may be appropriate for Bank financing, consult with other potential sources of external capital, and report back to the Bank management. Individual loan applications flow from this process of consultation and analysis. In addition, at the request of potential borrowers, the Bank may provide technical cooperation for the preparation of loan projects and loan applications.

After a loan application is approved by the Bank's Board of Executive Directors, a detailed loan contract is prepared and signed by the borrower and the Bank.

Under such a contract, the Bank does not disburse the loan in a lump sum, but over a period of time, as actual expenditures are incurred by the borrower in the execution of the project. Most projects require four to six years to complete. Each disbursement request must be properly documented and its purpose verified by the Bank's staff. The Bank has field offices in the regional member countries whose functions include supervision of project implementation and verification of disbursement requests by the borrowers.

Public and private entities in the Latin American member countries including national governments, their political subdivisions, independent agencies, public enterprises and local private firms, are eligible to borrow from the Bank. However, the Bank does not finance undertakings in the territory of a member country if that member objects to such financing. The Bank requires that loans to nongovernmental entities be guaranteed by a governmental entity.

Three international subregional organizations - the Andean Development Corporation, the Central American Bank for Economic Integration and the Caribbean Development Bank - also can borrow from the Bank for projects in their member countries.

Once a loan application has been reviewed for policy considerations, the Bank subjects the proposal to detailed institutional, technical, socio-economic, financial and legal analysis.

The institutional analysis aims at establishing whether the prospective borrower has the capacity to carry out the project efficiently, giving special attention to its financial, accounting, administrative and operational organization and to possible adjustments.

The technical evaluation centers on the engineering or practical feasibility of the project - the soundness of the plans, specifications, projections, estimated costs, the adequacy and appropriateness of the technology to be used, availability of raw materials and labor, and related factors.

The socio-economic evaluation seeks to determine the benefits and costs of the project to the society, including its net contribution to economic growth, its impact on employment, income distribution, production, trade and the environment, its influence on regional diversification and its relevance to the Latin American integration process.

The financial analysis aims at establishing the profitability of the project, the capacity of the borrower to meet the counterpart financing requirements, and whether once it has been executed, the project will operate on a self-sustaining basis.

The legal evaluation centers on the legal capacity of the borrower to contract the loan and assume its obligations.

Technical Cooperation

Technical cooperation is provided by the Bank to assist the borrowing countries and institutions in acquiring necessary technical skills and experience in two major fields of activity:

Preparation, financing and implementation of development plans and projects, including the study of priorities and the formulation of loan proposals for specific national or regional development projects.

Development and improvement, through seminars and other forms of training, of personnel specializing in the preparation and implementation of development plans and projects.

The beneficiary of the technical cooperation normally enters into a contract with a specialized institution, a consulting firm or a specialist of recognized competence, to secure the needed services. On occasion, at the borrower's request, the services may be performed by the Bank's own experts.

Countries, public institutions and private enterprises that are eligible to borrow from the Bank, as well as the regional or subregional organizations of which these countries are members, may apply for technical cooperation. Under exceptional circumstances, the Bank may take the initiative and directly administer regional or subregional technical cooperation activities which benefit more than one member country.

The Bank may provide technical cooperation on a grant, reimbursable or contingent repayment basis, depending on the country or objective involved.

Technical cooperation extended on a grant basis is primarily directed to the relatively less-developed or limited-market member countries. It may also be provided to the more developed member countries if the project meets specific conditions set by the Bank.

Reimbursable technical cooperation may be provided either separately or as part of a loan. Transactions of this kind may carry advantageous financial terms and conditions that allow long payback periods and low interest rates.

To expedite the preparation of preinvestment studies, the Bank allows global loans to the countries, establishing the criteria of the eligibility for the subloans.

Technical cooperation may also be provided on a contingent recovery basis when a reasonable probability exists that it will lead to a subsequent investment project. In such cases, it is specified that the Bank may recover the cost of the technical cooperation if the beneficiary should obtain a loan from the Bank or from some other external source to finance the resulting investment project.

Evaluation and Execution of Projects

The Bank has guides for the presentation of applications for loans for water supply and sanitation. These guides describe the basic information required for urban and rural projects.

