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NATIONAL RURAL DRINKING WATER SUPPLY AND SANITATION PROGRAMME FOR COMMUNAL AND RESETTLEMENT AREAS IN ZIMBABWE 1980 - 1989

A PAPER PREPARED
FOR
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BY

CHRISTOPHER W.E. MATUMBIKE
CHAIRMAN, NATIONAL ACTION COMMITTEE
RURAL WATER SUPPLY AND SANITATION
ZIMBABWE, JULY 1991

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Annex

List of Abbreviations

ADRA	Adventist Development Agency
AGRITEX	Department of Agricultural Technical and Extension Services
AUSTR	Australia
BL	Blair Latrines
CADEC	Catholic Development Cooperation
CC	Christian Care
CMED	Central Mechanical Equipment Department
CSO	Central Statistical Office
DANIDA	Danish International Development Agency
DDC	District Development Committee
DDF	District Development Fund
DERUDE	Department of Rural Development
DWSSC	District Water and Sanitation Sub-Committee
EEC	European Economic Community
FY	Financial Year
GOZ	Government of Zimbabwe
GTZ	German Development Corporation
IRWSS	Integrated Rural Water Supply and Sanitation
JICA	Japan International Co-operation Agency
KFW	German Development Bank
LWF	Lutheran World Federation
MCCD	Ministry of Community and Cooperative Development
MEWRD	Ministry of Energy and Water Resources and Development
MFEPD	Ministry of Finance, Economic Planning and Development
MHE	Ministry of Higher Education
MLARR	Ministry of Lands, Agriculture and Rural Development
MLGRUD	Ministry of Local Government Rural and Urban Development
MOH	Ministry of Health
MPA	Ministry of Political Affairs

NAC	National Action Committee for Rural Water Supply and Sanitation
NRWSSP	National Rural Water Supply and Sanitation Programee
NCU	National Co-ordination Unit for Rural Water Supply and Sanitation
NGO	Non Governmental Organisations
NMWP	National Master Plan for Rural Water Supply and Sanitation
NORAD	Norwegian Agency for Development Cooperation
NPA	National Planning Agency
ODA	Overseas Development Agency
PDC	Provincial Development Committee
PSIP	Public Sector Investment Programme
PWS	Primary Water Supply
PWSSC	Provincial Water and Sanitation Sub-Committee
SCF(UK)	Save the Children Fund (UK)
SIDA	Swedish International Development Authority
SWU	Shallow Well Unit
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VIDCO	Village Development Committee
WB	World Bank
WHO	World Health Organisation

National Rural Drinking Water Supply and Sanitation Programme in Zimbabwe

The Provision of safe and adequate drinking water and sanitation services are an essential social service to ensure environmental health among all Zimbabwean communities.

The Zimbabwe rural drinking water supply and sanitation programme has made relative progress, amidst numerous constraints. The National Action Committee (NAC) on rural drinking water supply and sanitation has attempted to remove some of these contraints,others however require political decisions way above the ability and capacity of the interministerial committee.

Sustainability as The Core Problem

A major concern of the National Action Committee has been that the central aspect of the programme design are unsustainable in the harsher economic and financial climate of the 1990s. Firstly, the programme is heavily dependent on external grants for capital investment and cannot continue on its own. Secondly, as the programme expands, recurrent costs escalate at a pace well beyond the level of recurrent funding. Thirdly, user involvement in the planning, implementation, operation and maintenance in the communal and resettlement areas is still very limited

Area of Study

Rural water supply and sanitation programme has emphasized the provision of services to communal lands and resettlement areas people through central government efforts. This paper concentrates on activities in the communal lands and resettlement areas.

District councils are the local authorities in communal lands where almost 57% of the Zimbabwe's population live. These areas are largely marginal, overused and inhabited by poor peasants. Land is communally owned.The Zimbabwean government has over the past 10 years provided water and sanitation services in these areas free of charge.

Resettlement areas are the newly acquired commercial farms now settled by landless people from communal areas, commercial farms and even urban areas. No local authority as yet exist in resettlement areas.Land is also communally owned.

Rural[1] and district councils and resettlement areas are currently merging under the 1988 Rural District Councils Act into one rural local authority in each administrative district.

Scope of Integrated Rural Water Supply and Sanitation (IRWSS) Programme in Zimbabwe

The National Rural Water Supply and Sanitation Programme (NRWSS) in communal lands and resettlement areas has grown from the small scale pilot projects of the early 1980s to a national programme with a 1989 annual expenditure of some $33 million. The programme derives much of its macro planning from the National Master Plan for Rural Water Supply and Sanitation (NMPRWSS). The programme presently comprises 20 major intensive interministerial, district, and provincial water supply and sanitation projects (see Map 1), a large number of non-governmental (NGO) projects, and continued governmental funding through the Public Sector Investment Programme and the Ministry of Health Disease Control Vote. The major work is carried out in the Communal Lands. Less activities are concentrated in the Resettlement Areas and the investment in the district and rural service centers with respect to water supply and sanitation has nearly come to a standstill.

Programme Components

The programme components are are divided into **hardware** and **software** elements. Hardware elements include the basic infrastructure and the software elements facilitate the long term sustainability of the facilities.

Hardware Componets

Primary water supplies:
- Boreholes with hand pumps
- Shallow wells "
- Deep wells (blasted) "
- Protected Springs

Sanitation:
- Blair latrines (ventilated improved pit latrines)

Rehabilitation:
- Rehabilitation of existing water points

Piped supplies:
- Limited till a sustainability methodology has been developed

Software Components
- Operation and Maintenance

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[1] Rural councils are made up of small and large scale commercial farming areas where land is held under freehold title. Drinkink water supply and sanitation is at the cost of the land owner and the government's role is to provide a legislative framework, technical advice, promotion of basic services for farm workers.

Health and Hygiene Education
Community Participation
Land Use Planning

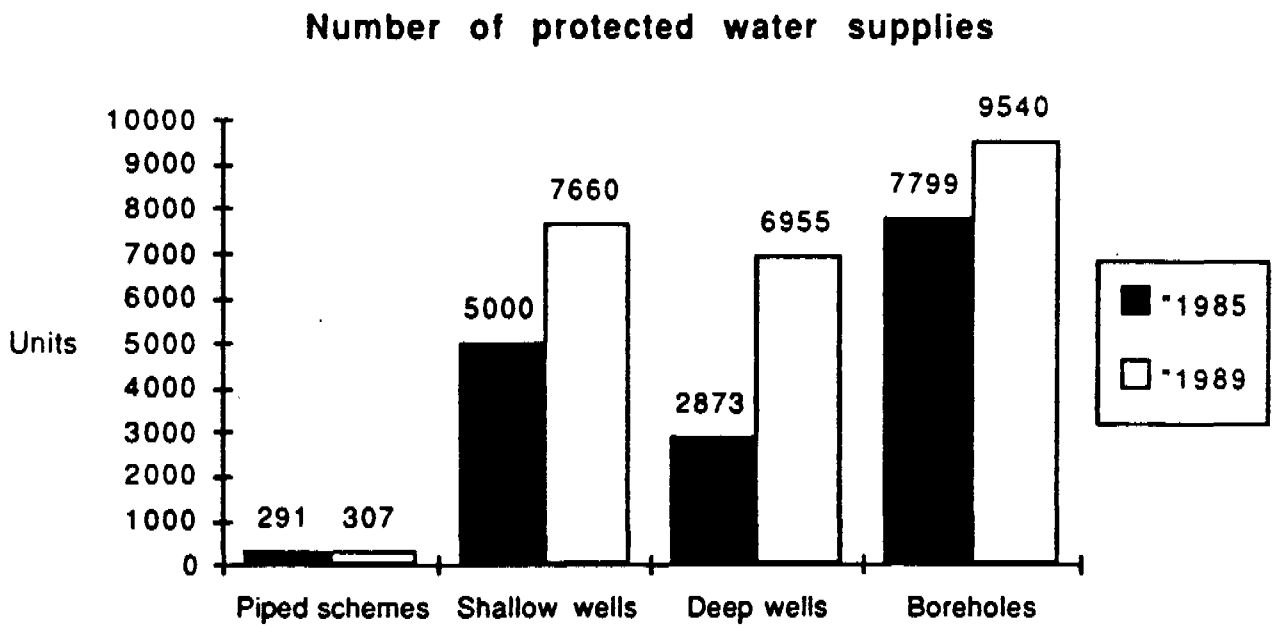
ACHIEVENTS TO DATE

Two factors make direct assessment of the achievements difficult; namely lack of adequate statistics and the inherent difficulty in assessing the improvement in public health. Despite the problems of the poor statistics figures can be given to show the current situation. Achievements are broken down according to project components. In addition the programme can also be reviewed in terms of achievements in coordination, and funding. The overall figures are reflected in the table and figure below which gives a comparison of the status in 1985 and the situation in 1989. Data from the NMPRWSS are used as a reference when comparing developments during the period 1985-1989.

Primary Water Supplies

Since 1985, service coverage to safe and accessible drinking water supply and sanitation facilities has increased the percentage of communal land and resettlement population covered from 33% to 55% in the case of water and from 15% to 21% in the case of sanitation. Figure 1 below shows comparative figures from 1985-1989 years indicating a marked improvement in performance.

Figure 1: Number of Protected Water Supplies (1985 and 1989)



Source: Figures have been provided by the implementing ministries for 1985 while figures for 1989 are based on district inventories.

The coverage of the water supplies is as given in the table below.

Table 1: Water Coverage (Persons)

Type of Facility	Population served in 1985	Population served in 1989
Shallow Well	250 000	383 000
Deep Well	430 950	1 043 250
Borehole	1 949 750	2 385 000
Total	2 630 700	3 811 250

Local Technology

The Zimbabwe programme has benefited largely from the availability of local appropriate technologies in both the water and sanitation facilities. The Blair Research institute and the private sector have produced the blair latrines and blaair pumps, as well as the bush pumps well suited to the local environment.

Table 2: Sanitation Coverage in the Rural Areas (Persons)

Sanitation service level	1985	1989
Blair latrines (BL)	6 000	187 000
Covered	36000	1 122 000
Not covered:	4770 000	4 210 386
Percentage coverage:	**7.5%**	**21%**

*The assumption is that 1 Blair serves a household of average 6 persons

Software Components

In terms of Operation and Maintenance of water supplies, a three tier maintenance structure has been established in all districts involving, pump minder, water point caretaker and water point committees for all primary water supplies. The problem is that water provision is free to the users and all the major costs are met by the central government through allocations to District Development Fund (DDF) or Ministry of Energy Water Resources and Development (MEWRD).

A recent evaluation of two district integrated projects has shown a poor performance in health and hygiene education. The emphasis is still on physical structures. As a major component of the programme,community participation is still limited in scope. Some successes were achieved in terms of water point siting by communities, construction of blair latrines, and establishment of water point committees, however, much still remains to involve local authorities and communities in planning, implementation, operation and maintenance. Gender participation is still very limited to menial tasks. The NAC has stopped inclusion of piped schemes into intergrated projects until a policy has been enunciated on the operation and maintenance responsibilities by the users. There has been an overall improvement in sanitation from 7.5% coverage to 21% over 4-5 years. The major concern is the sustainabilty of the level of susbsidy as well as the health and hygiene education comprehension in the communities.

Role of the Government

Government's role as a facilitator in this programme can be measured in terms of its political will, coordination role and the allocation of resources to the sector. In terms of political will, at independence in 1980, the new government accepted the basic needs approach to rural development with emphasis on the hitherto neglected communal lands. In 1981 the government endorsed the International Drinking Water Supply and Sanitation Decade. In 1985 the government commissioned the preparation of the NMPRWSS for communal and resettlement areas. That Plan even though not formally endorsed by cabinet formed the basis for the current programme through the establishment of the National Action Committee in 1987 as well as the changing of the chairmanship of that committee from Ministry of Health (MOH) to Ministry of Local Government, Rural and Urban Development (MLGRUD).

Capital development of the rural drinking water supply and sanitation services is financed by government investments, donor grants, and private contributions. In 1982, external support agencies contributed only 20% to the sector. By 1985, this had increased to 35%. The current level of ESA support is 85% The key contribution of the central government has been in coordinating and channeling resources to the sector.

Types of Projects and Funding Sources.

Sector activities have mainly been financed by Donor agencies. Projects funded by the Government are funded under the Public Sector Investment Programme

(PSIP). Operation and maintenance costs of water facilities are borne by the Government with minor contribution in kind from the communities. On the average the sector has been receiving over Z$ 30 million annually. This magnitude of finance is adequate to meet the targeted objectives of the Sector by the year 2000. In order to review what has happened during the past decade, differentiation has been made between five types of projects. This differentiation is based on a combination of implementation strategies and sources of funding.

Integrated Rural Water Supply and Sanitation (IRWSS) Projects

IRWSS projects follow the NAC approach of decentralised planning and implementation at the district level. These projects are implemented according to the agreed inter-ministerial responsibilities. Sixteen IRWSS projects were under implementation in January 1991. An additional 8 projects are expected to start in FY 1991/92. All the IRWSS projects, except for Mutoko the are Donor financed.

Donor Funded Non Integrated District Projects

These are donor funded projects which do not follow NAC agreed inter-ministerial approach. The projects are normally implemented by one or two agencies in a given district. They can take the form of either a water supply project or a sanitation project.

The chart below shows the distribution of the commitments by Donors for IRWSS and Non Integrated projects. The total commitment over the 1987-1992 period is about Z$ 60 million. Figures below show the scale of that funding by type of project. Central government's own funding has been rather limited considering what is required to sustain the sector.

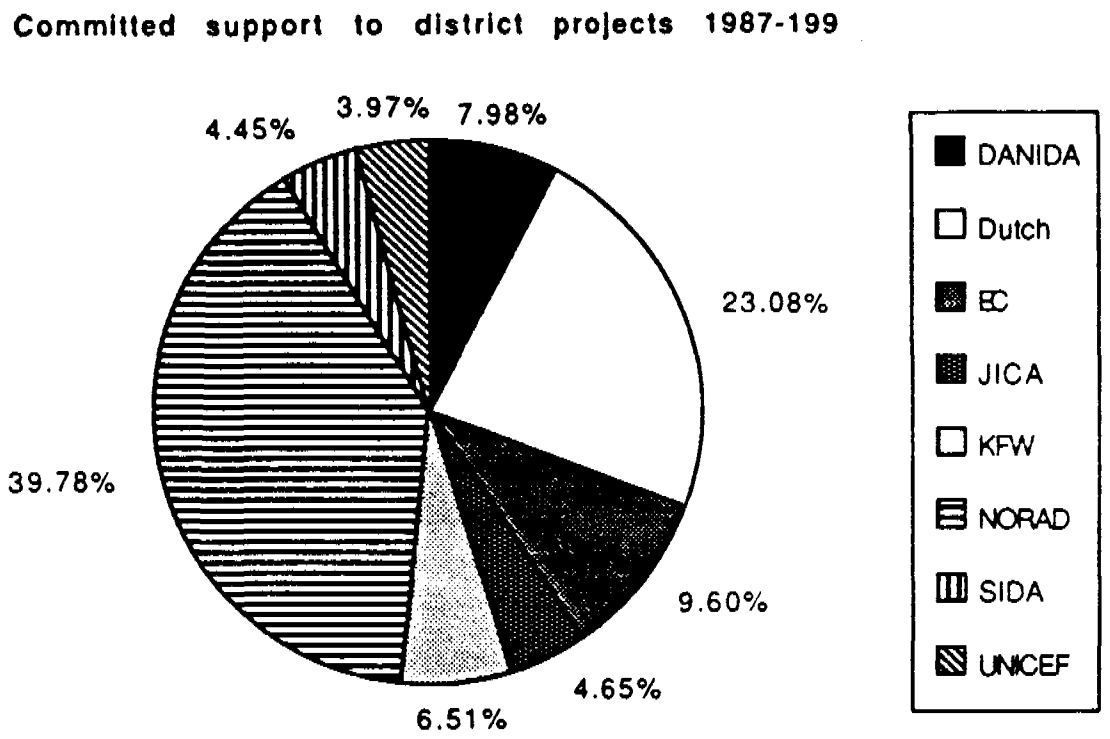


Figure 1: Financial support for Integrated and Non Integrated District Projects

Donor Funded Head Office Projects

These projects have mainly contributed to the institutional capacity building of the various agencies in order to effectively implement and manage the various projects. Head Office projects have taken the form of provision of Technical Assistance, both Expatriates and Local Consultants, and provision of technical equipment, spare parts, tools and vehicles. The chart below shows the distribution amongst the donors of support to institutional capacity building through Head Office projects. It is notable here that the number of donors supporting the sector is increasing. The total commitment over the 1987-1992 period is about Z$ 51 million.

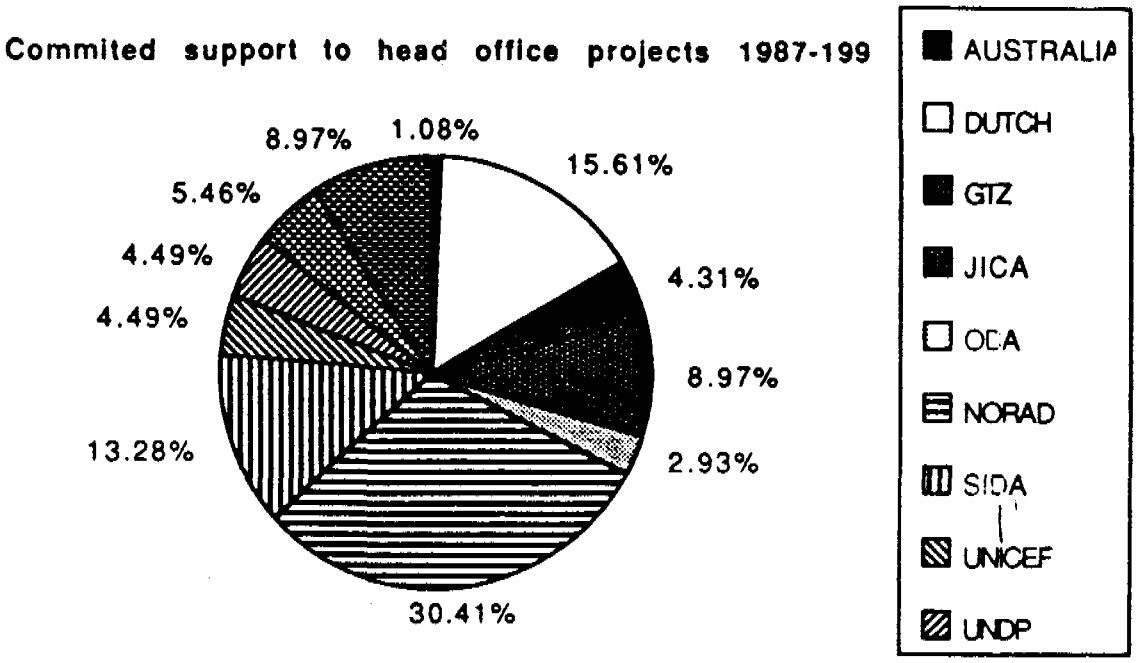
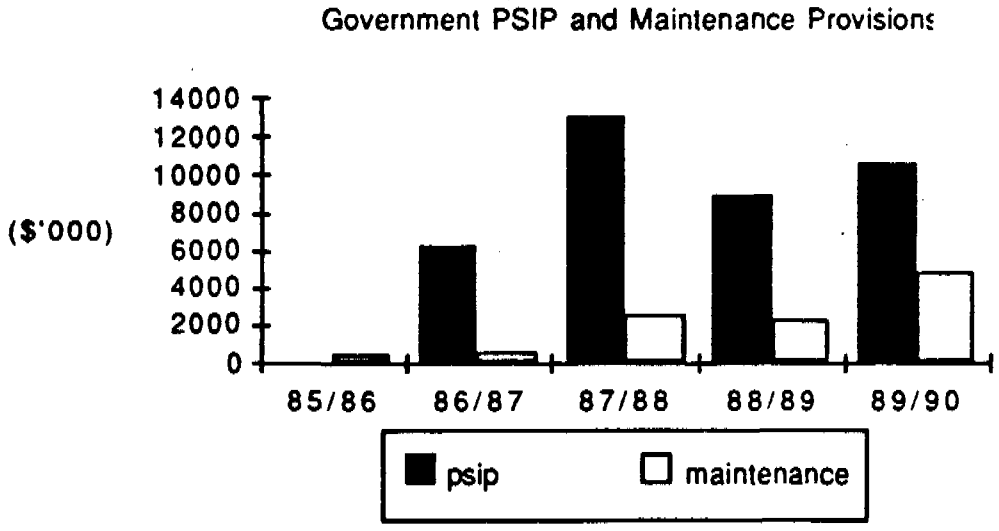


Figure 2: Donor Support for Head Office Support Projects

It is quite clear that the support by central government has been consistently falling below needs particularly on recurrent expenditure. The gap between capital and recurrent (inclusive of donor and NGO funds) is too wide. The result is that new structures will remain unmaintained.



*Taken from the Estimates of Expenditure 1986/87,87/88, 88/89 and 89/90 Government Printers.

Sector Co-ordination

The decentralized structure of rural development committees namely, Village Development Committees (VIDCOs), Ward Development Committees (WADCOs) and District Development Committees (DDC) had at the early part of the planning period not been properly established. Poor co-ordination led to different agencies moving into the same areas to do the same things. From the early period there are many examples of poor utilization of resources caused by poor co-ordination in the sector. All activities are now relatively better coordinated. All sector ministries have agreed to the division of responsibilities as outlined in the NMWP which are:

MLGRUD
- Project Co-ordination and Chairmanship of NAC
- Planning and monitoring of the national programme

MLGRUD has established a National Co-ordination Unit (NCU), for daily co-ordination of rural water supply and sanitation development

DDF
- Construction of deep, blasted wells
- Rehabilitation of Primary Water Supplies
- Water point siting
- Drilling of boreholes and construction of headworks
- Operation and maintenance of all primary water supplies in the communal lands through the three tier system

MEWRD
- Siting of boreholes
- Planning and implementation of piped water supplies
- Borehole drilling and headworks construction
- Registration of water supplies in an national database
- Hydrogeological Research

MOH
- Construction of shallow, hand dug wells
- Construction of Protected Springs
- Upgrading of Family Shallow wells
- Construction and supervision of rural sanitation , i.e. blair latrines
- Health and hygiene education

MCCD
- Community mobilization for community participation
- Community Training
- Monitoring of Community Inputs

MLARR
- Land Use Planning

MFEPD
- Donor Co-ordination
- Control of Funds
- Programme Monitoring and Evaluation

All sector agencies have agreed to decentralized planning and development of the programme using Water and Sanitation sub-committees under the provincial and district development committees.

Donor Co-ordination

Many donors and NGOs had selected particular ministries to whom they provided their assistance. As the different ministries were asked to include more and more supporting activities into their programmes, different ministries undertook activities which were outside their ministry's portfolio. The NAC has streamlined the presence of donors in the sector especially through the Ministry of Finance Economic Planning and Development (MFEPD).

CONSTRAINTS

The rural water supply and sanitation programme is faced with a number of constraints emanating from the socio-economic, political and institutional environment in which the programme is operating.

Institutional Constraints

The involvement of many ministries and agencies has lead to some **duplication** of functions. **Commitment** is hardly found in the same proportions from each ministry. The **bureaucratic structure** of the programme at times hinders faster decision making.When Donors have provided the foreign exchange for the kits to be imported it has taken a long time to go through the procedures of getting the vehicles into the country. Cumbersome bureaucratic **financial procedures** cause unnecessary delays in project implementation. The **centralisation of all government payments** has meant that some suppliers have had to go for six months to a year without payment. This unsatisfactory situation has caused incredible difficulty in getting supplies especially from the small rural traders who can not afford that long delay.

The unclear land reorganisation policy issue has had a bearing on the implementation rate of the programme in particular the community participation aspect which is time consuming. The delays have been exacerbated by staff shortages in the Agritex Department. In addition the facilities have been provided where the people live instead of where they will be expected to live after the land reorganisation.

The programme is directed from head offices so that plans, technology choice, financial control and decision making is determined from the top. This lack of decentralisation in terms of vital decision making has meant that local authorities, the the planning and mobilisation agencies do not play active role in the provision of water and sanitation facilities as well as financing their maintenance.

Constraints Related to Performance of the Economy

Shortages in the sector are closely related to the lack of foreign exchange either for the manufacturers of the items or shortage to procure the items from outside Zimbabwe. The shortage of forex is generally explained by the struggling economy like in many other developing countries. Major material shortages are in terms of **cement, galvanized steel pipes,and lack of spares** for hand pumps. Although cement and hand pumps are manufactured locally, the manufactureres are finding it difficult to meet the ever **increasing demand** from the programme.

These shortages have affected the implementation of projects very seriously. Short gap measures have been taken such as procurement under commodity assistance programmes but that is not sustainable in the 1990s. The biggest constraint to the sector is the limited **financial resources** for development to the sector. It has been NAC's objective to start at least one district in each Province each year. However, this has not been possible. With decentralised implementation of the projects, the capacity to implement more projects is available, but the limited availability of funds has cut the number of projects that can be undertaken.

The **human resources problem** has been evident in the economy since Independence and Technical Assistance has been required in the sector. What has generally been lacking is personnel with the right kind of training and experience especially in the technical areas. A notable constraint for the Government agencies in the sector has been the drift of qualified personnel to the Private sector. The low Public Sector salaries relative to the **private sector salaries** have always allowed for the drift of personnel. This is particularly so with experienced technical personnel whose replacement and/or training is very time consuming. An allied problem is the difficulty that is encountered in trying to get new posts created in the Civil Service. This has forced a reliance on Technical Assistance (expatriates and local consultants) even in posts which could be filled with local personnel.

Rural development is not possible without transport. **Shortage of transport** has been a major constraint in the sector. Transport is required for supervising projects

and for ferrying materials and tools to the project sites Then sites are usually distant from the administrative centres. Lack of transport has meant reduction in project implementation rate. The unavailability of spare parts for vehicles has also continually affected the fleet.

Political Constraints

The major constraint is related to sustainability of the programme. There is a lack of political commitment to face the issue of sustainability in the sector. Central government is bearing the maintenance costs to date (an average of $186 a year per water point). However, as the programme is expanding and more installations are being erected the burden is increasing. The MFEPD has hinted repeatedly that it cannot continue to bear the burden alone. The issue of sharing costs with users has not been appreciated by politicians. A clear exampmle are the existing piped water supply schemes. These schemes are very expensive to maintain and financial allocations from Treasury are inadequate. Consequently NAC have not adopted this technological option until some cost sharing mechanism is in place.

There is generally a **lack of decentralisation** to rural local authorities in decision making and resource generation. The role of people's representatives is continually eroded by more centralisation of functions and responsibilities. The creation or disbanding of departments and ministries is vested in the President. Any complaints can only be resolved by him. The division of responsibilities between departments can also be finalized by the President. The poor resource base of local authorities is a direct result of the refusal of central government to devolve tax base to local authorities. It appears that the relationship between government and users is one of **patron and client**. The obvious outcome is that the users, do not fully identify with the projects as belonging to them but to government or any other donor.

Constraints in Resettlement Areas: Operation and Maintenance

The major constraint to the provision of water under the resettlement programme is the capacity of the service Ministry responsible for water provision, i.e. Ministry of Energy Water Resources and Development and the shortage of maintenance funds for the existing water points. The allocations to DDF for maintaining boreholes is less than $20 per borehole per year. The Ministry simply does not have enough equipment, materials, manpower and transport facilities to fully service the requirements of the programme.

As regards sanitation in resettlement areas, settlers have given a low priority to the digging and construction of toilets. The key constraint has been the people's perception of health and hygiene education.

STRATEGIES TO OVERCOME PAST CONSTRAINTS

Institutional Constraints

Efforts have been taken to address the institutional constraints in the sector. The NAC has asked departments with overlaps such as DDF and MEWRD (borehole drilling and headworks) and MOH and DDF on shallow well sinking, and Ministry of Community and Cooperative Development (MCCD) and Ministry of Political Affairs on community participation and mobilization to iron out differences and design some modus operandi in the sector. A more decentralised planning and implementation strategy is envisaged where the districts local authorities will be responsible through interministerial integrated approach to projects. Currently, DDCs and their District Water Supply and Sanitation Committees (DWSSC) and Rural District Councils (RDCs), which are more directly are accountable for planning and implementing projects.. The Rural District Council's Act of 1988 is finally about to be implemented. The Act will give more responsibilities to the local authorities and this will increase the coordinative role of local authorities.

The Economic Reform Programme or Structural Adjustment Programme is affecting the size of agencies. The size of the public sector is definitely going to be affected by the reform exercise. Duplication of functions is certainly a key aspect under scrutiny.

The Decade Consultative Meeting, November 1990.

