ENUI

FINAL DRAFT
(Yellow Cover)

RURAL WATER SUPPLY AND SANITATION

IN

SUB-SAHARAN AFRICA

A STRATEGY BRIEF

May 1989

AFRICA TECHNICAL DEPARTMENT
Infrastructure Division

INFRASTRUCTURE AND URBAN DEVELOPMENT DEPARTMENT
Water and Sanitation Development Division

EXECUTIVE SUMMARY

i. Rural Water Supply and Sanitation (RWSS) are indispensable components of rural development. Alone but even more effectively combined with health education, RWSS improves human health and thus productivity. Such schemes do so only if provided on a permanent basis. Therefore, the objective of all RWSS projects must be:

"TO DEVELOP SUSTAINABLE EFFECTIVELY UTILIZED
WATER SUPPLY AND SANITATION FACILITIES" 1/

ii. The International Drinking Water Supply and Sanitation Decade (IDWSSD) commenced in 1980 has stimulated many organizations to reexamine their work in order to make it more effective. This effort has resulted in the clear recognition that non-technical aspects play a crucial role particularly in RWSS, that community participation in all aspects of project development, implementation and operation is indispensable and that health and hygiene education is an essential component of successful RWSS projects. 2/ This Strategy Brief, drawing on the many experiences to date, sets out an appropriate policy agenda for the countries of Sub-Saharan Africa, donor and other lending agencies as well as for the World Bank. 3/

1/ This formulation was first proposed by Dr. D. Narayen-Parker of PROWNESS in the draft PEGESUS guidelines.

2/ The World Bank has also produced two important papers by Churchill et al (Sept. 1987) and by Briscoe and de Ferranti (March 1988) - See references 8 and 10.

3/ References to the World Bank include IBRD and IDA; loans and lending incorporate both IBRD loans and IDA credits.

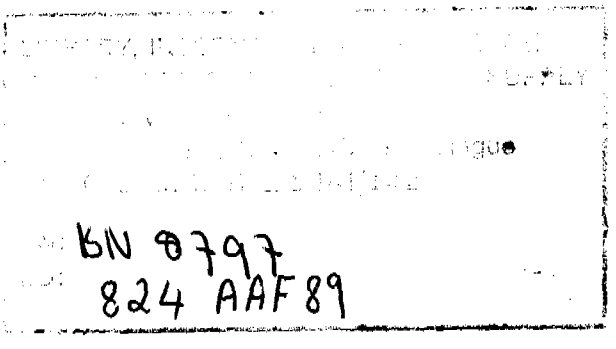
iii. At the same time, it was recognized that more appropriate technologies had to be used; many were identified or developed and then successfully applied through cooperative efforts of multi-and bilateral organizations.

iv. Successful accomplishments at the project level based on the socio-culturally responsive use of appropriate technology must now be replicated on a large scale through (a) the adoption of national policies which encourage this approach to RWSS and (b) the adoption of a process of planning and implementation that facilitates the large scale replication of these successes through national programs.

v. Experience reviewed in preparation of this report shows that efforts to improve RWSS have suffered from several misconceptions. Among them are the assumption that:

(a) rural populations are unable to contribute towards construction or maintenance of facilities, thus requiring centralized administrative systems and grant funding of RWSS;

(b) technologies could be "parachuted in" without regard for socio-cultural and economic conditions;



(c) rural populations would understand the need for clean water and good personal hygiene and thus use the facilities properly.

vi. As a result of those misconceptions, RWSS facilities frequently fell into disuse or were abandoned and progress overall has been unsatisfactory;

vii. Nevertheless, there have been some remarkable successes based on:

(a) community participation in project development, implementation and operation after extensive health information efforts - often by NGOs;

(b) technologies selected by the community reflecting socio-cultural conditions and the communities' capacity to maintain the facility and to contribute, in cash or kind, towards construction; construction tasks shared by community and contractor on the basis of complexity and community ability;

(c) government support rather than rigid control of the communities' efforts.

viii. The conclusions which emerge from those experiences are that the rural population is both able and willing to contribute towards RWSS and able to maintain facilities if properly motivated. The degree of financial support needed depends on the technologies selected and rural development policies which impact on income potential of the population. Appropriate credit arrangements can assist in generating user contributions.

ix. The basic approach which can be derived from this experience and which should be adopted by government and assistance agencies alike is:

(a) Community Management of its own RWSS efforts, with a support structure to assist the community with tasks beyond its capacity;

(b) Implementation of Community Management through initial efforts in education and motivation followed by technical assistance by those with the best track record, usually NGOs.

(c) Achievement of long term sustainability through cost recovery sufficient to cover, as a minimum, operation, maintenance and replacement, with implementation priority given to projects generating resources in cash or kind towards construction.

x. Progress in RWSS will depend on how well the lessons of the past and in particular those learned during the IDWSSD, can be implemented at the national level. This should be done through national sector development plans prepared by national authorities with the assistance of local, national and external organizations competent to make a contribution. The following steps would lead to the adoption of national sector plans:

(a) review of experience and dissemination of lessons learned through the consultative framework recently established by multi-and bilateral organizations and NGOs. The dissemination effort could be in the form of case studies (by country or topic, with cross-country comparisons for the latter), training materials, workshops and seminars;

(b) development of national, regional and district plans by governments with the help of external support, as appropriate, including the formulation of policies and implementation strategies for all sector investments and the creation of needed community support structures;

(c) identification, planning and implementation of projects, and

(d) monitoring and evaluation of national plan implementation with experience disseminated through consultative framework so lessons learned can be used in future planning and development.

xi. The World Bank should play a catalytic role in the establishment of national plans by:

(a) targeting its financial support to projects which implement policies designed to achieve long term sustainability;

(b) making an increasing amount of the funds lent in the form of sector loans in support of sector policy and strategy changes, including the financing of project or program components implemented by others, such as NGOs;

(c) agree with government on the delegation of project development and implementation to UNDP/WB Decade Programme or other lead organization, including other External Support Agencies (ESAs) or NGOs with a proven track record, in order to increase the size, impact and effectiveness of its lending operations.

xii. Enough is known today, after the intense efforts made so far during the IDWSSD by many organizations, to put RWSS development at the threshold of rapid progress provided the lessons learned are applied by all and the complementary abilities of all organizations are applied to the mutual benefit of all. This document outlines possible policies and strategies with a plan of action which should be discussed with other ESAs and governments. Hopefully, such discussions will lead to the adoption of policies and strategies by African governments and ESAs which will increase the effectiveness of all support activities to the benefit of those in greatest need, the rural population presently without satisfactory water supply and sanitation service in Africa.

Footnote: This Strategy Brief will be further refined when the results of (a) the Health Benefits Study and (b) country/thematic case studies have been completed during 1989.

docname:ex.summ.

I. INTRODUCTION

1. Objectives of the Strategy Paper

1.01 The World Bank and its African Members States recognize that Rural Water Supply and Sanitation (RWSS) are important ingredients of rural development. They, and others who are providing financial and technical assistance to the RWSS sector, are also aware of the many difficulties encountered in implementing RWSS projects and the limited progress made towards reaching International Drinking Water Supply and Sanitation Decade Targets set by the various governments.

1.02 Experience gained during the Decade so far leads to conclusions which hold the promise of more effective efforts in the future. It is the objective of this paper to:

(a) present experiences in RWSS projects of the recent past;

(b) draw lessons learned from these experiences;

(c) suggest policies and strategies appropriate to the needs of Sub-Saharan Africa (SSA);

(d) recommend a role for the World Bank and others in supporting the sector in SSA; and

(e) assist in coordinating activities of all participants in the RWSS sector in SSA.

Two important papers concerning RWSS have been published by the World Bank in recent years (see references 8 and 10) which have contributed, inter alia, to the preparation of this paper. However, this paper is more sharply focussed on an agenda for implementation in Africa.

1.03 The paper is intended for decision-makers in the World Bank, Member Governments in Sub-Saharan Africa and External and Internal Assistance Agencies, including Non-Government Organizations (NGOs), and those responsible for implementing those decisions. The paper should, it is hoped, promote the discussion of issues presented and policies proposed - it is acknowledged that some countries and donor agencies are already pursuing policies and objectives similar to those contained in this paper. Eventually, probably in early 1990, the paper will be finalized after probably two workshops of decision makers and then could form the basis of a common approach towards RWSS for the next Decade.

1.04 Recommendations are made in the paper for undertaking several studies leading to guidelines on specific topics. These studies should also help the exchange of information between countries so all may benefit from the experience of others. At the same time, they will provide an opportunity to quantify the largely anecdotal information available today.

1.05 Finally, one of the principal purposes of the paper is to enable the World Bank to work more effectively with member countries and other sector support organizations.

2. Organization of Strategy Paper

1.06 The paper is organized as follows:

Section I describes the objectives and the organization.

Section II provides an overview of existing conditions of RWSS in Sub-Saharan Africa.

Section III discusses the issues and suggests how to resolve them.

Section IV formulates a country sector strategy based on the review of the issues in the previous section.

Section V proposes a more effective role for the World Bank in RWSS and includes a plan of action to implement the proposals.

1.07 The principal sources of information used in the preparation are World Bank documents, those of other organizations reporting on RWSS experience, particularly those of bilateral assistance agencies and WHO, and documentation prepared by the UNDP/WB Decade Programme. Section II has been abstracted from a comprehensive review "Phase 1: Basic Sector Analysis".[1] That document contains available statistical evidence on service coverage, costs and government and external support for selected countries in Sub-Saharan Africa.

1/ Rural Water Supply and Sanitation Strategy Review, Phase I: Basic Sector Analysis. Working Report, July 1988. AFTIN (Dr. P. Yletyinen and Mr. H. Vikman, Consultants).

II. RURAL WATER SUPPLY AND SANITATION IN SUBSAHARAN AFRICA

1. Existing Conditions

(i) Characteristics of Rural Water Supply and Sanitation Sector

2.01 Within the area of 22 million square kilometers of Sub-Saharan Africa there are about 400 million people (1985) representing 2,000 ethnic groups in 45 developing countries. The rural population in Sub-Saharan Africa is scattered in thousands of villages, clusters of small settlements, dispersed groups of dwellings and, to a lesser extent, roving bands of nomads. The geographic, socio-cultural and economic environment varies considerably, thus making generalizations difficult and necessitating flexibility and versatility in any development strategy.

2.02 The physical separation of the population in rural Sub-Saharan Africa requires thousands of individual water schemes and even more numerous on-site sanitation facilities. Not surprisingly, service coverage varies widely among countries, as the following Table 1, compiled by AFTIN, demonstrates.