To facilitate the economic evaluation of projects the Bank has developed two methodologies: a cost effectiveness methodology for the rural projects and the public works simulation model (SIMOP) for the urban projects.

For the implementation of projects the Bank has also developed a method for project follow-up: the Project Monitoring System (PMS).

Finally, the Bank uses to establish in all its operations, economic measures of efficiency and social equity in order to carry out the ex-post evaluation and to determine the impact of the project.

ANNEX I

FINANCING OF

WATER SUPPLY AND SANITATION PROGRAMS

SUMMARY

MILLIONS US$

YEARS

FUNDS	61 - 69	%	70 - 75	%	76 - 79	%	61 - 79	%
IDB	434	26	401	12	422	12	1257	14
OTHER	173	11	468	14	432	11	1073	12
NATIONAL	1034	63	2594	74	2874	77	6502	74
T O T A L	1641	100	3463	100	3728	100	8832	100

RURAL WATER SUPPLY

FUNDS	61 - 69	%	70 - 75	%	76 - 79	%	61 - 79	%
IDB	44	16.4	54	12	61	19	159	15
OTHER 1/	1.5	0.6	42	9	44	13	87.5	8
NATIONAL 2/	223.5	83	365	79	222	68	810.5	77
T O T A L	269.0		461		327		1057.0	

1/ Includes other programs in which water supply is a component.

2/ Includes other national programs without external financing.

ANNEX II

INTER-AMERICAN DEVELOPMENT BANK

LOANS AND TECHNICAL COOPERATIONS APPROVED BETWEEN 1961 - 1979 - WATER SUPPLY AND SANITATION SECTOR

(IN THOUSANDS OF US DOLLARS)

	LOANS						
	RESOURCES						TECHNICAL
COUNTRY	OC	IC	SF	TF	OTHER	TOTALS	COOPERATIONS
ARGENTINA		31.000	84.240	8.500		123.740	300,0
BARBADOS			12.260			12.260	310,0
BOLIVIA			51.552	2.600		54.152	877,0
BRASIL	27.797		93.100	43.110	4.930	168.937	612,0
CHILE	6.305		25.647	4.970		36.922	200,5
COLOMBIA	22.370	34.000	105.946	15.470		177.786	115,0
COSTA RICA			23.038			23.038	363,0
ECUADOR			85.637	8.341		93.978	3.303,8
EL SALVADOR	1.259		34.700	7.940		43.899	165,5
GUATEMALA	163		86.630	6.520		93.313	1.412,2
HAITI			48.623			48.623	1.775,0
HONDURAS			27.808	2.522		30.330	2.906,2
JAMAICA	5.900		16.900			22.800	539,0
MEXICO	28.233		3.700	13.786		45.719	
NICARAGUA			30.250			30.250	380,0
PANAMA			10.463	2.762		13.225	
PARAGUAY			33.500	" "		33.500	1.410,0
PERU	3.910		56.750	9.750		70.410	1.818,2
REP.DOMINICANA			27.061	1.150		28.211	1.436,0
TRINIDAD TOBAGO	395		5.276			5.671	990,0
URUGUAY	8.068	26.000	12.372	2.500		48.940	660,0
VENEZUELA	17.576		7.200	29.990		54.766	
T O T A L S	121.976	91.000	882.653	159.911	4.930	1.260 470	19.573,4

NOMENCLATURE: OC= Ordinary Capital
IC= Interregional Capital
SF= Fund for Special Operations
TF= Trust Fund
Other= Swiss Fund

WHERE THE MONEY AND TECHNICAL ASSISTANCE COME FROM

Bilateral Agencies: Agency for International Development

by

Robert F. Fedel [1/]

ABSTRACT

The history and background of US bilateral development assistance through the Agency for International Development (AID) and its predecessor agencies, starting 1942, are described. AID activities and organization in general are given. How projects come into being and the part played by AID in the host countries are outlined. Project execution is described, including the procedures for contracting and purchasing the equipment. Water and sanitation activities in Jordan, one of the countries AID provides assistance to, is used as an example of AID activities.