In line with the International Declarations for Health for All By 2000, The UN Fourth Development Decade, the Global Strategy for Shelter, Safe Drinking Water by Year 2000, and the World Declaration on the Survival and Protection of Children, Zimbabwe held its Decade Consultative Meeting in November 1990 to review progress towards these declarations. The meeting came up with recommendations seeking to ipmrove the implementation of the water and sanitation programme. The meeting advocated the strengthening local authorities. Human resources development, community participation in particular the role of women were emphasized. The Meeting also felt very strongly the need to

streamline functions of departments with a view to increasing efficiency and effectiveness.

Effort to Remove Constraints Related to the Economy

An attempt has been made to solve the limited financial resources constraint by making more donors aware of the programme and interesting those donors who are currently not involved in the sector. Of great importance here are reporting procedures, monitoring and evaluation which have been well maintained. Good in respect to financial accounts progress reports to the donors has gone a long way in maintaining and winning donor confidence. The NAC has invested great efforts in this and will continue to do so. The government of Zimbabwe has been called upon to increase its own resources to the sector. This is becoming a requirement by many donors. The government has shown interest by funding the Mutoko IRWSS project under its PSIP. The proposal before the Senior Minister of Local Government recommends an increase in domestic resource mobilization for capital costs through requiring consumer contributions to sector development. Close attention would be required to set consumer payments which affect real cost savings and not unnecessarily disrupt the programme nor disadvantage the rural poor.

The shortage of qualified personnel is exercabated by poor remuneration in the public service. Hence the continued requirement for Technical Assistance in the period under review.The NAC has recommended and also undertaken that there be understudies to the expatriates. This exercise has been effective in some instances. In certain cases however this has not been possible because of the limitations within the civil service because of the budgetary constraints. Bonding has been necessary only as a short term solution. Training of the local personnel is continuing under the National Training Plan is being developed which should help identify the areas requiring development. It has been emphasized by NAC that wherever possible technical assistance be provided in advisory capacity.

The NAC has made use of donor funds available in foreign currency to procure items in short supply such as vehicles, cement, equipment and spare parts. The NAC has also instituted the purchase in bulk of items in short supplyas a short gap measure.

Attempts to Remove Political Constraints in the Programme

Sustainability of the programme and programme outputs is the key issue that needs immediate attention in the sector. While strong consideration has been taken in respect of the choice of technology, central government support in terms of maintenance, decentralisation, and increased funding is uncertain. In 1989 MFEPD made it clear that they could not continue to bear the ever increasing burden of funding the whole maintenance. The concept of a cost sharing between the Government and the beneficiaries requires political backing in taking it to the users. A policy paper has been prepared in respect to this for the Senior Minister of Local Government Rural and Urban Development for presentation to Cabinet. It proposes contribution from the beneficiaries mainly to cater for the maintenance of the facilities. The cost sharing programme should involve the local authorities and communities[2] . A second paper under preparation will spell out the mechanics of how this cost sharing will take place.

The need to increase the capacity of the MEWRD, the DDF, and MOH still remain. A study for the greater involvement of the private sector in the programme is under commission.

With regards sanitation, community mobilization for community participation by the Ministry of Community and Cooperative Development and health education by the Ministry of of Health will further be emphasized.

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[2] Two rural willingness to pay studies in Zimbabwe were undertaken both of which conclude that the willingness to pay for water is at a level appropriate only to contributions to maintenance costs of primary water provision. Consumers are already responsible for maintenance of sanitation facilities.

NATIONAL RURAL WATER SUPPLY AND SANITATION PROGRAMME
Status July 1991

Province	District project areas	IRWSS-Projects: Donors	IRWSS-Projects: Ongoing	IRWSS-Projects: Approved Awaiting Finance	Donor non-integrated WS-projects	Ongoing NGO-implemented with Govt. funds	NGO-implemented with Donor/NGO funds	IRWSSP-Next district to be prioritized	IRWSS-Project Proposal under preparation
MANICA	CHIPINGE	Norad/Sida	Yes				LWF/WV (FEF)	Extension	
MANICA	MAKONI	Norad/Sida	Yes				Africare/LWF		
MANICA	CHIMANIMANI	Norad/Sida	Yes				LWF	Extension	
MANICA	MUTASA				Sida	Africare/LWF	WV (FEF)		
MANICA	NYANGA	(Norad)	(92/93)	Yes	Sida		CC (FEF)	1	
MANICA	MUTARE			Yes	Sida		ADRA / Plan Int	2	
MANICA	BUHERA				Sida		CC	3	
MASH E	MUDZI	Norad	Yes				RB/WV/FFH	Extension	
MASH E	MUTOKO	GOZ	Yes		Sida				
MASH E	MUREHWA/ UMP	(JICA)		Yes	Sida/Unicef		RB/WV		
MASH E	WEDZA	(JICA)		Yes	Sida				
MASH E	MUREHWA/ Ikobeleng	(Norad)	(92/93)		Sida		WV	1	X
MASH E	GOROMONZI				Sida			2	91/92
MASH E	MARONDERA				Sida			3	
MASH E	SEKE				Sida			4	
MASH C	MT DARWIN	Norad	Yes				WV (FEF)	Extension	
MASH C	GURUVE	Dutch	Yes				WV		
MASH C	RUSHINGA	Dutch	Yes				CADEC (FEF)		
MASH C	CENTENARY	(Norad)	(92/93)					1	X
MASH C	MAZOWE							2	91/92
MASH C	BINDURA							3	
MASH C	SHAMVA							4	
MASH W	NYAMINYAMI	Dutch	Yes				SCF (UK)		
MASH W	CHIRORODZIVA	Dutch	Yes		Unicef		WV		
MASH W	HURUNGWE	Dutch	91/92	Yes	Unicef		CADEC		
MASH W	KADOMA	(Norad)	(92/93)	Yes	Unicef			1	
MASH W	CHEGUTU (Mhondoro							2	91/92
MIDL	CHIKOMBA	(Danida)	(91/92)	Yes			WV		
MIDL	SHURUGWI	(Danida)	(91/92)	Yes					
MIDL	ZVISHAVANE	Norad	Yes				ZWP		
MIDL	GOKWE	EC	91/92	[illegible]					
MIDL	MBERENGWA	(Norad)	(92/93)	[illegible]			Africare/WV	1	X
MIDL	MASHAMBAZOU			[illegible]			Africare/WV	2	91/92
MIDL	MANYAME							3	
MIDL	TAKAWIRA						Africare/WV	4	
MASV	ZAKA	Norad	Yes				ADRA Africare CADEC	Extension	
MASV	[illegible]	KFW	Yes						
MASV	[illegible]	Norad	Yes				Africare		
MASV	MWENEZI	KFW	91/92	Yes					
MASV	CHIREDZI	KFW	91/92	Yes			RB (FEF)		
MASV	BIKITA						LWF	1	91/92
MASV	MASVINGO						Africare/LWF/WV	2	
MAT N	NKAYI	Dutch	Yes						
MAT N	HWANGE	(Danida)	(91/92)	Yes			Africare		
MAT N	TSHOLOTSHO	Dutch	Yes				CADEC/WV		
MAT N	BINGA					SCF (UK)	SCF (UK)		
MAT N	BUBI						WV	1	X
MAT N	LUPANE							2	91/92
MAT S	BULILIMA MANGWE	Dutch/EC	Yes		EC		CC		
MAT S	UMZINGWANE	EC	Yes					Extension	
MAT S	INSIZA	EC	Yes					Extension	
MAT S	MATOBO	EC	Yes					Extension	
MAT S	BEITBRIDGE	(Unicef)		Yes	Unicef	LWF	ADRA/Africare/LWF		
MAT S	GWANDA					LWF	LWF		

Abbreviations Donors

1	DANIDA	- Danish International Development Agency
2	DUTCH	- Government of the Netherlands
3	EEC	- Commission of European Communities
4	KFW	- German Development Bank
5	JICA	- Japan International Cooperation Agency
6	NORAD	- Norwegian Agency for Development Cooperation
7	SIDA	- Swedish International Development Authority
8	UNICEF	- United Nations Children Fund

IRWSS-projects - Integrated Rural Water Supply and Sanitation Proj
WS - projects - Water and Sanitation Projects
NGO - Non-Governmental Organizations

Abbreviations NGOs

ADRA	- Adventist Development and Relief Agency
CADEC	- Catholic Development Commission
CC	- Christian Care
LWF	- Lutheran World Federation
RB	- Redd Barna
SCF (UK)	- Save the Children Fund (United Kingdom)
WV	- World Vision
ZWP	- Zvishavane Water Programme
Plan Int	- Plan International
FEF	- Fridrich Ebert Foundation
FFH	- Freedom from Hunger

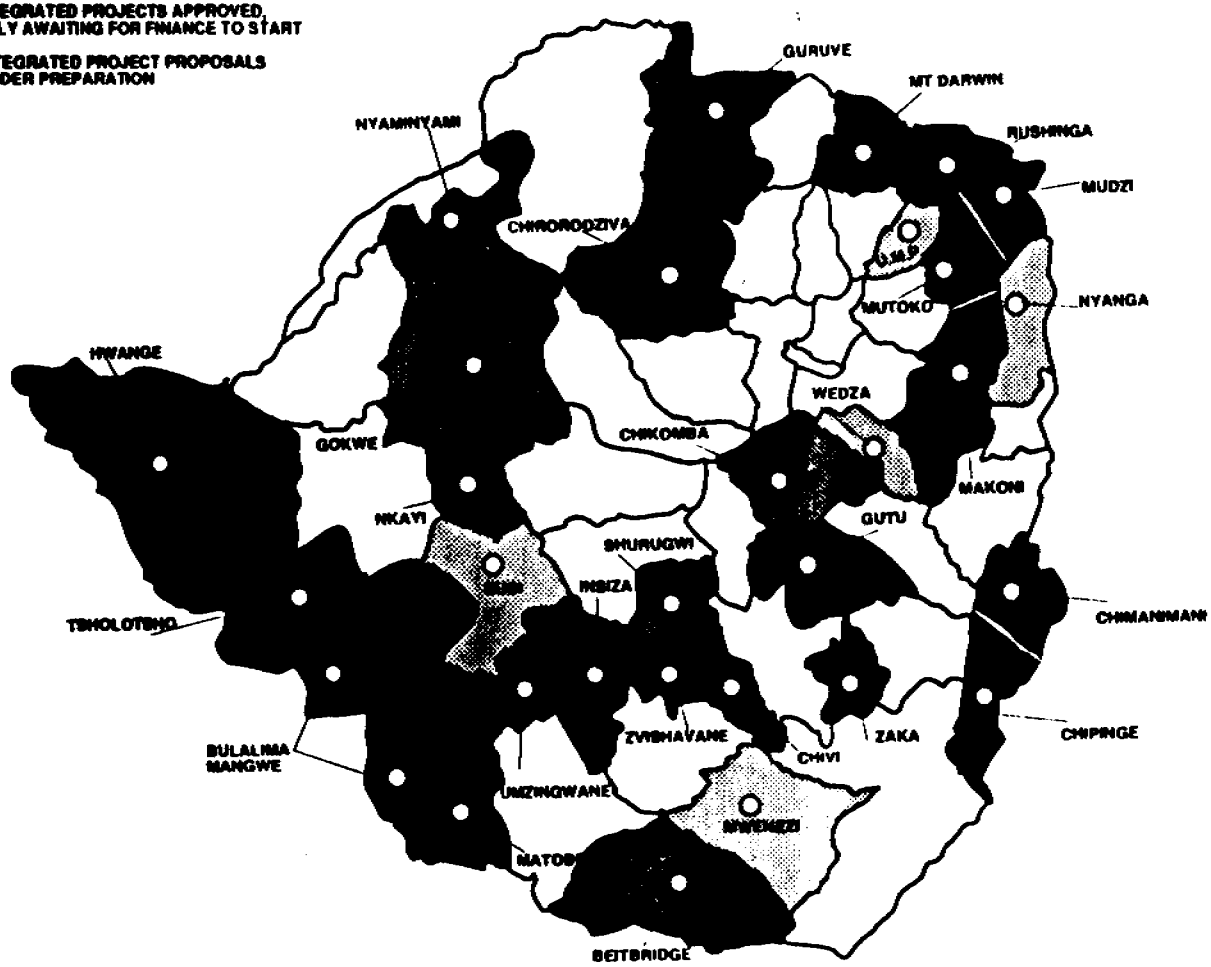
The National Coordination Unit
Ministry of Local Government Rural and Urban Development

16 Intage
8 Awaiting finance
5 North)

INTEGRATED PROJECTS IN PROGRESS
(Norad - 8 districts)
(Dutch - 8 districts)
(EC - 3 districts)
(GTZ/KFW - 1 district)
(GOZ - 1 district)

INTEGRATED PROJECTS APPROVED, ONLY AWAITING FOR FINANCE TO START

INTEGRATED PROJECT PROPOSALS UNDER PREPARATION



Revised: July 1991
National Co-ordination Unit,
Ministry of Local Government Rural and Urban Development

Community participation in planning and implementation — RDC, MPA

Shallow wells with bucket pumps — DDF

Deep wells or boreholes with hand pumps — DDF, MMMD

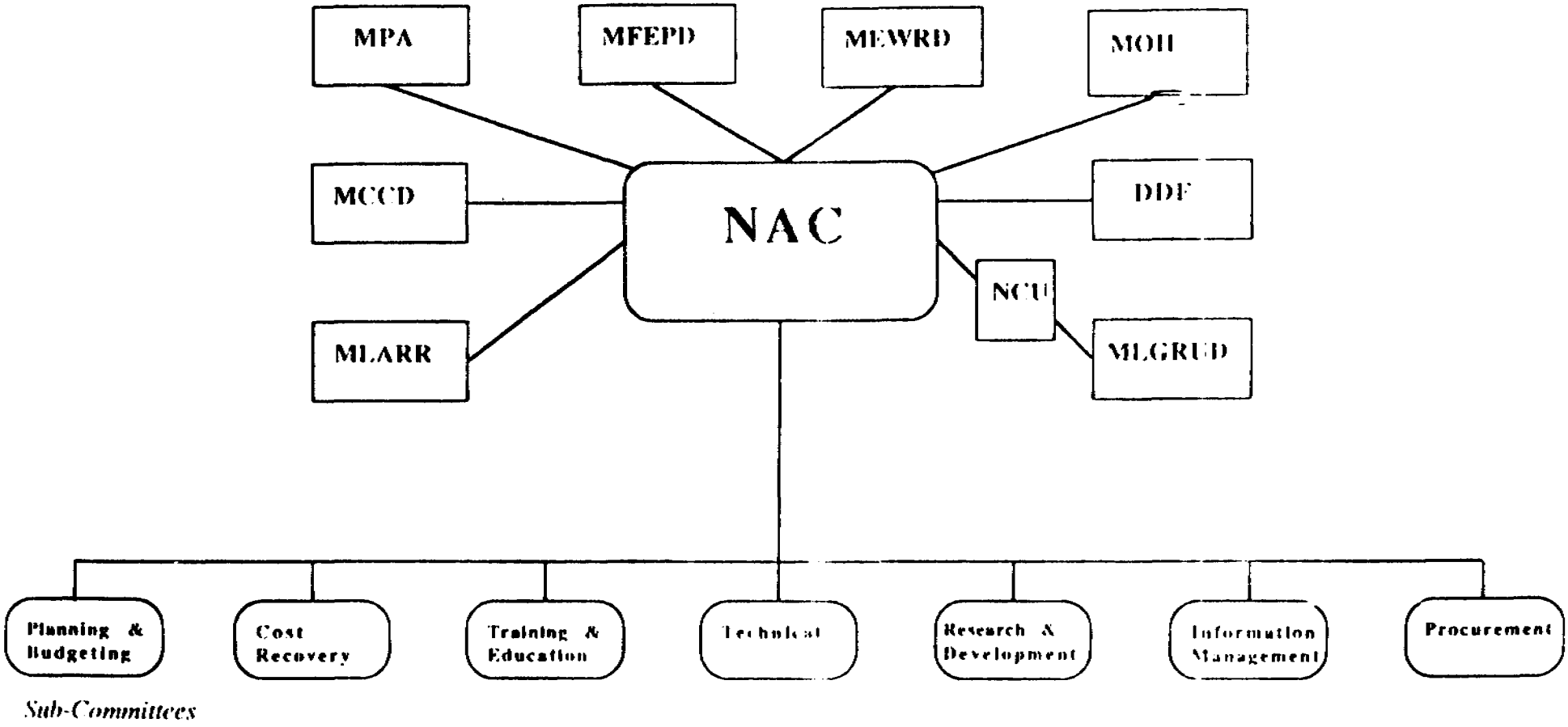
Sustainable Operation and Maintenance — DDF

Sanitation with Blair toilets — MOH

- Health and hygiene education — MOH

- Land Use Planning — RLARR

ORGANIZATIONAL STRUCTURE, NAC



Sub-Committees

RECOMMENDATIONS

This document gives an outline summary of the recommendations contained in the 5 Year Development Plan for the Rural Water Supply and Sanitation Sector.

Planning

1 The Integrated Rural Water Supply and Sanitation (IRWSS) project is the recommended implementation model.
2 Government funding of IRWSS projects should be guided by the results of the evaluation of the Mutoko government funded integrated project.
3 A Donor financing either Water or Sanitation projects should be encouraged to finance the corresponding software of Community Participation, Co-ordination and Land Use Planning for sustainability purposes.
4 Where a Donor finances either Water or Sanitation projects alone matching funds for the other component should be sought and a joint project be implemented.
5 All Donor funded Non Integrated projects within the National Programme should pass the National Action Committee (NAC) rather than an individual ministry to ensure even distribution of projects throughout the country, foster co-ordination and facilitate efficient resource allocation.
6 Donor funded Head Office projects should be used to provide support to implementation of IRWSS projects.
7 All Non Governmental Organisations (NGOs) working in a given district should work through the local authority structure for Water and Sanitation.
8 Water and Sanitation services offered should be uniforme in the Resettlement Schemes and in the Communal Lands.
9 The technical and policy issues delaying further provision of services in District and Rural Service Centres need to be resolved as a matter of urgency to ensure continued development of a sustainable water and sanitation infrastructure in these areas.

Training and Human Resources Development

10 Training for Water and Sanitation should focus on Interministerial training to foster better coordination.
11 NAC should seek stronger linkages with the established training institutions like Public Service Training Centres, Zimbabwe Institute of Public Administration and Management (ZIPAM) and the Training Centre for Water and Sanitation (TCWS).
12 Sector ministries should review and assess their training capacity and needs within the policy framework approved by NAC.
13 Technical Assistance (expatriates and local consultants) should be used only in advisory positions.

Financing

15 A government policy on cost recovery in the provision of Water and Sanitation should be sought for beneficiaries to contribute to the cost of operation and maintenance.
16 Government Payments and Financial procedures should be streamlined and decentralized to ensure prompt service to Government requisitions by suppliers.

Institutional

17 The responsibility and authority for planning, financial control, implementation, operation and maintenance of rural water supply and sanitation, including decisions relating to technology choice, must increasingly be borne by the Local Authorities and community members, leading to complete management through established local structures.

18 A forum should be established to improve the coordination of all Donors and NGOs involved in the Rural Water Supply and Sanitation sector.

19 The existing duplication of functions within the sector, particularly in the areas of borehole drilling, well sinking, community mobilisation and operation and maintenance should be resolved.

20 The main thrust of central government's role should focus on overall sector guidance and promotion, training, information dissemination and support to communities and local authorities.

21 The contribution of the private sector and the NGOs in implementing Water and Sanitation facilities should in the future assume greater importance and should be encouraged and co-ordinated.

Procurement

22 Donor funds available in foreign currency should continue to be used to procure commodities and equipment in short supply on the basis of a co-ordinated Procurement Plan.

23 Donor involvement in Commodity Import Programmes should be strengthened in order to facilitate procurement of equipment in national shortage.

Hygiene Education and Community Participation

24 Health and hygiene education within the sector must be strengthened through the participation of community members in the identification of problems, messages and target groups and in the development of training and promotional materials.

25 Recognising that community mobilisation and health and hygiene education are essential components of the National Programme, all agencies need to support these activities. Village Community Workers have an essential role in hygiene education and all efforts should be made to encourage their involvement in this activity.

26 Recognising the central role of women in Rural Water Supply and Sanitation, their active and full involvement in all levels of project implementation and in operation and maintenance must be achieved.

Technology

27 The range of technology options recommended for Rural Water Supply and Sanitation must be expanded to provide sustainable and affordable options for all areas of Zimbabwe. Where feasible, family facilities should be promoted.

28 The success of the National Programme is largely due to the development of standardised, indigenous technologies, and this policy should continue to be followed.

2.5 Country Level Collaboration - Case Study Africa - Zimbabwe

Summary of the Paper

The paper gives a broad outlook of the Water and Sanitation programme in Zimbabwe. It, however, does not treat country collaboration in isolation of other important problems which include sustainability, duplication and political commitment. All these issues, including Collaboration are addressed to in the paper without special treatment or emphasis, simply because of the special interdependence of these issues. Even if one looks at the solutions proposed in the paper the same broad brush approach is used because of the interlinkage of these issues.

What comes out clearly in the Zimbabwe case study is the issue of dependence of the sector on donor funding, 85% of the capital outlay comes from donors. Zimbabwe Goverment contribution to the sector has been consistent in O&M, capital contributions have been at best limited and at worst erratic. In other words, of the 16 on-going and 8 about to start integrated projects, only one (Mutoko) is funded by the Zimbabwe Government. This obviously creates a very difficult collaborative task for the Government of Zimbabwe.

Achievement in the Field of Collaboration

The Government of Zimbabwe endorsed the International Drinking Water Supply and Sanitation Decade in 1981. It then tasked the Ministry of Health in 1982, to co-ordinate the sector. In 1985 the Government commissioned the preparation of the National Master Plan for Rural Water Supply and Sanitation. The plan even though not yet formally endorsed by the Cabinet formed the basis for the current programme through the establishment of the National Action Committee in 1987 as well as the changing of the chairmanship of that committee from Ministry of Health to Ministry of Local Government Rural and Urban Development. It must be acknowledged however that although the collaborator's role of NAC is made difficult by problems already observed above one must give NAC credit for continuing to try.

What Should Come out of the Discussion

The paper broadly proposes a number of solutions such as decentralisation. The contention is that if Local Authorities (Communities) are given the whole responsibility of providing and maintaining water supplies and sanitation facilities, country collaboration by the local (national

government) would be enhanced. Decentralisation is chosen simply because it also addresses the other crucial problems such as role conflict (duplication) sustainability (cost recovery).

Obviously, discussion should then focus on lasting solutions to such questions as:

(a) In situations where the developing country is heavily dependent on donor funding how does it reconcile its own national policies and donor country demands (policies)?

(b) How does a country collaborate an array of donors who have of essence to satisfy its financiers and therefore have different demands?

(c) How does a country collaborate when some donors want to import their experiences from elsewhere to the recipient country?

INTER-AGENCY COLLABORATION

IN THE RURAL WATER AND SANITATION SECTOR,

PAKISTAN

BY

Hafiz Pasha, Dr. Hafiz Pasha is
Director of the Applied Economics Research Centre
at the University of Karsalic

and

Michael McGarry, Dr. Michael McGarry is
Principal of Cowater International, Canwater

at the

Collaborative Council Global Forum

Oslo, September, 1991

This paper describes the collaboration between CIDA and the World Bank since 1987 in Pakistan which provided for a country-wide rural water supply and sanitation strategic Investment Plan and Project Preparation. It has resulted in $137 million in assistance to the sector. Results and constraints to collaboration are discussed.

COWATER

The provision of potable drinking water enjoys high priority in national planning in Pakistan. Given the performance of the country in social indicators in relation to its per capita income (approaching $350), there is an increasing recognition of the need for improvements in quality of life in the rural areas, where the bulk of population (over 68 percent) resides. Consequently, a higher share of development allocations is being devoted to rural health, primary education, roads and water supply and sanitation.

The decade of the 80s has witnessed major investment programs for expansion in the coverage of rural water supply. However, while the levels of expenditure are impressive in relation to historical levels, these have not been translated into corresponding increases in coverage or quality of services on a sustained basis. Increasingly, as the country runs into macro-resource constraints due to low national savings rates and declining prospects for foreign assistance, the focus has shifted to consolidation of past investments and improvement in efficiency of new investments in achieving targets. This has led to emphasis on institutional strengthening of the delivery agencies in the sector, to the gradual decentralization of responsibilities of management of investments to local institutions including beneficiary communities and to the greater involvement of the private sector. It is within this context that the scope, nature and potential gains from inter-agency collaboration in the rural water supply and sanitation sector of Pakistan need to be examined.

The objective of this paper is to trace the genesis for such collaboration, the constraints to collaboration and possible solutions, results of collaboration to date and the major lessons learned. The prospects for future collaboration are also identified. We start with brief description of the relevant features of Pakistan.

1. BACKGROUND

The population of Pakistan in 1991 is estimated at about 114 million, with about 78 million in the rural areas. There are four provinces -- Punjab, Sindh, North West Frontier (NWFP) and Balochistan -- constituting the federation. In addition, there is a vast network of local councils, both in the urban and rural areas. Responsibility for development of rural water supply and sanitation rests primarily with the Public Health Engineering Departments (PHED) of the provincial governments. Maintenance functions are expected to be provided by union councils, the lowest tier of local government in the rural areas. In recent years, the provincial Local Governments and Rural Development Departments (LGRDD) have become increasingly involved in the sector, especially in small schemes.

National coverage of rural population with potable drinking water is currently estimated at 40 percent. Wide variation exists in the level of coverage among provinces, ranging from a high approaching 50 percent in the NWFP, to 40 percent in Punjab and to a low of about 20 percent in the provinces of Sindh and Balochistan. These coverage figures include coverage by piped systems and partial (uncontaminated) coverage by hand pumps. Sanitation coverage is substantially lower at 10 percent. While there is strong demand from rural households for improvements in rural water supply, this is generally not the case with sanitation.

Development allocations for rural water supply and sanitation (including drainage) range from 8 to 15 percent of the provincial Annual Development Programs (ADPs). This is equivalent to about 2 to 4 percent of the total public sector outlay. Direct financial involvement of donor agencies in the sector has traditionally been very limited.

2. THE GENESIS OF COLLABORATION

The induction of an elected civilian government in 1985 after a long period of military rule has increased responsiveness to the electorate's needs. The high share of rural population, its relative deprivation in the process of development and the need to stem the tide of migration to already congested metropolitan cities have led to greater emphasis on rural development. The Five Point Program launched by the then newly elected government was primarily geared to achieving this objective. This led to a quantum jump in allocations for the provision of basic services to rural areas. From 1986-87 onwards, the level of investment in rural water supply was raised in real terms by a factor of two to three times.

Simultaneously, during the decade of the 80s Pakistan received high levels of foreign assistance. The country's strategic importance in the context of the Afghan situation and its traditionally good relations with the West led to large inflows of foreign aid. Total disbursements during the decade aggregated to over $15.5 billion, and financed almost half the total public sector investment during the period. However, there was growing concern that despite this sizeable involvement of donor agencies, there has been little breakthrough in the social indicators. As compared to its per capita income, the literacy rate remains very low and there has been very ittle improvement in the life expectancy rate, infant mortality, etc. This has led to change in emphasis in foreign assistance programs away from investments in physical infrastructure aimed at accelerating the rate of

economic growth towards social sector outlays with the objectives of poverty alleviation and improvements in the quality of life. Greater involvement in water supply and sanitation is increasingly being seen by the donor agencies as pivotal to improvements in health status, to protecting the interests of underprivileged groups like women and children, to targeting the poor and to improvements in the quality of the living environment in the villages of Pakistan. The World Bank, the Asian Development Bank, the Canadian International Development Agency, DGIS and GTZ are among the major donor agencies who have shown an increasing interest in diverting their activities towards provision of rural social infrastructure like primary education, health, roads, water supply and sanitation.

The first major initiative for large-scale involvement of donor agencies in the rural water supply and sanitation sector has come from CIDA. Prior to this, UNICEF had been engaged in small scale activities in the sector, mostly with NGO or local council collaboration. While these activities had only a minor impact on coverage, UNICEF had made pioneering efforts for developing low cost implementation methodologies which could potentially be replicated generally once large scale assistance became available. Acknowledging the World Banks growing interest in the sector, in 1986, a Canadian consulting firm, COWATER, first mooted the idea of collaboration between CIDA and the World Bank. This was the genesis for the joint sector mission by CIDA and the World Bank in 1987. The mission was headed by the co-author of this paper and consisted of an inter-disciplinary group of international and local experts with a focus on inter-sectoral linkages between water supply, sanitation and health. The report of the Mission was prepared in 1987. It provided the first comprehensive review of the sector. It presented the data base and highlighted the major issues related to the sector. It also identified strategies, institutional roles and laid out a program for development of the sector. The Mission report was generally well received by policy makers and officials of line agencies in Pakistan. It represented the key starting point to greater involvement of donor agencies in the sector.