TABLE 1

AFRICA REGION
WATER SUPPLY AND SANITATION
BASIC INDICATORS

	Country	Population: million mid-1987	Population: Avg. Ann Growth % 1980-87	Area (000) (km2)	Density Pop/km2	GNP per capita: US$ 1987	GNP per capita: Avg. Ann. Growth % 1965-86	Water % Access: Urban	Water % Access: Rural	Sanitation % Access: Urban	Sanitation % Access: Rural	Infant Mortality (per 000) 1986	Life Expect. (years) 1987	Adult Lit'cy Rate %	Debt Service % Export Goods, Service 1986	Water Disease per 100,000
Low-income economies																
1	Angola	9.2	2.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		44			
2	Benin	4.3	3.2	113	38.1	300	0.2	30	15	20	5	115	50		28.8	
• 3	Burkina Faso	8.3	2.6	274	30.3	170	1.3	50	30	30	5	144	47		14.8	
4	Burundi	5.0	2.7	28	177.5	240	1.8	90	20	n.a.	15	118	49	35	19.0	
5	CAR	2.7	2.5	623	4.3	330	-0.6	30	5	n.a.	n.a.	137	50		9.6	
• 6	Chad	5.3	2.4	1,284	4.1	150	n.a.	n.a.	n.a.	n.a.	n.a.	138	46		2.2	
7	Comoros	0.4	3.5	2	212.0	380	0.6	n.a.	n.a.	n.a.	n.a.		56			
8	Djibouti	0.4	n.a.	22	16.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		47			
9	Equat. Guinea	0.4	1.9	28	13.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		46			
•10	Ethiopia	44.8	2.4	1,222	36.6	120	0.0	70	5	20	n.a.	168	47	8	25.8	
•11	Gambia	0.8	3.3	11	71.8	220	0.7	n.a.	n.a.	n.a.	n.a.		43			
12	Ghana	13.6	3.4	239	56.9	390	-1.7	70	40	20	n.a.	94	54		10.8	
13	Guinea	6.5	2.4	246	26.3	n.a.	n.a.	25	15	n.a.	n.a.	153	43		n.a.	
•14	Guinea-Bissau	0.9	1.9	36	25.7	170	-2.0	21	37	n.a.	n.a.	160	39	82		
•15	Kenya	22.1	4.2	583	37.9	340	1.9	80	20	45	20	91	56	47	n.a.	
16	Lesotho	1.6	2.7	30	54.0	360	5.6	40	20	n.a.	10	106	56	70	4.2	30
17	Liberia	2.3	3.3	111	20.9	440	-1.4	n.a.	n.a.	n.a.	n.a.	127	55		6.4	
18	Madagascar	10.9	3.3	587	18.6	200	-1.7	75	10	60	5	109	54	56	27.7	7,140
19	Malawi	7.6	3.3	118	64.4	160	1.5	70	50	50	n.a.	156	46	25		
•20	Mali	7.8	2.4	1,240	6.3	200	1.1	55	20	n.a	n.a.	174	47		14.2	
•21	Mauritania	1.9	2.6	1,031	1.8	440	-0.3	n.a.	n.a.	n.a.	n.a.	132	48		17.4	
22	Mozambique	14.6	2.7	802	18.2	150	n.a.	50	50	10	n.a.	123	48	44	n.a.	
•23	Niger	6.8	3.0	1,267	5.4	280	-2.2	50	30	35	10	140	45		40.3	
24	Nigeria	106.7	3.3	924	115.5	370	1.9	60	30	n.a.	10	109	51		23.4	
25	Rwanda	6.5	3.3	26	248.1	310	1.5	70	60	60	80	124	49		7.6	
•26	Sao Tome & Pr	0.1	2.8	1	114.0	280	0.7	98	79	n.a.	n.a.	80	65		79.9	
27	Sierra Leone	3.8	2.4	72	53.3	300	0.2	n.a.	n.a.	n.a.	n.a.	175	41		8.2	
•28	Somalia	5.7	2.9	638	8.9	290	-0.3	60	20	n.a.	5	152	47	60	62.1	
•29	Sudan	23.2	2.8	2,506	9.3	330	-0.2	50	30	n.a.	15	112	49	32		22,000
30	Tanzania	23.9	3.5	945	25.3	220	-0.3	80	40	80	n.a.	110	53	79	n.a.	
31	Togo	3.3	3.4	57	57.0	300	0.2	n.a.	n.a.	n.a.	n.a.	97	53		32.5	
•32	Uganda	15.7	3.1	236	66.3	260	-2.6	60	10	60	30	108	48	52	6.5	
33	Zaire	32.7	3.1	2,345	13.9	160	-2.2	25	5	10	n.a.	102	53		n.a.	
34	Zambia	7.2	3.5	753	9.5	240	-1.7	70	30	90	50	84	53	44	n.a.	
	Subtotal	406.7		18,400	22.1								49			
Middle-income economies																
1	Botswana	1.1	3.5	582	1.9	1,030	8.8	90	65	70	25	71	59	35	4.3	n.a.
2	Cameroon	10.9	3.3	475	23.0	960	3.9	40	30	n.a.	n.a.	89	56		22.8	
• 3	Cape Verde	0.3	2.1	4	85.8	500	n.a.	60	30	30	5		65		n.a.	
4	Congo	2.0	3.3	342	5.8	880	3.8	50	10	n.a.	n.a.	77	59		39.8	
5	Cote d'Ivoire	11.1	4.2	322	34.3	750	1.2	90	40	35	10	105	53		n.a.	
• 6	Mauritius	1.0	1.0	2	520.0	1,470	3.0	90	80	70	30	25	67		85.0	
• 7	Senegal	7.0	2.9	196	35.5	510	-0.6	60	30	30	10	137	48		20.2	
8	Swaziland	0.7	3.4	17	41.9	700	2.8	n.a.	n.a.	n.a.	n.a.		55			
9	Zimbabwe	9.0	3.7	391	23.0	590	1.2	80	30	80	20	77	57	70	n.a.	
	Subtotal	43.1		2,331	18.5								58			
Upper middle-income economies																
1	Gabon	1.0	4.1	n.a.	n.a.	2,750	n.a.	n.a.	n.a.	n.a.	n.a.		52			
2	Seychelles	0.7	0.7	n.a.	n.a.	3,180	n.a.	n.a.	n.a.	n.a.	n.a.		70		n.a.	
	Subtotal	1.7											61			
	TOTAL	451.5		20,731	21.6								54			

Sources: WDR 1988; World Bank Sector Reports, Appraisal Reports, WHO Data, Field Data Collection, World Bank Atlas 1988.

• Reviewed and ratified by AF INF Depts.

(ii) Institutional Framework

2.03 In many countries in the region, local communities are responsible for the provision of water supply and sanitation services (Rwanda) or central governments are reassigning them that responsibility (Tanzania). Nevertheless, because local communities have been unable to meet this obligation, many central governments have taken the full responsibility for activities in rural water supply and sanitation (RWSS) ranging from policy-making, financing and planning to construction and operation and maintenance. Unfortunately, extensive experience clearly shows that in RWSS, centralized institutions - whether public or private - have not been able to cope with requirements, and services are at their worst. Some exceptions exist; for example, Malawi has succeeded very well with centrally administered programs which are based on community participation.

2.04 Typical consequences of the dominance of central government are: a downgrading of local government; restraints on the private sector; excess bureaucratization; and neglect of both the user and the facilities placed at his disposal.

(iii) Non-Governmental Organizations and their Role

2.05 NGOs have long been active in all areas of social and physical infrastructure, including RWSS. They usually have close ties to and understanding of local level activities. Although the NGOs have achieved many good results, they are generally active in small-scale operations only. In addition, they usually provide assistance without cost-recovery.

(iv) Women in Development

2.06 Women are often the main beneficiaries of improved water supply services, but they are seldom recognized as potentially valuable partners. In some societies, women, even with their responsibility for providing water, are not allowed by custom to take part in public affairs and or to have access to expendable incomes.

2. The Sector's Impact on Rural Development

(i) Poverty Alleviation

2.07 The impact of the RWSS on poverty alleviation is difficult to quantify. Benefits are: the saving of time spent for queuing for or hauling of water; improvements in health and; employment in construction, operation and maintenance of RWSS facilities. Financial benefits of time saving and better health obviously depend on employment opportunities.

(ii) Health Impact

2.08 Most rural water supply and sanitation projects have been justified on the basis of assumed improvements in health which are highly correlated with literacy, level of female education, and income, rather than the level of water and sanitation services alone. Recent studies show clearly, however, that water supply, sanitation and hygiene education together may reduce the incidence of diarrheal diseases in young children by as much as 40%.

(iii) Resource Allocation

2.09 There is no doubt that the RWSS sector is a necessary component in the development of rural communities. There is some evidence that time saved as a result of more accessible water supply is being used to increase agricultural productivity. Studies have shown that acute water related illness is resulting in economic loss to the household. Nevertheless, RWSS is in general among the first components to be dropped in connection with rural development projects, if there is a scarcity of funds or if it does not directly support agricultural or livestock production.

3. Economic Constraints

2.10 The initial objective of the International Drinking Water Supply and Sanitation Decade (IDWSSD) to provide safe drinking water and adequate sanitation for all by the year 1990 exceeded the financial and institutional capabilities of most countries. Unfortunately, the economic difficulties most countries experienced in the 1980's forced them to reduce their financial support to the sector to a fraction of the Decade plan estimates. Initial reluctance to implement cost recovery policies has contributed to the resource gap. The "Phase I: Basic Sector Analysis Report" provides information on the level of investments and foreign assistance of selected countries. The figures shown in that report indicate that from less than 10 to 35% of loans and grants were allocated to the water and sanitation sector, but only from less than one to six percent to rural water supply, which explains the continued low coverage in rural areas.

4. Recent Project Experience

(i) Implementation

2.11 Two of the key findings from a review of past experience are the dominance of central government in the RWSS project implementation, but that sustainability and replicability in RWSS programmes are likely to be achieved only through decentralized planning, implementation and maintenance activities.

(ii) Human Resource Development

2.12 Human resource development has been often understood as a separate training component of a project although it is closely interrelated to institutional development. This has led to fragmented training, which has concentrated on providing professional and technical skills to some staff of the institution without considering career development and employment conditions necessary to retain staff.

(iii) Projects

2.13 RWSS in Sub-Saharan Africa has a character of a social service rather than a sustainable economic activity. This character has probably attracted specific bilateral donor agencies and NGOs, and encouraged them to launch programmes based on subsidized services and

neglect of cost-recovery or cost sharing. Fortunately, during the last few years, governments as well as international donor agencies have come to recognize the resultant lack of sustainability of RWSS services and are changing their approach. NGOs, for example, have found that people often do not value very highly what is received free and have instituted policies requiring user contribution even though they themselves do not recover any of the funds.

5. Relative Role of Various Donors and Donor Coordination

2.14 The vast majority of RWSS investments (70-95%) in Sub-Saharan Africa are financed by donor agencies, bilateral aid accounting for a lion's share of the external financing. With the resulting influence, some bilateral donor agencies have had a key role in the formulation of sector policies and strategies in Sub-Saharan Africa. With each agency having its own objectives and policies, conflicts on priorities and methods occasionally arose.

2.15 Donor coordination is the responsibility of the recipient governments. Their task is usually made difficult due to the weaknesses of their institutions, the specific and often conflicting objectives of donors, and the lack of national policies, strategies and development plans for the sector. Competition for attractive projects has on occasion led to very generous support and, reflecting this competition, with only minor attention paid to cost-recovery issues. Improved donor coordination would provide recipient governments with more effective assistance. Donors, individually and

jointly, should assist governments in the preparation of sector strategies and plans which define the role of external assistance as well as government policies and institutional responsibilities. A cooperatively developed sector strategy would allocate tasks to various organizations so they could be undertaken by those best qualified to the benefit of all.

2.16 Water availability in Sub-Saharan Africa varies greatly. Most regions suffer from a severe water deficit although some countries in West Africa (and a few in East Africa) are blessed with abundant water resources. Just as important a consideration for RWSS development is the interannual variability of rainfall which can reach as much as 30 to 40% change from average. This variability affects the shallow ground water resources which in handpump supplied RWS is the principal source of water (for a graphic presentation of annual rainfall, surplus and deficiencies; and variability, (see figures 1 to 3 in Annex 1).

Recent severe droughts have demonstrated the problems of inadequate water resources; at the same time they revealed just how little is known about Africa hydrogeology. Efforts have started to overcome this problem and to create the database necessary for adequate water resource planning. In the meantime, water supply projects in the drought areas should emphasize water conservation and reuse.

III. ISSUES DISCUSSION

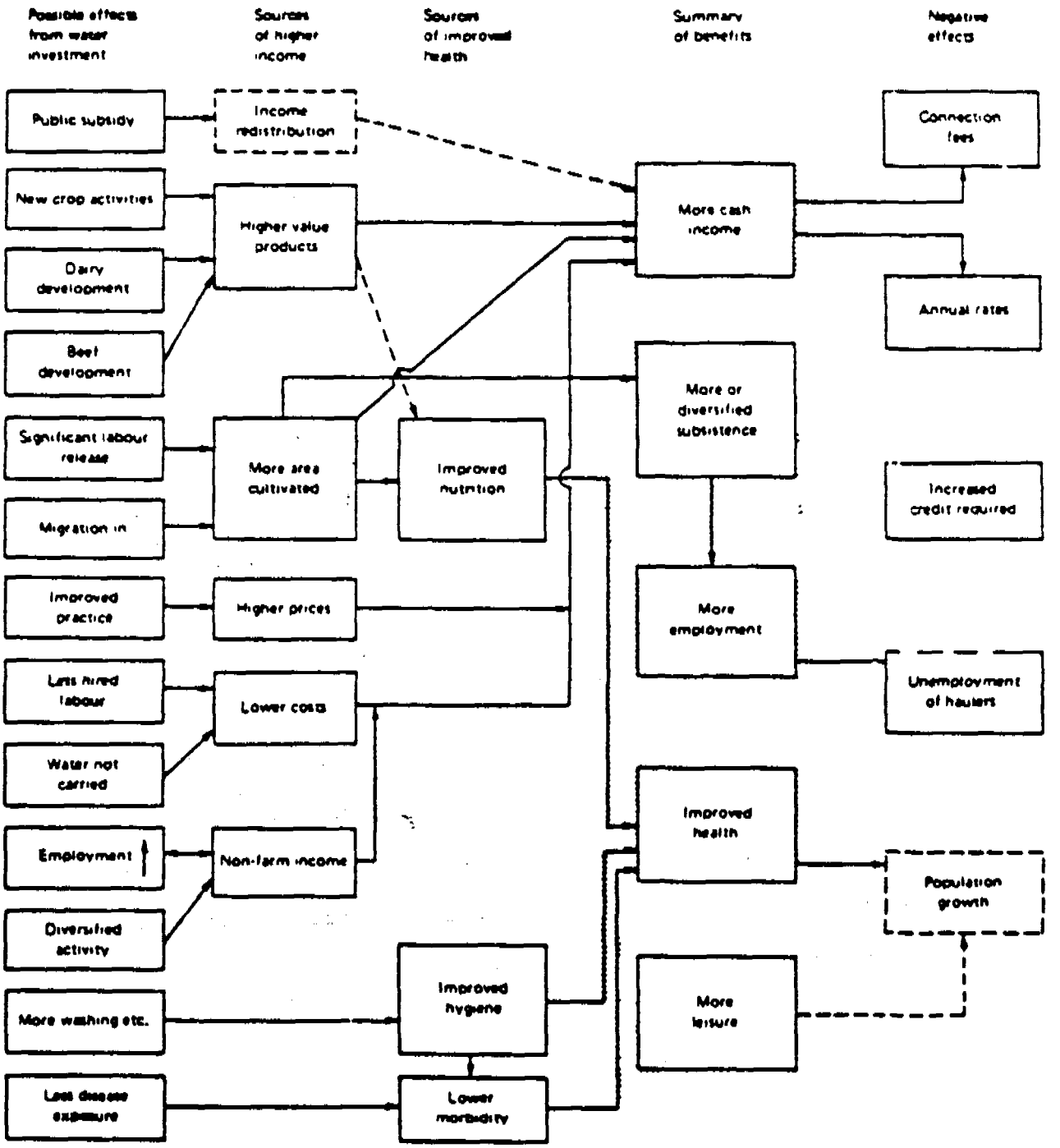
1. The Role of Water Supply and Sanitation in Rural Development

(i) Economic and Financial Aspects.