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WHERE THE MONEY AND TECHNICAL ASSISTANCE COME FROM:

BILATERAL AGENCIES: AGENCY FOR INTERNATIONAL DEVELOPMENT

INTRODUCTION:

A bilateral assistance agency is one which provides direct assistance from one country to another, as constrasted with multilateral assistance whereby one country provides funds to an organization which assists many countries. The agency of the U.S. Government responsible for bilateral assistance in the developing world is the Agency for International Development (AID). AID specifically is concerned with the implementation and financing of economic development and social assistance to the less developed nations of the world. Historically, US bilateral aid to the lesser developed nations began with the Coordinator of Inter-American Affairs Program in Latin America in 1942, followed by the Marshall Plan assistance. Prior to that time American involvement was limited to participation in various multilateral and bilateral development and humanitarian efforts by international organizations. U.S. assistance to Greece and Turkey continued a greater U.S. involvement in overseas development through a number of programs such as: Point IV, which in 1949 provided technical assistance to developing nations; the 1954 Food for Peace Act, which still continues to direct American agricultural abudance to the hungry, and, the Development Loan Program which in the late 50's was established to enable developing countries to obtain capital assistance for economic development,and the more costly, needed infrastructure improvements.

In 1961 Congress authorized the establishment of the Agency for International Development to consolidate and administer most of the various foreign assistance activities and agencies. AID, until recently was organizationally located in the Department of State because the provision of economic aid was considered an instrument of foreign policy. In 1979 AID was absorbed with other US overseas assistance agencies into the US International Development Cooperation Agency (IDCA) an executive agency administered by the President.

In addition to funding AID the U.S. provides assistance to multilateral agencies such as: The Asian, Inter-American and African Development Banks, World Bank, International Monetary Fund and United Nations Programs. The bulk of developmental assistance, however, is bilateral and is implemented through AID. In the earlier AID programs attention was directed at improvements to infrastructure which ultimately contributed to expanding the economies of the developing nations. Such projects included highways, airports, ports, dams, power plants, schools, road maintenance facilities etc. The Foreign Assistance Act of 1973, however, changed the focus of AID Assistance. Congress directed that highest priority US bilateral assistance focus on improving the lives of the world's poorest. In 1978 for example, 76% of bilateral assistance was directed to countries where per capita income was less than $300/year. Most of this aid took the form of technical assistance programs dealing with improvements in health, nutrition, education, population control and agricultural production.

Some capital assistance was also provided for infrastructure needed to support the technical assistance to these sectors of concentration. Specific types of capital projects include constructing and equiping rural health clinics and schools, constructing water systems, rural electrification, agricultural feeder roads, irrigation systems, range watering facilities, and land reclamation.

In further support of the Congressional mandate, the US, under Public Law 480, provides a Food for Peace Program through which developing nations purchase US agricultural commodities with funds loaned at low interest and long term payback. Other Food for Peace programs donate food to private volunteer organizations (PVOs) who administer child feeding and school lunch programs as well as disaster and emergency food relief. Such examples include drought relief in the Sahel region of western Africa and the Somalia area of Eastern Africa.

AID presently employs about 3800 American direct hire (civil and foreign service) employees. About 1700 are assigned overseas in missions located in about 67 countries throughout the world. Individual AID Mission staffing varies from country to country depending on size of the program. One or two AID generalists might be attached to an American Embassy to administrator a small program. In contrast, another country might have a large staff, Egypt for example with about 110 US citizen employees. This staff is capable of planning and carrying out diverisfied capital, human resources, and tehcnical assistance projects and programs requiring all types of engineering , social, financial and legal expertise to plan,implement and monitor. Some of AID's larger missions, along with Egypt, are Indonesia, Thailand, Bangladesh and the Phillipines. In addition, AID has regional missions which provide services to countries in particular geographic areas, such as East Africa from Nairobi and West Africa from Abidjan. Other regional offices are located in Central and South America and Southeast Asia.

HOW ARE PROJECTS AND TECHNICAL ASSISTANCE PROJECTS CONCEIVED AND FUNDED?

Mission staff in AID's bilateral assistance countries, together with development and planning officials of the country, jointly prepare a strategy for AID assistance, indentifying particular sectors for AID concentration and particular technical and capital assistance projects critical to specific improvements in these sectors. Frequently, AID assistance is coupled with assistance from other international donors to bring about coordinated improvements in a particular sector. Typically, AID might finance the engineering feasibility and design for a large water and sewerage system, while other donors will fund discrete contracts for its construction. In some cases one donor may finance the cost for all the pipe to be used or just finance a treatment plant, or the technical assistance required to operate and maintain it. In general, joint construction of the larger capital projects by various donors are coordinated by the host country.