The sector review identified as one of the principal programs of the sector the lack of sustainability of investments already made arising primarily from inadequate institutional and financial arrangements for maintenance. It identified a major role for the beneficiaries, through local community based organizations, at all stages of project selection, execution and subsequent maintenance. Given the dispersed nature of the over 40,000 settlements in the country and the need for vast outreach capability of the centralized organizations such as the

provincial PHEDs, the process of decentralization through village level CBOs appeared as the only viable option. However, community involvement in infrastructure delivery, management and financing is not commonly observed in Pakistan. Therefore, this proposal was received with a considerable amount of scepticism by officials of line agencies. The World Bank and CIDA commissioned in 1988 an investigation of case studies of community involvement in the provision of services to demonstrate that this was possible and was in fact on-going in the Pakistani context.

Six case studies were completed. The first was on the Aga Khan Rural Support Program in the north of Pakistan where village organizations have been established to mobilize savings for partial financing of infrastructure investments like irrigation canals. The second was the Baldia Soak Pit project in a large squatter settlement of Karachi, the largest city of Pakistan, which was sponsored by UNICEF and involved community based organizations in the demonstration and installation of latrines. The third case study was on the Balochistan Integrated Area Development program. It was an ambitious program launched by UNICEF to provide an integrated package of services (water, sanitation, hygiene education) by the creation of a special development agency and local community involvement.

The fourth case study related to the Mansehra District Development Program in the NWFP. It had special significance as the vehicle for executing the program was a government agency, the district council, with some assistance from UNICEF.

The fifth case study was on the Orangi Pilot Project, in one of the largest squatter settlements in the world in Karachi. The primary objective of the project was to build a sewerage system for the township with the help of community organizations in each lane. Spectacular success has been achieved by the project and the community based organizations have diversified into other development activities. The last case study related to the Punjab Sanitation Program, a major initiative of UNICEF to provide an integrated package of water supply and sanitation with the help of the rural local councils and village sanitation communities.

These case studies were presented at a CIDA/World Bank sponsored National Workshop in Islamabad, in 1988. The workshop was held by the federal ministry of local government and rural development and was attended by a large number of officials from line agencies, representatives of the donor agencies, project personnel of the above-mentioned projects, etc. Using the case studies the workshop was

successful in demonstrating the cost effective, sustainable delivery of services can be achieved by community involvement and that this approach minimized not only the administrative but also the financial burden on government. Recommendations of the workshop revealed that the case studies had a major impact on changing the thinking of officials from line agencies such as the PHED.

The workshop was followed immediately by a Policy Conference again sponsored by CIDA and the World Bank. Senior officials were invited from the relevant federal and provincial departments along with representatives of the donor agencies. The Conference provided a forum for interaction and dialogue not only among different government agencies but also between sector professionals and representatives from the donor agencies. Its **Islamabad Declaration** endorsed by the participants represents an important policy statement for the sector. It proposes a strategy that will ensure sustainability and assist resource mobilization through greater community involvement (with special emphasis on the role of women), integration of water supply, sanitation and hygiene education, greater institutional coordination among line agencies, enhancement in the role of the private sector and the choice of technology and service level which reflect the demand and willingness-to-pay of beneficiaries.

The sector review followed by the National Workshop and Policy Conference set the stage for involvement of donor agencies in development of the sector. It was a major achievement of inter-agency collaboration.

3. THE STRATEGIC INVESTMENT PLAN

Preparation of the **Sector Investment Plan** (SIP) for Pakistan was conceived as the vehicle for presenting a positive and coordinated approach to sector improvement in the country, based on the consensus already reached between government and donor agencies. This activity was undertaken in 1989 with **funding by the CIDA and project execution by the World Bank.** A consortium of Canadian consulting firms (WARDROP and COWATER) in association with Pakistani firms was engaged for this purpose.

The Sector Investment Plan emphasized sustainability, community involvement, cost recovery and appropriate technology choice. The SIP is for the Seventh and Eighth plan periods, up to 1998. It is not based on attainment of target levels of coverage but on a realistic assessment of future institutional absorptive abilities and financial resources. Separate plans have been prepared for each of the four

provinces in the country and for the State of Azad Jammu and Kashmir (AJK) and the Northern Areas respectively.

The total size of the SIP is about $900 million. The hardware component is $815 million and the remainder, $85 million, is for institutional development, monitoring and evaluation and hygiene education. Within the former, the share of new water supplies is 57 percent while that for new drainage schemes is 36 percent and the residual, 7 percent, for rehabilitation of existing schemes.

The SIP for AJK emphasizes the provision of mainly gravity fed water supplies and builds on the existing model of community involvement which has proved fairly successful. In Balochistan, the primary focus is on institutional strengthening rather than on direct increments in coverage. In Northern Areas, promotion of latrines is the major element of the plan. In the SIP for NWFP, a province with relatively high levels of coverage, the focus is on regional equity, with greater share of investment in the more backward districts. Drainage is ranked relatively high in terms of priorities for Punjab, the largest province of Pakistan. In the case of Sindh, special emphasis is placed on water provision in the aid areas of the province.

Implementation of SIP is likely to result in additional coverage of about 11 million, raising the coverage currently at 40 percent to about 70 percent by the end of the plan in 1998. The SIP proposes basic changes in the existing implementation methodologies, funding allocation criteria, project approval procedures, etc.

A number of donor agencies including CIDA, ADB, GTZ and the Dutch participated at various stages in the SIP preparation process along with the lead agency, the World Bank. Following the finalization of the SIP, these donor agencies were invited to identify the type of projects that they were interested in funding. These projects were then prepared in the second stage of the SIP process. By and large, the allocation of projects was along regional lines -- World Bank initially showed interest in picking up a slice (over and above expected government funding) of the plan in the AJK, Sindh and Balochistan; CIDA in Sindh; ADB in Punjab; the Dutch and GTZ in NWFP and Balochistan. In the case of a common regional interest, allocation was on the basis of executing agency and type of project. In Sindh, for example, the World Bank opted for funding larger schemes to be executed primarily by PHED while CIDA indicated a preference for smaller village schemes to be developed largely by the LGRDD.

4. CONSTRAINTS AND SOLUTIONS

The overall process of donor involvement in the RWSS sector has proceeded on systematic and rational lines in Pakistan. Following broad consensus with government on the components of the strategy for development of the sector at a National Policy Conference, a comprehensive planning exercise has been undertaken under the framework of the SIP leading to the identification of projects consistent with the goals and priorities of different donor agencies. However, a number of constraints have been identified which have general implications on the success of the strategic investment planning approach.

4.1 *Differences Between Donor Priorities*

Inevitably, there are differences among donors in their priorities for funding. Within the RWSS sector of Pakistan, CIDA, for example, is focusing on health improvements and on community development in general rather than specifically on water supply. The World Bank has a stronger interest in overall sector support and the institutional development necessary to achieve a higher rate of investment in the sector. The ADB is more interested in water supply and sanitation programs in rural towns and at the rural-urban fringe rather than in spreading its resources over a dispersed network of small settlements.

Perceptions also differ on the types of benefits that can be realized from the projects. CIDA is interested in improvements in health status, and community development. The World Bank has focused on the value of time savings in procurement of water. The Staff Appraisal Mission report for its project quantifies the benefits essentially on the basis of the opportunity costs of time of women as measured by their participation in income generating activities, including cottage crafts and agriculture. However, interest in the impact on poverty, on special target groups like women and children and on the environment is common to most donor agencies.

During the strategic investment planning process, a degree of flexibility was shown by donor agencies, so as to accommodate each others interests. The World Bank demonstrated a growing interest in promoting community development and in integrating hygiene education with the hardware components of the plan. CIDA was appreciative of the Bank's interest in

funding a project which involved relatively large outlays in infrastructure development. The process of interaction demonstrated that donor agencies can learn from each other in a specific country setting.

4.2 *Problems in Co-Financing*

The reluctance for pursuing cofinancing arrangements on the part of some donor agencies can be attributed to basic differences in the approaches to project development, project approval processes and in project/program administration. Past experience with such arrangements had resulted in timing and other difficulties.

The Consultant had problems in being fully responsive to the needs of each donor at the project preparation stage. Consequently, the degree of adequacy of the project document varied from donor to donor. The solution appears to lie in the development of a common terms of reference for project preparation by the collaborating donors to ensure that a common minimum level of detail required is attained. For example, the World Bank is interested in detailed project design such that projects could be transferred quickly to the PC-I format, required for formal government approval prior to funding. This exceeded the time and resources available with the consultant.

4.3 *Resources for SIP and Project Preparation*

Sector planning for investment both by government agencies and donors requires substantial funds for acquiring adequate international and local expertise and for developing the necessary data base. The SIP and subsequent project preparation activity cost almost $3 million in Pakistan. In addition, considerable management and technical skill was required to guide and supervise the process. Fortunately, CIDA had the funds available and the World Bank was willing to make the necessary staff time available to act as the executing agency. If, however, this exercise is to be replicated for a number of countries then pooling arrangements of finances and skills will have to be evolved among donors.

4.4 *Need for Major Policy Changes*

Although there had been general agreement in the form of the Islamabad Declaration among government agencies and donors on the strategy to be adopted for development of sector in the investment plan, this remained more a philosophical rather than an operational commitment on the part of the former. When the time came for actual project preparation and identification of precise institutional roles and financial arrangements, there was strong resistance to change from conventional line agencies. The PHED was engaged in implementation of an expanded development program and was resistant to make any change midway in its delivery mechanism which would slow down the rate of utilization of funds. It possessed a strong engineering orientation arising from its earlier involvement in large urban schemes. The approach was largely supply-driven and strong vested interests had been created. There was naturally a strong resistance to orienting projects to the needs and demands of beneficiaries and to involving communities in project selection, design, execution and subsequent management. This was seen not only as representing loss of control but also as infeasible in the short run and a bottleneck to speedy implementation.

The solution appears to lie in changing the character of these line agencies over time by inducting in professionals who are more responsible to the needs of community development such as anthropoligists, social workers and "empathetic" technologists. Also, a degree of accountability has to be introduced in line agencies by making funds available to them only by them routing them through elected local councils or community based organizations. Simultaneously, there must be continued effort at demonstrating the benefits of community participation through workshops like the one held in Islamabad in 1988 on local case studies of successful community involvement including the production of publications and videos.

4.5 *Delays*

There appears to be a trade-off between planning by donor agencies and speed in reaching the stage of actual project implementation. In the case of Pakistan there was a gap of over one year between the Sector Review and commencement of the work on the SIP. Preparation of the SIP and individual

projects took about a year. Since then only the World Bank support is just now recently available. By the time the project implementation starts it is expected that two years will have elapsed from the time the SIP was completed. This implies that the total period from the Sector Review to project start-up has been four years. Meanwhile, large outlays have been made by government agencies with all their inherent shortcomings and there is a danger of the SIP becoming out of date.

A number of factors are responsible for the delays. Some are perhaps specific to the Pakistan setting and others a natural outcome of the process. Among the former are the three changes in government that have taken place in Pakistan since 1988. These have had the consequence of slowing down the process of bureaucratic decision-making. Also, prior to loan agreement the World Bank stipulated certain conditionalities that had to be fulfilled. In Sindh, the Bank required the imposition of a surcharge on land taxes to finance the O&M costs of schemes as the direct mechanism of user charges was capable of only yielding part of the required revenues. Given the dominance of landlords in the power structure of the province it was difficult to institute this surcharge. Over a year was lost in issuing of the necessary gazette notification. More generally, evolution of consensus on the strategy for development of the sector among line agencies with different mandates and interests and between government and donors is by its very nature a time consuming process. Also, the approach of strategic investment planning required innovative approaches which inevitably took more time. Further, the commencement of project execution activities has been constrained by the slow pace of finalization of terms of reference for consultants.

It is expected that as more countries undertake the preparation of SIPs for the sector, the methodology can be standardized and efforts made to ensure that the data base is prepared in advance.

Also, fulfilment of conditionalities may be linked to completion of different phases of a project and to commitment for additional funding rather than be met fully prior to the signing of the loan agreement. This should particularly be the case with conditionalities which impinge significantly on the existing socio-economic and political structure of the country.

5. RESULTS OF COLLABORATION

Despite the above shortcomings, the benefits of collaboration have been substantial. In the Pakistani setting, they have enabled a collective review both by government and donors of the sector at a critical stage of its development when sizeable public investments have already been made and problems have become clearly visible. This review has led to the identification of a new strategy and implementation methodologies which promise greater success in coming years.

Preparation of the SIP is likely to be useful not only to donor agencies but also to the government agencies engaged in service delivery from the normal development funds. Most such agencies have not had a medium-to-long-run perspective on development of the sector. The SIPs provide a blueprint for action, facilitate project identification and the material for developing the case for lobbying for higher allocations to the sector.

It can be argued that collaboration, of the type that has taken place in the sector in Pakistan, has promoted greater donor involvement and financing. Projects have been prepared to achieve a mutually agreed set of goals and the process of interaction has induced a sense of participation and commitment to development of the sector. Traditionally, there has been no direct funding by donor agencies in the RWSS sector of Pakistan. As of now, the World Bank is already committed to a relatively large loan of $137 million for the sector. The Dutch are exploring the possibilities of a grant of over $10 million Guilder to a project in NWFP. GTZ are continuing their involvement in Balochistan.

6. LESSONS LEARNED

A number of lessons have been learned from the process of collaboration among ESAs in the RWSS sector of Pakistan since 1987.

6.1 *Problems in Collaboration*

Collaboration among donors is not easy. Given the differing perceptions and priorities it has been difficult to achieve consensus on types of policy and institutional change required in the sector. The World Bank, for example, has pushed for a stronger financial justification for the sector through cost recovery, especially of O&M costs. It has argued for a strong link between willingness-to-pay and the level of service

provided. Other agencies have had a somewhat greater concern for poverty alleviation, the ability-to-pay and gender equity.

The differences in objectives and approach have had to be reconciled by patience and more than a little trust. This has required imagination and sometimes stretching sometimes normal administrative procedures. However, given the basic commitment to the development of the sector there has been welcome flexibility shown by most donor agencies.

6.2 *Limits to Collaboration*

There has to be some recognition of the fact that given the diversity among donor agencies there exist limits to collaboration. There is potentially a lot of scope for exchange or ideas and unanimity of views up to the stage of preparation of the SIP. Beyond this, however, as the project identification stage is reached it appears that donor agencies prefer to go largely on their own. This arises from differences in procedures for project preparation, approval and execution. Future efforts by ESAs in the region or elsewhere should, therefore, attempt to maximize collaboration largely at the macro and policy level and not strive for this at the micro project level.

6.3 *Impact of Collaboration on Policy Change*

The combined efforts of the ESAs in Pakistan have clearly had a stronger impact on policy change than would have been possible with an individual, piece meal approach. The success in the Policy Conference, as embodied in the Islamabad Declaration, leading to agreement on basic changes such as greater involvement of communities and private sector, cost recovery from beneficiaries of O&M costs, demand oriented provision of services, etc. were largely made possible because of the common front presented by donor agencies in the dialogue with government. Similarly, the collaboration among donor agencies at various stages in the SIP preparation ensured that the strategy adopted in the SIP was consistent with the principles outlined in the Islamabad Declaration.

7. NEED FOR FUTURE COLLABORATION

Collaboration among ESAs in the RWSS sector of Pakistan appears to have peaked from 1987 to 1989 from the time of preparation of the Sector Review to completion of the SIP and individual projects by the consultant. Since then there has been a noticeable decline in the degree of collaboration, as each agency has pursued its own interests. It is important, therefore, to develop a mechanism for collaboration on a continuing basis so as to ensure adherence to a common approach, to assess developments in the sector, to exchange experiences gained from involvement in the sector and to initiate a joint dialogue with government.

This highlights the need for institutionalizing the process of ESA collaboration at the country level in the form of a monitoring unit in the federal capital, Islamabad. This is being established by the World Bank financially supported by CIDA. This unit will perform secretarial functions, maintain a sector data base, disseminate international publications with the country to relevant agencies and organize periodic seminars/workshops.

In summary, the basic conclusion is that the process of collaboration among donor agencies in Pakistan from 1987 onwards has, by and large, been successful in inducing policy change and promoting greater international involvement in the sector. It has, however, been somewhat limited apart from the principal agencies (CIDA and the World Bank). However, it can be looked upon as a model which can be used in future collaborative efforts between ESA and elsewhere.

THE NORDIC INITIATIVE

A
PAPER PREPARED FOR
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by
Prof. Mark R. Mujwahuzi
Senior Socio-Economic Adviser
DANIDA WATER PROJECT
TANZANIA

THE NORDIC INITIATIVE

1. What is the Nordic Initiative

The Nordic Initiative is a planned joint contribution by the Nordic countries (Denmark, Finland, Norway and Sweden) in the field of freshwater resources to the United Nations Conference on Environment and Development (UNCED) to be held in Brazil in June 1992.

The Rationale of the Nordic Initiative

Preparations for UNCED in Brazil in June 1992 has been taking place at various levels in international fora and at regional and national levels. The preparations at UN level is taking place through the UNCED Preparatory Committee (PrepCom)

When the decision was taken by the UN General Assembly to convene the UNCED it was also proposed to hold a Conference on Water and the Environment, in particular on freshwater resources, as part of the preparatory process for UNCED. The proposal was endorsed by the UN Intersecretariat Group on Water Resources (UN-ISGWR) in October 1990 and the Conferace will be held in Dublin In January 1992. The Dublic conference is an "expert meeting" at which governments are represented by designated water experts. The basic conference documentation is a set of strategies for various sectors of water resources development prepared by relevant UN agencies with input from the regional Economic Commissions. These strategies are very thorough and comprehensive in their analyses of the key issues, and recommendations and proposed action plans are mostly at a very general level. At the Dublin conference itself national contributions will be invited. but limited time will be available at the conference itself to present and discuss these contributions.

As fresh water aspects have always been an important issue in Nordic development aid the governments of the Nordic countries felt a commitment to contribute to the preparation of UNCED in the field of fresh water resources and thereby sharing the considerable operational experience gained both in project formulation, planning and implementation.

Two aspects which the Nordic countries will address are:

- increased operationality in recommendations.

- increased government participation in the process.

In other words, the Nordic governments want the strategies and action programme(s) to result from UNCED preparatory process to be operational and not only to consider "what to do and who is to do it" but also "how to do it". Thus, the Nordic efforts are going to be directed towards operationalizing the rather general recommendations produced by the United Nations system.

3. Action Taken

At a Nordic meeting in late summer 1990, it was agreed that Denmark should seek to coordinate the Nordic efforts and contributions to the UNCED preparatory process in the area of fresh water resources.

In the latter part of 1990, each of the Nordic countries established its own resource group on fresh water resources to initiate discussion of the possible format of a joint Nordic Contribution. Contacts were established with the UNCED Secretariat and WMO (which hosts the secretariat for the Dublin Conference on Water and Development to be held in January 1992 as part of the UNCED preparatory process).

3.1 The Nordic Meeting

The first comprehensive contacts among Nordic water experts took place at a meeting in Copenhagen on February 14-15, 1991. The meeting discussed the following topics:

- defining Nordic expectation for the Dublin-UNCED process and the means to achieve them.

- initiating discussions on the direction of a substantial Nordic contribution.

- discussing the format of a Nordic seminar to be held February 28 March 1, 1991, with participants from Nordic collaboration partners in developing countries.

3.2 The Hornbaek Seminar

The Hornbak seminar took place on 26 February to 1st March 1991 soon after the Nordic meeting of February 14-15, 1991. The seminar was rather a continuation of the Nordic meeting in a bigger forum including representatives from Africa, Asia and central America.

Seminar participants spent a considerable amount of time discussing two key issues which were identified during the Nordic meeting, namely "local water resources management" and "water as an economic good", including appropriate means of operationalizing recommendations.

3.2.1 Local Water Resource Management

It is recognized that Local Water Resource Management (LWRM) takes place at many levels - community, local, regional, national, and even international. The term LWRM should be

understood not as management of local water, but as (optimized) management of water at local level (sub-basin scale). The impact of upstream development and consideration of downstream requirements, call for a minimum ordering and hierarchy of the responsibilities and fields of competence of the managing authorities. The main concern is to bring the decision-making down to the lowest appropriate level (sub-basin scale) whilst also at the same time being subject to constraints fixed at a higher level (basin-scale).

Thus, the Seminar outlined Some of the basic principles of community management as follows:

- people should be given incentives to regulate water at the source to the extent possible (attack causes rather than effects of water problems - quantity as well as quality)

- regional and central authorities should support this process - provide an "enabling environment" for local initiatives and clearly define the role of local authorities, including their technical, administrative and financial responsibilities. Management should take place as locally as appropriate.

- capacity-building on all levels, i.e. local, intermediate and central.

- local implementation of water rights would be a first step towards operationalizing community water management.

- a necessary 'minimum level of demand' should be met as a first objective.

- environmental standards (water quality and emission standards) should reflect local conditions and levels of development. They should be affordable and be

prepared within a time framework for introduction of increasingly stricter standards.

3.2.2 Water as an Economic Good

There was a common agreement that a precondition for meaningful water resources management in the long run is that water be considered as an economic good with an opportunity cost related to alternative future utilisation scenarios.

Charging (all or part) of this opportunity cost of water to the various consumer groups is one of the instruments to consider in controlling overall resource utilisation and allocation and in promoting water conservation. It may also be seen as one of the means of local revenue generation, which is of such importance for the sustainability of local water resources management.

However, it is important to recognize that certain basic needs for water (human consumption and subsistence farming) must be met with no or only minimal charges to the poorest population segments. A distinction between costing and charging must be made. Trashould values and principles of water charging should be defined at the local/regional level and consider such aspects as:

- charging in the context of other allocation mechanisms
- components to be charged (opportunity cost, exploitation cost, distribution cost, cost of polluting)
- affordability and possible cross subsidizing traditional rights to water
- charging of resource (opportunity) cost for productive use only (for agriculture, industrial and commercial use)
- requirements as to local revenue generation and economic autonomy of local water authorities.

If water by tradition is considered a free good charging may be met with considerable resistance. However, it may be acceptable if such charging is introduced simultaneously with improvement in the supply situation (reliability and quality). Another point was made that providing water as a free good is a disincentive in relation to maintenance. Finally, it was suggested that introducing water as an economic good in water scarce, drought-prone regions, as e.g. Niger, could prevent financing of rural projects because of financial non-feasibility. In such regions the concept of charging resource (opportunity) cost would not be feasible in the short/medium term.

3.2.3 Element of Operationalisation

The seminar spent some time on identifying important element in operationalising recommanditions. It was agreed that government understanding and commitment is essential and that the first and most important step is to establish a cross-sectoral policy dialogue on the efficient and productive use of water with the key decision makers. Such a dialogue should involve ministries of finance and/or planning and take place before and during project preparation.

3.2.4 Conclusions

It was finally agreed that the Nordic substantive contribution should comprise the following elements:

a. Identification of all key issues threathening the sustainable use of fresh water resources with emphasis on the adverse effects of human intervention in the hydrological cycle.

b. A critical review of the various UN documents on the key issues and of their recommendations from an operational point-of-view; identification of strengths and weaknesses in this documentation.

c. Elaboration of local integrated water resources management as a key concept according to some of the view-points above.

d. Introduction/demonstration of 'water as an economic good' as one of the key mechanism, subordinate to and as an integrated part, of local water resources allocation and management.

e. Point of departure in the Nordic contribution should be on experiences gained in development of water resources for human settlements (IDWSSD experiences).

f Review of selected case studies to develop/support operational recommendations (rural and peri-urban cases of water supply development)

g. Identification of possible demonstration projects for implementation in a collaboration between Nordic countries and interested developing countries.

4. Review of Selected Case Studies

It was observed during the Seminar that Case Studies are good instruments in illustrating the difficulties of proper Water Resource Management. It was further noted that such studies provide useful vehicles for developing specific guidelines and operational action plans based on practical experience. On this basis the Seminar decided to commission five case studies to be carried out in developing countries. The chosen Case Studies are:

1. Ismani - Tanzania
2. Banfora - Burkina Faso
3. Save River - Zimbabwe
4. Interface Forestry, - Tamil Nadu - India
5. Kenya - Finland Western Water Supply Programme, Kenya

4.1 Status of the Case Studies

The terms of reference for the case studies were presented and discussed at a Nordic meeting on June 20,1991 in Copenhagen. All the case studies are being carried out. Draft report on these studies will be ready by September 1, 1991 and will form the basis of developing and recommending operational action plans for Water Resource Management.

Global Forum, Oslo, 18-20 September 1991
Introduction to the Working Group session

Rural Sanitation

by Uno Winblad

The last few years have seen a proliferation of papers, reports and articles with titles like "Achievements of the Decade", "Beyond the Decade" and "Time for a change". Some claim that the Decade was a "qualified success"[1] particularly because it directed attention to previously untouched issues like institutional development, community and women's participation and the promotion of low-cost technologies[2]. Other writers are more critical and talk about its "disappointing record"[3] or point out that "none of the low-cost sanitation projects promoted in Africa by the World Bank has lead to the construction of more than a couple of thousand latrines"[4].

In this introduction to our discussion I shall try to make a realistic assessment of the situation, define the problems, mention the on-going research I know about, and indicate some urgent research needs. The emphasis is on sub-Saharan Africa where we have the fastest population growth and the largest proportion of unserved population.

Official statistics tell us that between 1980 and 1990 a total of 433 million people in rural areas were provided with "appropriate sanitation". The number of people still unserved is given as 1,364 million[5]. The situation

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1 Kalbermatten, JM. The water decade: personal reflections, in Waterlines, vol 9, no 3, 1990.

2 Christmas, J and de Rooy, C. The Decade and beyond, in Waterlines, vol 9, no 3, 1990.

3 Churchill, AA et al. Rural water supply and sanitation - time for a change, World Bank, Washington DC, 1987.

4 Cairncross, S. Water supply and sanitation, in Jnl of Tropical Medicine and Hygiene, 1989, 92: 301-314.

5 UN. Achievements of the International Drinking Water Supply and Sanitation Decade 1981-1990, Report of the Economic and Social Council (A/45/327), July 1990.

is particularly bad in Africa where the coverage rate for rural sanitation is said to be only 26%.

These figures are based partly on exaggerated claims of what has been achieved and on rather flimsy definitions of "appropriate sanitation". The true coverage rate is lower: some latrines are recorded but were never built, many are left unfinished, quite a few are poorly designed and/or badly constructed, others have collapsed or are full. In India "most of the latrines provided in rural areas with 100% subsidy from the government are not used - instead, the latrine cubicle is used for other purposes"[6]. Official statistics therefore give too bright a picture of the real situation.

One of the Decade's most successful rural sanitation programmes is that of Zimbabwe, where the VIP latrine was developed in the mid-1970s. The government's stated goal is to provide the entire communal and resettlement area population (6 million in 1991) with safe and adequate facilities by the year 2005. In terms of rural sanitation "safe and adequate" in Zimbabwe means a VIP latrine. Only latrines with a lined pit, a screened ventpipe, a squatting slab of reinforced concrete and a superstructure of permanent building materials are considered "safe and adequate". Since 1980 more than 100,000 such latrines have been built on an aided self-help basis with an ESA-funded subsidy consisting of cement, reinforcement, flyscreen gauze and transport. The demand for these latrines far outstrips the government's ability to provide training, supervision and materials.

The achievements of Zimbabwe in the field of rural sanitation are quite remarkable. No other country in Africa has achieved comparable results. The main factors contributing to this success are:

- an excellent latrine design based on years of research, development and field testing in Zimbabwe;

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[6] Pathak, B. Sanitation: low cost, low acceptance, in Health for the Millions, Vol 16, No 5, 1990, pp 30-32.

- a firm government policy;
- a substantial household subsidy consisting of cement, reinforcement, flyscreen gauze and transport;
- foreign aid covering the subsidy with additional input for planning, import, training and supervision;
- standardized instructions for project workers in the form of high quality, field tested and evaluated Builder's Instructional Manual.

In spite of its apparent success, the programme seems unable to solve Zimbabwe's rural sanitation problems. The coverage rate for Manicaland province after the construction of 30,000 subsidized latrines, is no more than 17%. At the current rate of construction (3,000 per year) the Manicaland programme is just about keeping pace with the population increase. This means that over 80% of the rural households are without safe and adequate sanitation.

A recent study of rural sanitation programmes in Africa[7] found that in the HESAWA programme in Tanzania the VIP demonstration latrines were wrongly designed and often poorly constructed. They were also much too expensive for the majority of rural households and built with materials not readily available in the country. The study concludes that HESAWA during its first four years never addressed itself to the real magnitude of the problem: how to establish a local, sustainable capacity for improving sanitation for all in a situation of rapid population growth, a stagnant economy and a non-functioning commodity market. Similar comments are made on the Kwale project in Kenya: unsuitable latrine design, poor workmanship, flyscreens missing or broken, VIP latrines too expensive, low demand. A general finding of the study was that rural sanitation programmes are characterized by high costs, subsidies, poor training in latrine design and construction, superficial hygiene education and often poor participation.

[7] Nordberg, E and Winblad, U. Environmental hygiene in SIDA-supported programmes in Africa - review and recommendations. Report to SIDA 1990.