3.01 Water supply and sanitation have an impact on people's health and well-being, economic development (industry, commerce, agriculture), and the environment. The impact, in turn, is affected by socio-cultural conditions, education and personal income. The usual problem in project justification has been the difficulty of quantifying the expected benefits which has led to a lack of commitment and support from financial decision makers or economic planners. For example, provision of easily accessible water supply reduces time required to carry water from traditional sources. Assigning a value to time saved can provide economic justification; but with no opportunity to spend the saved time in gainful pursuit, there is no incremental financial return nor additional income to pay for the investment. Studies show not only that complex interactions between RWSS and other activities exist which make quantification of benefits from a single intervention difficult, they also show that impacts are sequential or linked. A graphic presentation of water supply impacts is shown in Box 1. The graph was developed by Carruthers (1) while working in Kenya in the 1970's, on the basis of experience in East Africa. The figure shows not only the impact of water supply but also the complexity of interactions.

BOX 1

Impacts of Water Investments (Carruthers, 1973)



3.02 Both anecdotal and statistical evidence of the economic benefits of RWSS exists. For example, a 1988 study (2) of the impact of Guinea worm infection on women in selected Nigeria villages reveals an average annual loss of cash income of US$70, about 15 to 20% of their income. In addition to loss of income, these women had expenses for medicine, child care and household help in cash or in kind. Adequate RWSS would have prevented this loss. On a positive note, women benefitting from the water supply component of a World Bank rural development project in Nigeria's Sokoto State (3) report an increase in cotton production as a result of reduction in time spent carrying water.

3.03 Poverty alleviation is also a consideration in the promotion of RWSS. The long term gain in employment is admittedly limited, handpump caretaker and similar occupations have a very limited potential for increasing employment. Short term employment can be significant, as the latrine construction programs by local masons in Lesotho (4) and Botswana (5) indicate. The indirect benefits, as demonstrated in the previously discussed case of income loss due to preventable illness, can be substantial. In that case, safe and easily accessible water is indispensable to prevent loss of income. Studies are needed to quantify these impacts in order to strengthen project justification.

(ii) Health Impacts.

3.04 A similarly clouded issue has been the health impact of water supply and sanitation investments. The difficulty here lies in proportionating impact among water supply, sanitation, health education and other, less directly related aspects such as nutritional status, primary health care, etc. Reductions in infant mortality due to Oral Rehydration Therapy (ORT) have led to preference for ORT rather than improvement in water supply and sanitation: a choice in favor of the quick fix over long-term improvement (disregarding the fact that ORT has no impact on morbidity, only on mortality, i.e. it has to be used again and again) (6). The problem has been compounded by the difficulty of conducting adequate long-term studies to quantify health impacts. However, recent examinations of available evidence published by WHO (7) reveal the following impacts:

Improvements in	Medium % Reduction in Diarrheal Morbidity
1. Water Quality	18
2. Water Quantity	25
3. Water Quantity and Quality	37
4. Excreta Disposal	22

The addition of health education to improvements in water quality and quantity and excreta disposal improves the impact even futher. The financial/economic implications are significant considering that diarrheal diseases are responsible for around 30% of childhood mortality in less developed countries. How much the productivity of individuals is affected depends on whether the disease strikes at planting or harvesting time, for example. Several excellent long term health impact studies are being written up. A summary report will be prepared early in 1989 and its conclusions presented in the final version of this strategy paper.

3.05 There are some diseases where the impact of an intervention is clear. Some 120 million people in Africa are at risk of guinea worm infection. Safe water will eradicate the disease. Amongst other diseases for which substantial impacts, though with greater efforts (a combination of water supply, sanitation and health education) can be achieved are schistosomiasis, typhoid, a variety of helminthic infections, skin infections and eye infections.

(iii) Linkages

3.06 Water supply and sanitation are a necessary and indispensable component of a number of activities required to improve human health and productivity. Hygiene education, maternal and child care, nutrition, immunization are others, commonly referred to as primary health care. Depending on local circumstances, there might be clear

priorities among them. In any event, investments in rural water supply are often ineffective without at least hygiene education and should not be undertaken without it. Sanitation, at least its planning where investments cannot be made simoultaneously with water supply investments, should also be considered an indispensable component of water supply projects.

3.07 External linkages may be equally important. Water supply may indeed be more successful as a component of a rural development project than as a free standing effort by itself. For example, rural development projects can offer incentives water supply alone cannot. Institutional development may also be more successful as part of an economically more visibly productive activity. Although free standing water supply and sanitation projects should not be eliminated, particularly where strong interest exists or communities are capable of handling the effort required, an attempt should always be made to incorporate water supply and sanitation components into or coordinate with rural development plans.

(iv) Benefit Assessment

3.08 Many RWSS benefits have a long term impact and cannot be easily measured in the short term. Evidence suggests, nevertheless, that health and many of their corresponding economic and financial impacts can be quantified (8). Churchill et al suggest that in the rural context one cannot simply observe how much people presently pay for service and use that evidence as a basis for estimating how much

they would be willing to pay for improvement - many rural households pay nothing or only a very small amount that is unrelated to how much they would be willing to pay. They suggest that the amount of time that users would save as a result of whatever service improvement is being considered should be assessed and then the value of this time to users estimated based on evidence of the household behaviour. In relating the value of time to investment costs and technology they suggest that if the value of time is above about US$0.20 per hour, the yard tap system is the least cost option, assuming that consumption is in the 20 to 75 lcd range. When the value is less than US$0.05, the hand pump system is the least cost alternative. RWSS project justification should identify these impacts, quantify where possible, and audit those impacts as the project progresses. Due to the dearth of information and evidence, economic/financial/health impact studies should be undertaken and methods for their quantification for project justification developed.

2. Institutional Issues

(i) Delivery Systems.

3.09 In many countries, provision of water supply and sanitation services (among others), is the legal responsibility of the local authority (town, village, district council). Rural communities generally do not have the financial, technical or organizational capacity to perform this role. As a consequence, governments have

created a variety of usually centrally controlled mechanisms (ministries, semi-autonomous institutions, regional authorities, etc.) to provide services. Some of these arrangements have had a modicum of success, more often services have remained at an inadequate level.

3.10 The reasons for this lack of success are many and often reflect early government preference for centralized, state controlled activities. Staff prefers to remain in urban areas where living conditions are attractive. Private enterprise has been discouraged from developing rural activities. As a consequence, both competent staff and access to spare parts is missing in rural areas, resulting in a high incidence of malfunctioning and abandoned facilities.

3.11 The solution to this problem of service delivery is for outside institutions to support the community, not to replace it. This requires of centralized institutions first a deconcentration of its functions to make them more accessible to the rural community; and eventually a decentralization which places the responsibility of providing services on the community. Several African countries, among them Botswana, Burkina Faso, Lesotho, Malawi and Mali, have successfully implemented such decentralization while others, such as Kenya and Tanzania, are in the process of doing so. Concurrent with this deconcentration/decentralization should be an effort to encourage the private sector (local mechanics, associations, cooperatives, entrepreneurs, manufacturers, NGOs) to provide operation and maintenance services and spare parts. Project planning is already

frequently provided by private contractors but implementation support for construction work by the rural community may require new "partnership" arrangements between community and private entrepreneurs. Boxes 2 and 3 demonstrate attempts by two different governments to solve this problem.

BOX 2

Private Sector Operation and Maintenance - SODECI in the Cote d'Ivoire

The "Societe de Distribution d'Eau de Cote d'Ivoire" was in charge of O&M of water supply services for urban and rural communities under an affermage (liaise) contract for which it was paid a percentage of the revenues collected from the sale of water in the urban centers. The larger share of revenues was paid to the public body financing and owning the facilities. Service in communities benefitting from piped systems has been satisfactory, but inadequate for those served by handpumps. Although part of the population in the latter communities were willing to pay for repairs, SODECI di not succeed in providing prompt and reliable service.

As a consequence, responsibility for handpump supplies is being transferred to the villagers themselves. The Direction de l'Eau (DE) under the control of DCGTX 1/ is responsible for community mobilization (motivation and training) and for providing necessary technical assistance through its own staff. Training of DE staff in both handpump technology and villagers sensitization was carried out by expatriate technical assistance. Maintenance will be performed by village repairers and local mechanics under contract with the community. Technicians of DE have identified and trained these mechanics. DE has also established a private sector spare-parts network to serve the rural communities.

Rehabilitation of non-functional handpumps in sensitized villages is financed by the WB/Ln. 2130-IVC , but future replacements and O&M of handpumps is the responsibility of the users.

- Renewal of handpumps: to be paid by villagers;
- Construction of boreholes: at the charge of Government.

Abstracted from the World Bank documentation.
1/ DCGTX: Direction et Controle des Grands Travaux.

BOX 3

National Authority for Urban Water Supply - REGIDESO in Zaire

REGIDESO (Regie de Distribution d'Eau de la Republique de Zaire) is responsible for piped water supply in both urban and rural centers. Non-piped water systems are generally the responsibility of SNHR (Service Nationale d'Hydraulique Rurale). The latter, unfortunately, has not been very effective and only 10% of the rural population has reasonable water supply service; 62% of the urban population has adequate service.

To improve rural water supply service, the government has charged REGIDESO with carrying out a sector study and strategy and providing technical assistance (planning, design, research) to SNHR. Among the REGIDESO experiences to be applied is the use of concessionaires of public standpipes with the intent of shifting O&M responsibility for standpipes to concessionaires who pay their water bills to REGIDESO and therefore are fully motivated to recover costs. At the same time, preference for project implementation (through packages of works to be identified) is to be given to contractors and use of force account work would be reduced.

In the framework of the recently approved Third Water Supply project (concerning 18 semi-rural centers) the government make an equity contribution for the 18 centers where full cost recovery tariffs would exceed the consumers ability to pay. In the case of SNHR rural boreholes, the users are expected to pay the cost of hand pumps, with grants from donors and government covering the cost of the borehole. The community would be responsible for O&M.

Sanitation program planning and implementation is the responsibility of the interministerial PNA (Programme National d'Assainissement) while O&M is the responsibility of the municipalities. In rural areas, villagers build latrines at their own cost, if at all, sometimes supported by NGOs and Health Zones (semi-autonomous parastatal entities).

The approach described here has been initiated four years ago and needs to be closely monitored to determine how successful it ultimately will be.

Abstracted from the World Bank documentation.

(ii) Human Resource Development

3.12 Among the greatest challenges facing water supply and sanitation agencies, particularly those serving rural communities, is the development of a sufficient human resource base. This requires not only appropriate training but attractive career opportunities and adequate salaries, including incentives for staff stationed in rural areas (9). This is particularly important at a time an organization is deconcentrating or decentralizing its functions.

3.13 Traditionally, sector staff is receiving technical training. RWSS development, however, requires additional skills in social sciences and public health. The responsible institution must therefore attract professionals of other (non-technical) disciplines to form the necessary multi-disciplinary teams as well as train its own staff to be responsive to the concerns of the rural community. Working with NGOs will also place additional burdens on staff. Increased RWSS activities will therefore have to be accompanied with the appropriate training programs and policies to attract and keep competent staff.

(iii) Community Management

3.14 Sector literature is studded with references (8) to communities' inability to maintain RWSS facilities, even the simple handpump. The explanations given are either faulty technology (too

complex or inappropriate for the conditions) or lack of interest by the community. The former problem can today be overcome by sector professionals, the latter is ascribed to a lack of community participation which, in extremis, leads to the attitude: the government built the facility, the government owns it, the government should maintain it. The attitude is understandable from a community who is not necessarily convinced of the need for and benefits of RWSS, or the appropriateness of the project's design. Clearly, the community must make its own assessments of needs and priorities. The community's decision should be respected; if negative, further outside efforts should be restricted to education and provision of information. RWSS facilities not demanded and approved by the community should not be built. Care must be taken, however, that an expression of interest represents actual committment demonstrated by voluntary contribution of funds towards construction, the making available of land for facilities, etc.