To enable budgeting and funding in future fiscal years, the AID Missions

annually submit the capital and technical assistance programs which were developed jointly with the host country. These programs, with cost estimates for particular projects, are discussed and reviewed by Washington and, when considered in relation to the entire AID program, form the basis for a presentation to the Congress for funding in the following year. Congressional committees hold hearings with AID on the entire program, frequently looking into the purpose and rationale for individual projects. When agreement is reached, a final Foreign Assistance Act providing for a fiscal year program is authorized by Congress. The AID authorization bill still requires funding however, and a bill appropriating funds for AID's program is introduced in the House of Representatives which also reviews the program content, cost and funding requirments. Once financing is agreed upon the Congress appropriates the funds to carry out AID's program for that fiscal year.

Table I shows the AID program for FY 1980. It should be noted that assistance is broken into two parts: a Development Assistance (DA) Program; and a program funded from the Economic Support Fund (ESF). The DA program (broken down functionally in the table) is specifically directed toward assisting the poorest countries and their populations through projects intended to raise their standard of living through nutrition, health, education and agricultural programs. The Economic Support Fund, formerly known as Security Supporting Assistance, is that economic assistance administered by the State Department and provided because of special economic, political or security interests of the United States. Much of this assistance in recent years was directed to countries of theMiddle East, that is, Egypt, Israel, Lebanon, Jordan and Syria. Other ESF recipients include: Turkey, Sudan, Botswana, Zambia, Portugal, Phillipines and Nicaragua. The bulk of FY 1980 ESF funding ($2.0 Billion) has been directed to Egypt and Israel, with Egypt receiving $750 million and Israel $785 million in economic assistance. Israel received funds in the form of cash transfer and Egypt in the form of project assistance. Funds to both Egypt and Israel included a mixture of grant and long term (40 years), low interest (2 - 3%) loans. This mixture of grant and loan funds prevails throughout AID's bilateral program. Generally, grant funds are used to finance US technical assistance and loans finance capital project assistance.

With reference to a specific country's program, the submission to Congress includes funding for particular projects. After the program has been approved and funded by the Congress, the AID country mission and host country staff proceed to develop the data needed to support project authorization by AID. Once authorized, funds can then be released by AID to carry out the project. To support authorization, AID staff, in cooperation with the host country, prepare what is known as a Project Paper (PP). As prescribed in AID manuals, the project paper must include discussion and documentation of criteria needed for project justification and support. In general, the Project Paper answers such questions such as: What is the project? Where does it fit into the country's development plan? What are its costs? How and whom will it benefit? How will it be implemented? What other financial and host country contributors are necessary for its proper implementation? Most of these questions are answered through: technical

Agency for International Development
FY 1980 Authorization and Budget Request and Proposed Program
FY 1981 Authorization Request
(in thousands of dollars)

	1980				1981
	Foreign Assistance Act Authorization Request	Budget Authority Request	Estimated Reimbursements	Proposed Program	Foreign Assistance Act Authorization Request
Functional Development Assistance					
Agriculture, Rural Development & Nutrition	715,366	715,366	-	715,366	789,000
Population Planning	216,321	216,321	-	216,321	255,000
Health	146,373	146,373	-	146,373	210,000
Education & Human Resources Development	119,497	119,497	-	119,497	140,000
Selected Development Activities	136,122	136,122	-	136,122	180,300
Subtotal, Functional Accounts	1,333,879	1,333,879	-	1,333,879	1,574,300
(Grants, included above)	(918,342)	(918,342)	-	(918,342)	
(Loans, included above)	(415,537)	(415,537)	-	(415,537)	
Sahel Development Program	160,000 a/	105,000	-	105,000	- a/
American Schools and Hospitals Abroad	15,000	15,000	-	15,000	20,000
International Disaster Assistance	25,000	25,000	-	25,000	25,000
Foreign Currency Programs	-- d/	(20,500)	-	(20,500)	(-)
Subtotal, Functional & Other	1,533,879	1,478,879	-	1,478,879	1,619,300
Operating Expenses	268,000	268,000	2,000	270,000	285,000
Foreign Service Retirement Fund	- b/	25,676	-	25,676	- b/
Total AID Bilateral Development Assistance	1,801,879	1,772,555	2,000	1,774,555	1,904,300
International Organizations and Programs	277,190	277,190	-	277,190	315,325
Total Development Assistance	2,079,069	2,049,745	2,000	2,051,745	2,219,625
Security Supporting Assistance c/	1,995,100	1,995,100	-	1,995,100	
Total, Agency for International Development	4,074,169	4,044,845	2,000	4,046,845	