The high cost of the preferred technology is one of the major problems in rural sanitation. The cost of a household size VIP latrine in Manicaland was in March 1991 the equivalent of US$170-180 (*Z$520-540*). In the Kwale project in Kenya the cost of a demonstration VIP latrine was US$700 (*KSh13,000*) in 1988. In Botswana the average cost of a BOTVIP latrine was US$830 (*P1,650*) in 1990, in the more remote districts even higher, US$1,256 *(P2,500*).[8] Although these latrines are called "low-cost" in Decade-related literature a majority of households cannot afford them. Promoting such latrines for low-income rural households is hardly in accord with the Alma Ata Declaration of 1978 which states that: *Primary health care is essentially health care based on .... technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every state of their development in the spirit of self reliance and self determination.*

The high cost is often concealed by government subsidies. Over 30% of the cost of a household latrine is subsidized in the Manicaland programme in Zimbabwe, and around 70% in the National Rural Sanitation Programme in Botswana. But Third World governments cannot afford to subsidize on a large scale and ESA-funds are limited. Most rural sanitation projects are therefore fairly small. Another argument against subsidies is that they make it difficult for private enterprise to provide latrines.

Some of the materials and essential items required for a VIP latrine, such as cement, reinforcement, corrosion resistant flyscreens, motor vehicles and fuel are not available locally. These problems are concealed by ESA-funded project-specific imports, thus creating a total dependence on foreign funding.

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8 Winblad, U. Review of the SIDA-supported health, water and sanitation programme, Zimbabwe, Manicaland/Mashonaland East. Draft report to SIDA 1991.
Nordberg, E and Winblad, U. Environmental hygiene in SIDA-supported programmes in Africa, Report to SIDA, 1990.
Botswana, Ministry of Local Government & Lands. National rural sanitation programme strategy paper (draft), 1991.

The VIP latrine has been the technology of choice for multi- and bilateral rural sanitation programmes since the beginning of the Decade. In Zimbabwe the technology is well understood and most latrines there are properly designed and well constructed. This is generally not the case in other countries, however. An amazingly high proportion of so called VIP latrines are wrongly designed and/or poorly constructed. As a result they do not function properly. This indicates that there are problems of information and training. Trainers, builders, village health workers and users must understand the basic principles of the VIP latrine. If not, the considerable additional cost of a VIP as compared to an OSP is wasted. (What I have said here about lack of understanding basic VIP latrine principles may or may not be true for the pour-flush waterseal latrines - my own experience of this type is too limited.)

Many of the Decade papers mentioned earlier point out that nowadays it is generally recognized that providing physical facilities is not enough and that hygiene education is routinely incorporated in rural sanitation programmes [1]. This may be so but in most programmes I know of the hygiene education component is omitted or carried out superficially. A common constraint is the lack of useful health learning material, particularly in local languages, and relevant material for use by school teachers. Lack of transport for hygiene educators is often stated as a major problem. More serious is probably the lack of properly trained personnel.

Mtu ni Afya

In 1973 the government of Tanzania carried out a 12-week intensive multi-media health education campaign called "Man is Health" ("Mtu ni Afya" in Swahili). The objectives of the campaign were:

- to increase participants' awareness, and to encourage group actions on measures which groups and individuals can take to make their lives healthier;
- to provide information about the symptoms and prevention of five specific diseases (malaria, dysentery, hookworm, schistosomiasis, tuberculosis); and
- to encourage the maintenance of newly-acquired reading skill by providing suitable follow-up materials on hygiene and

health.

The ESA-supported campaign was organized in close cooperation between different government sectors at central, regional and local level. 75,000 study circles followed 12 radio programmes and 1 million participants were issued with learning aids in the form of two booklets. Group leaders were trained in a staged training system whereby regional teams trained district teams who, in turn, trained the study group leaders at divisional level. To ensure that the control elements of the training message survived the diffusion process there were centrally prepared handouts, prepared flip-over charts summarizing the most important points of training and prerecorded cassettes for role playing exercises.

The campaign emphasized the importance of action following study circle discussions. The types of activities which individual groups undertook varied according to the local situation and the priorities of the study circle participants. Examples of actions include digging or rebuilding latrines, draining stagnant water, and boiling drinking water. In one district (Dodoma) about 200,000 latrines (close to one per house) were built during the campaign period.

The campaign was thoroughly evaluated and generally regarded as successful.[6]

The technical and social dimensions of sanitation are closely inter-connected. It is difficult to create demand for malfunctioning and expensive latrines, offering no tangible benefit. Popular participation in such projects is unlikely.

During the Decade most countries have adopted a similar approaches: government initiated, top-down programmes, emphasis on the construction of household latrines, a standardized technology based on Zimbabwe's VIP model or the pour-flush, waterseal, twin-pit latrine, heavy subsidies and, particularly in Africa, a heavy dependence on ESA-funding . The results even under the comparatively favourable circumstances of Zimbabwe indicate that there might be something basically wrong with the standard approach. Most households are still unserved, the number of people without access to safe and adequate sanitation is growing, the

selected technology is much too expensive for the rural poor, the programmes are heavily dependent on foreign aid and and are therefore neither sustainable nor replicable.

The great challenge over the next few years is to find ways of initiating a sustainable process of achieving adequate sanitation for all - a process based on local self-sufficiency. The size of that task is much greater than what is envisaged in the "beyond the Decade" papers mentioned earlier. Take the example of Kenya and Tanzania. Their total population is today 51 million out of which 36 live in rural areas. Twenty years from now the total may have reached 100 million with about 50 in rural areas[9]. Some ten million rural inhabitants in these two countries may already have access to sanitary facilities of Decade standard (VIP or similar) but all of these will have to be replaced. The problem over the next twenty years is therefore to provide 50 million rural inhabitants with "adequate sanitation". Can Kenya and Tanzania achieve this by continuing with policies based on the Decade's approach to rural sanitation?

In a recent report the UN Secretary General stated that "the 1990s will require an intensification of efforts to provide the unserved with water and sanitation services by the end of the century"[10]. A mere intensification of efforts is not enough though . The magnitude of the problem is such that a completely new approach is required. The basic tenets of this new approach should be:

- construction of latrines left to individual households;

- no ESA-funded subsidies for household latrines;

- government and ESA interventions restricted to the promotion of applied research and development, health and hygiene education, training, the production of teaching/learning materials and possibly

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9 The figures are based on table 28 and 35 in The World Bank, Sub-Saharan Africa - from crisis to sustainable growth, Washington DC, 1989.

10 United Nations. Achievements of the International Drinking Water Supply and Sanitation Decade 1981-1990, A/45/327, New York 1990.

the provision of latrines at schools and health facilities.

The new approach to rural sanitation must be supported by a redirected and intensified research and development programme. On the technical side little has happened since the development of the pour-flush, waterseal, twin-pit latrine in India in the 1960s, and the work on ventilated pit latrines and compost latrines in Zimbabwe,

Tanzania and Botswana in the mid-1970s. The Blair Research Laboratory in Zimbabwe is currently field-testing low-cost versions of the original Blair latrine and improved versions of the traditional, unventilated pit latrine. The work is specifically aimed at increasing community self-reliance by reducing the use of cement and reinforcement. Another example of current R&D is the work on solar heated composting latrines carried out by Grupo de Tecnologia Alternativa SC in Mexico.

A most urgent action research need is to establish a sanitation upgrading sequence[11] taking as its point of departure local practices and what is affordable rather than what is hygienically desirable. It must be able to offer sustainable reuse and disposal systems ranging from no-cost/near-no-cost systems like the one-day latrine[12] and other types with a short-life pit to high-cost systems like VIP, ROEC, solar-heated composting, and pour-flush latrines.

Another urgent action research need is on rural sanitation under difficult conditions (extreme poverty, continuing economic decline, refugee

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[11] The idea of a "sanitation upgrading sequence" was promoted by a World Bank project as the solution for the Decade: Start with something simple and affordable even if it is less than what would be hygienically desirable, and improve on it when resources are available. This simple concept was, however, misinterpreted from the beginning, even by the Bank itself. Instead of starting with a "no-cost" system, that is, at the bottom of the upgrading scale, the Bank advocated a start close to the top: "The initial sanitation facility would consist of a ventilated improved pit (VIP) latrine". (Kalbermatten, JM et al. Appropriate Technology for water supply and sanitation, Vol I,World Bank, Washington DC, 1980.)

[12] Winblad, U. Excreta disposal and the rural poor, in Nordberg, E & Finer, D (eds) Society, environment and health in low income countries. Karolinska Institutet, Stockholm 1990.

camps, lack of tools and building materials, high ground water table, floods, unstable or unpickable soil etc).

More research is required on the feasibility and the health implications of widespread use of composting latrines. Can they be combined with vermiculture? Can composting of human excreta and household garbage be turned into a sustainable income generating activity? (Sale of compost as a horticultural medium, intensive horticultural production at the homestead, the use of walls and rooftops for gardening, earthworm production to feed small animals?)

"Children's faeces are more likely to contain pathogens, possibly in greater numbers, than the faeces of adults."[4] The safe disposal of children's faeces is an important area for action research.

How can fly and mosquito breeding be prevented in different types of latrines? The Blair latrine is capable of solving this problem but can it be managed at lower cost and what can be done where corrosion-free flyscreen gauze is unavailable? Biological control methods?

Little research and development have so far been done on extension, on how to promote sanitation. The availability of truly low-cost, well-functioning technologies for human excreta disposal is a prerequisite for acceptance and extension - but it is not not enough. Is a multi-media/adult education/ mobilization campaign like "Mtu ni Afya" in Tanzania (see box on page 5) cost-effective? Are the results lasting? How often should such campaigns be repeated? Other approaches? Training of extension workers?

How can personal and environmental hygiene be promoted through the school system? Development of low-cost teaching-learning materials? Mobilization and training of teachers? Child-to child methods? Hygiene facilities at schools?

In the field of programme organization and management there is a need to question the preconception that water supply and sanitation should be combined in a single programme[4].

Conclusions

A critical review of some recent sanitation programmes indicates that there might be something basically wrong with the standard approach of the Decade. Most rural households are still unserved and the number of people without access to safe and adequate sanitation is growing, the selected technology is much too expensive for the rural poor, the programmes are heavily dependent on foreign aid and and are therefore neither sustainable nor replicable.

A new approach to rural sanitation is called for in this paper. It must promote sanitation rather than latrines and local self-reliance rather than subsidies. In a longer perspective it will be necessary to regard human excreta as a valuable resource to be reused rather than as a nuisance to be disposed of. The major role of ESAs in promoting the new approach is to support capacity building for country-specific applied research on rural as well as urban sanitation.

Collaborative Council Global Forum, Oslo, Sept 18-20, 1991
Block 6.3 Small Town Water Supply Systems

DRAFT

EVOLUTION OF CONSUMER-MANAGED WATER COOPERATIVES IN FINLAND WITH IMPLICATIONS FOR DEVELOPING COUNTRIES

by ***Tapio. S. Katko***

Tampere University of Technology (TUT), Institute of Water and Environmental Engineering (IWEE), P.O. Box 527, SF-33101 Tampere, ***FINLAND***

tel. +358-31-162 867 fax +358-31-162 869

The study analyses the long-term evolution of consumer-managed water supply cooperatives in Finland, a country that used to be somewhat backward but which is today one of the most developed countries in the world. Much of the knowledge gained from that evolution should be applicable to the developing world.

The Finnish experience shows that development is based on consumers' initiative. Each party should assume the duties they do be. Consumers should pay or otherwise cover the main part of the costs. The government should concentrate on policy issues, promotion and guidance. Associations should have management responsibility, where the role of the key person, the "champion" / "prime-mover" is decisive. The private sector could supply many of the external services. Donors and developing countries should analyse the experiences and potential of water associations in their areas. More realistic time-frames should be allowed for development cooperation projects in the sector.

INTRODUCTION

The traditional assumption is that because of the different conditions, the development experiences and paths of today's developed countries cannot be applied to planning strategies for the least developed countries. This study analyses the long-term development of rural water supply in Finland; a country that used to be somewhat backward but which is today one of the most developed countries in the world [1]. The objective of the study is to review the tradional assumption and show that at least some basic principles of water supply are applicable anywhere in the world.

The study concentrates on water supply associations that have traditionally been the dominant institutions in Finnish rural water supply. The study is based on the analysis of institutional changes and focuses especially on open-ended theme interviews of 122 sector professionals. These persons represented 39 selected cases in various parts of the country. This paper is based on the original research report on the issue [2].

Finland has a long tradition of joint cooperative activities in rural areas. These have included various types of cooperatives in agriculture but also in telephone and electricity services, for instance. Lake drainage associations date as far back as the 17th century [3].

INSTITUTIONAL DEVELOPMENT TRENDS

In this study "association" refers to partnerships, cooperatives, stock companies and bulk supply companies. The partnership is the oldest form of association in Finland and it dates back to 1734. A new Partnership Act was passed by the Parliament in 1988; it lays down some more specific provisions [4]. A partnership can be established by two members either by oral or written agreement. In principle, each member is personally responsible for the debts of the

partnership.

The first Act on Cooperatives was passed in 1901. It was revised in 1954 and further modified in the 1980s. In 1990 the laws on cooperatives were amended with the objective of improving possibilities to get additional capital. This means a shift toward stock-type companies. The water supply cooperatives are managed by a board of administrators elected annually by the cooperative association. Each member is eligible to participate in the annual meeting of the cooperative association. The board of administrators decides the charges and dues as well as the fees for joining the cooperative and is responsible for the finances of the cooperative.

The first act on stock companies in Finland was enacted in 1864. The latest act was passed in 1980. In principle, it made information concerning the stock company more freely available, but the right of the shareholders to exercise control over the articles of association were weakened. A stock company can be founded by one or more physical or legal persons. In Finland, municipalities usually own at least some shares in the water company to protect the interests of the public. By this arrangement, municipalities can influence economic development and land use planning in their respective areas.

Conventionally, water supply stock companies have been responsible for water purchasing, treatment if needed and delivery of water to retail customers. Bulk supply companies sometimes only abstract and treat water, but usually also deliver it to a few main distributors who then resell the water to individual customers. Often several municipalities and/or other parties own a bulk supply company. Sometimes smaller associations may own the majority of the shares together [5].

The first stage associations, from the early 1900s to 1950, were mainly informal partnerships or cooperatives. Typically, they ran gravity systems supplying spring water via

wooden pipes. About 60 percent of these were on the western coast where the landscape is flat, the population lived along the river banks and a tradition of entrepreneurship existed[6].

The Government began its financial support to the sector in 1950. The second stage water associations covered the period from 1950 to the mid-1970s. These associations included also stock companies typical of rural centres. Typical for this stage were (i) government support and later municipal support for the sector, (ii) the decrease in self-help-based construction, (iii) the introduction of mechanized construction methods (iv) the replacing of wooden pipes by plastic ones, and (v) the increasing interest of rural municipalities toward developing water supply and sewerage.

The third stage associations, from the mid-1970s to the present, include an increasing number of small cooperatives in sparsely populated rural areas. Municipalities often give considerable support to these associations that have sprung up especially in the northern and eastern parts of the country. Also large bulk sale companies were established.

At present, partnerships and cooperatives are the dominant organisation forms for systems serving less than 1 000 people. The overwhelming majority of larger systems are municipally owned and managed (Fig. 1). Most water associations serve less than 200 people and do not appear in the official statistics of the water authorities. The data for this study was collected from water and environment districts, district health authorities and through direct contacts. Partnerships are most common in the category of less than 100 people served. Cooperatives are very common up to the size of 1 000 people served, whereas stock companies are more evenly represented in each category.

In the 1970s, several associations were transformed into, or merged with, municipal systems. Nevertheless, new associations have been established in sparsely populated areas

thereafter. The institutional diversity of water supply is reinforced by the fact that the bulk sale companies are jointly owned by municipalities and associations.

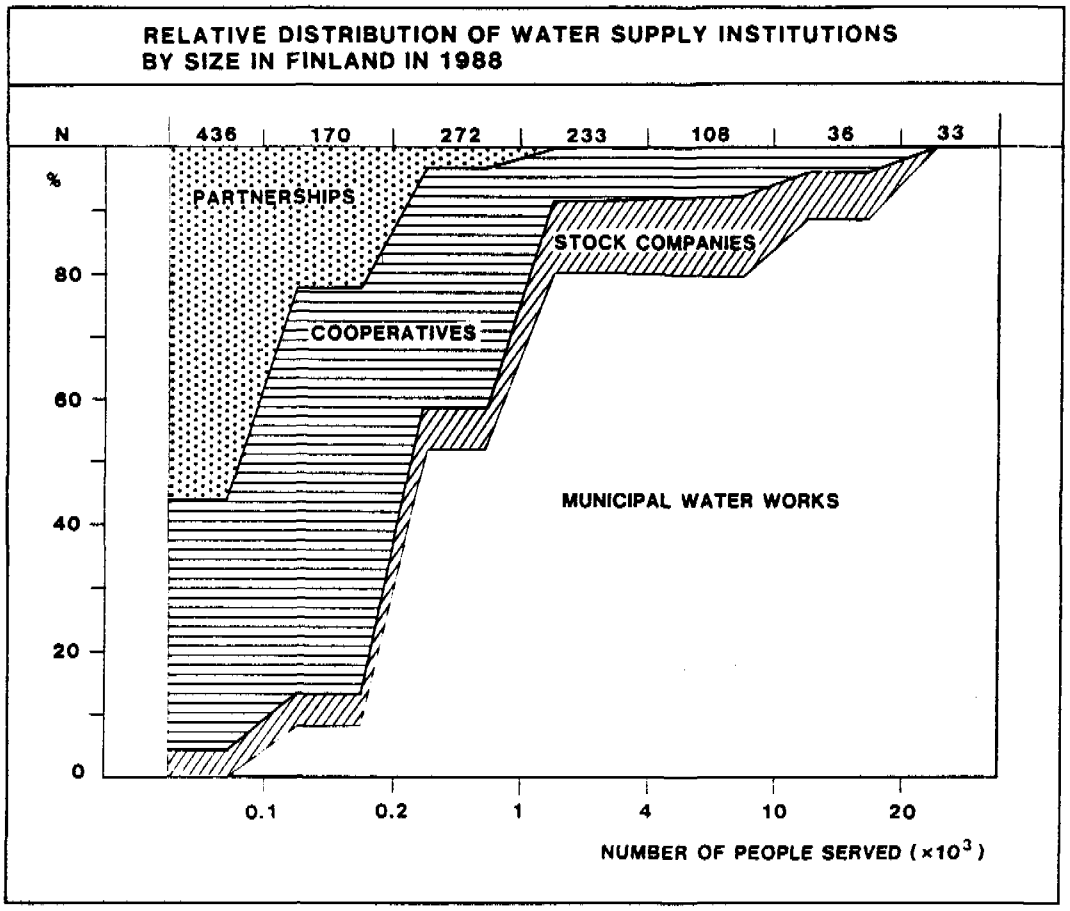

Figure 1. The relative institutional distribution of water supply works by size in Finland in 1988 [3, modified].

Development Stages of Associations

The development of water supply associations is described here as a gradual process from initiation to implementation all the way to the operational phase. The steps represent the key

decisions that consumers and the association have to make during the process. The steps include (i) the need for improving the water supply, (ii) the establishment of an association, (iii) the selection of the type of organisation, (iv) the consumers' willingness to join the association, (v) planning and implementation, and (vi) the operational phase.

Each type of association has its advantages and disadvantages. The major advantage of water cooperatives is its long tradition. The experience of this organization type and its management dates far back in Finland (Table 1). Flexibility in decision-making and the circumvention of unnecessary bureaucracy were one important advantage. Several statements stressed the equity issue. In practical field management, cooperatives rely on consumer participation and commitment. They are especially applicable to small systems with a homogenous body of consumers. Yet, there are a few large water cooperatives in Finalnd serving about 10 000 people. Municipal boundaries do not limit the service area of cooperatives, as they do in the case of municipal water works.

The possible unwillingness of cooperatives to expand their service area is the biggest problem. This was a problem earlier also with self-financed systems, which did not get external support. Their connection charge was typically the same for each member, and therefore, cooperatives did not want to construct long pipelines for new connections. Today the government and municipalities require written agreements defining the boundaries of service areas in order for them to give external support. The difficulty of collecting funds for new investments also limits expansion. Especially earlier cooperatives considered the initial investments "final", and subsequently, were only interested in providing water at a minimum cost.

Table 1. Summary of the responses to the open-ended question on the advantages and disadvantages of water cooperatives [2].

Advantages	Disadvantages
• long tradition and experience (12)	• possible reluctance to expand the service area(9)
• consumer commitment to management, operation and maintenance (6)	• possible lack of technical know-how (7)
• flexibility of decision-making (6)	• possible lack of coordination with sewerage (6)
• democratic and equitable system (5)	• limited possibilites for accumulating investment capital (6)
• good for homogenous body of consumers (4)	• tendency to minimize charges and risk financing (5)
• applicability to small systems (3)	• risk of management problems after takeover (5)
• members' property not at risk (2)	• decision-making of large consumers limited (2)
	• possible problem of "generation gap"

( ) frequency of the characteristic

total number of respondents 50, total number of individual characteristics 95

The flexible decision-making - especially as compared to municipal water and sewerage works - was the main advantage of stock companies. This results in less bureaucracy and better cost-effectiveness. The autonomous decision-making seems to produce lower water tariffs and better cost recovery (Table 2).

Table 2. Summary of the responses to the open-ended question on the advantages and disadvantages of water stock companies [2].

Advantages	Disadvantages
• flexibility in decision-making	• risk that larger consumers' views dominate (3)
• decision-making is related to ownership (5)	• possible difficulties with continuous increase of share capital (3)
• cost-effective through proper pricing (3)	
• system can be expanded quickly (2)	

( ) frequency of the characteristic

total number of respondents 20, total number of characteristics 33

The biggest disadvantage of a stock company is that there is a risk larger consumers may dictate their will. Here we have another contradiction, since some consider the decision-making based on ownership a positive phenomenon. In the long run a tendency toward larger integrated systems can be distinguished, but small associations will be needed, especially in dispersed rural areas.

DEMAND-BASED DEVELOPMENT

The key finding of the study is that the development of the sector has been highly dependent on private initiative. Demand has promoted the gradual and dynamic evolution of water supply. Initially the demand derived from home-based production and cattle farming and later from industry. Thus, the productive use of water has been a major driving force in rural areas. In urban areas hygienic and health concerns have been predominant. The expansion of common

water supply was not carefully planned; it just "happened".

Fig. 2 shows the logistic diffusion of electricity and water services to Finnish farms from 1941 to 1978. Animal husbandry has held a central position in the development of rural water supply. Electricity was introduced before piped water; cow sheds were provided with piped water before dwellings got sewers, and dwellings were provided with sewers before piped water.

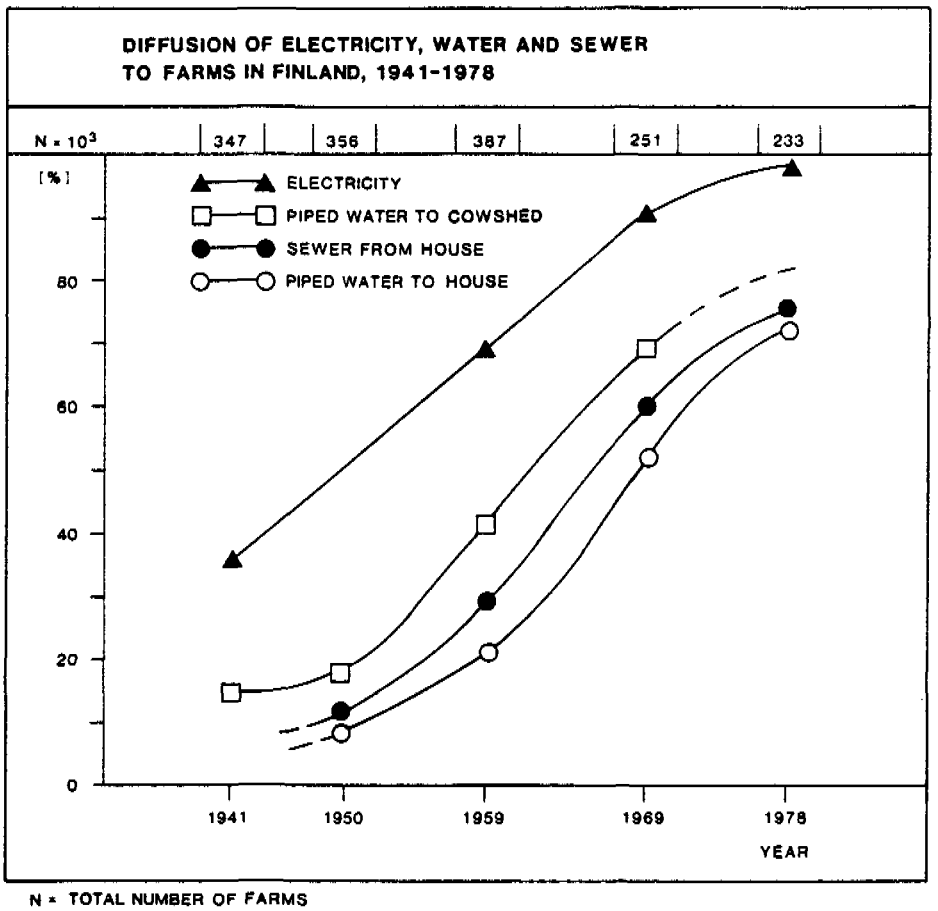

Figure 2. The spread of piped water, sewers and electricity on Finnish farms [2].

Government support to the water supply and sewerage sector started quite late. The support was directed first to rural centres, and gradually later, also to dispersed rural areas. The

support to regional transmission mains and trunk sewer lines has encouraged the establishment of larger regional systems. The northern and eastern parts of the country have less economic resources and their natural conditions for common water supply are more difficult. Government appropriations to create jobs have therefore been channelled into water supply and sewerage development in these regions. Still, Government support has always been less than 10 per cent of the total investments (Fig. 3). But it has been an important incentive for systems that otherwise probably never would have been realised.

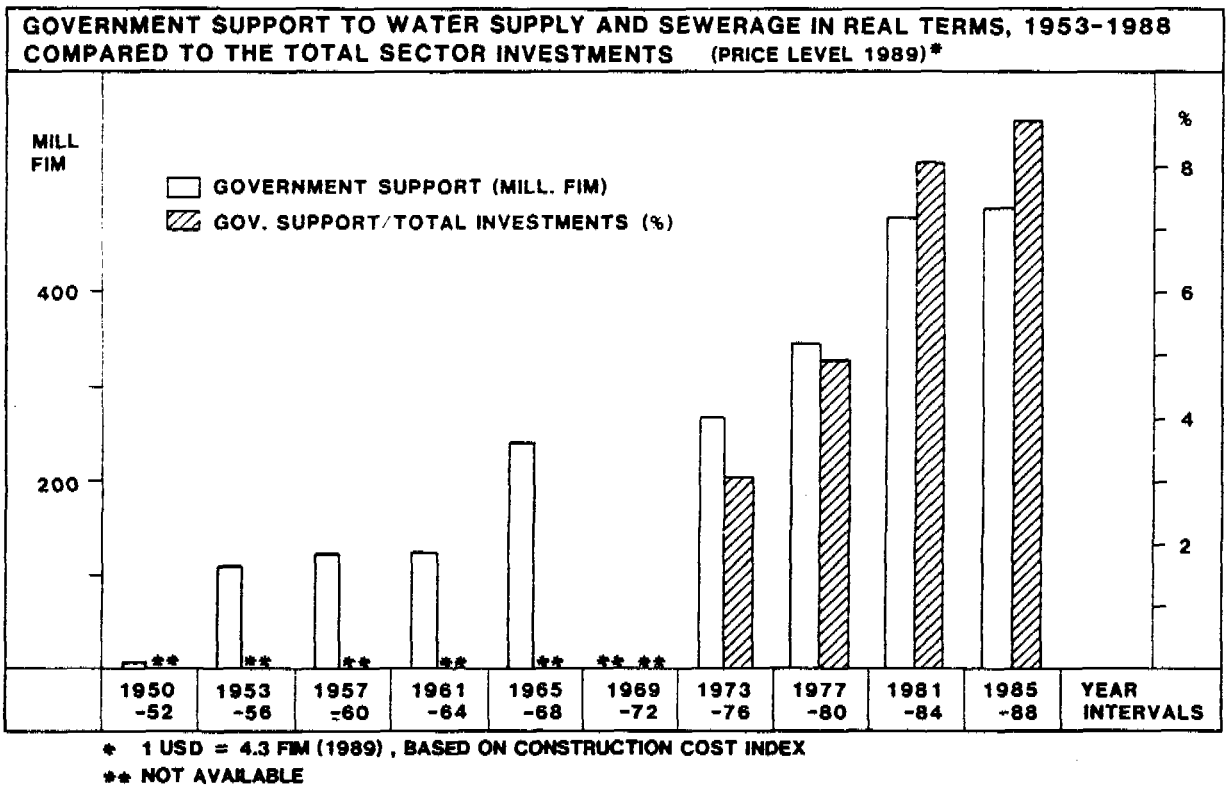

Figure 3. Government support to water supply and sewerage compared to the total sector investments [2].