3.15 For community participation to be successful, it means that communities and individuals must take a central role in the selection of service levels and in decisions about the how and why of cost recovery. Communities must be allowed to participate in all phases of designing, implementing, maintaining, supervising and evaluating new water supply and sanitation systems (8). Where Government or external agencies are involved, respective roles must be clearly defined and they must act as supporter of the community, not as owner and manager of the water supply. Sector literature (10) also reveals that

facilities built by the community with NGO help following intensive and lengthy information/education activities are more successfully maintained. Sustainability, or effective community management, of RWSS services is dramatically enhanced when women have key responsibilities. Larger bilateral projects undertaken with the help of intensive technical assistance also tend to show reasonable results in the more recent past although not reaching the success level of NGOs. The massive input of resources in RWSS project preparation required makes expansion of NGO and even bilateral efforts difficult. Multilateral organizations could help by means of sector loans or sector policy adjustment loans, using bilaterals and NGOs as "executing agencies" to perform project preparation field work.

(iv) Intermediation

3.16 Rural communities do not have the administrative infrastructure which would allow them to directly deal with ESAs, provide credits to users, purchase goods and spareparts or contract services nationally or internationally. Similarly, they usually do not have the means to ensure that extra-sectoral needs vital to RWSS success are met. Although the communities must manage their own RWSS efforts, they do need intermediaries to help them: an intermediary support structure is required. The important thing is to avoid complicated coordinating mechanisms and to ensure that the community knows of and has access to the nearest representative of the organization it needs to deal with. The community is more knowledgeable about when and how it needs help than a far away coordinating group. Among the arrangement could be:

(a) A regional authority or association, for example a water and sanitation authority (urban or rural), could be the major channel of assistance.

(b) The district office of a ministry responsible for community development could be the coordinator.

(c) A NGO, rural development or similar could assist at the local level and train community leaders (e.g. water committee) how to obtain the services they need and assist them in doing so.

(d) A bank or savings and loan facility could set up a revolving fund scheme to channel external and national resources to the community and receive funds collected by the community.

(v) Non-Government Organizations

3.17 Non-government organizations have a long history of mostly successful work with communities in water supply and other development efforts. Among the variety of organizations are those international in scope. Others are national or even local. Some are independent associations or cooperatives, some affiliated with religious movements. Some raise their own funds (both within and (mostly) outside the community to be served) and prefer to have no ties with official donors, others accept financial support from External Assistance Agencies (ESAs). In general, NGOs

(a) are involved in many small projects;

(b) have staff on site (often volunteers) which work closely with the target audience and train them by example;

(c) provide funds for their activities on a grant basis from resources raised externally, but often require contributions from the beneficiaries for financial reasons and to test seriousness of demand;

(d) tend to emphasize assistance to the least prosperous, those who clearly cannot help themselves; and

(e) work at the community set pace rather than pressing to meet project imposed deadlines.

3.18 NGOs clearly have experience and abilities in areas where the World Bank (and other multilaterals) and even government agencies have, at best, second hand experience: organization and implementation at the community level. On the other hand, NGOs are usually working at a scale too small and a pace too slow to have significant impact on national service coverage or the transfer of funds, which are among the objectives of governments and multilateral ESAs. However, if cooperation between NGOs, governments and ESAs can be strengthened (11), more rapid expansion of services is achievable through the scaling up of NGO activities with ESA funding. World Bank OMS 5.30

provides guidance to staff about the use of NGOs in Bank projects (see Box 4). For this to happen, the legal basis for cooperation and fund transfer would have to be created and funds made available by ESAs wishing to delegate project development and implementation tasks to NGOs. Similarly, legislation empowering communities to contract NGOs and the private sector to undertake RWSS activities on its behalf will be required in most countries (See Box 5).

BOX 4

World Bank Collaboration with Non-Governmental Organizations

Operational Manual Statement 5.30 of August 1988 provides guidance on collaboration with Non-Governmental Organizations (NGOs). NGOs are usually humanitarian or cooperative rather than commercially oriented organizations; they can be associated with religious or charitable movements or be cooperatives formed by people to achieve specific common objectives.

NGOs usually offer the ability to reach low income groups, promote self help and community participation, are adaptable and innovative. They usually are small scale, work in isolation without integration in broad programs and, on occasion, have political or religious objectives which reduces their attraction to governments.

NGOs can be used in project identification and preparation as consultants or advisers, or as a source of information and contact with intended beneficiaries. NGOs may finance and implement parallel activities or project components. Finally, they may implement Bank financed projects under contract with the government or the beneficiaries. A Bank supported project may also finance NGO activities, for example, upscaling from an NGO pilot or demonstration project to large scale application.

Appropriate Bank criteria and guidelines (consultant selection, procurement, audit, etc.) would apply, although direct contracting may be justified where the NGO is the only organization capable of carrying out an activity. Arrangements to reduce the administrative burden (using an intermediary to work with several NGO's, etc.) should be made whenever possible.

Abstracted from the World Bank OMS 5.30 (1988).

BOX 5

Non-Governmental Organizations in Project Development and Implementation - The Rwanda Second Water Supply Project.

The objectives of the Second Rwanda Water Supply Project are to improve rural living conditions, particularly that of women and children, through adequate water supply sustained on a permanent basis. This is to be accomplished through institutional support to the community which is to assume responsibility to manage its water supply system. Several external assistance agencies provide financial support.

Rural water supply has suffered from inadequate maintenance. The project thus introduces the concept of community management of newly constructed facilities including the raising of funds for O&M and at least 5% of construction cost. The project also includes a program of rehabilitation of existing deteriorated systems, strengthening the General Directorate of Water (GDW) so it can effectively provide technical assistance to rural communities, and creation of a National Fund for Rural Water Supply (NFRWS) to channel funds more effectively.

Project development and implementation is the responsibility of the communes and their organisms, assisted by NGOs under contract by GDW. NGOs are reviewing/defining designs with communes, undertake information collection, user education and operator training programs. They help organize the communes and assist them with the construction of the secondary distribution system.

Responsibility for operation and maintenance is carefully organized. Neighborhood (secondary) systems are the responsibility of user associations. Commune associations composed of an delegate from each user association are responsible for all systems in the community, delegating the day to day management to a Water board it elects. The board collects water charges and employs maintenance staff. The user associations also elect representatives to a Communal Water Committee in which communes officials participate. This committee has final jurisdiction on all commune water related activities and can take over deficiently operated user association systems.

Facilities shared with other communes (transmission mains, pumping stations, etc.), are the responsibility of an Intercommunal Association. It delegates day to day O&M to a Water Authority who may hire staff or private contractors to exercise its functions.

This project is an innovative approach to solving a number of problems commonly encountered in RWSS. Initial success has been promising, but experience needs to be evaluated over the long term before firm conclusions can be drawn.

Abstracted from the World Bank documentation.

(vi) Bilateral Organizations

3.19 Industrialized countries provide assistance through a variety of bilateral organizations. Some of them provide both investment funds and technical assistance, others concentrate on one or the other. They reflect the objectives of their governments in the choice of countries and policies followed (tied aid). During the last several years, stimulated by the International Drinking Water Supply and Sanitation Decade (IDWSSD), a significant convergence of policies has taken place (12). Although emphasis may differ, policies tend to favor cost recovery for the long term through user charges; service to the underserved; and community participation and hygiene education. Given this apparent agreement on fundamental policy issues, it should be possible by all ESAs active in a country to agree on a sector plan and to ensure that their activities are complementary. For example, technical assistance agencies could undertake HRD and institution building activities as a precursor to investment projects financed by other organizations.

(vii) Women's Role

3.20 Major efforts are being made to respond to women's needs and to engage them as active partners in sector projects, although too often women are still perceived as beneficiaries of project services rather than as providers. Projects should treat women as providers of health related services at the household level, which makes them the principal partners in community participation based projects. With or

without projects, women are responsible at the family level for water supply; environmental sanitation; hygiene training; and health care; among many other tasks.

3.21 Whatever the socio-cultural environment, women should participate in the development of water supply and sanitation services. They should help choose technology, participate in hygiene education activities, help decide cost recovery issues. Wherever possible, women should also participate in operation and maintenance (See Box 6). As the "carriers of water" they have a great incentive to ensure the service functions without interruptions. Where men spend part of the time away from home working elsewhere, operation and maintenance of necessity becomes women's responsibility. Where they are a household's "treasurer", or where they have their own income, they exert major influence on a families' willingness and ability to pay. Therefore, women should be involved in technology selection and project implementation; facilities management, operation and management; financial management; and hygiene education (13).

BOX 6

Women in Rural Water Supply and Sanitation - The Kwale Project, Kenya

Women usually list water supply as a higher priority than men, reflecting their role as carriers of water. Despite women's primary interest, men play the dominant role when decisions are made about water supply and are put in charge of operation and maintenance. Longterm improvement requires that women, the members of the community with the greatest motivation, be given responsibility to manage a communities water supply and sanitation activities.

The Kwale Project (the South Coast Handpump Project) had a dual purpose, improving water services and test handpumps. Previous similar projects had neglected community participation, and failed. In Kwale, a socio-cultural study started the community participation process. The entire community was involved in the decision making process, and women were eventually given major responsibility for operation and maintenance.

KWAHO, the Kenyan Water for Health Organization (a Kenyan national NGO) provided training to enable the community to organize its participation in design, implementation, operation and maintenance, and financing of the project. As a parallel activity, a health education and sanitation campaign was carried out. KWAHO also liaised between the community and a number of Kenyan and external agencies involved in the project.

Women manage the systems successfully, despite some early reservations by project promoters (the population is predominantly moslem although the community includes many non-moslem up-country settlers). Women have majority representation on well committees and are responsible for operation, maintenance and repair of hand pumps. They also collect fees and manage funds.

The Kwale Project is a success because the community manages every aspect of the water supply, from technology selection to maintenance and the collection of fees to pay for it.

Abstracted from the World Bank documentation.

3. Technology Choices

(i) Appropriate Technology

3.22 Technology must be appropriate to local conditions, i.e.:

(a) socio-culturally acceptable to the user;

(b) promoting an adequate service level in accordance with the community's willingness to pay;

(c) maintainable (user/community must be capable to operate and maintain facilities or able to pay for it); and

(d) technically correct, least cost and affordable.

There is, of course, no single universally applicable solution (14, 15). Water resource availability and quality will determine the technology selection initially, affordability and socio-cultural acceptability will determine the service standards, and technical competence may restrict technical options which can be selected (although technical competence could be created (training) if the user would be able and willing to provide the necessary resources to pay trained staff). Several solutions are usually needed in the same country or within regions of a country. Experience in Malawi shows that properly motivated and organized communities can handle technologies as diverse as handpump and gravity water supply (See Box 7).

BOX 7

Community Participation - Malawi Gravity - Flow Water Supply

In the late 1960's when the first gravity water supply scheme was initiated, the rural water supply situation was poor. By the mid-1980's over 800,000 people are served by gravity schemes. The government's strategy which has led to this success is simplicity itself.

(1) The community is responsible for its own water supply.

(2) The Government supports the community's efforts.

Community responsibility requires that Community:

(1) Requests system.

(2) Assists in necessary studies and participates in design.

(3) Elects water committee to manage construction, operation and maintenance, raise funds.

Government support consists of:

(1) Technical assistance in organizing community, construction and maintenance.

(2) Design the system.

(3) Provide external funds, training and user education, pipes, fittings and other construction materials and transport.

(4) Monitor performance and provide services for tasks the community can not handle.

In practice, a key role is played by the Water Project Operator (WPO) of the Department of Land, Valuation and Water (DLVW). The WPO is the link between government and community, working with a committees organized for specific tasks. there is a District Development Committee (DDC) chaired by the district commissioner. Its members are the district chairpersons of the Malawi Congress Party, the League of Malawi Women and the League of Malawi Youth, and the district medical officer and technical personal. Village requests must be approved by the DDC who recommends them to DLVW.

After project approval, a main project committee, branch and village committees are set up. Each of these committees has specific responsibilities reflecting local concerns (village committees), coordination and organization involving several communities (branch committee) and the project as a whole (main committee). Village committee members are elected by the community. Members of all committees are trained by the WPO who also assists them in their functions and acts as their adviser. He has no executive powers and works with the community through the committees. He also trains people in installation, maintenance and repairs and provides user education.

Abstracted from the World Bank documentation.

3.23 In general, water supply projects should give preference to gravity supply from protected sources, followed by groundwater sources, and only use surface water supplies requiring treatment when gravity or groundwater sources are not readily available. Treatment methods of preference should be simple without reliance on disinfection to simplify O&M, e.g. slow sandfilters with or without presedimentation or rouging filters.

3.24 Sanitation in rural areas with rare exception will be based on on-site facilities. Although the choice must be based on socio-cultural preferences (it is easier to change technology then people's attitudes!), users should be informed of other available technologies. In rural Africa, dry latrines are the overwhelming choice. Those migrating to urban centers aspire to conveniences such as the flush toilet. Rural populations should at least be informed, especially those using (i) water for anal cleansing or (ii) the latrine for bathing, that a water flushed version of the latrine exists at comparable cost.

3.25 Standards of service in rural areas usually are standpipes and handpumps or wells for water, latrines for sanitation. Upgrading of water supply to yard or house connections improves convenience and depends principally on a community's means and desires. Upgrading costs can be substantial particularly when arrangements for sullage water disposal have to be made, which is usually the case when water

consumption rises above 50 liters per capita or soils are relatively impermeable. Health impact of water supply is greater with in-house supplies, particularly where hygiene training is inadequate, while health impact of a latrine maintained in clean conditions is the same as that of a flush toilet. Waterborne sewerage is usually required for sullage water disposal rather than excreta disposal.