Development Assistance and Economic Security Assistance

Countries Assisted FY 1979 - 1980

Afghanistan
Bangladesh
Benin
Bolivia
Botswana
Burundi
Cameroon
Cape Verde
Central African Empire
Chad
Chile
Colombia
Costa Rica
Cyprus
Djibouti
Dominican Republic
Ecuador
Egypt
El Salvador
Ethiopia
Gambia
Ghana
Guatemala
Guinea
Guinea-Bissau
Guyana
Haiti
Honduras
India
Indonesia
Israel
Italy
Jamaica
Jordan
Kenya
Lebanon
Lesotho
Liberia
Malawi
Mali
Malta
Mauritania
Mauritius
Morocco
Mozambique
Nepal
Nicaragua
Niger
Nigeria
Pakistan
Panama
Paraguay
Peru
Philippines
Portugal
Rwanda
Senegal
Seychelles
Sierra Leone
Somali Republic
Spain
Sri Lanka
Sudan
Swaziland
Syria
Tanzania
Thailand
Togo
Tunisia
Turkey
Upper Volta
Yemen
Zaire
Zambia

a/ $200 million has been authorized by Section 121 of the Foreign Assistance Act of 1961 as amended; in FY 1978 and 1979 a total of $125 million was appropriated

b/ Section 963 of the Foreign Service Act of 1946 authorizes necessary appropriations to the Foreign Service Retirement and Disability Fund. The Foreign Assistance Act of 1973 authorizes the participation of A.I.D. career Foreign Service personnel in the Fund.

c/ Programs for the Treaty of Friendship with Spain ($7 mil), the Sinai Support Mission ($12.1 mil), United Nations Forces in Cyprus ($9 mil), and the Philippines ($20 mil), included in this request, are justified in a separate Congressional Presentation Document submitted by the Departments of State and Defense.

d/ Authorized by the FAA, Section 612.

and economic feasibility studies; beneficiary and social impact analyses; environmental assessments; and financial analyses. These are carried out both by AID staff and AID funded contracts. Host country committments to projects include: funding assistance, institutional involvement, and so-called in-kind contributions. A completed Project Paper is reviewed by AID/Washington and provides a basis for AID authorization of the funds needed to help the host country carry out the project. Implementation of various phases of a capital project is usually carried out by contracts with American firms and can include: services for detailed project design, construction and construction supervision, and materials and supplies. Additional services might be required for technical assistance to train, operate and maintain the facility and for procurement and installation of particular equipment.

HOW PROJECTS AND TECHNICAL ASSISTANCE ARE IMPLEMENTED BY AID

AID contracting is carried out in two ways, 1) by direct contract with the supplier of goods or services, wherein AID, through its contracting officer becomes a party to the agreement and 2) by host country contract wherein a host country official usually representing the involved ministry or agency, executes the agreement. It is AID policy to utilize host country contracting and procedures whenever possible. Usually AID direct contracts are: 1) executed for centrally funded AID projects dealing with several countries or regions; and 2) for procurement and utilization of services under AID's indefinite quantities contracts (IQC). AID direct contracts are carried out in conformance with the basic Federal Procurement Regulations which form the basis for AID's procurement rules. Host country contracting is carried out in conformance with host country contracting practices, providing they are consistent with AID procurement rules. Host country contracts will include the pertinent clauses required by AID. And contracts, prior to execution, are reviewed and approved by AID technical and legal staff.