Rural supply systems expanded rapidly after domestic production of plastic pipes started in the late 1950s. General metering was also introduced then.

ROLES OF VARIOUS PARTIES

A water association has a part-time manager, a board and members (consumers) who are the ultimate decision-makers. The other parties involved include water and environmental authorities in 13 districts, health authorities, municipalities (460 at present), and the private sector (Fig. 4).

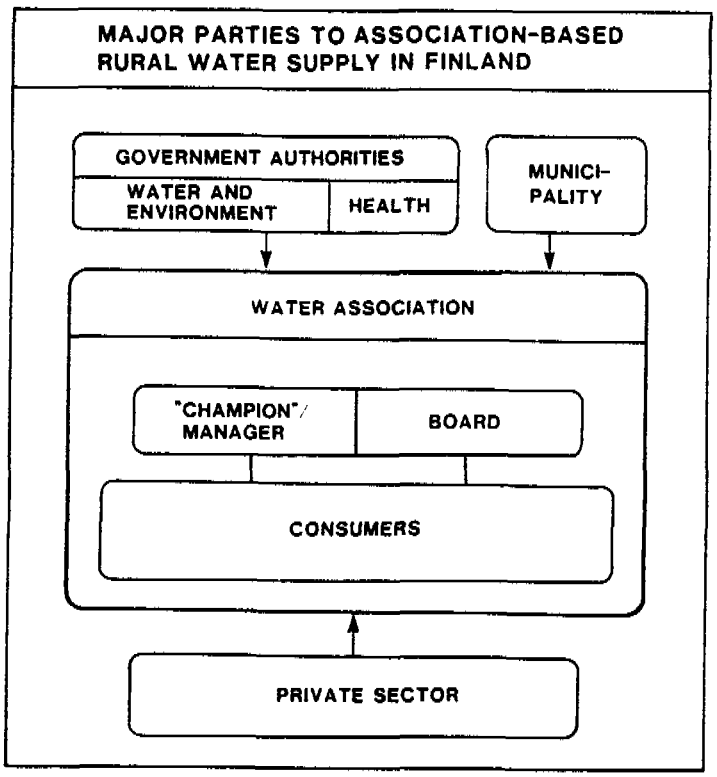

Figure 4. The parties involved in the development of consumer-managed water cooperatives in Finland.

Fig. 5 presents the relative responsibilities of the major parties during the three stages in the development of water associations. The association, i.e. the "champion" or manager acting as a "prime-mover", the board and the consumers have given up some of their responsibilities over the years. The comparison considered seven activities: water resources inventory, initiation and establishment of association, planning and design, implementation, operation and maintenance, financing and water quality control. A modified version of the delphi-method was applied. The volume of responsibilities was originally estimated by the author. It was further evaluated by six selected experts familiar with the sector development. The result is undoubtedly subjective, but, nevertheless, it shows the relative importance of various responsibilities. If the comparison were based on monetary, labour or other inputs, the differences between the responsibilities and their changes would be even larger.

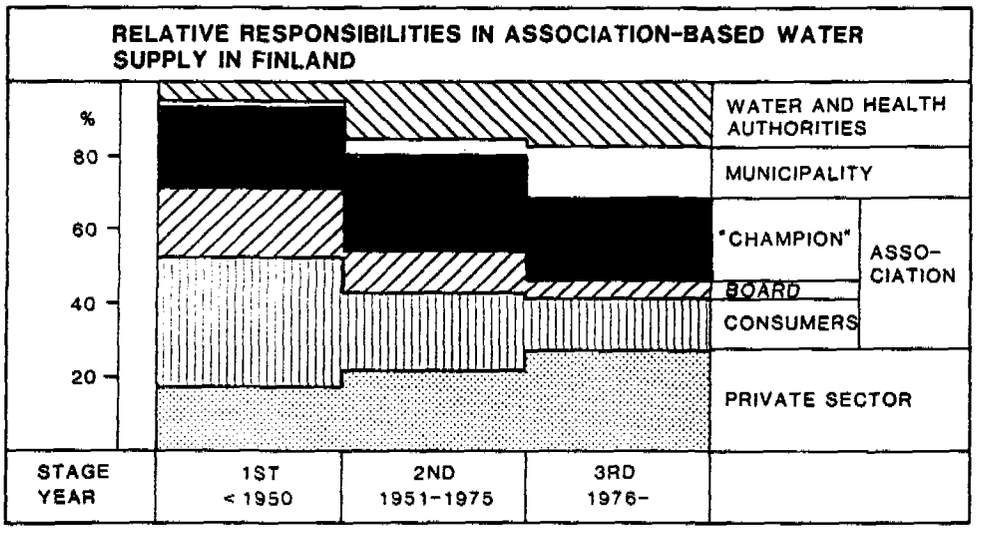

Figure 5. Relative responsibilities of the various parties and their long-term changes in rural water supply in Finland [2].

"Champion"/entrepreneur as manager

An energetic and determined individual, a "champion", is of fundamental importance to any water association. He, or occasionally, she has commonly been the driving force in initiating and promoting the water supply system. The "champion" has typically been in charge of managing the implementation and later the operation. He or she has gradually changed from an unpaid volunteer to a part-time and full-time manager.

Consumers

Consumers have always covered the major part of the costs, including capital costs. In earlier times consumers themselves contributed much of the required labour and materials. Consumers have traditionally been very eager to participate and contribute in the initial phase. But after implementation, they have shown interest only if operational problems have arisen.

Fig. 6 presents the average growth of households' willingness to join (WTJ) a common water supply system in 4 to 11 case cooperatives. During the first enquiries, only a few households are willing to join. Several meetings and preparatory work may be needed before establishing the cooperative. In the establishing meeting, 10 to 40 per cent of the potential households join the cooperative. By the time construction starts, the figure goes up to 30 to 60 per cent.

The number of member households increases remarkably during construction, reaching 50 to 90 per cent. The numbers are only indicative, since there are variations between the systems in terms of location, age, size, etc. In a limited service area, the coverage may reach 100 per cent whereas in systems with an expanding service area the coverage may be much lower.

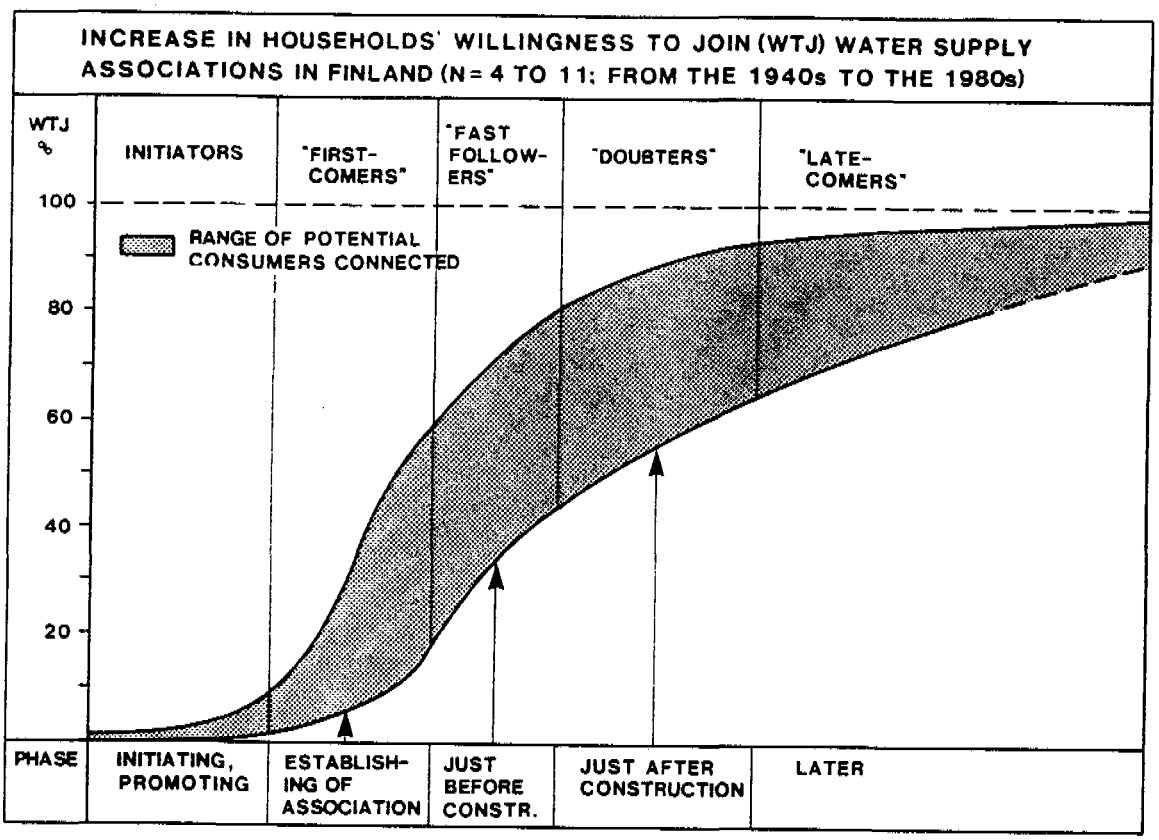

Figure 6. Households' willingness to join common water supply systems at various stages [2].

Most households join the system during implementation. The decision to join, or not to join, is made at household level. For a long time, the important role of women as primary water users went unrecognised. At household level their role has probably been decisive in promoting joining a common water supply system. Moreover, the Government's financial support to the sector was influenced by the proposal of a parliamentary committee of nine members, all of whom were women [7].

Water authorities

Water authorities have concentrated on promoting, advising and exploring ground water resources. Their financial support has been directed to systems with the highest demand. Since the 1970s, water districts have promoted and supported financially, the implementation of large bulk sale water supply systems, and recently also, large sewerage systems. Although the financial support has been modest in general, the role of water authorities has been very important in directing overall development and policy. The role of health authorities has been limited in rural water supply.

In the 1950s rural municipalities did not consider water supply as their duty. Therefore, the initial legislation favoured the forming of associations. Later municipalities took over many stock companies and merged several cooperatives. For the last decade, municipalities have supported financially, and by other means, the establishment of water supply associations in sparsely populated areas.

The private sector

The private sector has traditionally shouldered partial responsibility for planning but mostly for implementation and operational services. The major responsibility for various activities has been shared by the "champion" of the association, the consumers and the private sector. With the modernization of society and the technology development, the roles of the "champion" and the consumers have weakened, while that of the private sector has grown stronger.

OTHER FINDINGS

Limits of economies of scale

The study included an analysis of the annual water bills of a family-of-four collected by water cooperatives, stock companies and municipal water works in Finland. It showed that economies-of-scale do not apply to systems serving less than 1 000 people. In this case associations seem to be able to supply water at lower prices than municipal works. Costs are kept in check because of relatively simpler technology, the acceptance of higher risks, at least partly voluntary (unpaid) association management and consumer contributions. Each water association decides on its water tariffs and structures annually according to its financial needs. This is contrary to geographically uniform tariffs, typical of many developing countries. Economies-of-scale seem to apply, to a degree, to municipal water works serving more than 1 000 people.

Evidence from other countries

The survey by Tamm [8] on water associations and their development in the US shows remarkable similarities to the experiences of respective institutions in Finland. Water supply coperatives, or their equivalents, are common in many developing countries in Latin America (Argentina, Bolivia and Chile) and the Middle East [9].

APPLICABLE PRINCIPLES AND RECOMMENDATIONS

The applicable primary principle is that development should be based on consumers' *initiative*. Furthermore, the external parties should concentrate their support on areas which they know best. There are many other applicable lessons in spite of the obvious difficulties due to the different conditions. It is true that the experiences from one country, such as Finland, cannot be directly transferred to different conditions. Yet, it appears that the success of rural

water supply has been highly dependent on assigning appropriate roles to the various parties. This is often not the case in many developing countries. Therefore, developing countries would benefit from adhering to the following principles:

- Common water supply should be based on consumers' real needs and priorities.

- Central government should concentrate on policy, guidance, promotion and water resources inventory.

- Associations should have the main management responsibility. The role of the key person, the "champion" is decisive in promoting and managing the association.

- External services could be bought from the private sector, which will develop in a favourable policy environment.

For external support it is recommended that

- The policies of central governments in developing countries should favour the establishment of consumer-managed associations for rural water supply.

- A considerable amount of contributions should be collected from consumers.

- The experiences of water associations in the home countries of external support agencies should be further surveyed and analysed. The same applies to systems already known to exist in the developing countries.

Finally, it should be stated that even in a country with progressive economic development and a policy favouring private initiative, it has taken decades to develop water supply to its present level. Still, in today's Finland, half a million people (of a total of 5 million) do not have access to domestic water of adequate quality or quantity. In many developing countries economic growth is low or negative, and often cannot keep up with the population growth. Therefore, *more realistic time frames* and objectives should be accepted for water supply projects especially in areas with high population growth.

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REFERENCES

1 Hjerppe, R., The Finnish Economy 1860 - 1985. Growth and Structural Change, Bank of Finland Publications, 1989.

2 Katko, T., (forthcoming), "Development of Water Supply Associations in Finland with Implications for the Developing Countries", The World Bank, Division of Water Supply and Sanitation, Washington DC, Discussion Paper, 1991.

3 Anttila, V., "Lake Drainage Associations in Finland: Ethnological Study", PhD Thesis, University of Turku, Finland, 1967 (In Finnish, Abstract in German).

4 Juhola, P., "Development of Water Associations in Finland", M.Sc. Thesis, Tampere University of Technology, Institute of Water and Environmental Engineering, 1990, 129 p (In Finnish, Abstract in English).

5 Kotila, E., "Development of Consumer Initiated and Managed Water Supply Cooperatives in Vihanti", In: Katko, T. and Morange, H. (Eds.), Institutional Alternatives of Water Supply Services, Seminar Paper, Tampere University of Technology, Institute of Water and Environmental Engineering, B 39, 1989, 66 p.

6 Wäre, M. "Common Rural Water Supply Networks and Sewers", Maa- ja vesirakentaja, Vol. 1, no 1., pp. 82-88, 1951 (In Finnish, Summary in German).

7 The Committee for Rationalization of Households, Finland, "Improvement of Rural Water Supply and Sanitation", 1950 (In Finnish).

8 Tamm, G., "Institutional Framework of Small Community Water Supply Systems in the United States", UNDP/World Bank, Washington DC, Draft, 1989.

9 Roth, G., "The Private Provision of Public Services in Developing Countries", Oxford University Press, UK, 1987.

DRINKING WATER SUPPLY IN CENTRAL AMERICA

By Dr. Jorge Jenkins Molieri

Coordinator of Environment and Health Program in the Central American Isthmus, MASICA. (PAHO/WHO). Managua, Nicaragua.

Global Forum, NORAD

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DRINKING WATER SUPPLY IN CENTRAL AMERICA

Jorge Jenkins Molieri

In Central America, as in the rest of Latin America and the Caribbean, the outcomes of the International Drinking Water Supply and Sanitation Decade (IDWSSD) varied among the seven countries which comprise the isthmus. The principle factors responsible for these differences were the presence of political and military conflicts, generalized economic crisis, demographic growth - among the highest of Latin America as a Subregion (2.4%)-, accelerated urbanization, and foreign debt. The three countries most affected by the social and institutional crisis and by armed conflicts, Nicaragua, El Salvador and Guatemala, are those which show the worst results in terms of drinking water supply and sanitary disposal of human waste. Those with more social stability and peace - Costa Rica, Belize, and to a lesser extent Panama - have maintained and improved their indicators of drinking water and basic sanitation coverage. Honduras show an intermediate position (See Annex 1).

The population of Central America now exceeds 28 million. By the year 2,000 it will exceed 40 million, requiring more and better services related to basic sanitation. Despite the fact that the

majority of the population is still rural (52.4%), due to the high indigenous population of Guatemala, the trend is toward progressive urbanization, as it is in the rest of Latin America. On the whole, the Central American capitals house more than 25% of the population of their countries; war and agrarian conflicts of the last ten years have accelerated migration from the countryside toward the cities.

CENTRAL AMERICA POPULATION (1990)*

COUNTRY	Sup. km^2/(Hab. km^2)	P. Total (x 1000)	Urban (x 1000)	Rural (x 1000)
BELIZE	22,965 (7.7)	179	103	76
COSTA RICA	50,700 (57.9)	2,940	1,790	1,150
EL SALVADOR	21,041 (250.9)	5,280	2,480	2,800
GUATEMALA	108,889 (84.0)	9,150	3,450	5,700
HONDURAS	112,088 (44.4)	4,980	2,200	2,780
NICARAGUA	130,000 (29.6)	3,850	2,350	1,123
PANAMA	77,082 (30.0)	2,315	1,192	1,123
TOTAL	**522,765 Km^2.**	**28,694**	**13,565**	**15,129**

* It is important to note that the most recent census in Belize was taken in 1991. Panama took one in 1990. Costa Rica's last census was in June 1984 and the last one in Guatemala was in 1981. Nicaragua and Salvador have not taken census for 20 years.

The figures above show that in Central America the services are over-demanded due to three factors: population growth, urbanization, and accelerated migration toward the cities, especially in countries in conflict. The drinking water agencies, the municipalities and central governments do not have either the financial resources or the institutional capacity to

confront this influx of people which accelerates marginal urbanization, generating a greater cycle of poverty.

The past decade has been called "the lost decade" by many economists. In 1985, approximately 65% of the population was living in poverty, and of this number, some 10 million people, about half of whom were children, were living in extreme poverty. Presently, 57% of the population is unemployed, 40% lack access to health services, and 52% of school age children do not have access to education. More than 160,000 people have died as a result of armed conflicts and more than 2 million people are refugees or have been displaced because of war, not to mention the psycho-social consequences of political and military upheavals. The average income of Central Americans is presently 20% less than in 1978 and the level and quality of life continue to deteriorate. Until recently, Central America invested US$6,000 annually in each soldier and only US$ 78 per person in education and US$ 21 in health. Approximately 10 million Central Americans do not have access to safe drinking water. In the rural zones more than 60% of the population lacks this resource.

One of every ten children die before reaching the age of five. Many of the diseases of the Subregion are related to the inadequate supply of water and poor condition of basic sanitation. It can be said that nearly 80% of all diseases are transmitted by water and poor hygenic habits and that, therefore, they are preventive diseases.

MORTALITY RANKING BY AGE GROUP DUE TO DIARRHEIC DISEASES (DD) IN CENTRAL AMERICA *

	BELIZE ('86)	COSTA RICA ('88)	EL SALVADOR ('84)	GUATEMALA ('84)	HONDURAS ('81)	PANAMA ('87)
- Mortality ranking due to intestinal infection and DD among the 5 main causes of death in the general population/100,000 inhabitants.	-	-	5a.	1a.	2a.	-
- Mortality ranking due to intestinal infection and DD among the 5 main causes of death among children under 1 year of age/100,000 live births.	3a.	4a.	2a.	3a.	1a.	3a.
- Mortality ranking due to intestinal infection and DD among the 5 main causes of death among children 1-4 years of age/100,000 inhabitants.	-	4a.	1a.	1a.	1a.	1a.

*Statistics corresponding to Nicaragua do not appear.

Source: Las Condiciones de Salud en las Américas. OPS/OMS. Ed. 1990.

Despite what has been indicated for the past decade, Central

America offers a stimulating challenge for the 1990's. All of its countries, without exception, have held free elections and now have democratic civilian governments more dedicated to the health of their people. The war in Nicaragua has ended and peace negotiations are underway in Guatemala and El Salvador.

The decade has strengthened national institutions charged with drinking water supply and sanitation, improving their management and planning capacities. This has at once permitted better identification of problems and more objective consideration of various alternative solutions.

Subregional cooperation has also improved and institutions like the "Regional Coordinating Committee of Drinking Water and Sanitation Institutions of Central America" (CAPRE) and the "Interamerican Association of Sanitary and Environmental Engineering" (AIDIS) are playing a very imporant role in coordination, resource development, and execution of projects of subregional interest. CAPRE, together with other agencies such as IDB, GTZ, PAHO/WHO, UNDP and FINNIDA, has carried out projects of a subregional nature, aimed to resolve common structural problems. Presently, FINNIDA is financing a project for the Production and Marketing of Chemical Substances and Other Inputs Used in Water Treatment, which is being administered by CAPRE and PAHO/WHO.

BELIZE: Belize is among the countries with the most favorable indicators of drinking water supply in the Subregion, reaching

78% of the population (83% in the urban sector); 74% have the benefit of human waste disposal services. This means that diarrheic diseases (DD) have been displaced by another type of pathology. Communicable intestinal diseases rank seventh among general causes of death, the first being diseases of perinatology nature. Nonetheless, communicable and parasitic diseases are still the third cause of infant mortality in Belize.

COSTA RICA: Costa Rica is the Central American country which has the best indicators of basic sanitation and health, with 94% of the population supplied with drinking water (100% in the urban sector) and with 97% of its population having safe human waste disposal. This means that the main causes of infant mortality have changed in the last two decades. From 1970 to 1986, infant mortality due to DD moved from first to fourth place, with a rate reduction from 14.5 to 1.1 per 1,000 live births. This contributes to a new epidemiological profile in which early infancy diseases and hereditary diseases are the two primary causes of death in this age group. Undoubtedly, sanitation conditions have contributed to creating this situation.

EL SALVADOR: Forty-one percent of the population is provided with drinking water and only 10% of the rural population receives this vital service. Safe human waste disposal is available to only 38% of the rural sector. More than 60% of the morbidity and infant mortality is related to communicable and parasitic diseases, especially diarrheas. Infant parasitism, flu, acute diarrheic diseases (DD), and amoebic dysentery continue to be

primary diseases.

GUATEMALA: The main cause of infant mortality is DD (23.8%). Only 53% of the total population has the benefit of a drinking water supply and in the populous rural sector only 41% enjoy this service. It is estimated that about 85% of the urban water systems contain some degree of contamination due to the lack of protection of the sources and deficient treatment. Sewage systems and other types of human waste disposal services are available to 72% of the total population.

HONDURAS: In 1983, 69% of the deaths due to diarrhea occurred in children under five years of age. Intestinal infections continue to be predominant problems and the primary cause of ambulatory morbility is DD. Honduras has drinking water coverage which reaches 73% of the population. Sixty-three percent of the general population has human waste disposal services, however only 12% of the rural population benefits from such services.

NICARAGUA: The main causes of general mortality documented in 1985, 1986, and 1987 were acute diarrheic diseases (DD) and other communicable intestinal diseases, which also represented the primary cause of death in children under 1 year of age from 1985-1987. In 1990, Nicaragua achieved a general drinking water supply coverage of 55%, of which only 19% of the rural population benefited. With respect to sewage systems and other systems for human waste disposal, only 38% of the population was served.

PANAMA: This country traditionally has been counted among those which have the best coverage in Central America. At the end of the IDWSSD, 83% of the population had access to a drinking water supply and 86% were served by human waste disposal systems. In rural areas, the second highest cause of infant mortality was DD, which nonetheless, is the eighth cause of infant mortality in urban areas. Panama is like Costa Rica in that the primary cause of death of newborns is due to diseases of the fetus or the newborn such as hypoxia and asphyxia.

CENTRAL AMERICA: LIFE EXPECTANCY AT BIRTH (1), DRINKING WATER SUPPLY (2), SEWAGE AND EXCRETA COLLECTION (3).

COUNTRY	(1)	(2)	(3)
BELIZE	71.0 Years (1981)	78%	74%
COSTA RICA	74.3 Years (1985-90)	94%	97%
EL SALVADOR	56.0 M/61.0 F. (1987)	41%	61%
GUATEMALA	60.0 M/61.0 F. (1987)	41%	61%
HONDURAS	61.0 Years (1983)	73%	63%
NICARAGUA	63. Years (1985-90)	55%	38%
PANAMA	72.2 Years (1988)	83%	86%

For more details, see Annex 1.

Source: Las Condiciones de Salud en las Américas. OPS/OMS. Ed. 1990./ Encyclopedia Britannica. 1990 Book of the Year./ Identification Mission to Central American of the Collaborative Program for the Water Supply & Sanitation Sector. Final Report. August 1991/ MASICA Information.

In synthesis, as the International Commission for Central American Recovery and Development indicated in 1989, nearly half of Central Americans did not have access to basic health

services, a reliable supply of drinking water, nor safe human waste disposal.

When considering the lack of basic sanitation and the accompanying deterioration of health of the last decade, one must also take into account: the problems of the war and the population displaced and refugees, the growing wave of violence related to the economic situation and unemployment, the growth of poverty and marginalization (especially in urban sectors), and the frequent natural disasters (hurricanes, volcanic eruptions, earthquakes, droughts, floods, etc.).

Despite the fact that not all of the established goals were reached during the decade and despite the rapid population growth, which resulted in an increase of approximately 6.5 million people during the Decade, it can be considered a success that the Central American governments have managed to stop both the deterioration of services and the indices of drinking water and sanitation coverage, which in absolute terms increased. The strengthening of institutions, training programs, better evaluation and planning processes have contributed to improving the overall situation of drinking water and sanitation.

As IDWSSD comes to a close, some considerations for the Central American subregion can be made. These are comments which have already been made by the Pan American Health Organization (PAHO/WHO), the Committee of Drinking Water for the Region (CAPRE), the Interamerican Association of Sanitary and

Environmental Engineering (AIDIS), the Meeting of the Central American Health Sector (RESSCA), and the Regional Conference on Water Supply and Sanitation in Puerto Rico (September 1990) which in general are consistent with the rationale of the project Conservation of Water Resources and Drinking Water Quality Surveillance, one of the Subregional Program on Environment and Health in the Central American Isthmus, MASICA:

1.- The quality of water resources is deteriorating rapidly without there being efficiently organized monitoring systems and control measures. The outbreak of the cholera epidemic in Perú at the beginning of 1991 confirmed the weaknesses of control mechanisms of water quality and its sources in Latin America.

2.- Quality control of water for human consumption is carried out with greater regularity in urban areas with more than 100.000 inhabitants than in rural areas.

3.- More than 97% of wastewaters are discharged without treatment into the environment, polluting both the natural ecosystems and the sources.

4.- The quality of water sources is also deteriorating due to the increasing use of pesticides and fertilizers; Central America is considered to be the region of the world which imports the most pesticides per capita.

5. The accelerated rate of deforestation in Central America affects the quantity and quality of water resources, as much for human consumption as for other uses.

6. Water losses due to illegal connections to systems are an important factor in inhibiting system expansions; it is estimated that losses to systems exceed 50% of total volume.

7.- Some countries of the Subregion show worrisome indicators with respect to water-borne diseases .

8.- Three of the seven countries of the Subregion rank among the six countries with the worst health indicators and the lowest Life Expectancy at Birth in the Americas

9.- Legislation in effect and the standards for the sanitary control of drinking water and of industrial and domestic effluents, when they exist, are deficient and in general inadequate.

10. There is a need for developing innovative approaches in the conceptual, technological, administrative, and financial aspects, in order to find feasible solutions to the problems related to drinking water supply and sanitation. The adaptive technology aspects require a large effort to seek more adequate and lower cost solutions.

11.- Managerial development and the management capacity of the institutions of the sector is limited, with little intersectoral coordination and with a need for increasing and improving human resources and administrative efficiency and effectiveness.

12.- Coordination and exchanges of information and experiences at the subregional level, despite the worthy efforts of CAPRE and of AIDIS, still are not sufficient. This conclusion implies the need for increasing the efforts carried out during the last decade.

13.- Despite the progress achieved, a weakness still exists in the scientific and technical capacity of national laboratories charged with monitoring water quality, the standardization of methods, procedures, subregional standards, the exchange of information, and the existence of a subregional reference laboratory. The Health Ministries of the Subregion have, by law, responsibility to asure the quality of water for human consumption with the aim of protecting people's health. Nonetheless, these institutions show weaknesses in their structural capacities with respect to laboratory facilities and personnel.

14.- More organized and active community participation is required to solve problems of drinking water supply and human waste disposal.

The 1989 report by Dr. Carlyle Guerra de Macedo in his capacity as Director of the Pan American Health Organization (PAHO/WHO), in reference to water and sanitation of the Environment Health Program states that "Water quality is far from being satisfactory : 75% of the water supply networks are not disinfected adequately in order to guarantee that the water is potable, and the programs for quality control lack the personnel and laboratory support they need". This assertion, legitimate for the Americas, takes on still greater momentum with reference to the countries of the Central American subregion.

MASICA PROGRAM.