(ii) Unit Costs

3.26 The people which make up Africa's nations are of such a variety of backgrounds, have such a diversity of cultures and traditions, and live in so many different environments of climate and topography, that a universally applicable technology does not exist. Not the least of these factors is the more recent history. It is interesting to note the anglophone East African countries prefer government agencies to drill for water while in francophone West African countries this task is assigned to the private sector. The choice of technology has to be based on all these factors and on the community's skills and financial means, and the cost of the technology. A range of cost for different technologies encountered in Africa is presented in Tables 3 and 4 below:

Table 3 1/

Cost of Various Water Supply and Sanitation Technologies as of 12/1983

Region	Construction Cost US$/CAP — Water Supply — Rural Systems	Urban Standpipes	Urban House Connections	Sanitation Rural
Africa median	39	56	98	30
range	8-200	8-200	12-300	8-300
Asia median	14	58	61	9
range	2-70	6-111	60-150	3-20

Table 4 2/

Examples of Rural Water Supply and Sanitation Costs US$/CAP

Country	Water Supply		Sanitation
Burundi	6	Springs (materials only)	
Cameroon	20	Springs	
Cameroon	10	Dug Wells	
Malawi	26	Gravity	
Kenya	16	Springs	
Lesotho			14
Botswana			30
Zimbabwe			15

Costs in Africa appear significantly higher than in similar income countries in Asia. For example, a drilled, handpump equipped well in Asia can cost from $1,500 to $2,500 while the same well in Africa will cost from $3,000 to $15,000. Well drilling in some African countries is much more concentrated in government agencies than in Asia where private sector competition keeps prices lower. Privatization offers opportunities for cost reduction and should be encouraged.

1/ Abstracted from Tables 8 and 9, WASH Technical Report No. 43 (6), Sept. 1987, based on WHO statistics, and from UNDP/WB Decade Programme Reports.

2/ Obtained from internal World Bank/UNDP project reports.

(iii) Water Resource Allocation

3.27 Water Resource Allocation is inextricably linked to technology choice as well as to rural development in general. For arid and semi-arid zones water resource allocation should be an integral part of a sector plan so as to provide for the most efficient use of a scarce resource. In other situations, the purpose of water resource allocation is to ensure the efficient use of a more abundant resource and flood control. Among the principal considerations are:

(a) Water use varies greatly with standard of service. Handpump and standpipe users consume from 20 to 30 lcd while those served by house connections use upwards of 100 lcd. If water resources cannot sustain consumption at the latter amount, quantity standards should be set at the lower consumption level. If consumption at the higher is possible but reduces water availability for agricultural use, used water may be provided for agriculture and clean water provided for potable use. Quality standards must be set to provide safe water, though standards for mineral content should reflect local conditions and abilities.

(b) Multiple water use may be necessary even where water use is relatively abundant. Sequential use, such as hydropower generation, domestic use followed by irrigation or industrial use (or a combination of the two) can increase investment efficiency and stretch water resources.

(c) Environmental impacts may influence use of water. For example, watershed protection and reforestation to prevent soil erosion and down-stream flooding may require water resources - possibly in the form of sewage treatment plant effluent.

3.28 The list of scenarios can be extended at will. The important fact is that water resource allocation must be part of every sector plan because service standard selection has far reaching impacts on the availability and cost of water supply and sanitation. Even where water is abundantly available, in-house conservation measures (using water saving appliances) can reduce water demand from 30 to 40% at no extra cost to new housing and no lowering of service standards and thus substantially reduce waste water disposal costs. Legislation will be required in most countries to empower a designated body to set water quality standards and allocate water resources.

(iv) Rehabilitation

3.29 Rehabilitation needs are reported to be substantial in the majority of countries in the region. Requirements range from handpump repairs to restoration of piped system. Causes for existing deficiencies are a lack of user motivation to maintain facilities, a lack of readily available spareparts and, at times, technologies which exceed local capacity to maintain them. A contributing factor to this

unsatisfactory maintenance status has been the preference of donors and governments to build new facilities rather than repair and maintain old ones. The decision of the Government of the Cote d'Ivoire to give precedence to rehabilitation hopefully is the first sign of a new trend.

3.30 Rehabilitation, to succeed, has to address the issues which have been identified as having caused it:

(a) Motivation of users to maintain facilities must be generated through education at all levels, the adults through health education, the children in school, the caretakers through training. The measure of success of this efforts is the willingness of the community to pay for maintenance.

(b) Support structures must be created so the community has access to expertise it does not have itself. The necessary steps range from the training of local mechanics in handpump and equipment repairs, the sale of spareparts to local merchants from district depots (or the consignment of spareparts on commission to reduce the merchants' need for capital) to the establishment of subregional technical assistance providers which could be part of a ministry, NGOs or private entrepreneurs contracted by the government (retainer plus fees for work performed). Establishment of

savings and loan facilities (revolving funds) should also be considered to provide the communities with a means to deposit savings and borrow funds. Revolving funds could be financed through sector adjustment loans.

(c) Technology selection to reflect the ability of the user community to maintain it.

Priority should be given to those facilities which can be restored with greatest cost effectiveness if action is taken promptly, i.e. the cost of delay in terms of minimizing funds needed for repairs and income lost from lack of service must be considered.

4. Resource Mobilization

(i) Sources of Funds

3.31 Funds for rural water supply construction are derived from government, the community itself, and ESAs. Usually, means of the community are very limited and construction is financed largely through loans and grants from government and ESAs. In the past, operation and maintenance has been similarly financed but that practice is less popular now. Because priorities in the application of funds by these sponsors change, the availability of resources can change substantially. Some countries have attempted to overcome this

problem by raising funds for rural water supply through cross-subsidies from urban water customers through the establishment of appropriate tariffs. However, this approach does not work in the long term, because it takes away the motivation for villagers to participate in or pay for appropriate solutions and can quickly lead to demands for inappropriate levels of service and to high water tariffs. Another attempt has been to finance a revolving fund using social security tax revenues (see Box 8). Revolving funds could serve to channel both government and external funds to the community and to provide it with a mechanism to deposit revenues and obtain credit of specifics of such an approach would have to be studied with interested governments. The major benefit of such arrangements is the achievement of a consistent flow of funds into development and the avoidance of inefficient stop and go programs.

BOX 8

Revolving Fund Financing of Water Supply and Sanitation Investments - The Example of Brazil

During the 1960's, Brazil's water supply and sanitation sector lagged behind that of countries at a similar stage of development. In the years 1968 to 1970 Brazil's government created the institutional structure and financing systems which brought rapid progress to the sector. This system serves urban communities which are classified as those having populations of at least 5,000 or being administrative centers of political subdivisions regardless of size (communities with population as low as 500 people fall into this category). Small communities and dispersed populations are served by another program.

PLANASA (National Sanitation Plan) is administered by the Federal Savings Bank (CEF), financed by the Sanitation Financing System (SFS). The funds for the SFS (and other investment programs) are raised through the Employee Indemnity Fund (FGTS) supported by an 8% payroll tax. These funds are distributed by CEF to the states as loans under interest rates and repayment conditions reflecting the states economic conditions and the federal governments development objectives.

CEF payments are made to a state revolving fund (FAE). State governments match the CEF contributions. If matching payment exceeds a predetermined percentage of state revenues, the state can borrow the difference from CEF.

State water and sanitation companies (SWS) borrow 100% of the needed capital for sector projects from FAE and repay borrowed funds to it. SWS income is derived from statewide tariffs for its services. A consumer, regardless where located in the state, thus pays the same amount for the same service. Tariffs are set to provide a reasonable rate of return on investments while not exceeding a given percentage of the users income.

Over the years, CEF and the states have contributed approximately 42% each to the FAE, the remainder consisting of developers' contributions and repayments. The latter are expected to increase as grace periods of earlier loans expire.

3.32 Grants and subsidies by governments to RWSS are often justified on grounds of equity and to discourage rural urban migration. Commodity pricing and other economic policies may in the short term prevent the rural producer from earning the funds necessary to pay full costs of RWSS. Changes in RWSS cost recovery must therefore reflect rural economic development policies. Until they provide the rural inhabitant with the means for paying the full cost of RWSS services, compensatory government grants are one measure of overcoming the shortfall.

3.33 Structural adjustment loans are used by the World Bank as one method to assist its member governments to overcome distortions caused by past policies or to provide funds against financial shortfalls expected by the implementation of fundamental adjustments in economic policies. In many countries the water and wastes sector, in particular RWSS, suffers from past well intentioned but unsustainable policies and strategies. Sector adjustment loans could help overcome these problems and provide governments with the means to finance the basic work which is required prior to project preparation and implementation. Such loans could also be used to fund revolving funds needed for both new projects and rehabilitation because credit facilities to assist the rural beneficiary in financing water supply and sanitation facilities rarely exist.

3.34 Raising of funds is but one side of the coin, allocating them is the other. A system should be developed to allocate funds based on

socio-economic indicators (income, health, development potential, local contribution, etc.) with amount and lending terms adjusted to reflect the status of the community. Foreign assistance should be allocated based on the same system. Whatever the source of funds and the method of allocation, the funding should be:

(a) consistent over time rather than stop and go;

(b) raised internally as much as possible; and

(c) allocated equitably with long term commitment to the sector.

(ii) Cost Recovery

3.35 Cost recovery, i.e. the payment of fees by the user to pay for operation and maintenance and the repayment of loans (or to raise capital) is the clearest indication of community interest and participation. Recent experience indicates that lack of willingness is often more a reflection of users not comprehending benefits to be achieved, or of the wrong choice of technology, or of offense to local socio-cultural tradition, than inability to pay. China is a good example of a government's policy of community self reliance in rural water supply (see Box 9). Another problem concerns the safekeeping of collected funds. Financial institutions are often not available and government officers considered less than reliable. NGOs and local banks (where they exist) cooperatives or associations could serve as the "money managers" in such situations. Finally, the timing of collection and the convenience of making payments is important. Often people are able to make many small, but not infrequent large payments.

Accepting small amounts at neighbourhood collection points may solve the problem. Payment of larger amounts after harvests are sold may be another way of collecting funds. A farmers cooperative could be the collection agency in such a case.

BOX 9

Cost Recovery in Rural Water Supply - People's Republic of China (from John Briscoe and David de Ferranti "Water for Rural Communities: Helping People Help Themselves", the World Bank, March 1988).

China's policy of self-reliance has resulted in villages being largely responsible for sector development and for providing their own water supply. Typically, a village is expected to pay 90 to 100 percent of the capital cost of the system and the full cost of operating it.

The community plays the leadership role in initiating the water project and in selecting the source, system technologies, and service levels. Plans for waterworks are submitted for approval to the county, which helps in the design and purchase of materials and decides on the need for subsidies. The provincial government in turn compiles plans submitted by the counties. In the past, the provincial government has provided only limited financing, but recently some provinces have helped to set up revolving funds for financial rural water projects. The central government has only recently become active, offering guidance and coordination and, in exceptional cases, providing financing assistance.

Most waterworks in rural areas are owned, managed, and operated by the villages with some collectively owned water companies formed in the more industrialized regions. The virtual absence of central government financing for rural water supply distinguishes China from most other developing countries. Local governments and entities are expected to provide finance for capital costs, and consumers almost always pay the recurrent costs. In villages, householders share the costs with funds derived from communal activities. Water charges normally cover the costs of operation and maintenance and occasionally some depreciation.

For village waterworks systems, the village accountant, working part-time, keeps records of receipts, payments, and inventories for the waterworks entity. For larger systems serving several villages, accounts are kept at the waterworks offices by full-time accountants.

There is a strong sense of pride and ownership, which is demonstrated by a willingness to pay the bulk of the cost in advance, and the fact that systems are almost invariably well operated and maintained. Thus, water supply investments in China are both sustainable and replicable.

4. Investment Needs

3.36 An investment program has to reflect a country's needs and resources. It is nevertheless interesting to look at regional investments, both past and future, and project different scenarios in an attempt to project overall resource requirements.

3.37 WHO reports (16) that rural water supply and sanitation in Africa has risen from 22 to 25% and from 20 to 25%, respectively between 1980 and 1985, the first five years of the Decade. The figures in the urban subsector were substantially better, rising from 66 to 78% and from 68 to 79%. The African countries set Decade targets of 46% and 52% for rural and 84% and 82% for urban water supply and sanitation. Average costs for rural water supply and sanitation in Africa are reported by WHO (16) to be 40 and 25$/cap. Thus, investments for the period from 1980 to 1985, can be estimated as US$1,265 million. Spending for the remaining 5 years of the Decade would have to rise better than four fold to US$5,220 million, beginning in 1986, for the achievement of revised Decade targets. There is no evidence of that or of the needed increase of external financing to cover 70% of US$13,000 million to reach urban and rural Decade targets suggested by the countries of the region. Although these figures are disappointing measured against early Decade expectations, they are nevertheless remarkable, having been achieved in a period of economic stagnation. Per capita GNP rose from $260 to $290 during the period, a fall in real terms.