Contractor selection procedures are the same for both direct and host country contracts. A synopsis of the services or goods required is prepared and published in the Commerce Business Daily (CBD) a document published by the US Department of Commerce. The advertisment also indicates: who is eligible to submit qualifications; who is funding the project (AID also publishes non-AID financed services and procurements in the CBD); what prequalification information documents are required and where they can be obtained and to whom and when they are to be returned. For engineering services, Standard Forms (SF) 254 and 255 are submitted and reviewed for purposes of establishing a short list of most qualified firms. Each firm on the short list is sent a request for proposal (RFP) which includes a detailed description of the project and available data. Short-listed firms prepare proposals which are judged as to their understanding and responsiveness to the task and the manner in which they propose to handle the job. The firm submitting the best proposal is selected for contract negotiation. The selection process and its documentation is the same for both host country and direct AID contracts. Host country staff assisting in the selection and review process are provided with the necessary AID guidelines and assistance from the resident AID Mission staff. In soliciting AID-financed construction services a similar advertising, questionnarie completion and short-listing process is carried out with the award ultimatley going to the lowest responsive bidder.

Another AID direct contracting mode is the IQC, which is designed to provide easily mobilized, specialized, expertise or services from particular technical disciplines which can range from anthropology, economics, agriculture and social sciences, to sewerage treatment plant operation, soils analysis, road maintenance and industrial production. Firms selected for AID IQC's are also selected by the same advertising, short-listing process used to select engineering firms. Once selected, the IQC firms in various disciplines negotiate terms and agreements to provide expertise to AID as required for short-term (not to exeed 120 days) assistance to countries needing that particular expertise. Assistance is funded and mobilized expeditiously by issuance of task or work orders. Another mode of securing services of an individual through either direct and or host country contract, is the Personal Services Contract (PSC) whereby expertise and or special services are provided for a specific length of time either in the host country or in the U.S. PSC's are executed by the AID contracting officer (or Host Country Official) and the individual.

The source and origin of AID financed services is discussed in detail in AID manuals. Particular project loan and grant agreements executed between the US and recipient countries specify the source and origin rules which apply to the financing of that particular project. AID policy relating to a particular country will usually determine whether AID funds can finance only US dollar cost (code 000), local costs, or those costs incurred by funding goods and services from countries currently designated as developing nations (code 941). Without getting into the legal implications and interpretations of the source and origin of goods and services it can be stated generally, that AID, in practice, finances only those engineering services provided by US firms even in cases where code 941 or local cost procurements are permitted. In code 941 situations US firms seeking AID financed construction overseas, until recently, have been in competition with firms from Korea, Taiwan, Israel and other advanced developing countries eligible for AID funding under code 941. However, recent legislation passed by Congress concerning AID financed engineering or construction services commencing with funds obligated after December 1980, identifies 18 countries, including those noted above, which are temporarily restricted from competition permitted under code 941. AID is now developing guidance and a system for implementing this provision.

In recent years controlling interest in several US construction/engineering firms has been acquired by foreign firms. This action has brought about a revision in AID's nationality requirements concerning eligiblity for AID financing. In general, foreign owned US firms are eligible if: 1) they have been legally organized in the US for three years; 2) have been doing business in the US for three years; 3) employ US citizens in more than half its permanent full-time positions in the US and 4) has the existing capability in the US to perform the contract. AID has established policy on this issue and rules and regulations are available for review and inclusion in IFB documents prepared for AID financed procurements of services.

AID'S WATER AND SANITARY ACTIVITIES IN JORDAN

With this general background as to how AID projects are conceived, justified and financed, let us relate this process to some of AID's project activities in THE DRINKING WATER AND SANITATION DECADE. The following pages discuss AID-assisted activities in Jordan as an example of how engineering, construction, materials and technical assistance resources have been mobilized to help Jordan resolve its major concern - WATER.