The Pan American Health Organization (PAHO/WHO) formulated, with decisive support of the Central American governments and the international development agencies of Sweden (ASDI) and Norway (NORAD), a program called the Subregional Program on the Environment and Health in the Central American Isthmus, MASICA. MASICA consists of seven interrelated projects which aim to improve the health of the population by means of participatory actions in environmental areas which are significantly affected. One of these projects, which pertains to protection of sources and to monitoring drinking water quality, intends to respond to many of the concerns which have arisen since the evaluation of IDWSSD, and has taken in consideration:

1) the recommendations of a water meeting of high-level Central American officials sponsored by PAHO/WHO and CAPRE, which took place in San José, Costa Rica in August of 1984; 2) the desire to obtain sustainability of water resources through protection

of supply sources - surface and underground - which are deteriorating in Central America; 3) the need to emphasize the quality of water resources, an aspect which did not receive much attention during the IDWSSD; 4) the desire to strengthen the interchange of experience and cooperation between countries of the Subregion to confront similar problems; and 5) the need to further reinforce the training of people who work in this sector.

The **objectives** of the Conservation of Water Resources and Drinking Water Quality Surveillance project are:

- To apply at different levels the concept and aspects of promotion, protection, improvement, and rehabilitation of health through actions of conservation and improvement of the environmental quality and specifically that of quality of drinking water and its sources.
- To strengthen the managerial and technological capacity of the institutions of the Subregion responsible for management and conservation of water resources, especially in surveillance and control of drinking water quality.
- To improve family and personal behavior concerning the adequate and hygienic management of drinking water at the household level and to promote habits that prevent pollution of consumption sources, especially in light of the cholera epidemic which is spreading to Central America.
- To promote community participation in programs for drinking water supply, placing special emphasis on the participation of women as principle users-beneficiaries and as fundamental factors in the creation of family awareness of conservation and adequate

management of water resources and surveillance and control of drinking water quality.

- To incorporate pertinent nongovernmental organisms(NGO) in activities oriented toward expanding coverage and to ward quality control of drinking water, as well as the conservation and the rational management of water resources.

The components designed for the attainment of the objectives are:

1) Planning of General Policies.
2) Training of Human Resources.
3) Applied Research and adaptative technologies.
4) Epidemiological Surveillance and Primary Health Care Associates with Water for Human Consumption.
5) Surveillance and Monitoring of Sources and of Drinking Water Quality.
6) Development of Standards, Regulations, and Legal Instruments.
7) Social Participation.

Obviously, the Project, destined to give integral treatment to water resources, is also designed to fight diarrheic diseases. MASICA, therefore, arrives in an opportune moment to join in the efforts which these countries are making in the face of the cholera epidemic, which is now spreading throughout Central America. MASICA would assume the task of environmental monitoring of the Vibrio cholerae.

MASICA can also contribute to the interchange of knowledge and experience and give its support to the design of a Master Plan

for Integral Management of Water Resources for Human Use in Central America and to the strengthening or adoption water policies in each country.

DEBT SWAP FOR WATER AND SANITATION

For the entire Latin American and Caribbean region, some studies at the end of the decade estimated that US$13.61 billion was needed to provide 100% coverage of services in 1990. This figure can be compared to the funds asigned to the Latin American region by the Interamerican Development Bank (IDB) for drinking water and sewage systems in the period of 1960-1990, which amounted to US$3.741 billion, of which $665.1 million were for Central America, with the exception of Belize. Other sources indicate that the IDB provided loans to Latin America of US$2.4 billion during the ten years of the Decade and that the World Bank loaned US$2 billion to the region during this period.

CENTRAL AMERICA: FOREIGN DEBT, 1989.*(x 10^6) DEBT PER CAPITA

COSTA RICA	3.480	1.214
EL SALVADOR	4.657	329
GUATEMALA	2.089	240
HONDURAS	2.823	610
NICARAGUA	7.453	2.083
PANAMA	3.575	1.566
TOTAL SUBREGION	**US$ 21.170**	**US$ 780**

* Excl. Belize.

Source : Informe sobre el desarrollo Mundial 1991. La Acuciante Tarea del Desarrollo.

Indicadores del Desarrollo Mundial, Washington , D.C., Junio de 1991

Since the financial sector is key for amplifying the coverage and improving the quality of water resources, the possibility of debt swaps for water and sanitation should be explored. Without this course of action or other long term loans, it will not be possible to confront the enormous challenge by the year 2,000, when it will be necessary to furnish new services to 8 million additional inhabitants and to serve 12 million people who were deprived of services in 1989. In other words, services will be needed for more than 20 million Central Americans. In 1989 it was determined that the investment required in Central America alone to complete these goals by the year 2,000 was on the order of US$ 5.125 billion. Recently, a similar calculation was made for Nicaragua alone yielding the following costs required by the year 2,000:

A- Cover deficit of Drinking Water	US$ 199.0 million
B- Cover deficit of human waste disposal	US$ 261.0 million
C- Projection of population increase	US$ 280.0 million
D- Rehabilitation of present services	US$ 122.5 million
TOTAL ESTIMATED COST BY 2,000	**US$ 862.5 million**

A more realistic estimate for the resources required according to the institutional and administrative capacities of these countries, is on the order of US$ 400 million per year for all of the Subregion.

INTERNATIONAL COOPERATION

The countries of the Central American subregion appreciate the support rendered by various External Support Agencies (ESA). These countries estimate that to reach better levels of drinking water supplies and sanitation, it is imperative to increase the resources directed to these ends. It is considered particularly important to obtain the support of the Agencies for projects in rural areas and in less favored periurban areas in order to: strengthen this sector's institutions and national capacity for effective and efficient management of water and sanitation services; develop human resources and information systems; develop and apply low cost technologies; develop social and technical research for the promotion of community participation and for adequate use of the sanitary infrastructure; study and adapt compatible financial mechanisms with real possibilities for countries of the Subregion. Presently, agencies such as UNDP, UNICEF, PAHO/WHO, USAID, CIDA, CARE, IDRC, SIDA, NORAD, FINNIDA and the governments of Italy, Holland, Japan, Spain, France, Israel and the United Kingdom are collaborating in effort to improve the coverage and quality of water supply, management capacity of Central American countries, and inter-country cooperation. It is important to mention that initiative of the Collaborative Program for the Water Supply and Sanitation Sector, came from the agreement of several international agencies such as UNICEF, UNDP/World Bank Program, WHO and USAID/WASH. This initiative will strengthen the provision of water and sanitation services in Central America.

SUBREGIONAL COOPERATION

It is also important to promote interregional cooperation via the organizations which handle drinking water supply and sanitation problems, especially by developing administrative and financial capabilities and cooperation. The strengthening of CAPRE is opportune, just as is the strengthening of AIDIS, universities and research centers which build capacities of peoples who later work for water supply agencies; thus it is important to involve the Central American University Confederation, CSUCA. Likewise, the Central American Commission for Environment and Development (CCAD) should be included. CCAD had been designated by the Central American Presidents to be the highest level of coordination of environmental protection and development action in Central America. Other organizations that work toward Central American integration should be welcomed in this effort to maximize drinking water supply resources.

BIBLIOGRAPHY.

1.- Situación del Sector Abastecimiento de Agua Potable y del Saneamiento al Finalizar el Decenio 1981-1990. Región de las Américas. Programa de Salud Ambiental, OPS/OMS. Washington , D.C. Abril de 1990.

2.- The Situation of Drinking Water Supply and Sanitation in The American Region at the End of the Decade 1981-1990, and Prospects for the Future. Vol.1. WHO/PAHO/HPE. Washington, D.C. July, 1990.

3.- International Drinkimg Water Suppply and Sanitation Decade, Report on the Situation in the Region at the End of the Decade, PAHO/ WHO. CE107/12. Washington D.C. 24. April 1991.

4.- Evaluación del Decenio de Abastecimiento de Agua Potable y Saneamiento (1981-1990) en América Latina y el Caribe: Una Perspectiva de los Años 90 y más allá. Peter Koenig. OPS/OMS. Conferencia Regional sobre Abastecimiento de Agua y Saneamiento. San Juan, Puerto Rico, Septiembre de 1990.

5.- Nicaragua. Evaluación del DIAAPS 1981-1990. Managua, Nicaragua, Marzo de 1990.

6.- Declaración de Puerto Rico. Conferencia Regional sobre Abastecimiento de Agua y Saneamiento. San Juan, Puerto Rico.
4-6 de Septiembre de 1990.

7.- V Reunión del Sector Salud de Centroamérica y Panamá (RESSCAP). Informe de Agua y Saneamiento preparado por el CAPRE. Informe Final. Panamá, Julio de 1989.

8.- Organización Panamericana de la Salud. Informe del Director. Cuadrienal 1986-1989 y Anual 1989. Documento Oficial Nº 234. OPS/OMS. 1990.

9.- Proyecto Medio Ambiente y Salud en el Istmo Centroamericano. Una propuesta de abordaje a la problemática. Perfiles del Proyecto MASICA. Dr. Jorge Jenkins. OPS/OMS, Managua, Nicaragua, 1990.

10.- Urban Example- Prospective for the future. Water Supply and Sanitation to Urban Marginal Areas of Tegucigalpa, Honduras. UNICEF. Guatemala.

11.- Project Conservation of Water Resourses and Drinking Water Quality Surveillance. Subregional Program on Environment and Health in the Central American Isthmus-MASICA. OPS/OMS, Managua, Nicaragua, April 1991.

12.- Las Condiciones de Salud en las Américas. OPS/OMS. Publicación Científica Nº 524/2 vol. Washington, D.C. 1990.

13.- World Resources 1990-91. WRI, UNEP, UNDP. 1990.

14.- The Report of the International Commission for Central American Recovery and Development. Duke University Press. 1989.

15.- La Mortalidad en la Niñez en Centroamérica, Panamá y Belice. 1970-1985. CELADE, OPS/OMS, UNICEF, Costa Rica, 1988.

16.- Situación en Cobertura de Agua y Saneamiento en América Central en la Etapa Final del DIAAPS. Ing. Rodolfo Sáenz. OPS/OMS. Washington, D.C. 1989.

16.- Proyecto Subregional Producción y Comercialización de

Sustancias Químicas y otros insumos de uso común en los Sistemas de Agua Potable y Saneamiento. CAPRE. San José, Costa Rica, Enero de 1990.

17.- Asamblea Plenaria del Consejo de Colaboración ACE. Volumen 1. Informe Principal. Organización Mundial de la Salud. Gobierno de Francia. Septiembre, 1990.

18.- CEPAL. Centroamérica: La Evolución de la Economía en 1987. CEPAL. LC/MEX/ L.80/Rev. 1. 7 Septiembre de 1988.

19.- CEPAL. Evolución de la Integración en 1988. CEPAL LC/MEX/MEX/ L.105. 23 de Junio de 1989.

20.- CEPAL. Balance Preliminar de la Economía de América Latina y el Caribe. 19 de Diciembre de 1990.

Managua, September 1991.

ANNEX. 1

CENTRAL AMERICA WATER SUPPLY AND SANITATION: 1990

	WATER SUPPLY SERVICE			SEW. AND EXC. DISPOSAL SERVICE		
	TOTAL POP. (%)	URBAN (%)	RURAL (%)	TOTAL POP. (%)	URBAN (%)	RURAL (%)
Group 1						
BELIZE	78	83	71	74	83	61
COSTA RICA	94	100	84	97	100	93
PANAMA	83	100	63	86	-	-
Group 2.						
HONDURAS	73	89	60	63	88	44
Group 3.						
GUATEMALA	53	72	41	57	72	48
NICARAGUA	55	78	19	38	48	26
EL SALVADOR	41	76	10	61	86	38

Source: MASICA Information/CAPRE.

WATER AND SANITATION IN BANGLADESH : NGO PERSPECTIVE

NGO Forum for Drinking Water Supply & Sanitation
3/14, Block-E, Lalmatia, Dhaka 1207, Bangladesh

WATER AND SANITATION IN BANGLADESH: NGO PERSPECTIVE

--- S.M.A. Rashid
Coordinator
NGO Forum

Environmental problem today is not confined to the bounderies of a few nations greedily overusing the nature's limited resources, it has infact become a global concern. The images of cities made hazy by smoke, industrial wastes polluting and destroying water resources, desertification altering the ecological balance and of course, the depletion of ozone layer have become quite familier now a days pressure groups like Green Peace are getting more and more vocal, endless conference and consultations are taking place; but still there is nothing in the offing.

Perhaps there is no other field of development where the widely used paradigm, "Think Globally and Act Locally" has gained the magnitude of importance as it has in the environmental sector.

Each country has environmental problems of their own and it is unfair to pressurise the nations to take the initiative to embark upon programme which does not fall in their area of priority. For instance Bangladesh is a agribased society, therefore, those who wants us to invest in the areas like controlling industrial wastes or pollution caused by vehiculer smoke should remember that these will not only mean wastage of resources, it will also aggravate the real problems that continues to plague the socio-economic condition of the country. Here in Bangladesh if we can tackle the water and sanitation problem we can safely claim of solving 40% of our environmental problems. The thing that we would like to assert is that each country should be free to plan their own remedial measures to restore environment and the resource flow from the Developed countries should be channalised into those sectors identified by the each individual countries,otherwise we will fall into the catagory of a Aid Managers rather than development agent.

From the NGOs viewpoint it is not only with the ESAs we find difficulty in communicating but our governments most occasions are on the move to curb our initiative. The idea that NGOs are there to support and complement government's development initiatives and not to compete with them is yet to gain currency among the policy makers. Moreover, the importance of water and sanitation has failed to attaract its due attention in our country. Though there has been 32%

Contd.....P/2.

increase during the third 5 years plan in comparison to 2nd five year plan yet the sectoral allocation has declined from 2.1% to 1.2 whereas in many of our neighbouring countries the sectoral allocation is much higher. On the otherhand more than 80% of Bangladesh is village; despite that the rural/urban ratio in terms of budget allocation for the two key govt. actors were :

	Second Five Year Plan		Third Five Year Plan	
	1980 - 1985		1985 - 1990	
WASA ---	36%	64%	26%	74%
DPHE ---	73%	28%	41%	58%

In the 4th five year plan the allocation projects steady trend. We shall have to keep the fact on our mind that we will be having 47 million more people to serve by the end of the year 2000. If by a sudden stroke of miracle the population growth comes to a stands till we will still have to serve 30 million people for providing safe water. But it is more likely that there will be an addition of 47 million people bringing the number to 77 million. With 77 million people to serve we will be needing 2,500 (approx) million taka which excludes capital, administrative and transportation charge.

In the sanitation sector the scenerio is a far more grim. We have achieved 5% coverage during the previous decade. For the next decade we will have to bring 95 million plus 47 million people under sanitation coverage. Assuming it takes 400 taka for a latrine to install we will have to produce 14.2 million latrines by the year 2000, which will require an investment of 5,680 million taka, not to mention again the huge amount of capital expenditure for production centers and other charges, whereas the total budget allocation in water and sanitation combindly amounted to taka 5,500 million during the last decade.

These are the area of frustration but there are silver lines too. This year to our delightful surprise we have seen the priorities and attitude of the government has shifted considerably for the better. For the first time in a rare gesture of goodwill it has conceded its failure in the sanitation sector and have actively sought the assistance of the other partners in progress specifically the NGOs.

Contd.....P/3.

Bangladesh's record in water sector has out paced many of its counterpart but as said the sanitation coverage is in a deplorable state. During this decade the main thrust of activity will be towards sanitation. The main initiative in thus regards has been taken up the UNICEF. Under UNICEF auspices a national task force on sanitation has been formed comprising members from govt. NGOs and ESAs. Alongwith a few national NGOs, NGO Forum has been assigned to represent the NGO sector. UNICEF on the other hand has intialised Ansar/VDP (Village Defense Force) programme. If successfully implemented the sanitation coverage will rise upto 30% to 35%. NGOs have been asked to join force to support the programme. Presently extensive consultation between GO and NGO is in progress to ascertain the areas of responsibility. NGOs have also agreed on principle to give their major thrust of activities in the sanitation sector during the decade.

As it is a established fact that the resource base for sanitation coverage throughout the country is grossly inadequate, NGOs have decided to mount all out promotional campaign. The very nature of operation has put the NGOs into advantage in this regards. NGOs operate among the grassroot people. The workers speak the language of the people there. Moreover the locational advantage helps the NGOs to keep a constant tab on the programme. On the otherhand the govt's administrative reach is extended only upto the sub-district level.

Govt. and NGOs have also trying to beefup the private sector producers to meet the ever growing need of hygienic latrines.

The main purpose of the NGOs will be to motivate people for making latrines on their own without any extra expenditure, that is, the idea of fixed place defecation will be promoted. Such attempts were made in the form of pilot projects in certain districts of the country by NGO Forum and the outcome was a bit unexpected. Within a span few months over 10,000 families were effectively motivated to build their own latrines. Same project was taken up at Barisal by the local administration and the project met with equal success.

Contd.....P/4.

Green House Effect is taking its toll here in our country. The unprecedented flood of 88 and this years cyclone catastrophe which claimed millions of life are clear indications. Every year standing crops of the country is destroyed by floods and droughts, people are rendered homeless and thus, day after day we are falling into the abyss of the endless spiral of the poverty's incrows cycle. But things cannot go on and on like this, we shall have to initiate action plans to mean the cycle of the malthasium trap.

We (NGOs) can only build and hold our endeavours through adequate institution building. For resource constraints the NGO workers are not getting the proper education training as workers or as technical hands. Moreover, the number of workes in relation to the need is grossly inadequate, Moreover, adding to the problem is the ESAs reluctance to provide adequate administrative support to achieve a targetted project. In most of the cases the programme personnel has to stretch their activities almost beyond their tolerance limit. This creates additional pressure and curbs the efficacy of the programmes.

As the greater area of our environment is plagned by increase of population, poverty depletion of land and any intervention in the invironmental sanitation sector in isolation is bound to be affected by these factors. Therefore, we shall have to create awareness among the people and the policy makers to confront the problems by giving these factors its due impatance. Otherwise the uniformity of progress will be lost.

These problems should be adequately voiced in the International Forum. We would like to propose to create a Regional Forum comprising members from Asia so that we can inter-exchange our ideas and this will also enable us to articulate our problems and experience in the International Forum more discreately. After all the key to success depends upon mutual cooperation through constant information exchange.

Status Report

on

GARNET

Presentation to the Water Supply
and Sanitation Collaborative Council

Sept. 18, 1991

Oslo, Norway

by

Dan Campbell, Librarian, WASH Project
James Chauvin, WASH Consultant
Craig Hafner, Deputy Director, WASH Project

Water and Sanitation for Health Project
Sponsored by the Office of Health, Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523

Status Report on GARNET

INTRODUCTION

The SAFE WATER 2000 meeting in New Delhi in September 1990 marked the formal end of the Water and Sanitation decade. Delegates from over 100 countries met to discuss and assess the accomplishments, problems and lessons of the previous ten years. Their overall conclusion was that a great deal had been accomplished during the decade in improving water and sanitation conditions of peoples in the developing world, but a great deal more was needed.

An example of one of the many specific conclusions drawn from the decade was that applied research had made a significant contribution to improving people's understanding of the social, institutional and technical issues in the sector. This point was highlighted toward the end of the decade when the Temporary Working Group (TWG) on Applied Research was established by the Collaborative Council and met to discuss applied research issue, and priorities in London in March 1989. The TWG concluded that there was a need to improve the flow of applied research information in the sector among institutions and individuals, between researchers and program implementors, and between the industrial and developing countries. The report of the TWG recommended that a "decentralized informal approach to facilitate the exchange of information on applied research" be implemented.

In the spring of 1990, the International Development Research Centre (IDRC), the UNDP/World Bank Joint Program and U.S.A.I.D.'s Water and Sanitation for Health (WASH) project were asked by the Collaborative Council to develop such an informal approach or mechanism. That same summer the preliminary framework for such a mechanism was developed. The concept of GARNET, or the Global Applied Research Network for Water Supply and Sanitation, was presented formally and endorsed during a session at the SAFE WATER 2000 meeting in Delhi.

The GARNET conceptual paper presented in Delhi discussed in detail the purpose and proposed structure, some examples of potential network participants, and the immediate plans for GARNET. Since we last met, GARNET has evolved. The purpose of the Oslo presentation is to further define what GARNET is, to describe what has been accomplished in the first year of operation, to discuss the issues that have emerged during this initial period, and to propose plans for future activities, including the role of a reconstituted working group on applied research.

I. WHAT IS GARNET?

GARNET was designed to help facilitate the sharing of information on applied research in the water and sanitation sector around the world. From the outset it has emphasized an informal, decentralized people to people approach that we hope will keep costs to a minimum and facilitate rapid information exchanges. It does not have to be a sophisticated system, i.e., an electronic system. A central feature of GARNET is its non-directive nature and the use of a demand-driven response mechanism to define its activities. In other words, its purpose is "to create and support a highly decentralized structure of existing organizations and agencies that, with a modest amount of resources and using the latest information technology, can expand the number of contacts and establish mechanisms for the exchange of ideas and information on applied research on a permanent, efficient and timely basis."

GARNET seeks to fill a niche. It is not an institution. Nor is its purpose to function as an information center such as IRC, ENSIC, CEPIS, and CEHANET. These centers perform a very important function. They have been responsible for popularizing and disseminating information about water supply and sanitation activities to a large audience on a wide variety of subjects. But, to date, there are few information exchange mechanisms relating to specific applied research topics. This is a weakness within the sector identified by the Temporary Working Group on Applied Research. It is GARNET's primary function to remedy this situation. GARNET is a mechanism, an activity, to promote, facilitate the development and strengthen the modes of exchange of information, with the aim of supporting the timely exchange of relevant information about applied research experiences among network members.

The GARNET activity has a number of players, including: the GNC or Global Network Coordinator; a growing number of TNCs or Topical Network Coordinators; and RNCs or Regional Network Coordinators.

The primary function of the GNC is to identify existing TNCs and RNCs, to promote the establishment of networks for topics where none exist, to encourage the acceptance by institutions to becomes TNCs and RNCs, and to assist in their creation. The GNC is responsible also for facilitating communications among organizations involved in the GARNET activity, and periodically reporting on the status of GARNET to the members and the WS&S Collaborative Council. The TNCs function as a worldwide focal point for applied research on a particular topic. The TNC serves as a contact point for inquiries regarding the topics and it reports periodically to the GNC. The RNCs are institutions involved in a variety of applied research topics (not just one, as is the case for TNCs) which have agreed to function as a focal point for other research organizations within a country or region. Appendix A is a matrix of the institutions which have agreed to function as TNCs and RNCs.

In order to become a TNC and a RNC, organizations are asked by the GNC to comply with a number of requirements. First and foremost the organizations have to commit themselves

to facilitating the flow of information about applied research to all interested parties. In addition, they have to have the financial and personnel resources to be able to sustain this process. Equally important, the organizations should have access to up-to-date communications facilities to access all parts of the world or their region. Guidelines for becoming a TNC or a RNC are found in Appendix B.

We have categorized TNCs and RNCs into three levels 1, 2, or 3, depending on the amount of human and financial resources they are prepared to devote to networking with others and the GNC. These three levels are described in Appendix C.

II. GARNET'S ACCOMPLISHMENTS TO DATE

Initially, IDRC agreed to assume responsibilities of the GNC following the Delhi meeting. However, due to a variety of factors, it was unable to continue, and the WASH project agreed to take over as the GNC in March, 1991.

The first task of the GNC, immediately following a planning meeting in late March, was to make contact with all those institutions and agencies which had expressed an interest in sharing information on applied research during the tenure of the TWG in 1989 and 1990. Thirty five institutions were canvassed in April to solicit information about the existence, topic focus, structure and membership criteria of applied research networks. The results of this initial contact indicate the existence of 23 functioning (or soon to be functioning) topic specific applied research networks, which we are referring to as TNCs, located in 16 institutions/organizations. Most relate to specific applied research topics, as specific as the investigation into suspended solids in wastewater, to a general topic on institutional development. Several have existed for some time, such as Rainwater Harvesting, while others are recently created (for example, the Dracunculiasis Operations Research network), or are in the planning stage.

The information received has been translated into a matrix (see Appendix A), which displays the network topics, the name and address of the contact person, the level of operation (1, 2, or 3), the number of members, whether the institution is actively involved in applied research activities, whether they require membership fees and whether they are established or recently formed. The matrix is available to all institutions that request information regarding the GARNET initiative, or which are attempting to identify the TNC for a particular topic. To date, we have received a number of inquiries from individuals asking to be part of GARNET. Our response is to send them a copy of the matrix and suggest that they identify which topic or region they are interested in and then contact that organization listed on the matrix. In this respect the GNC is functioning as a clearinghouse to facilitate the communication between individuals and institutions seeking information on applied research in the sector.

The Temporary Working Group on Applied Research report of July 1989 divided research in the sector into four major segments: Expansion and Enhancement of Service; Benefits of Improved WSS Services; System Sustainability; and Environmental Sustainability. The TNC research topics listed in Table 1 are grouped under these four major divisions.

TABLE I
List of Topics from TNCs

(as of September 1, 1991)
(grouped by TWG categories)

		TOPIC	ORGANIZATION	COUNTRY
I.	**Expansion and Enhancement of Service**			
	1.	Appropriate Technology	CSIR	S. Africa
	2.	Handpumps	U. of Malaya	Malayasia
	3.	Pumping Technologies - Non-mechanized	U. of Warwick	U.K.
	4.	Latrines - Emptying Pit Latrines	IRCWD	Switzerland
	5.	Latrines - Compositing	CEMAT	Guatemala
	6.	Rainwater Harvesting - General	WASH	U.S.
	7.	Rainwater Harvesting - Water Quality	CREPA	Burkina Faso
	8.	Solar - Distillation	BRACE	Canada
	9.	Solar - Water Disinfection	BRACE	Canada
	10.	Solar - Water Pumping	U. of Ottawa	Canada
	11.	Wastewater - Reuse	IRCWD	Switzerland
	12.a.	Wastewater - Treatment - Anaerobic	IHE	Netherlands
	12.b.	Wastewater - Treatment - Anaerobic	Wageningen Univ.	Netherlands
	13.	Wastewater - Lagoons	CREPA	Burkina Faso
	14.	Wastewater - Separate Process	IWSA/IAWPRC	Belgium
	15.	Water Treatment - Iron Removal	CREPA	Burkina Faso
	16.	Water Treatment - Suspended Solids Removal	IHE	Netherlands
	17.	Groundwater Pollution	IRCWD	Switzerland
II.	**Benefits of Improved WSS Services**			
	18.	Health Impacts	AIIH & PH	India
	19.	Dracunculiasis Operations Research	LSHTM	U.K.
III.	**System Sustainability**			
	20.	Monitoring and Evaluation	UNDP/WB	U.S.
	21.a.	Institutional Development	IHE	Netherlands
	21.b.	Institutional Development	WEDC	U.K.
IV.	**Environmental Sustainability**			

The list of topics in Table 1 includes some networks or TNCs which have been functioning for a number of years without the GARNET title of a TNC. The list also includes some recently formed TNCs as well as some TNCs which are just now being established. The Rainwater Harvesting TNC, topic number 11a. in Appendix A, operated by the WASH project is an example of a well established and fully functioning TNC. Begun initially to promote the diffusion of the idea of rainwater harvesting as an appropriate technology alternative, the Rainwater Network has grown from fewer than 50 members in 1984 to over 500 members from 85 countries today. The network responds to requests for information, and produces a semi-annual newsletter called RAINDROP which has a feature on applied research. It has not organized any workshops on applied research but it has sent representatives to the bi-annual International Rainwater Harvesting Conference where research is discussed. Based in Washington, D.C. it's annual budget is approximately $15,000.

The Dracunculiasis Operation Research Network(DORN), topic number 2 in Appendix A, is an example of a recently formed TNC. Centered at the London School of Hygiene and Tropical Medicine with support from UNICEF, DORN is coordinating and promoting applied research on guinea worm as part of the global effort to eradicate this disease. It has an initial membership of 20, hopes to produce a modest newsletter, and is presently planning a workshop to be held in Burkina Faso in late September, 1991.

The Participatory Monitoring and Evaluation Network, topic number 9 in Appendix A, is an example of a newly emerging network which is just beginning to get organized. With origins in a workshop held in Geneva in June, 1990, this topical network is focusing on the research into participatory approaches to monitoring and evaluation of water and sanitation projects. It is centered with the joint UNDP/World Bank Program in Washington, D.C. and has 50 members to date. A second regional workshop (the first was held in Kenya in November 1990) is planned for Latin America, and a newsletter is to be produced and distributed to network members later this year.

In addition to mature, recent and brand new "topical" networks, there are three Regional Network Coordinators or RNCs. Their network systems cover a variety of applied research topics over a wide geographical area. These include ENSIC, ICDDR/B, and WEDC, which are functioning as RNCs for Southeast Asia, Bangladesh and the United Kingdom, respectively. The United Kingdom's RNC is operated by the Water Engineering and Development Centre (WEDC) of Loughborough University, which recently submitted a proposal for funding to the British Overseas Development Administration (ODA) to function as the coordinator of information on all applied research in the UK. There are presently six U.K. institutions participating in this network. In summary, of the 14 countries with institutions agreeing to serve as TNCs and RNCs, six are in the developing world.