3.38 More important for the long term is the fact, that the countries of Africa have adopted an approach of using low cost technology, community management and cost recovery. These are essential ingredients for long term sustainability. This approach will eventually lead to a reduction of per capita cost to the level achieved in the SE Asia region (with comparable GNP per capita) of US$14.50 per capita each for water supply and sanitation, also reported by WHO (16). It seems nevertheless clear that even the revised Decade targets are unlikely to be achieved. Progress is more likely to be similar to what has been achieved so far, another increase of 3 and 5% respectively, reflecting the momentum already achieved and the lowering of unit costs as a result of increased adoption of low cost technologies. The 1990 coverage can thus reasonably be expected at 28 and 30%, respectively. It is interesting to note that sanitation shows greater coverage, undoubtedly reflecting the approach developed in Africa of emphasizing household motivation, bypassing time consuming community organization efforts.

3.39 Three scenarios are presented in Table 5 to estimate coverage at the year 2000 and financial resources to achieve them. Per capita costs used for the projection are US$20 and US$15 for water supply and sanitation in the expectation that unit costs would decrease to levels similar to those achieved in Asia. The scenarios are:

1. 100% coverage.
2. Achievement of percent coverage midway between scenario 1 and 100%.
3. Continued Progress at the rate achieved at mid-Decade.

Table 5

Year	1990		2000	
Service	Water	Sanitation	Water	Sanitation
Total Population	330	330	380	380
Scenario 1				
Percent served	28	30	100	100
Population served	93	99	380	380
Population not served	237	231	-	-
Investment in US$million	-	-	5,740	4,125
Scenario 2				
Percent served	-	-	67	69
Population served	-	-	255	262
Population not served	-	-	125	118
Investment in US$million	-	-	3,240	2,445
Scenario 3				
Percent served	-	-	34	38
Population served	-	-	129	144
Population not served	-	-	251	236
Investment in US$million	-	-	720	675

Investment during the second half of IDWSSD is estimated to be US$630 million for water and US$600 for sanitation, calculated on a per capita investment of US$35 and US$25. Maintaining investment levels at the second half DWSSD rate but using per capita cost of 20 and 15 dollars would lead to scenario 4 presented in Table 6.

Table 6

Scenario 4	Water	Sanitation
Percent served	41	47
Population served	156	179
Population not served	224	201
Investment in US$million	1,260	1,200

Scenario 4 shows the impact of unit cost reduction on investments; with a continuation of present investment rates, a coverage of 41 and 47 percent can be achieved. It would thus appear reasonable to set an overall African target of 50% minimum coverage by the year 2000. For

long term sustainability, this minimum target would have to be accompanied with cost recovery policies that would guarantee funds for maintenance and replacement and rehabilitation of presently inoperable facilities. Properly managed revolving funds could significantly increase coverage during the next Decade. For example, recovery and reinvestments of 50% could increase coverage by another ten percent. These projections do not include financial needs for rehabilitation of existing facilities which should be covered by the beneficiaries with the help of appropriate credit arrangements by national and external donors. Care must be taken not to encourage neglect of operation and maintenance by generous rehabilitation assistance.

5. Summary

3.40 The International Drinking Water Supply and Sanitation Decade has focussed attention on unsatisfactory water supply and sanitation services in less developed countries and identified various methods to improve existing conditions. The situation can be summarized as follows:

(i) Appropriate technologies have been identified and methods of community management tested that would permit significant expansion of coverage in future years if systematically implemented;

(ii) Much of the development field work has been undertaken by NGOs and some Bilaterals at a relatively small scale and decisionmakers in most countries are not yet sufficiently aware of the potential of the solutions identified;

(iii) A first step thus has to be the creation of awareness amongst the decision makers of the opportunities which exist (through publications and seminars) followed by the preparation and implementation of national sector plans; and

(iv) Sector plans should formulate the policy framework for RWSS and the process of implementation leading to the full scale application of the lessons learned through NGO and demonstration projects.

A model sector plan is outlined in section IV.

IV. COUNTRY SECTOR PLAN

4.01 Requirements on how to improve and manage the sector vary from country to country, but each country must develop and update from time to time its own sector plan as an integral part of its RWSS sector development framework. Such a framework would address country

issues and strategies as part of the overall Sector Strategy, while the Action Plan covering activities related to preparation and implementation would be prepared at the level of National, Regional and District programmes. A generalized plan, reflecting the issues discussion, is outlined below. Examples of good sector plans are those of Zaire and Pakistan.

4.02 The sector plan first defines the objectives to be achieved, describes policies needed to achieve them and support the sectors development, and finally identifies strategies and priorities to implement the policies. It is important that all institutions active in the sector, both national and external, follow the sector plan to avoid conflicts in definition of objectives and allocation of resources. In the following paragraphs, suggestions are listed from which specific country sector plans can be developed.

1. Objectives

4.03 The objectives are defined as:

(a) Rural Development. RWSS must contribute to increased well-being of the rural population, either as part of an integrated project or as a separate, coordinated effort improving health and environment.

(b) Improvement of Human Productivity. RWSS can improve the health of beneficiaries and reduce time required to obtain water. The increased energy and saved time can be productively used if concurrently appropriate opportunities are created.

(c) Health Improvement. RWSS combined with health education contributes to general health improvement and can eliminate specific health hazards, such as guinea worm infestation.

(d) Long Term Sustainability. Whatever the benefits to be derived from RWSS investments, they must be sustainable for the long term.

Other objectives are:

(e) provision of basic services to the greatest number of people prior to improving service standards to few;

(f) provision of water for limited gardening and animal husbandry;

(g) increasing efficiency of RWSS investments; and

(h) encouragement of private sector involvement.

2. Policies

4.04 The policies to be followed would provide for:

(a) Community Management of RSS to assure long term sustainability. The community would assume responsibility for selection, implementation and operation of facilities, creating appropriate mechanisms (committees, cooperatives, associations) assisted with information, training and technical cooperation by an adequate support structure.

(b) Support Structure to assist community with tasks if cannot handle alone. The policy would provide for deconcentration of existing centralized structures and provide a role for the private sector including NGO's. The policy would also define the participation of ESAs.

(c) Program and Project Justification on the basis of specific measurable improvements of productivity and health consistent with overall investment priorities of rural development program.

(d) Cost Recovery which would provide initially from users' fees as a minimum funds sufficient for operation and maintenance and a portion of construction cost, in kind or cash, commensurate with the economic status of the community with the long term goal of 100 percent recovery.

(e) Resource Allocation from government and external sources which reflects in amount and credit conditions the communities financial capacity and the governments development. Justification and amount of grants would be indicated. Administrative and software costs would most likely not be charged to the community.

(f) Institutional and Human Resource Development providing for adequate autonomy, continuity, financial and human resources to support target communities.

(g) Coordination of efforts at the national (interministerial) level, the private sector, and with ESAs.

(h) Privatization of RWSS activities to increase effectiveness and reduce costs, if necessary by providing incentives.

3. Strategies

4.05 Specific strategies to be followed depend on objectives to be achieved. Some basic strategies which should be followed unless exceptional circumstances (disasters, epidemics) prevent it are:

(a) Initial Investments in program and project development should be for health education, communications and demonstration facilities to stimulate demand/verify need - a marketing effort.

(b) Willingness and Ability to Pay. Project priority should be based on demand (need) and on willingness and ability to pay. Once prospective users understand benefits, they are usually willing to pay and able to finance at least a portion of the costs themselves;

(c) A Support Structure to serve the user with technical assistance, credit and spare parts during and after project implementation should be in existence or established as part of project preparation activities.

(d) Credit and Costs Recovery. Mechanisms need to be established to provide the user an opportunity to borrow and repay funds. Willingness to pay reflects not only understanding and income but also the ability to borrow and the convenience of repaying (e.g. patterned to reflect income fluctuation; charging rural cooperatives to collect payments prior to profit distribution). Means such as revolving funds should be considered to provide conventional credit and repayment facilities. National, regional or community revolving funds could be financed with ESA and government (central, provincial, regional) contribution and managed by banks, cooperatives and/or communities. The Fund would extend credit to and collect repayment from users. Repayments would be used to provide credit to additional users (community or individuals). Progress in extension of service would be proportional to the effectiveness of cost recovery. Lenders

could make future assistance proportional to the effectiveness of cost recovery and the period of credit. Appropriate procedures for financing and management of these funds would have to be developed. The funds would receive loans, credits, grants and cross-subsidies for onlending to users. Service fees could be established to reflect administrative costs, user economic status and government development objectives;

(e) Privatization. To encourage private entrepreneurs to enter the field, credits for equipment purchase (or leasing by government), or other incentives and training opportunities would have to be provided. A mechanic-contractor could provide major maintenance and repair services to a village caretaker under a contractual arrangement (possibly guaranteed by government) more effectively than a government district office (proximity, no overhead, etc.). Manufacturers should be encouraged with training, credit and marketing assistance to enter the RWSS equipment market. Shop-keepers should be encouraged to stock spare parts through elimination of government monopoly and purchase credits.

(f) Community Management should be implemented using agents skilled in training and supporting the community from appropriate government agencies or NGOs or a combination of the two. For example, government could provide general guidance with NGOs providing training and implementation services under contract with the local community.

(g) Legal Framework. Although the community usually is legally responsible to provide infrastructure services, it often does not have the legal authority to contract for outside assistance. National authorities need to pass necessary regulations as appropriate.

(h) Training of local, district and national staff should be managed as part of a national WSS program. A community by community approach would not be efficient, and technical assistance will have to be provided by the sector in any event;

(j) Coordination. The Water and Sanitation Sector in many countries is fragmented, with many independent or semi independent authorities. Frequently, RWSS responsibility is assigned to a ministry different from the one responsible for urban water supply and sanitation (UWSS). Whether separated or joint, procedures must be established to facilitate the provision of technical assistance from UWSS to RWSS because the staff resources and expertise usually reside in the former. Specific tasks, such as technical training for the entire sector, could therefore be assigned to UWSS and urban authorities could provide technical support to rural communities in their regions, under mutually satisfactory contracts. Rural agencies may also be able to provide T/A to urban authorities, for example, in community participation activities in urban fringe areas, ground water hydrology and

abstraction, etc. Other activities need to be coordinated with other ministries (Health, Agriculture, Public Works, etc.) and other agencies. Coordination is also necessary with ministries of finance, economic planning organizations and ESAs. A national coordinating body is often the most effective method to accomplish this coordination.

(k) Technology Choice has a major impact on cost and thus on cost recovery effectiveness. The closer the technology matches the users ability to pay, the quicker the repayment, the faster expansion of services. To ensure that the greatest number of users benefit from at least basic services, credit assistance should be limited to basic needs service facilities. Costs associated with increased convenience or luxury should be funded by the user himself without outside assistance;

4. Priorities and Options

4.06 Choices will have to be made about which communities will receive assistance, what kind and how much. Priorities and selection criteria must consider:

a. Needs.

b. User attitudes including willingness and ability to sustain services.

c. Cost effectiveness and technology selection.

d. Development potential: impact on economic productivity - input to other products.

4.07 Priority criteria can be set both at the macro and micro level. The former will reflect the status of a region (province or state), the latter the status of community and individual. Criteria might be:

a. The less people served, the higher the priority. Alternatively, the more people are already served the greater the potential to reach sustainability and thus the higher the priority which could be assigned if reaching self sufficiency is the government's objective.

b. The lower personal income, the higher the priority.

c. The higher the number of water related diseases, the greater the time spent to fetch water, the higher the priority.

4.08 Priority can be expressed by other means. For example, economically depressed areas can be provided with more grants than other areas, or with loans with concessionary interest rates reflecting, for example, personal income levels.

4.09 At the micro level, values could be assigned, for example, as follows:

a. Needs a) Percentage not served.

b) Health status.

b. Economic Development potential (community, industry).

c. Self-help potential and ability to sustain facilities.

d. Institutional capacity:

1) existing community organization;

2) access to other organization;

3) access to support structures;

4) availability of private sector (entrepreneur, cooperative).

4.10 The greater the needs and potential, the higher the priority. The ranking of areas (macro) and communities (micro) can be separate or combined and numbers can be weighed to provide greater impact to specific criteria. The value of a priority ranking system is the establishment of clear guidance, an elimination of a subjective allocation of funds. The system itself can be designed to reflect peoples needs and government priorities, but once established should be used consistently because it provides clear guidance in the allocation of available resources, whatever the amount available.

5. Project Development and Implementation

(i) Development Conditions

4.11 Rural water supply and sanitation project/program development is slow. Communities progress at their own pace and attempts at accelerating the process have had dubious successes. The iterative nature of RWSS development strategies is becoming increasingly accepted whereby planning and implementation are executed on a continuous basis with adaptations made as experience is acquired. In many countries NGO's and bilaterals are effectively undertaking preparatory activities. With reasonable prospects for investment funds, the latter can be expected to staff up to prepare projects additional to those they can finance themselves.