For several years AID's development strategy in Jordan (population about 2.5 million) has focused on the water sector i.e. 1) conducting water resources studies to discover and assess new and existing sources of ground water; 2) to expand urban water supply and treatment systems; 3) construct wastewater collection and treatment facilities; 4) construct irrigation canals; 5) initiate water management techniques to efficiently utilize the available surface water for agricultural production; 6) investigate desalting technology to utilize saline waters for agricultural use; 7) provide technical assistance to water/sewerage utility operation and management; 8) plan and design a large earth dam for surface water impoundment; 9) design water supply transmission facilities to supply urban areas; 10) evaluate feasiblity of constructing new dams and raising existing dams; and 11) initiate environmental studies and assessments of water quality. The foreging activities are representative of AID's responsiveness to needs arising in Jordan's water sector. Some of these activities have required the services of particularly qualified individuals, other activities required the comprehensive effort of major study and design contracts. AID currently is financing at least nine U.S. engineering firms to carry out water and sanitary engineering activities in Jordan. AID is also helping to finance construction contracts with US, Korean and Turkish firms to construct irrigation canals, treatment plants and urban sewer and water lines. AID's water activities in Jordan also include numerous personal services contracts and IQC task orders for the provision of individual services such as limnology studies, underground aquifer assessments, long-term assignments of financial and sanitary engineering advisors to the Amman Water and Sewer Authority, technical experts advising on water and sewage treatment techniques for developing nations; the technical analysis of plans and designs prepared by European engineers; and analysis of proposed high head pumping stations.

The above activities funded by AID were provided in direct response to requests by the Government of Jordan for help in improving and managing their limited water resources. Water continues to be Jordan's major resource limitation. Data of variable reliability fix per capita daily consumption at 28 to 50 liters depending upon the source of data. The World Health Organization (WHO) medium-safe health standard is 80 liters per capita per day. The supply and distribution of available water in Jordan must be efficiently expanded by identifying new sources implementing conservation measures, and maximizing water recycling for agricultural use. The Government of Jordan is making an effort to establish a national authority to set water policy and manage and allocate the distribution of scarce water resources between the major competitors for water, i.e. agricultural and domestic consumers. The Jordan water sector has been identified as priority by AID for several years and capital projects and programs have been initiated and funded to help meet specific needs.

The development of the Jordan Valley is one particular project concerned both with irrigation, and its beneficial agricultural production, as well water supply and its demand by the city of Amman, The area generally extends northward from the Dead Sea (400m below sea level) to the Sea of Galilee (200m below sea level) a distance of about 105 km. The width of the area which lies east of the Jordan River is 4 to 16 kilometers and all below sea elevation. In spite of the climate and sparce rainfall (91% of valley has less than 200mm of rain per year), the provision of irrigation is the catalyst that is turning the valley into a major agricultural area.

The Jordan organization responsible for development of the valley is the Jordan Valley Authority (JVA) which, like our own TVA, manages the land and water resources. It provides the infrastructure necessary to irrigate and thus support agricultural production which is critial to Jordan's economy and its balance of payments position. Under JVA's plan, the Jordan Valley has undergone redistribution of agricultural land. Facilities and services have been provided which are needed to attract and provide for a Valley population of 150,000 in 1985, (1973 population was about 50,000, 1979 estimated at 80,000). The most important factor in development of the valley was the construction of the 90Km East Ghor Main Canal providing water for gravity and pressurized on-farm watering systems. Villages for settlement of farmers have been constructed, including water, electricity, schools, clinics and community centers. Housing has also been constructed for immigrating famers and families, credit institutions have been set up for purchase of housing, equipment, seed, irrigation, hardware and fertilizer. Agricultural extension services have been organized to aid in farm development and production. In short the JVA, through provision of water and settlement infrastructure, has laid the groundwork for Jordan's agricultural and economic development. Many of the diverse Jordan Valley development projects have been carried out with AID funding and US technical assistance in the form of advisors and engineering and construction engineering services. Other major donors participating in the development of the valley are the World Bank (IBRD) and Republic of Germany. The JVA meets periodically with the donors for purposes of evaluating and coordinating valley development and project progress.

To help capture and store available surface water, the JVA in mid 1977, completed construction of the King Talal Dam on the Zarqa River. During the first two years of its operation Jordan experienced the driest period in 50 years. The river became polluted and the limited impoundment in the reservoir became highly eutrophic. The extraordinary November 1979 rains however, filled the reservoir to its capacity of 56 Million Cubic Meters (MCM). At one point, the reservoir was rising at the rate of 3 mtrs per hour. During these rains a considerable amount of valuable water was spilled over the Dam into the Dead Sea basin. This event illustrates the magnitude of Jordan's water problem and the need to catch and utilize all water. Present efforts are directed at constructing dams on most major rivers and wadis to capture all available flows.