III. GARNET ISSUES

In the course of the brief period since launching the GARNET initiative a number of issues have surfaced which we have tried to address. They are as follows:

1. Topics vs. Regions

In the original concept paper of GARNET we proposed that specific WS&S topics be the focal points for applied research. Our idea was to have one organization, a TCA, now changed to TNC, coordinate worldwide applied research information for a particular topic. This has been accepted by many of the organizations we have contacted. However, we have also found some organizations within particular countries such as the United Kingdom and Bangladesh, seeing a need to have a geographical or regional focal point for any and all applied research in the sector.

The question is, should GARNET emphasize a worldwide topical focus and in addition include a regional or country focus which includes a variety of topics? Our answer is yes. We see no reason why GARNET can not include the names and addresses of TNCs as well as regional coordinating centers or RNCs.

2. Two Organizations Wanting to be a TNC

This issue has come up repeatedly since we first introduced the concept of TNCs. Our position is that the GARNET Global Network Coordinator will NOT try to determine which organization should or should not be a TNC. Since we view GARNET as an informal network, we are and will continue to urge different organizations to work together and jointly share the responsibilities of a TNC and we will list both of them on our matrix. (For example see Institutional Development Item 6 in Appendix A.)

3. Financing of TNCs

This problem has surfaced in recent months with the requests from a few organizations to become a TNC accompanied with a request for financial support. We have turned down these requests since, as indicated above, one of the requirements for becoming a TNC is to have the financial means to operate at least at the minimum level. Clearly, the GNC was not conceived to be a funding source of TNCs and we have no plans to become one. We will however, suggest possible funding sources if we can identify them.

4. Lack of Experience of TNCs

In addition, it is apparent that one or two organizations applying to become a TNC for a particular topic have had very limited applied research experience in that topic. Our position has been that the GNC will not attempt to judge the depth of experience of TNC applicants and will take their application on face value. If other, potentially more experienced,

organizations later come in and desire to become a focal point, we will encourage them to work together with the less experienced institution. We will monitor a TNCs performance as indicated above, and if after a period of time the TNC can not show they are performing we will consider dropping them as a TNC.

5. Communicating in Languages other than English

Another issue that surfaced relates to the exclusive use of English as the language of communication for GARNET. In discussions with representatives of institutions in both west Africa and Latin America that had received GARNET correspondence, it became obvious that they had not fully understood what was written.

Realizing that the translation of direct communications to institutions into French and Spanish can be a costly proposition, and can cause delays, it was suggested that we consider preparing and attaching a synopsis of the letter's content in French and Spanish. In this way, recipients should be able to determine the objective of the communication and possibly seek translation assistance.

6. Understanding of the Role and Responsibilities for TNCs

In several cases, the intent of the GARNET initiative and the anticipated role and responsibilities for the TNCs had to be reiterated, even though they were dealt with in the correspondence. Besides the language issue raised previously, there has been a problem with some people reading what they want to read. In other words, there may be a tendency for some potential TNCs to view GARNET as a means of obtaining financial support for their operation, or for support directly for their applied research. Clearly the strengthening of some potential TNCs is an issue that will need to be addressed, but not in the mandate of GARNET.

7. Territoriality or Perceived GARNET overlap with Information Center

During the first months of operation, GARNET has received support from some of the sector information centers but some centers have been reluctant to join. The cause for this reluctance appears to be the view that the GARNET initiative will duplicate the mandate of these centers. Duplication of effort is clearly not in anyone's interest.

Our view is that GARNET should serve to bolster and improve the role of information centers by concentrating on current and planned applied research issues, not general information. In turn, GARNET would benefit from the information center's experience in establishing and sustaining information exchange networks. GARNET has already used numerous information center newsletters to publicize our efforts and we hope this will continue.

8. Performance of TNCS

Since the GARNET concept paper was presented at Delhi in September 1990 we have found different agencies have interpreted the duties and responsibilities of the TNCs somewhat differently. Over the past few months we have attempted to more clearly define the responsibilities of a TNCs and our expectations for their performance. Those are listed in Appendices B & C.

As the TNCs become established and operational, we envision the GNC monitoring their performance every six months. The indicators the GNC would use to monitor could be the following: increase in number of TNC members; amount of correspondence/ communication sent out and received; amount of research findings; and the means for communicating the finished and on-going research findings - whether by newsletter, meetings, or other. This information would then be summarized in a six month report to all GARNET members and to the Collaborative Council.

IV. ISSUES BEYOND THE GARNET GNC

The GARNET survey also identified several issues that warrant further reflection and action, but which are beyond the mandate and the capacity of the current GNC to address. Some of the more noteworthy include:

1. Gaps in Applied Research

With some notable exceptions, the majority of the researchers and institutions that have generated and carried out basic and applied research on technology issues are concentrated in the developed countries, where there has existed for some time a strong tradition of networking, and where conditions appear to be more amenable to their creation and maintenance. Professional engineering associations have played a major role in this regard. Several multilateral and bilateral agencies have actively promoted and supported the creation and expansion at developing institutions of new networks on technology-specific issues.

Despite the promotion of health, social and economic issues during the IDWSS Decade, the majority of applied research networks identified to date relate still to hardware/technology issues. Yet a review of sector-related journals and publications over the past few years indicates a significant increase in the number of studies on software issues as well as an expansion in their scope of interest. Many applied research experiences are field-based, and take place in developing countries. Often, the researchers are nationals of developing countries. The information contained in Table 1 would seem to suggest that applied research networks on software issues are few. It is probable that linkages among researchers in this domain tend to be informal and ad hoc. Most are a consequence of a

meeting or seminar on a specific issue. However, we believe there exist many more networks on software issues, but that they are small and "hidden".

There are several factors that may account for the seemingly low number of applied research networks on software issues:

- the time required to form a network around a specific topic: the acceptance of social, health and economic issues as an integral and important component of sector activities is a relatively recent phenomenon;

- the diversity and specificity of research topics: the number of potential applied research topics relating to software issues is vast and diverse. As well, the applied research methodologies for software issues do not appear to be as well defined as those for engineering-based technology issues.

- the effort required to develop these linkages and forge networks is greater than that required to develop networks within the north-north context: the geographic spread of individuals involved in applied research issues appears to be greater than for technology-related issue. Many of those involved in software-related applied research are based in developing country institutions; however, the linkages between these institutions and others, particularly on a "south-south" basis, are nonexistent or often immature.

2. Quality Control of Applied Research

Several eminent sector professionals, such as Briscoe, Feachem and Cairncross, among others, have documented the weaknesses that limit the validity and utility of applied research studies. Many relate to deficiencies in research methodologies and a weakness in statistical techniques. Other factors include the lack of expertise within the sector at the field level of disciplines such as epidemiology, demography and economics, required within the time required to carry out and the degree of sophistication required within research protocols to demonstrate a causal relationship between a WSS intervention and its supposed impact, and the cost related to carrying out applied research studies.

3. Time Required to Disseminate Information About Research Results

Time is of the essence when one considers the progress that must be made over the next ten years if the sector is to achieve the goal of Safe Water 2000. More, now than ever, researchers and practitioners must have at their disposal the results of research.

Many reputable journals require submissions be peer-reviewed, a time-consuming though important exercise. Consequently, and due also to the large volume of articles reviewed for publication, the time span between the submission of manuscripts about the results of a

research project and its publication as an article can be very long. The applicability of the research results to other research studies elsewhere may be limited.

Hence, one of the issues that may warrant further study relates to the means of disseminating research results quickly, without compromising quality control. A related issue is the lack of experience of many developing country researchers in the preparation of manuscripts for submission to peer-reviewed journals. Unless efforts are made to strengthen their capacity to write clear, concise and informative reports and articles, the essential elements of their research experiences will remain unknown.

4. Communications Modes Within Networks

The experience from the GARNET survey highlights several issues related to communications: the time-cost of communicating; the reliability of electronic communications mode; the variation in the communications capabilities of institutions. The initial GARNET survey was conducted by mail, and follow-up through phone and fax. In several cases, letters arrived at their intended destination much later than expected. In fact, telephone follow-up preceded the reception of the survey questionnaire in a few instances. The costs of communication, particularly through electronic media, can be very high, particularly from developing countries. The exercise demonstrated also that the maintenance of a fax contact can be problematic, requiring several attempts before a message is communicated successfully.

Such points may appear to be insignificant from a northern perspective. However, they may represent hurdles to the successful establishment and effective functioning of a developing-country based network. The costs, time and effort associated with the operation of the network may be substantially higher at a developing country institution.

Finally, it should be kept in mind that communications capabilities may vary greatly across institutions. We cannot expect that all networks will function with the same speed or efficiency. Not everyone has a fax or modem at their disposal. Alternative and non-conventional means of communication may prove to be more practical and effective. The issue is how to ensure that the communications component of a network operates effectively, and to identify the support mechanisms, that will serve to strengthen the TNCs' communications capabilities.

5. The Capacity of Institutions to Function as TNCs

Another important issue is institutional capacity building, so that developing country institutions can establish, operate and manage effective applied research networks. One option is direct ESA financial support to an institution. An alternative approach, one that may warrant further study, would involve the "twinning" of institutions that act presently as TNCs, with developing country-based institutions that indicate an interest and which meet established criteria for TNCs. The existing TNC could be responsible for assisting the

developing country-based institution to improve its capacity to host a network, and for the transfer of network operation responsibilities. The actual process, mechanics and terms of reference for such an approach still require elaboration.

It is apparent from the experience of the first few months of operating the GNC that there are certain things GARNET can not do. GARNET can not dictate what applied research needs to be done, it can not prioritize the applied research issues needing to be addressed, nor can it judge the quality of the research which is undertaken. We see GARNET as a tool or mechanism to assist the Collaborative Council members and the international community to rapidly learn about who is doing what, where, in applied research.

It became increasingly clear that some of these issues are beyond the capacity of the GNC to handle, and that some alternate mechanism is required. One would be to expand the number of participants which form the GARNET Advisory Committee. This committee acts as a support mechanism to the GNC. At present, a representative from the UNDP/World Bank Program and one from USAID form the Advisory Committee. An expanded committee would permit input from a broader base, and would also draw on the expertise and opinion of other Collaborative Council members. For example, the expanded Advisory Committee could:

- in consultation with the TNCs, review the operation of the applied research networks, to identify the topics of greatest interest to their network members and to also identify topics for which information requests have been made, but which could not be responded to;

- identify means of facilitating access to and decreasing the time period to disseminate information about research results.

- identify and address issues relating to communications linkages among network members and for TNCs; and,

- discuss how ESAs can be encouraged to improve the capacity of developing country-based institutions to function effectively as TNCs.

V. FUTURE PLANS

The goal for the GARNET activity of identifying at least 20 existing or potential TNCs by September 1991 has been achieved. Over the course of the next twelve months, the GNC expects to expand the roster of TNCs and RNCs. We expect to achieve our original goal set for September 1992, to have identified 40 to 50 TNCs and RNCs. This will be accomplished by contacting additional institutions, to solicit information about existing

applied research networks, or their interest and intentions of establishing networks. It will also require an expanded effort on the part of external support agencies, to provide technical and financial assistance for the development and operation of applied research networks.

The GNC will, over the next year, prepare two status reports, to be submitted to the Collaborative Council and to GARNET members, on the status of the initiative. Hopefully, the expanded Advisory Committee will be functional during this period, and the GNC will be able to report to its members about the results of the Committee's deliberations on various issues.

It is also intended, as a means of assisting and facilitating the establishment of applied research networks, that the GNC prepare, in collaboration with other ESAs and institutions, a short paper on the process for establishing and managing a preliminary applied research network.

The GNC proposes that before September 1992, the Collaborative Council, through auspices of some independent mechanism, such as a reconstituted TWGAR, or another committee, undertake an assessment of the GARNET initiative. The purpose of this study would be to determine the need for the continuation of the initiative, to identify its strengths and weaknesses, and the means of addressing the latter.

Finally, it has been the intention of the agencies that serve presently as the primary focus for GARNET that efforts be made during the course of 1991/92 to identify a replacement GNC, preferably an institution located in a developing country. This could be an activity of the new GARNET Advisory Committee, or, should the Council prefer, the TWGAR. In any event, the goal is to have identified by September 1992 a replacement GNC, and to have prepared a preliminary plan of action for the transfer of GNC responsibilities to this institution.

CONCLUSION

During its first year of operation, GARNET can boast several accomplishments: the launching of the initiative at the Safe Water 2000 meeting in Delhi; the successful transfer of responsibilities of the GNC from IDRC to WASH; and, the completion of an initial survey of institutions and the identification of 23 applied research networks. In fact, the GARNET initiative surpassed the 1991 goals set for it at the Delhi meeting.

Additionally, the experience over the past twelve months allowed those involved with the GARNET initiative to identify several issues that affect its future, and which touch upon the capacity of developing country institutions to function as TNCs and RNCs. However, the capacity of the GNC to address them is limited. A proposal is therefore made to expand the Advisory group of the GNC and/or to reconstitute the Temporary Working Group on

Applied Research as the fora for the discussion of the issues, and for the elaboration of the steps to be taken to address them.

The GARNET initiative is playing an important role in highlighting applied research issues, in cataloguing sector-related applied research networks, and in promoting the role of developing country institutions as TNCs. It has also served to demonstrate that an informal, low-cost and collaborative approach can achieve a great deal. The expectations of those involved in the initiative are that significantly more can be accomplished. The continuing success of this initiative requires the support and cooperation of you, the members of the Collaborative Council. We welcome your comments and participation.

Appendix A

NETWORK COORDINATORS

September 1, 1991

Topical Network Coordinators

Topic	Agency	Contact	Level	Members	Research	Fees	Status
1. Appropriate Technology	Division of Water Technology CSIR P.O. Box 395 Pretoria 0001 South Africa Phone: 27-12-841-3897 Fax: 27-12-841-4785	P. Solsona	2	20	Y	N	Estab
2. Dracunculiasis Operations Research Network	London School of Hygiene and Tropical Medicine Keppel Street London WC1E 7HT United Kingdom Phone: 44-71-636-8646 FAX: 44-71-436-5389	Sandy Cairncross	2	20	Y	N	New
3. Groundwater Pollution	International Reference Centre for Wastes Disposal CH-860 Duebendorf Switzerland Phone: 41-823-5018/17 FAX: 41-823-5028	Roland Schertenleib	1	15	Y	N	Estab
4. Handpumps, Unimade (IDRC Handpump Network)	University of Malaya Dept. of Mechanical Engineering 59100 Kuala Lumpur Malaysia Phone: 60-3-7553466 Ex.260 FAX: 60-3-7578308	Foo Lai Khim	3	13	Y	N	Estab
5. Impact Assessment (Health)	All India Institute of Hygiene and Public Health 110, Chittaranjan Ave. Calcutta 700 073 India Phone: 91-33-315286, 5288, 5200 FAX:	K.J. Nath	1	?	Y	?	?
6a. Institutional Development	International Institute for Hydraulic & Environmental Engineering Oude Delft 95 P.O. Box 3015 2601 Delft Netherlands Phone: 31-15-788021 FAX: 31-15-122921	Guy Alaerts	1	40	Y	?	New
Y = Yes N = No Estab = Established							

Topical Network Coordinators

Topic	Agency	Contact	Level	Members	Research	Fees	Status
6b. Institutional Development	Water, Engineering, and Development Centre Loughborough University Leicestershire LE11 3TU United Kingdom Phone: 44-509-263171 FAX: 44-509-211079	Andrew Cotton	1	?	Y	?	New
7. Latrines (Emptying of Pit Latrines)	International Reference Centre for Wastes Disposal CH-860 Duebendorf Switzerland Phone: 41-823-5018/17 FAX: 41-823-5028	Roland Schertenleib	1	15	Y	N	Estab
8. Latrines, Composting	Centro Mesoamericano de Estudios Sobre Tecnologia Apropiada 4a. Avenida 2-18, Zona 1 Apartado Postal 1160, Guatemala 01001 Guatemala Phone: 502-2-22153/53847 FAX:	E. Caceres	2	?	Y	N	Estab
9. Participatory Monitoring and Evaluation	UNDP/World Bank Water and Sanitation Program 1818 H St. NW Washington, D.C. 20433 United States Phone: 1-202-473-1304 FAX: 1-202-477-0164	Deepa Narayan-Parker	3	50	Y	N	New
10. Pumping Technology, Non-Mechanized	University of Warwick Dept. of Engineering Coventry CV4 7AL United Kingdom Phone: 44-203-423122 FAX: 44-203-418922	Terry Thomas	1	?	Y	N	Estab
11a. Rainwater Harvesting	Water and Sanitation for Health Project 1611 N. Kent St., Suite 1001 Arlington, VA 22209 United States Phone: 1-703-243-8200 FAX: 1-703-525-9137	Dan Campbell	2	500	N	N	Estab
11b. Rainwater Harvesting (Rainwater Quality)	Centre Regional Pour l'Eau Potable et l'Assainissement à Faible Cout 03 BP 7112 Ouagadougou 03 Burkina Faso Phone: 226-31-03-59/60 FAX: 226-31-03-61	C. Toure	2	19	Y	N	New

Topical Network Coordinators

Topic	Agency	Contact	Level	Members	Research	Fees	Status
12. Solar Distillation	Brace Research Institute MacDonald Campus P.O. Box 900, Ste-Anne-de-Bellevue Quebec H9X 1C0 Canada Phone: 1-514-398-4262 FAX: 1-514-398-6678	T. A. Lawand	3	10	Y	N	Estab
13. Solar Water Disinfection	Brace Research Institute MacDonald Campus P.O. Box 900, Ste-Anne-de-Bellevue Quebec H9X 1C0 Canada Phone: 1-514-398-4262 FAX: 1-514-398-6678	T.A. Lawand	3	30	Y	N	Estab
14. Wastewater Reuse	International Reference Centre for Wastes Disposal CH-860 Duebendorf Switzerland Phone: 41-823-5018/17 FAX: 41-823-5028	Roland Schertenleib	1	80	Y	N	Estab
15a. Wastewater Treatment (Anaerobic)	International Institute for Hydraulic & Environmental Engineering Oude Delft 95 P.O. Box 3015, 2601 Da Delft Netherlands Phone: 31-15-788021 FAX: 31-15-122921	Guy Alaerts	1	40	Y	?	Estab
15b. Wastewater Treatment (Anaerobic)	Wageningen Agricultural University Dept. Environmental Technology P.O.B. 8080 6700 Wageningen Netherlands Phone: 31-83-70-83174 FAX: 31-83-70-84411	Gatze Lettinga	1	?	Y	?	Estab
16. Wastewater Treatment (Lagoons)	Centre Regional Pour l'Eau Potable et l'Assainissmenet à Faible Cout 03 BP 7112 Ouagadougou 03 Burkina Faso Phone: 226-31-03-59/60 FAX: 226-31-03-61	C. Toure	2	19	Y	N	New

Topical Network Coordinators

Topic	Agency	Contact	Level	Members	Research	Fees	Status
17. Wastewater Treatment (Separation Processes)	International Water Supply Assoc. IAWPRC c/o Zegersdreef 46 2130 Brasschaat Belgium Phone: 32-3652-0244 FAX: 32-3652-02-44	Jan G. Janssens	1	550	Y	?	New
18. Water Treatment (Iron Removal)	Centre Regional Pour l'Eau Potable et l'Assainissement à Faible Cout 03 BP 7112 Ouagadougou 03 Burkina Faso Phone: 226-31-03-59/60 FAX: 226-31-03-61	C. Toure	2	19	Y	N	New
19. Water Treatment (Suspended Solids Removal)	International Institute for Hydraulic & Environmental Engineering Oude Delft 95 P.O. Box 3015, 2601 Da Delft Netherlands Phone: 31-15-788021 FAX: 31-15-122921	Guy Alaerts	1	40	Y	?	Estab
20. Solar Water Pumping	International Water Engineering Centre University of Ottawa/Civil Engineering Dept. Ottawa, Ontario K1N 6N5 Canada Phone: 1-613-564-2258 FAX: 1-613-564-9860	Eric Schiller	1	8	Y	N	New

REGIONAL NETWORK COORDINATORS

Topic	Agency	Contact	Level	Members	Research	Fees	Status
Asia	Environmental Sanitation Information Center c/o. A.I.T., GPO Box 2754 Bangkok 10501 Thailand Phone: 66-2-516-0110-29 FAX: 66-2-516-2126	Marta Miyahsiro	3	450	Y	Y	Estab
Bangladesh	International Centre for Diarrhoeal Disease Research GPO Box 128 Dhaka 1000 Bangladesh Phone: 800-2-600171/78 Ext. 242 FAX: 880-2-883116	Bilqis Amin Hoque	1	6	Y	N	New
United Kingdom	Water Engineering and Development Centre Loughborough University Leicestershire LE11 3TU United Kingdom Phone: 44-509-263171 FAX: 44-509-211079	Andrew Cotton	1	6-7	Y	N	New

Appendix B

GUIDELINES FOR BECOMING A TNC OR RNC

1. Demonstrate an involvement or strong interest in applied research: TNCs on the specific topic which is relevant to developing country situations; RNCs on a variety of topics relevant to developing country situations.

2. Demonstrate functioning communication facilities with easy access into and out of the TNC or RNC.

3. State that they have sufficient financial resources to support a minimum level of activities.

4. Agree to submit a brief status report every six months to the GNC.

5. Agree to negotiate with any other organization wishing to become the TNC or RNC for the same topic or region.

6. Promote the equal sharing of research findings and information.

7. Commit to assisting others in identifying funding sources for research in their topic area.

8. Commit to bringing researchers together through communications (e.g. mailings- level 1, newsletters- level 2 and workshops/meetings- level 3).

Appendix C
LEVELS OF EFFORT OF NETWORK COORDINATORS

As a Tropical Network Coordinator or Regional Network Coordinator, the organization will coordinate the sharing of information on applied research among network members. This will call for regular contact and communication with members. Each TNC or RNC may have a different level of time, effort and resources that can be dedicated to this activity. Below are some suggested levels of activities to be undertaken by a TNC and RNC depending on the available time and resources.

LEVEL 1

- Develop and or/maintain files or database on network members which will contain information on organization name, address, contacts, etc.
- Maintain current information on research efforts, studies or projects by network members.
- Update information on research activities by network members on a periodic basis through individual meetings, personal contact, questionnaires, etc.
- Respond to information requests from network members and others about the network.
- Provide information 2 times per year to the Global Network Coordinator (GNC) about the network. This will include information on the number of network members, network promotion, etc. See the attached form for a more detailed description.
- No fees charged to members.

LEVEL 2

- All of the above activities (except some topical networks may charge an annual membership fee).
- In collaboration with other network members, publish and distribute a periodic bulletin or newsletter. This publication would contain information on current applied research efforts, findings, proposals, etc.
- Establishment or expansion of information center that collects, obtains, and disseminates applied research information to network members.
- Promotion of the network through announcements, articles, etc.

LEVEL 3

- All of the above activities.
- Sponsor and/or organize periodic workshops, demonstrative visits, pilot projects, etc. among network members.

INSTITUTIONAL DEVELOPMENT

A SRI LANKAN EXPERIENCE

PRESENTED BY

M. WICKREMAGE

ADDITIONAL GENERAL MANAGER (CORPORATE PLANNING)

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

INTRODUCTION

The Institutional Development program funded by US Agency for International Development (USAID) took place at the National Water Supply and Drainage Board (NWSDB) between April 1985 and August 1991. Institutional Development is an expansion of Organizational Development (OD).

ORGANIZATIONAL DEVELOPMENT VS. INSTITUTIONAL DEVELOPMENT

OD is the development of an institution's effectiveness within the confines of the institution's stated mission and culture. ID seeks, in addition, to take account of the wider institutional ramifications, such as linkages with other authorities, sectoral goals and policies and possible modifications of the role of the institution within the external environment.

In the case of the NWSDB, a strictly OD approach would concentrate on improvements in internal organization procedures, technical task-specific target development, upgrading management effectiveness, operational planning and performance monitoring. By comparison, ID would add on an analysis of national sector policies and goals, sector planning in the context of sector needs, external stakeholder priorities and an analysis of liaison mechanisms and degrees of influence relating to key agencies operating in the external environment, particularly government Ministries and external support agencies (ESAs).

NWSDB

The NWSDB was formed out of the Department of Water Supply and Drainage in 1975 as an autonomous body under the then Ministry of Irrigation, Power and Highways and from 1977 under the Ministry of Local Government, Housing and Construction (MLGHC). It was charged primarily with developing, providing, operating and controlling efficient water supply facilities, to distribute water for public, domestic or industrial purposes and to charge for same. Other duties of the NWSDB included such functions as the provision of piped sewerage facilities, research and training.

Today the Board has a staff of 6932 and manages 199 schemes serving 3,400,000 people.

PRE-PROJECT SETTING

At the time of the project preparation in late 1983/early 1984, the NWSDB was functioning reasonably well in terms of construction of new schemes, performance was less than satisfactory in the areas of scheme operation and financial viability. In 1983 for example, collections represented only 12% of O&M cost and the number of billed consumers to staff ratio was only 8:4.

The basic problems with the NWSDB at the time of project design was that it had not been able to come to grips with the very significant role shift occasioned by its change from a Government Department to a public corporation. The new role demanded that its focus of attention be changed from capital projects to O&M and consumer orientation. This change in focus represented a radical redirection of emphasis, one that the NWSDB was not easily in a position to absorb.

The operational deficiencies resulting from the change in emphasis could be summarised as follows:

- Negligible emphasis on O&M
- Minimal commitment to financial viability

- o Negligible accounting/budget discipline
- o No corporate planning
- o Little attention to community/user considerations
- o Reliant on Government subsidies
- o Totally reactive to direction from MLGHC, local authorities and Members of Parliament

These deficiencies could not be overcome without a change in basic NWSDB staff attitude, supported by new operational skills and procedures.

PROJECT OBJECTIVES

The project had two elements, a comprehensive institutional building component and a programme to improve health education and rural sanitation services through the integration of NWSDB activities with the Ministry of Health (MOH).

Three basic objectives of the institutional - building element were:

- o consolidating the NWSDB organization responsible for a major World Bank-funded infrastructure project
- o decentralizing management to the regional offices
- o changing the overall organization structure, attitudes and actions to make the operation and maintenance (O&M) activities of the NWSDB the most important mission

The principal objective of the health education, sanitation and community participation element was to ensure, through a process of formal coordination among the NWSDB, MOH, participating Non-Governmental Organizations (NGOs) and beneficiary communities, that health education and sanitation services would be delivered to the communities simultaneously with the provision of new or upgraded water supply facilities.

Thc total estimated project cost at the time of inception, excluding contingencies and inflation allowances was $13.85 million, of which TA costs related to the ID and health components were estimated to account for 25%, at $3.52 million.

This data is presented to illustrate that although ID (and also health education) are essentially "software" projects, associated "hardware" non-Technical Assistance (TA) costs represented no less than three quarters of the total project costs.

TA RESOURCE MOBILIZATION

The prime contract was signed between Engineering-Science Inc. (ES) and USAID in February 1985 with an effective start date of 1 April 1985. The prime contract was amended on a number of occasions throughout the life of the project, the net result being that the original project duration was increased by 93% from 40 to 77 months, and the professional input (on-site expatriate and Sri Lankan) was increased by 79% from 440 to 786 person-months.

In accordance with the philosophy of serving as process consultants, change agents or catalysts, the TA team basically operated in a pivotal role, facilitating and monitoring the ID process. Of course, when it was necessary to secure the support of external stakeholders in order to sustain ID momentum, a more prescriptive mode was adopted.

The decision to move into the prescriptive mode was not taken lightly, it was discussed in detail with the external actor concerned and great care was taken to ensure that the pressure was in accordance with the stated ID goals, supported by the wider sectoral goals of government.

Although the use of external stakeholders became a recognised and indeed an essential element of the ID process, it was never openly discussed, probably because it was seen by all parties that its net effect on institutional change was generally positive.

NWSDB CULTURE

One of the fundamental facets of the NWSDB culture was that it was an engineering-dominated organization. The ID project introduced a different emphasis, on O&M and commercial awareness for example, functions that were alien to traditional civil engineers and were seen as a threat to their power base. The project, therefore, generated a basic feeling of insecurity on the part of the engineers. The ranks were closed, and resistance to the project grew until sacrifices had to be made through implementing major changes in key personnel in both the TA team and NWSDB executive management towards the end of the first year. Such changes was evident on the WSSSP, with most of the TA team members gradually coming to understand and respect the institution's culture, whilst at the same time the culture of the institution gradually changed as the project progressed.

ID PROCESS

The process of ID is dynamic, cyclical and subject to all the positive and negative forces at work both within the institution and in the external environment. The process has a range of positive forces being brought into play to counter and overcome pressures acting against change. The need for "hardware" inputs such as equipment, facilities and overseas training tours is recognised, not just to upgrade the asset base of the institution but also to provide incentives to accept changes. An ID project is usually commissioned at the behest of the institution. In the case of the NWSDB the real impetus for change came initially from the donor community who wished to see an increased level of accountability and a greater return on their investments.