4.12 Sector and sector adjustment loans are suitable vehicles for rural water supply and sanitation development because they provide the flexibility needed to finance a timeslice of an investment program based on (i) an agreement on criteria to be used in project design and (ii) priority criteria to be used in sub-project selection. Alternatively, cofinancing of bilateral and NGO programs could be considered to expand the Bank's catalytic role in the sub-sector without significantly increasing staff resources to do so. However, the capacity and leverage of the Bank to secure appropriate reforms is without doubt, when it becomes a direct and substantial investor in

any sector - the balance between leadership and delegation to others is a key question for the Bank. Again, the UNDP/WB Decade Program could perform on executing agency role. To implement this approach, agreements would have to be reached on policies and methods of implementation under the sector development framework with: (i) Governments; (ii) NGOs; and, (iii) Bilaterals and other donors, to ensure consistency of approach.

(ii) Project Preparation

(a) Identification.

4.13 Projects will be selected on the basis of established selection and priority criteria promulgated by government. A list of possible criteria abstracted from the Tanzania sector strategy is attached in Annex 2.

(b) Demonstration.

4.14 Unlike urban projects, with mostly existing institutions and generally accepted technologies, rural water supply and sanitation projects frequently use technologies unknown to the user, provide services the intended beneficiaries may not perceive as beneficial, and require for their implementation and sustained functioning a support structure which has to be created first.

4.15 Successful implementation of large projects may therefore require a stage of community scale demonstration. Rather than a demonstration of hardware and software applicability at community scale, the need is for a demonstration of replicability on a large scale: The establishment of institutional and community support arrangements involving government and private sector institutions. NGOs active in RWSS operate community size projects but are not implementing large scale projects of interest to multilateral financial organizations. Expanding those efforts with additional financial resources appears to be a very effective joining of efforts of governments, NGOs, and ESAs.

(c) Full-scale Projects.

4.16 Identification, demonstration and full-scale implementation will probably require a programme approach in which many individual small projects are implemented with financing through a sector or sector adjustment loan consistent with the pace of institutional development. A strict adherence to the philosophy of replicability and sustainability will likely entail a very slow process to reach any sizeable investment level. However, full scale implementation would probably require significant delegation of lender/donor functions to an intermediary, which could be an NGO. Various methods could be suitable, such as an NGO being contracted by a community to provide technical assistance and training. Another, or part of the same approach could be for bilateral ESAs with well established programs to take on the "management" of World Bank projects.

V. WORLD BANK ROLE

1. The World Bank in Rural Water Supply and Sanitation

5.01 Historically, and for legitimate reason, the World Bank has emphasized urban water supply and sewerage using conventional technologies. There are good reasons why this subsector can be expected to continue to represent the major portion of World Bank sector investments, eventhough the Bank's influence and role in rural water supply and sanitation should increase. In contrast to urban water supply, where the World Bank works closely with the implementing organization and its staff provides valuable advice and technical assistance through the appraisal and supervision process, contact in the rural sector is less direct. Responsible government organizations themselves often have only limited contact with the many dispersed sub-projects; executing agencies in rural areas are weak and the process of developing rural water supply and sanitation is slow. Rural projects require significantly more staff input per invested dollar and, although Bank staff would have to adjust to an environment whereby the Bank's involvement is at the level of a sector loan or credit, implementation would increasingly be by others. Such an approach to development and implementation of sector lending could also serve as a pattern for other donor interventions. Aid coordination for such activities would be the basis for an enhanced role for the Bank.

5.02 NGOs have worked with the communities and thus have the hands-on experience. Bilaterals place staff and more often consultants under contract in the country and also have significant direct contact. The Bank has no direct relationship with consultants in the field nor places staff there, although it often ensures such placement as part of its conditionalities. The one exception is the UNDP/WB Decade Program which does have field-staff directly involved with project development. Rather than increase its own staff resources for the subsector, a time consuming endeavor with no guarantee for success, the World Bank should use the RWSS expertise of others, including NGOs, and support an appropriate expansion of their activities by agreement with Governments. As has been mentioned in para 4.12 this balance between leadership (and appropriate staffing by the Bank) and delegation is a key issue.

5.03 The International Drinking Water Supply and Sanitation Decade has advanced cooperation and consensus in the water supply and sanitation sector. Earlier, during the seventies, substantial disagreement existed among donors and between them and governments on issues such as cost recovery, technology, sector management, etc. The Decade has brought about increased understanding and cooperation on these issues. The World Bank, in particular its Decade Program with UNDP, has contributed to the acceptance of:

1. Cost recovery;

2. Community Management; and

3. Appropriate Technology

as essential components of a successful sector strategy. The experience suggests a World Bank Strategy for the rural water supply and sanitation sector in Sub-Saharan Africa; it suggests that significant cooperation and improvements are achievable.

2. Strategy

(i) Strategy Components.

5.04 The World Bank strategy in Africa should be to:

(a) Act as the Catalyst for a rational approach to rehabilitation of thousands of existing wells and boreholes equipped with handpumps that have fallen into disrepair and lead the adoption of RWSS policies which emphasize long-term sustainability through:

1) Community Management, with adequate Support Structures;

2) Appropriate Technology Choice;

3) Cost Recovery; and

4) Coordination of efforts among complementary sectors and agencies and among ESAs.

5.05 The World Bank is in an ideal position to perform this function; (i) it has unmatched multidisciplinary expertise and (ii) has in place in Africa a sector support organization, the UNDP/WB Decade Program, which has been instrumental in improving sector activities and cooperation.

(b) Support Collaboration among ESAs and support governments in the establishment of country sector policies and strategies to be implemented by all to ensure more effective investments in the sector.

5.06 The international community has recognized that (i) there exists duplication, even conflict, in the approach of different organizations to the sector, and (ii) that the effectiveness of support could be improved through a sharing of experience, agreement on fundamental policies, a complementarity of efforts under the umbrella of a sector development framework. The World Bank should actively support these efforts and join others, such as AfDB, in leading such an effort.

(c) Target its Investment to bring about, to support or to strengthen the policies, strategies and adjustment needed to make the RWSS sector more effective. Sector Adjustment and Sector Loans should be used to achieve this goal.

5.07 Improving the effectiveness of sector investments requires fundamental changes already discussed, rather than simply improved projects. This requires strong leadership by governments and acceptance of country sector policies by ESAs, occasionally to the detriment of their own short-term interest. Development and acceptance of new, more rational approaches requires a policy dialogue with the prospect of follow-up support. This the World Bank can provide through sector adjustment and sector loans.

(d) Delegate Project Development and Implementation, when appropriate, to other organizations to increase impact and effectiveness of lending operation.

5.08 Development of RWSS projects and their implementation is a time consuming process requiring field staff with skills different from those commonly found within the World Bank. Long distance management of RWSS efforts would be difficult, at best. The World Bank should take advantage of the many experienced NGOs active in the field by agreeing with them and host governments on project selection and design criteria, then finance a timeslice of an agreed upon RWSS program satisfactorily prepared and implemented. The Bank has traditionally agreed with Governments on the use of consulting firms to help execute projects, this could be extended to the use of NGOs and bilaterals with field staff under the supervision of the UNDP/WB Decade Program, provided the Program's objectives are changed.

(ii) Policies and Priorities

5.09 Although policies and priorities would change from country to country, some basic policies would condition World Bank participation in the sector, with priority given to those countries which offer the opportunity to integrate RWSS with other World Bank supported rural development activities. These policies would be:

a. Community Management.

b. Cost Recovery.

c. Adequate Institutional Support.

Priority would be given to projects which:

a. Provide service to maximum number of users at affordable cost.

b. Provide greatest economic and health benefits.

(iii) Sector Planning

5.10 Sector plans within a sector development framework for each country would further elaborate on these policies and priorities and provide the basis of participation of all ESAs in RWSS activities in the country. Sector planning support to governments could be provided by any of the ESAs, preferably as is already the custom, through the

UNDP/WB Decade Program. The revival of National Action Committees, or equivalents as conceived by the Water Decade Program, would be a useful coordinating mechanism at the country level for preparation of position papers, sector strategies and action plans. Whatever the manner of its preparation, the sector plan should be discussed by the government with all ESAs and become the blue print for all of them for their work in the country.

5.11 Such a sector plan should also identify cooperative activities and sharing of experience among ESAs for the benefit of the country in question and possibly its neighbors. A much wider sharing of experiences on specific aspects among neighboring countries could be a valuable learning experience and should be encouraged.

3. Action Plan

5.12 An action plan, subdivided for each region or district within a country, to implement the recommended strategy will take several years to show results in improved service coverage.
A three to five year period appears to be a reasonable time frame for it. In the meantime, the customary project identification and preparation process should continue, with parts of the action plan incorporated as they are developed.

5.13 The action plan would develop as follows:

(a) Phase I Development and Demonstration (3 years).

1. Review and approval of strategy and policies by appropriate units of the World Bank.

2. Selection of priority countries (say six) in consultation with other sectors (agriculture, population and human resources), country departments and the UNDP/WB Decade Program.

3. Consultation with ESAs active in those countries to determine interest in participation in sector plan development.

4. Discussion and agreement with governments on sector plan development.

5. Formulation of World Bank policies and agreement with "executing agencies" on project preparation and implementation.

6. Supporting studies and guidelines such as:

   (i) Country Case studies and/or demonstration projects;

   (ii) Privatization;

   (iii) Health Impact;

   (iv) Economic/financial Impact;

(v) Work with and arrangements with NGOs;

(vi) Community Support Structures and Institutions;

(vii) Community participation/health education and its costs;

(viii) Marketing and cost recovery;

(ix) Rehabilitation and spareparts distribution; and

(x) Arrangements for donor coordination and donor participation;

7. Formulation of policies, objectives, priorities, implementation strategies, identification of demonstration projects, drafting of country sector plans by governments with ESA assistance.

8. Bilateral and multilateral discussions leading to agreed sector plan, demonstration projects and investment program.

9. Implementation of demonstration projects and other sector plan priority activities.

10. Monitoring, evaluating and review of demonstration projects and other activities, revision to sector plan.

(b) Phase II Large Scale Application (beginning in year 3).

11. Full scale applications as part of WB lending program and investments by others.

5.14 Notwithstanding progress already made in the adoption of sector approaches through the meetings in Brazzaville (December 1987) and Harare (November 1988), review of the strategy paper (para. 5.13 a-1) should include consultation with other ESAs, such as AfDB and USAID-WASH, who also are developing African WSS sector strategies as well as UNDP the Water Decade supervising agency. Even more importantly, the review should include consultation with African national advisers. This review should preferably conclude with a consultative meeting at which at least basic principles of a RWSS strategy could be accepted/endorsed by those participating. These endorsements could then serve as recommendations to national sector roundtable meetings.

5.15 Activities 2 to 8 and 10 would conclude with workshops attended by representatives of those organizations participating in the activities. The activity 2 workshop should be for the World Bank and UNDP/WB Decade Program staff with policy level country staff to review proposed sector development strategy and action plans as has been done in some countries of East Africa.

5.16 The UNDP/WB Decade Programme has been in the forefront of those implementing greater collaboration among ESAs and most of its activities are co-sponsored by Bilaterals. The Programme has moved in the direction described above and its case studies will provide valuable input to the policy formulation. The Programme does provide an excellent link to Bilaterals and NGOs. A possible scenario for World Bank implementation of rural water supply and sanitation programs would be:

- Continuation of the efforts to collaborate/integrate work programs of INUWS and the Region with appropriate expansion to include other sectors (for the selection of candidate projects). AFTIN should take the lead in implementing Phase I in specific countries while INUWS should continue to be responsible for research and development, promotion with ESAs and cross-country comparative analysis including related field studies. Countries selected should be those for which Phase II activities are anticipated.

- The Bank Region to participate/lead country roundtable discussions called to reach widest possible agreement on policies and cooperation among government, its agencies and ESAs.

- Field management of these activities by the Regional Water Supply and Sanitation Groups with country activities delegated to the local UNDP/WB project officer or the appropriate project officer of another ESA in countries where an ESA is active and the RWSG is not represented.

May 15, 1989.
R.Andersen/lm
namedoc:sector str.brief

References

1. Carruthers, I.D., Impact and Economics of Community Water Supply: A Study of Rural Water Supply Investment in Kenya, Agrarian Development Studies Report No. 6, Ashford, Kent (England) Wye College, 1973, 12 pp.

2. WASA, Nigeria: Maternal Morbidity from Guinea Worm and Child Survival, WASH Field Report No. 232, USAID Water and Sanitation for Health Project, March 1988, (Draft).

3. WB Nigeria Sakoto State. Personal Communication from Project Officer.

4. UNDP Lesotho. Various reports of UNDP Project LES/86/011.

5. UNDP Botswana. Various reports of UNDP Project BOT/79/003.

6. WASH, The Value of Water Supply and Sanitation in Development: An Assessment of Health-Related Interventions. WASH Technical Report No. 43, USAID Water and Sanitation for Health Project, September 1987.

7. Esrey, Feachem and Hughes, "Interventions for the Control of Diarrheal Diseases among young children: Improving Water Supply and Excreta Disposal Facilities", World Health Organization Bulletion 63 (4), 1986, pp 757-772.