Over the past five years the JVA has also worked on feasibility and the design of the Maqarin Dam on the Yarmouk River located on the Syrian border. This billion dollar project will impound at least 328 MCM by a 128 mtr high earth and rockfill dam. AID has participated in funding both the feasibility and design of this project by Harza Overseas Engineering Company. Impounded water will provide irrigation for Jordan Valley and 164 MCM per year of water to supply the cities of Amman and IRBID,(Jordan's third largest city). AID is financing the design of water and sewerage facilities for Irbid under a contract with Weston Intnl. and Stanley Consultants. AID also has programmed construction funding for part of the Irbid system. Irbid, a city with a present population of about 113,000 has no sewerage system. Jordan has only two sewage treatment facilites, the largest in Amman is being expanded with AID assistance. AID also is funding the study and design of systems in five other population centers mostly located on the northern plateau where 97% of the population are located.

The JVA will also provide water supplying the city of Amman. Amman's water system, with 53,000 connections, intermittently provides water (sometimes only one day a week) to a user population of about 400,000. A fleet of 50 utility operated tankers provides emergency water and water to areas not served by the distribution system. Over the past 15 years the city has constructed 75% of the water supply system and all the sewerage system. AID, as well as other donors, are funding projects for improvement and expansion of the Amman water supply and distribution system. Several related projects are discussed below.

JVA project for increasing the supply of water to Amman will provide for the construction of 39 kms of 1.2 meter diameter steel pipeline which will carry 45 MCM annually. This engineering feat will transport water from the Jordan Valley (elevation about 225 meters below sea level) to Amman (elevation about 1055 meters). Within a distance of 6 km the ground rises 825 mtrs. In addition to the pipeline the project includes a water treatment plant and pumping facilities (to handle a 1360 meter head) and distribution reservoirs around the city of Amman. AID is financing the engineering design being performed by Stanley Consultants and Boyle Engineering. AID will also participate in the construction of the treatment plant and pumping stations.

Water distribution and sewage collection systems within the capital city of Amman (population about 800,00) were designed by British and Scandinavian engineering consultants. AID and the IBRD are financing discrete construction contracts for various water and sewer lines in the city.The Amman Water and Sewer Authority (AWSA) manages the city's Water supply system and the pipelines and wells providing water for the city. A recently completed 130 km, 600 mm pipeline from the Azraq Springs to Amman will increase Amman's water supply by 6-8 MCM per year. AID is financing the services of a sanitary engineer and water utility financial expert to work under a long-term assignment to AWSA. These individuals under contract to AWSA, are working within the AWSA organization filling staff positions where their expertise is being applied to develop the capacity to deal with these areas. Recently, AWSA has made arrangements with the

Washington Surburban Sanitary Commission (WSSC) whereby personnel from both organizations, on an as needed-basis, work in each other's facilities to exchange work procedures and solve mutual problems. This program is both beneficial and economical in that travel and subsistence are the only costs. This program is proving successful and appropriate for implementation in other countries.

The foregoing discussion has highlighted some of the major problems that one country, Jordan, is facing in this Drinking Water and Sanitation Decade. On a worldwide basis the US and other advanced-technology nations are making appreciable progress in exploiting the maximum water available in water scarce countries. However, unlike food, which can within limits, be produced to the point of abundance with surpluses directed to the hungry nations, water, is a more precious resource which cannot be produced to excess and in many countries is limited in spite of all the technology available. Under such conditions, additional water can only be made available by conservation of existing supplies and increased efforts to better allocate and manage that water available. Such action is necessary just to maintain a constant per capita consumption. The US technology and its applications to water scarce areas, ultimately might increase the water available but when coupled with increased waste and pollution and high rates of population growth, the resulting per capita utilization will probably decrease. AID has recognized the critical role of conservation (as well as population growth) in this Water Decade, however "selling" less developed nations on conservation (or population control) is not easy. Since many countries lack an understanding of the technology needed to expand their own scarce water supplies and to effectively utilize the water they do have, it is ludicrous to expect them the grasp the full importance of conservation measures and the consequences of not carrying then out, particularly when they are exposed to promises of more and better supplies of water. Somehow, someway, conservation and water management should be given equal priority with the development and distribution of water in the developing nations of the world. This is not only a mandate for those organizations engaged in development but a mandate for all engineers and technicians involved in water resources activities both at home and abroad.