8. Churchill, A.A. et al, Rural Water Supply and Sanitation - Time for a Change, World Bank Discussion Paper No. 18, 1987.

9. Tapio Katko, "Technical and Non-Technical Aspects of Externally Supported Rural Water Supply Projects in Developing Countries", Tampere University of Technology, Department of Civil Engineering, Institute of Water and Environmental Engineering, Publication A33, 1987.

10. Briscoe, J. and de Ferranti, D., Water for Rural Communities, Helping People help Themselves, World Bank, 1988.

11. Qureshi, Moeen A., The World Bank and NGOs: New Approaches, Address to Conference "Learning from the Grassroots" organized by the Washington Chapter of the Society for International Development, April 22, 1988.

12. WHO, International Drinking Water Supply and Sanitation Decade - Global Sector Concepts for Water Supply and Sanitation.

13. PROWWESS, Peoples, Pumps and Agencies - the South Coast Handpump Project (Kenya) Prowwess/UNDP Draft, 1987.

14. World Bank, Appropriate Technologies for Water Supply and Sanitation, a series of 12 Volumes on technical, economic, environmental, institutional and socio-cultural aspects of water supply and sanitation technologies. World Bank, 1980.

15. World Bank, Information and Training Material for Low-Cost Water Supply and Sanitation, consisting of 17 slide-sound shows, instructors and participants notes, 3 training films and Project Preparation Handbook with Case-studies, reference materials and information pamphlets.

16. WHO, International Drinking Water Supply and Sanitation Decade - towards the targets, WHO/CWS/88-2, April 1988.

ANNEX 1

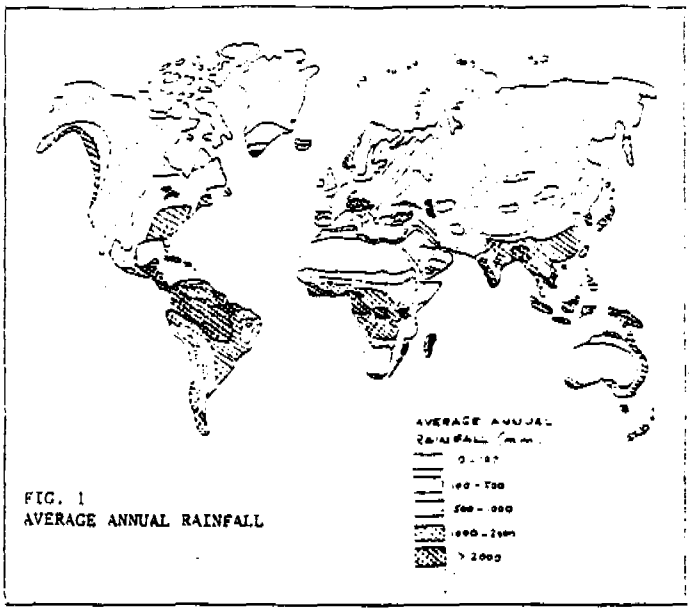


FIG. 1
AVERAGE ANNUAL RAINFALL

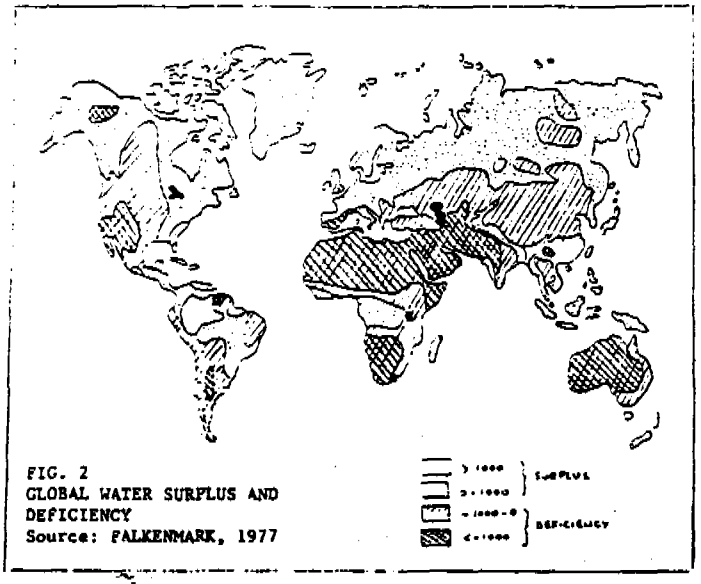


FIG. 2
GLOBAL WATER SURPLUS AND DEFICIENCY
Source: FALKENMARK, 1977

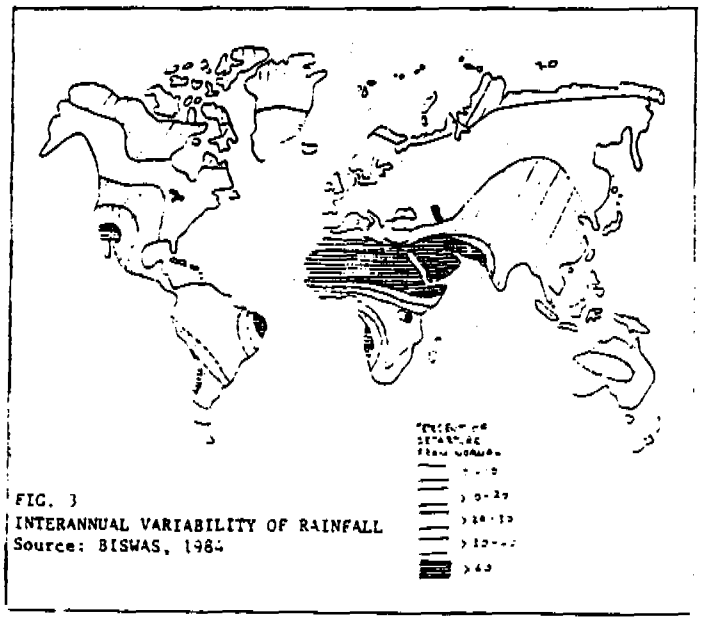


FIG. 3
INTERANNUAL VARIABILITY OF RAINFALL
Source: BISWAS, 1984

Project Selection Criteria and the Investment Program 1/

Selection Criteria

1. Selection criteria are used to rank projects in order of priority for implementation, using different categories in sequence and then continuing the rankings established for the different categories. Usually, the first selection criterion is need. A second ranking could be on the basis of cost effectiveness which would consider per capita cost (Investment and Operation Maintenance). Using only these two criteria, it would make sense to give those projects the highest ranking that demonstrates the greatest need and have the greatest cost effectiveness. Adding more criteria, usually necessary, increases the complexity of finding a combined ranking. Different selection processes using a variety of criteria are being used in Tanzania by different organisations in different regions. Inhabitants of these regions are thus treated differently. TWSSA, in consultation with these organisations, should establish a system of project selection to be used everywhere in Tanzania by all organisations active in the sector. Such a system should ensure equitable treatment of all people regardless of where they live and the greatest efficiency of investment nationality. A partial list of criteria follows:

(i) Needs
(ii) User Attitude
(iii) Cost Effectiveness
(iv) Technology
(v) Development Potential

Institutional Criteria.

2. Criteria can also be used to guide an authority developing and operating systems in different urban areas. They would be designed to safeguard the viability of the authority which could be endangered by the too rapid addition of less efficient systems than it now operates. Project specific criteria would be those already listed. The institutional criteria might be:

(i) present financial rate of return may not decrease;

(ii) when addition of projects results in a decrease, tariffs would have to be raised to maintain satisfactory financial rate of return (other financial indicator may be used);

(iii) sufficient adequately trained staff must be available to operate added system (or must be trained by the time system becomes part of authority);

(iv) existing status;

(v) proposed investment plan; and

(vi) benefits or benefit/cost ratio.

1/ Abstracted from the Tanzania Sector Strategy and Action Plan (UNDP Project URT/84/004)

3. The analysis leading to priority ranking can be done in two steps, particularly where regional disparities are great. For example, regions may be classified in terms of needs and a percentage of investment funds allocated to the most needy out of equity consideration. Projects would then be selected on the basis of priority rankings established separate for the "needy" and "less needy" regions. There should always also be a certain amount of investment funds, say 10% of total, to be allocated for specific government priorities, for example, to serve industrial/commercial development, eradicate waterborne disease, etc.

The Investment Programme and its Priorities

4. The existing investment plan for the water supply sector is a derivative of the fiscal year (1986-1988) Economic Recovery Programme. The main criteria for resource allocation, and for identification of priority activities for the recovery programme are as follows:

(i) rehabilitation of critical areas of the economy which have been inadequately maintained;

(ii) provision of key recurrent inputs and other products, in order to increase productive efficiency, and the availability of basic consumer goods;

(iii) completion of ongoing investment projects where relatively small additional resources would enable the project to become operational or where delays might lead to penalties and other contractual obligations; and

(iv) improvement of social services (especially health and education) as basic necessities and as minimum incentives for a productive population.

Proposed Method of Determining Investment Priority

5. The proposed methods for prioritization are:

(i) macro prioritization for regions;

(ii) micro prioritization for schemes.

The first, macro method, is for ranking the Regions, so that the most disadvantaged regions are identified. A percentage of investment funds can be allocated to the region so that in time they will reach a level more equal to the other regions. The second, micro method, is for prioritizing projects so that the least well served communities, regardless of where they are located, are provided with funds to improve their services.

The Macro Method

6. The Macro Method uses basically three factors: number of population served, number of obsolete schemes and number of schemes requiring rehabilitation as follows:

- the higher the number of population not served as percentage of population, the higher the ranking;

- the higher the number of schemes requiring rehabilitation as percentage of existing number of schemes, the higher the ranking; and

- the higher the number of obsolete schemes as percent of total schemes, the higher the ranking, (after sometime, this factor may no longer be relevant).

7. It is assumed that the three factors are equally important and based on these assumptions the first priority region determined by each factor is easily determined. thus a set of three regions with the highest priority is found. If funds are available to invest in additional regions, then the next three regions ranked with second highest priority could be selected.

The Micro Method

8. The micro method employs population (served, to be served), economic activity (agriculture, industries) health status and cost per capita. Equal weights of 100 points are awarded to each factor in order to minimize biases towards any of the four factors.

Population

9. Village population data obtained was projected to the current year 1987 using an average growth rate of 3.2% p.a. for rural areas, and 6-9% p.a. for urban areas. Based on experience in Tanzania and in the absence of more reliable data the service level of village schemes requiring rehabilitation are estimated as follows:

- above 5,000 people - 50% are considered served;

- between 3,000-5,000 people - 60% are considered served;

- below 3,000 people - 70% are considered served;

- gravity schemes irrespective of village population sizes - 80% are considered served.

Similarly, it is estimated that for urban schemes requiring rehabilitation about 80% of existing population is served.

10. The difference between the projected population and determined level of service is taken to represent the effect of the proposed rehabilitation (additional population to be served). Points are allocated as below.

Population To Be Served (Village size)	Population To Be Served (Town Size)
5,000 and over - 100 points	1,000,000 - 1,500,000 - 100 points
Less than 5,000 - 20 points per 1,000 people to be served	500,000 - 1,000,000 - 80 points
	250,000 - 500,000 - 60 points
	100,000 - 250,000 - 40 points
	50,000 - 100,000 - 30 points
	25,000 - 50,000 - 20 points
	5,000 - 25,000 - 10 points

Economic Activity (Agriculture and Industry)

11. 50 points each are awarded to agriculture and industry. For agriculture, rainfall is used as a substitute for agricultural potential as follows:

- the maximum of 50 points is given to those schemes found in regions where average annual rainfall is 1,500-2,000 mm;
- forty (40) points are assigned to schemes located in regions with annual average rainfall between 1,000-1,500 mm ;
- thirty (30) points are assigned to those schemes located in regions where annual average rainfall is between 500-1,000 mm; and
- twenty (20) points are assigned to schemes located in regions where average annual rainfall is 0-500 mm .

For industry, points are allocated as follows:

- a maximum of 50 points is awarded to schemes located in regions where the existing industrial activity is relatively high;

- forty (40) points awarded to schemes located in regions where hydro power and communications are existing;

- thirty (30) points are awarded to those schemes located to regions where there is only power available but poor communications; and

- twenty (20) points are awarded to those schemes located to regions where there is power but unreliable communications.

12. A scheme located in an area where industrial and agriculture activities both are highest could be given 50 points for each factor. A predominantly agricultural area would obtain 50 for agriculture and 20 points for industry and commerce. A predominantly industrial area would also get 20 points for agriculture and 50 points for industry and commerce. Low ratios in both sectors would result in 40 points.

Health Considerations (Disease Prone Areas)

13. The following groupings have been adopted:

- worst-hit areas - 100 points
- medium hit areas - 60 points
- remaining areas - 20 points

Cost per Capita

14. Points are distributed as follows:

RURAL AREAS		URBAN AREAS	
Cost per capita TShs	Points	Cost per Capita TShs	Points
10 - 100	100	100 - 200	100
100 - 150	80	200 - 500	80
150 - 300	60	500 - 1,000	60
300 - 500	40	1,000 - 2,000	40
500 - 750	20	2,000 - 3,000	20
750 and above	10	3,000 and above	10