Traditionally, an ID intervention proceeds along a carefully balanced path, specialist consultants are called in (assuming that there is no in-house OD/ID capability) to assess the weaknesses, and over time strategies are developed, in participation with the staff of the institution, to bring about change. In accordance with the theory of process consultation, reforms must be developed with the full involvement of the staff so that the ID process is "owned" by the institution.

In the case of the NWSDB, the sudden-shock approach was used for project start-up. Many consultants questioned numerous areas of the Board and recommended changes. There was a reaction by staff, but over a few months the project tended toward the more traditional philosophy of the gradual approval. The positive result of the sudden-shock approach was that the institution was forced into addressing the change issues.

AREAS OF CONCENTRATION

As the project progressed and the initial resistance began to subside, a strategy was mapped out to prioritize the consultant input in such a way that success could be achieved in key areas which would in turn generate increased support for further changes. Six principal pathways to institutional strengthening were identified, not all at once, some only became apparent in the second year of the project.

The primary initiatives or pathways undertaken during the project were -

i) <u>Decentralization</u>

This was the most significant initiative because it resulted in so many other positive spin offs which assisted the ID momentum. The Board had created 5 Regional Support Centres (RSCs). Although these offices existed, they tended to be headed by relatively junior engineers and any substantive decision-making was made at the Head Office level.

The degree of Head Office authority delegation achieved was far in excess of that over envisaged at the start of the project. One of the key components of the decentralization effort was the delegation of financial responsibility. The level of financial authority enjoyed by the RSC senior managers at the end of the project was twenty times greater (Rs.500000 compared to Rs.25000) than that enjoyed by the engineer managers responsible for regional operation at project inception. Additionally RSCs become responsible for:

- planning/design/construction, supervision (extensions, minor new and rehabilitation projects)
- groundwater development
- operations and maintenance/water quality monitoring
- community support/sanitation
- billing/collection
- financial management/budget control
- personnel functions
- local purchases
- local and on-the-job training
- performance evaluation
- MIS
- liaison with decentralized government agencies
- training
- regional data bank

It is pertinent to note that decentralization is a time-consuming process. In general it required from about 2 to 2.5 years to achieve 50% decentralization status and from 3 to 3.5 years to achieve 80% status.

ii) Management Development

The management profile of the NWSDB in 1985/1986 tended to show the following characteristics:

- o Unwillingness to make decisions
- o Limited delegation of responsibility, most decisions, even of an operational nature, made by executive management
- o Power and influence dominated by civil engineers who had a strong bias towards capital works
- o Limited group management skills, meetings dominated by individuals who were generally the most senior managers present
- o Lack of accountability and suppression of initiative, reluctance to be innovative
- o Absence of basic management systems (MIS, performance indicators, budgets)
- o Strong sense of pessimism and criticism of the institution
- o Strong resistance to change, although there was an awareness that change was required

The management development intervention comprised a series of interconnecting levels and continued at varying degrees of intensity over the duration of the project. The basic strategy was to actively follow up the formal training courses with day-to-day coaching by the resident TA team. This follow-up manifested itself in two ways, through facilitating and assisting in every-day operational issues and through workshops designed to address specific issues. These workshops ranged from half a day to three days in duration and whenever possible were held away from the office, usually in a resort hotel. As for senior management training, the workshops were preceded by an intensive series of surveys designed to clarify need assessment, to surface problems and to secure the involvement of the NWSDB staff in the design and actual implementation of the training event.

Building team spirit was a hidden agenda in almost every management development initiative. The TA team laboured the point continually, constantly showing how the managers could profit from the support and experience of their peers and how a cohesive group was better able to establish a positive identity and thereby demand and receive additional resources.

A retrospective evaluation of managers' performance over the life of project showed that only those who had been involved in active day-to-day coaching by the TA team were able to adjust their management styles to suit different work situations.

iii) Corporate Planning

The initial project objectives envisioned the formation of a corporate planning committee as a key step in the institutionalization of the process and early in 1986 a committee was formed, based in the Ministry of Local Government, Housing and Construction (MLGHC) and chaired by a senior Ministry officer at the Additional Secretary level. Membership of the committee comprised the NWSDB Chairman and GM with co-opted members comprising the USAID Project Officer, the TA Project Manager and others as necessary depending on the agenda items. The commitee met monthly and reviewed and decided on policy and procedure recommendations submitted by various task forces and working groups. Useful as these meetings were it soon became apparent that the committee was not actively helping the creation of a corporate planning process in the NWSDB.

During the first half of 1987 when the rapidly deteriorating financial status of the NWSDB became recognised, the decision was made to disband the corporate planning committee and to form a Management Cell which would report direct to Secretary/MLGHC on ID progress.

Although the Management Cell served an essential role in the policy development area, particularly with respect to preparation of Cabinet Memoranda on performance improvement strategies, deliberations on tariff reform, extent of decentralization, etc. it still did not meet the needs of establishing a truly participative in-house corporate planning capability.

Early in 1990 the Corporate Planning Division (CPD) was established, headed by an Additional GM. The CPD had a high visibility, on a par with the operations area, and was well-positioned to enhance the status of corporate planning within the organization.

Throughout 1990 the CPD spear-headed a programme of workshops designed with the specific purpose of securing total NWSDB management involvement in the corporate planning process.

By September 1990 the individual area-based action plans were compressed into a NWSDB-wide action agenda with specific goals and more short-term targets were established for the key areas of:

- o Decentralization
- o Sevice coverage (population served, new schemes/rehabilitation, policy on capital investment)
- o O&M (reduction in unaccounted-for-water, improvement in water quality, preventive maintenance)
- o Management improvement (staff optimization, employee evaluation, overtime control)
- o Financial issues (cost recovery, billing/collection targets, tariffs, decentralized financial autonomy)

Based on the outcome of the September 1990 institutionalization of corporate planning workshop, the CPD prepared the 1991 Corporate Plan which was issued in the first quarter of the year.

iv) Financial Viability

The key project objective to turn the NWSDB into a financially viable organization was approached through a combination of the following ID initiatives:

- o Billing and collection improvements
- o Performance budgeting (develop financial consciousness)

- o Management development (initiate performance-based operations)
- o Corporate planning (raise visibility of financial viability goal through interaction with external environment)
- o Financial procedures (upgrade existing systems)
- o MIS (provide timely financial information)
- o Cost containment measures
- o Tariff reform

The basic strategy was to awaken an interest among NWSDB management (at all levels) for financial discipline and improvement, to develop the mechanisms to enable financial information to be made widely available in a timely fashion, and to develop collaboratively financial targets supported as necessary by key actors in the external environment (notably ESAs, MHC and Ministry of Finance).

The introduction of performance budgeting drastically improved cost-control and management effectiveness overall.

The introduction of an efficient billing and collection system was seen as a fundamental key to improving the financial status of the institution.

An in-house microcomputer-based billing system was installed initially in Greater Colombo and gradually extended to cover all the regions (excpet the North-East RSC) by the end of the project.

The billing lag time (the time between meter reading and receipt of bill by consumer) which had averaged 6 months when billing was being carried out by a private bureau was reduced to 30 days. Because of the improved service, consumer billing complaints fell dramatically from over 10% of billed connections to below 2% by 1989.

Current collection ratios improved also as the consumers became accustomed to having to pay for water and the NWSDB became more aggressive in its collection practices. For example, during the first half of 1991 Colombo collections within 2 and 6 months of bill posting averaged about 60% and 74% respectively, compared to about 15% and 50% in 1986 when in-house billing and record-keeping commenced.

With the gradual development of a financial consciousness among NWSDB managers. both the attitude to waste and the lack of cost control changed, with the result that operating costs as a whole were held below inflation, a significant achievement which vindicated the emphasis placed on performance budgeting as a management development tool.

With the approval of tariff increases in 1990 and 1991 and the implementation of a staff cost reduction programme (based on overtime control, use of scheme caretakers and pensionable retrenchment) the financial situation of the NWSDB at the end of the project was vastly improved from that existing at project inception.

v) Human Resources Development

The development of an expanded training competence within the NWDDB was based on a strategy of Training of Trainers (TOT)/On-the-job training (OJT) and the extensive use of other training resource centres available in Sri Lanka. As the project progressed there was a significant change in emphasis from formal classroom training to OJT using NWSB officers in a training mode.

Some of the most impressive skills training was in upgrading basic management competence for middle managers and supervisors. These formal courses proved to be very successful, being carried out throughout the regions on a rotational basis. Networking was used extensively in an attempt to secure replication of achievements in one area across the whole institution.

Throughout the project great stress was placed on learning from water authorities in other less developed countries (LDCs), particularly those in similar conditions (climate, socio/economic status). Study tours were arranged to Singapore, Penang (Malaysia) and SANEPAR (Brazil), the latter two authorities were recognised as being highly efficient models of utility agencies in LDCs.

The development of an employee performance evaluation sytem was a key component of the upgrading process. A two-pronged strategy was used to build up an acceptance of the principles involved, this strategy comprised stimulating the demand and defining the procedural details. A period of 4 years was necessary to gain widespread acceptance.

This ID initiative was a good example of how careful coaching, backed up with sound, collaborative demonstrations can realise success. The approach was gradual, not rushed, and any increase of pressure was carefully controlled to parallel the frustration among NWSDB officers resulting from the inadequacies of the traditional method of staff assessment and promotion.

vi) Community Participation

Community participation was a principal component of the project element to improve health education and rural sanitation services. A specific unit was established early in the project with the following functions:

- To help other sections of the NWSDB in identifying and solving sociological problems in water supply and sanitation
- To assist appropriate agencies in understanding people and promoting self help and self reliance so that people could actively participate in water supply and sanitation projects
- To ensure proper use of water and sanitation facilities
- To provide orientation and training in health education, environmental sanitation, control of water and sanitation related diseases, community organization and participatory approaches to NWSDB employees, field level officers of related government departments and personnel of the NGO sector

Community participation, health education and latrine construction, all proceeded on schedule. A health education curricula developed and utilized and 5400 adult latrines constructed. An additional 1300 pre-school latrines were also constructed which demonstrated a significant impact on childhood diarrhoea episodes. Approximately 370 volunteer village health workers were trained to carry out health education activities. At the end of the project now included an element of community involvement.

ID STRATEGIES

Four key strategies were adopted to achieve successful ID. These were inculcating ownership, developing a team spirit, establishing a corporate identity and involvement of the external environment. By themselves they would not have had any impact on institutional upgrading. All four strategies operated within and around a web of discrete interventions.

- Corporate planning - introduced an operational analysis and action planning capability
- Financial management - through performance budgeting and billing/collection procedures a financial consciousness was developed
- Public relations - widened the vision, built confidence and narrowed the gap between the institution and its customers
- CPU - involvement of the community in the project cycle
- O&M - changed the emphasis from building new schemes to providing the consumer with a better quality service

MEASUREMENT OF ID PROGRESS

Monitoring and evaluating the progress of an ID project is vastly different from monitoring a more conventional intervention which has clearly defined physical outputs.

The inherent difficulties of monitoring an ID project were recognised by USAID right from the start and the Project Paper contained specific sections highlighting the critical questions, key indicators, data collection and analysis necessary for project monitoring and evaluation.

An innovative and highly successful approach which was also adopted by USAID was the annual project monitoring carried out by a two-man team from the Water and Sanitation for Health Project (WASH). The team leader remained unchanged throughout the project and since he had also been involved in the initial project preparation

he had a comprehenive appreciation of project needs. The secono member of the team was selected to reflect a current priority area at the time of project monitoring. The procedure used was as follows:

- Monitoring team interviewed counterparts to assess their reaction to the project, to review progress, and to define problem areas and perceived priorities
- Monitoring team interviewed TA team to assess problems and progress since last visit
- Monitoring team interviewed USAID officers, parent Ministry officials and ESAs (if in-country at that time) to ascertain any positive/negative feedback or suggestions for priority shifts
- Five-day workshop in an out-of-town location to address key ID issues and to develop an action plan for the next year. The workshop was attended by counterparts and the TA team
- Presentation of final report with debriefings to USAID/Colombo, NWSDB executive management, Secretary/MHC and TA Project Manager

The TA team certainly found the annual event highly profitable since it enabled priorities to be re-focussed and helped prevent the consultants from becoming institutionalized themselves.

The operational action plan was the chief monitoring tool used by the consultants to quantify progress on a regular basis. The plan was flexible, in that new tasks were added as they evolved, and it covered the following main areas of activity:

- Project management
- Corporate planning
- MIS
- Decentralization
- Billing and collection
- Public relations
- Engineering
- O&M
- Community support and sanitation
- HRD/training
- Colombo master plan update

A review of key operational indicators for the before-project situation (year ending December 1984) and at the end of 1990. There can be no argument that in almost every case the NWSDB was in a far better position in 1990 than in 1984.

NWSDB Key Operational Indicators

Indicator		Before Project (1984)	End of Project (1990)
Piped water produced	(M cu m/y)	155 (a)	219
Billed connections	(thousand)	79 (a)	185
Billed connections to employees ratio		13	26
Billings	(Rs million)	224	503
Billing lag time	(days)	180	30
Collections	(Rs million)	56	422
Collections	(% O&M cost)	31	99
Consumer complaints	(% connection)	> 10	3

Notes: (a) Average of 1983/1985 data.

LESSONS LEARNED

Consultant Team Selection

- Prior regional experience in a long-term resident capacity is a highly desirable prerequisite for key team members
- The team should comprise a mix of technical (functional area) specialists and OD/ID experts. The technical specialists should have a good manner of presenting their expertise to local staff and should be amenable to being coached in such skills by other team members if the need is apparent

- The Project Manager should have the same professional leaning as the key institution managers since this helps to strengthen the trust bridge between consultant/institution
- The Project Manager must continually evaluate his team's performance, be attuned to the undercurrents of negative feedback and be prepared to remove a team member immediately it appears that his continuation would jeopardise progress
- Team members will be more acceptable if they have had prior experience in an agency similar to the institution elsewhere

Transferring Ownership

- All change strategies, new procedures and other project interventions must be owned by the counterparts. From ownership came acceptance and commitment which in turn lead to sustainability
- The potential benefits of implementing new systems must be highlighted in order to engender enthusiasm for supporting the systems
- Training in technology-transfer should be arranged early-on in the project for the ID team members

Delegation Breeds Confidence

- Positive delegation of authority programmes are essential for ensuring dissemination of new systems - ownership throughout the institution
- Regional decentralization is a valid means of achieving delegatio~ and is highly suited to a service agency which has a large area of jurisdiction
- Promotion of delegation programmes must be backed up with initiatives to increase management and technical skills and to provide the necessary systems and procedures
- The increased degree of confidence resulting from delegation manifests itself in a measurable improved operational performance and a willingness to take on more responsibilities

Internal Performance Review

- Performance indicators must be developed within the institution and must be seen to be relevant to the operations being measured
- Performance targets must be achievable
- Initially all functional areas should be involved in performance criteria development, even though some areas will never use them. This strategy supports institutional cohesiveness and prevents some areas from feeling that they have been singled out for monitoring
- Performance review meetings should be held regularly, concentrating on specific functional areas. The meetings should be attended by top management (to show support for both the procedure and for those taking part) and peer review of area performance should be encouraged

External Monitoring Process

- There is a real risk on a long-term ID project for the TA team to become caught up in the minutiae of procedural details rather than focussing on the overall vision.
- An external monitoring team visiting the project on a regular basis will help to counter the adverse tendencies mentioned above
- The monitoring team members must be well versed in ID concepts, with a highly attuned cultural sensitivity
- The monitoring team must interact not only with the internal ID protagonists (consultants and counterparts) but also the key actors in the external environment (parent Ministry, ESAs)
- The team should focus continually on the issue of sustainability and not hesitate to recommend even major changes in project approach, resource inputs, project duration, etc. necessary to achieve this goal

Involvement of External Environment

- Political forces exist in the external environment which can be used to accelerate the overall ID momentum.
- Efforts should be made to consciously involve in the ID process those ESAs who are committed to linking funding to evidence of operational performance improvement
- Using the external environment to support institutional upgrading is a valid strategy, but the ID team must always be conscious of the fact that this strategy must remain secondary to that of helping the institution develop itself from within.

SUSTAINABILITY

Sustainability can be defined as the ability of the institution to perform effectively after the ID team has departed and after donor assistance has been terminated. Factors which suggest a strong likelihood of sustained performance at project completion were as follows:

Institution Related:

- Decentralized structure (responsive to consumers)
- Strong financial consciousness
- Acceptance of employee performance evaluation process
- Acceptance of community participation process
- Financially viable
- Corporate planning/policy development capability
- Competent management skills
- Potentially attractive for privatization

CONCLUDING COMMENTS

The major lesson learned on the WSSSP has been that ID is possible to achieve in a public sector organization in a developing country, provided that enough time is

allowed for the change strategies to take effect. It is suggested that six years is a minimum period on which to base a project design for this kind of intervention.

High-specificity activities such as regional operations (O&M, billing and collection, consumer service) were generally in the forefront of performance improvement, compared to the lower-specificity activities such as support services and the project development cycle. This observation supports the premise that specialized organizations (RSCs) tend to outperform generalized organizations (Head Office) because a specialised organization concentrates on what it has to achieve whereas a generalized organization has time to spend continually adopting to changing environmental circumstances.

Institutional change is usually more complicated than it appears initially and requires great willingness to revise plans and strategies in accordance with events. The ID project for the NWSDB has demonstrated that ID concepts can be put into practice provided that an institutional and external-environment specific approach is adopted.

GENDER ISSUES IN SERVICES. THE CASE OF WATER

Amelia Fort

Women's Participation: A Target in Many Projects

For years, women's participation has been stressed and pursued in many projects and developmental strategies. Certainly it has increased substantially when figures and experiences are reviewed. In spite of this, the same thing cannot be said when turning to the satisfaction of social needs.

A concrete experience about the relationship between women and water provision can help make the point.

With the interest of giving a water solution to the poor population around the city of Cusco, capital of tourism and archeology in Peru, a local technical commission received financial help from a European country to execute a project that would provide this basic service to 25 poor urban settlements.

The project was designed to offer technical assistance for the construction of infrastructure. The population was meant to do the works on a self-help basis. Communally they would provide labor each and every Sunday during five months. Also, they would receive help in their diagnosis and the setting up of their organization.

Men, women and children participated actively laboring in this communal water works. Particularly the women's participation was seen as very important since they not only worked like the men in the construction activities but also took the initiative to supervise. They showed much more anxiety than men in the need to have water.

A water committee was created as the communal organization in the project. It was composed of two delegates for each settlement: a man and a woman, recognizing in this way the importance of women's participation. This committee had a workshop to undertake communal planning.

An emergency plan was elaborated in this process in which various communal needs were presented as new projects for financing. The most important of these were: the construction of a main road to link the area with the principal transport corridor, roads and sidewalks, legal norms for the urban settlements, a day care service with complementary services modules (mother's clubs, communal kitchens and workshops for income generation activities), a health center and latrines.

The project considered that women had reached an equitable position after their participation in the water committee and the planning process. Supporting this view was the fact that a few women became communal leaders. Nonetheless, till now, the majority of communal leaders belong to the masculine sex.

Another aspect to take into account is that in all this process, not one of the local survival organizations, which are the feminine organizations, took part.

Currently, the project has ended and the families of these 25 urban settlements have public pipes which supply water in the ratio of 1 to 30 (families), three times a week and during three hours each time.

This is a project that draws in women, initially as part of the community and afterwards with the intention of making it more efficient upon the observation that women participate more actively than men. Nevertheless, the project is not effective in achieving its principal objective since the water supply obtained is neither sufficient nor desirable in terms of facilitating domestic strategies.

Women's participation in a project like this could be thought of as "natural" since water provision is an issue that pertains firstly to the domestic realm. This is the reason why they appear on the social scenery of this project but by enforcing this participation and channelling it through political committees there is no guarantee that the women's interests will be effectively attended. It is evident that there are gains for the women deriving from this participation, particularly in terms of acquiring experience or the possibility of becoming leaders or of presenting concrete demands for services such as day care centers. But, is one pipe for 30 households and giving service thrice a week during three hours a solution to their water supply needs? And who of all the family members is going to be more affected with this situation?

Here, women's participation is an end in itself that does not meet the means. It is not enough to observe what the project produces as a social reaction. Observation of daily life behaviors, traditions, the existing division of labor, relationships between men and women and amongst family members, is necessary. This is a first basic step and ends meet regarding women's participation.

Focusing on Gender rather than on Women in Development

The preceding example illustrates a gender-blind project even though it demonstrates a sensitivity to women's issues.

Focusing on women in the development activities has amounted to the search for efficiency or trying to minimize the effects of poverty on the very poor population or showing that women's specific needs have been excluded from planning processes. But what about women themselves?

It is important to focus specifically on women when dealing with urban provision or services issues because of the central role these play on their lives. How to do it correctly then?

A gender perspective relates women's particular problems and needs to the whys and leads to the search for social change more effectively.

In the terms of the anthropologist Caroline Moser, "gender is a social concept, used to identify the differences between men and women as social beings, and the social meaning of what is important to being men and women. In other words gender refers to men and women not as 'natural' sexual categories, but to the relationship between them, and the way these relationships are socially constructed. Men and women play different roles in

society with gender differences shaped by ideological, historical, religious, ethnic, cultural, and economic determinants." (1)

To plan with a gender focus means to understand that because men and women play different roles in society they often have different needs. This is the basic rationale underlying gender planning.

In planning for and implementing urban services, the community as a whole is generally taken as the unit of analysis and communal leaders or authorities, usually male, are conceived as the decision makers and act as the sources of information. This means that planners and policy makers are kept ignorant about the roles and needs of other categories of community members particularly women and this works in detriment of the concrete actions undertaken. Therefore, it is necessary to disaggregate within the community on the basis of gender.

What are Gender Issues in Relation to Urban Services

Urban services can be defined from different perspectives. Here they are viewed as part of the urban system and analyzed in reference to a specific category of population, that is the urban poor. The approach is that they are part of the system which comprises functions, relations and processes.

Disaggregating the target population or users in terms of income, facilitates the analysis that is commonly made. The production, management and consumption processes inside the urban system are mainly targeted to the poor communities and/or households in social planning. Other variables like age and ethnicity are more often taken into account than gender, thus giving way to specific categories of population that need specific services in many cases (the elderly, children, youth, Indian communities, etc.).

The awareness of gender differences between men and women makes it indispensable to look inside the units of analysis, communities and families, in search for crucial differences. Social stereotypes that propose the idea of a homogeneous population both within the household members and inside the communities, have to be disregarded.

Each service comprises processes and each of these as well can be analyzed in its various aspects, to assess their impact on the population. To do it with a gender focus implies looking specifically at each of both genders in every aspect.

As a case, with water supply, four processes can be identified, provision, management, maintenance and consumption, which embody aspects like coverage, access, needs, quality, control, information and consequences. Gender analysis should go through each of these and in a sort of matrix present the gender situation. For example, what are the needs of women and what are the needs of men in relation to water supply? How does quality affect women in their use of water and how does it affect men? Who, men or women, have access to fresh water supply for personal consumption, productive consumption, etc.?

Concrete gender issues can then be identified from the analysis of such matrix. In this sense, women's relationship with services: the constraints for their access to them, the lack of provision of those that are particularly

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Concrete gender issues can then be identified from the analysis of such matrix. In this sense, women's relationship with services: the constraints for their access to them, the lack of provision of those that are particularly

needed by them (for example water), the information they get about the use of services, the extra load that supposes their roles in the management of communal services, etc., produces gender issues.

In the area of urban services, gender issues are highly related with the situation of women. Particularly, in many societies in Latin America, the situation of women in low-income neighborhoods is worsened by the lack of provision or the very low quality of basic and social services.

This close relationship is based on the fact that in these societies, poor women have to balance a "tripe role" in their daily lives. Aggregated to their domestic duties in child rearing and housekeeping, most women do paid work whether at home, in the surroundings, in the market place or elsewhere. In addition, because of inadequate provision of housing and services related to habitat, women take responsibility for providing these and managing the scarce resources in their residential areas.

As community managers, women have a primary role in the organization of local-level protest groups and activities. In many instances this is the way by which they have managed to obtain communal infrastructure and basic services. As an extension of their domestic work they have to allocate scarce resources in the community and to produce new commodities or services.

All this work when not recognized as such and in consequence not paid, becomes a heavy load for many women. This is aggravated by the attitude of men in the community and by planners who on the one hand enforce voluntary participation by women and on the other are incapable of assessing specific needs of women regarding services. Mostly affected are the women heading households where a male partner is absent. This is a growing phenomenon in many poor rural and urban areas in Latin America, mainly due to migration on economic or political causes.

Gender issues in urban services do not affect women alone. Men are also suffering of inappropriate services constraining their possibilities to take their domestic responsibilities if they would wish so. Other examples come in the are of educational and health services where women are being attended more specifically than men in gender terms, through alternative programs. Nevertheless it is mainly women who are more drastically affected by the situation.

One example of how gender-biased has been research and planning for urban services is the conceptualization of poor urban settlements as "dormitories". The reality is that if this may be so for men, women and children remain in their neighborhoods most of the time. Reproductive, productive and communal activities are developed by them around their homes.

Urban living conditions and services pose in consequence, concrete and specific problems and needs for poor women that have to be tackled on the basis of gender analysis and planning.

Planning for Women in a Gender Perspective

Some biases and problems in the planning practices have been impeding an adequate assessment of the gendered social reality. These have tended to obscure the real condition of women produced by gender problems. Some of these are:

- The problems that women face are taken as women's issues in an isolated and non-integral approach.
- When dealing with the "important" policy and planning themes, gender concerns for women are not incorporated.
- Women are treated as minorities when being an object in social planning.
- As a specific population category, women only appear in plans and policies as subjects of assistance and promotion, thus separating their issues from the main economical and social policies.
- Women are incorporated in plans and programs as mothers or as mediators with the domestic unit. By extension of these roles they are also incorporated as communal providers and managers.
- Statistics about the situation of women are non-systematic or related only to a few, less important areas of concern. Particularly this is evident in women's participation in productive activity.

In contrast, gender planning for women must be based on a conceptual framework which starts by recognizing differences between men and women in terms of the social roles that each are given and concludes that because of this they often have different interests and needs. Methodologically it must observe the reality for these differences and disaggregate data for research and planning purposes.

As subjects of promotion and positive discrimination, women ought to be consulted, incorporated in all decision-making processes, given technological information and training. Men should also be brought in in all this process, since future constraints will only be eliminated by their awareness of gender differences and their active participation in the gender planning processes.

Urban solutions will only be so if they really address people's interests and attend their specific needs and this is possible when gender issues are considered.

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(1) MOSER, O.N. Caroline: "Women, Human Settlements and Housing", in the same title, edited by Moser and Peake. Tavistock, London, 1987.

MINISTERE DE LA COOPERATION
ET DU DEVELOPPEMENT

CAISSE CENTRALE
DE COOPERATION ECONOMIQUE

LA DESSERTE EN EAU POTABLE *
DES ZONES PERIURBAINES ET DES CENTRES RURAUX

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1 - ENTRE LE RURAL ET L'URBAIN, QUELS ENJEUX ?

1.1 Une desserte en eau très insuffisante

A l'heure du bilan de la première Décennie de l'Eau Potable et de l'Assainissement, force est de constater que, dans les pays en voie de développement, l'amélioration des conditions d'alimentation en eau a été la plus réduite dans les zones périurbaines et les centres secondaires, gros villages ruraux ou centres semi urbains.

Ces agglomérations connaissent pourtant le plus fort taux de croissance, et regroupent les populations les plus démunies ou les plus instables.

L'essentiel des investissements a en effet été orienté vers la desserte du centre des grandes villes ou des villages, c'est à dire vers deux secteurs institutionnellement bien définis, mettant en oeuvre des systèmes de desserte standardisés et s'appuyant sur des modèles de gestion bien rodés.

La gestion des réseaux urbains est le plus souvent confiée à des sociétés distributrices, publiques ou privées, dont l'autonomie constitue la meilleure garantie d'efficacité et d'équilibre financier.

L'équipement des villages est plus récent, mais s'est développé très rapidement sur la base d'un modèle vite adopté : le forage équipé d'une pompe manuelle, dont la gestion est confiée à un comité de point d'eau et l'entretien à des artisans.

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* Rédigé par Pierre GENY, Ministère de la Coopération, Sous-Direction du Développement Rural, Jean JAUJAY CCCE, Département Afrique de l'Ouest, Pierre VAILLEUX, consultant au BURGEAP.

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Pour la desserte des agglomérations intermédiaires, on a tout d'abord tenté d'appliquer, presque tels quels, les modèles existants. Le constat d'inadaptation a été rapide : les réseaux, souvent surdimensionnés il est vrai, se sont révélés d'un coût prohibitif, les bornes fontaines n'assuraient pas la couverture des frais d'exploitation de la société distributrice, les pompes manuelles, mal entretenues, ont été fréquemment abandonnées.

De nouveaux systèmes ont alors été introduits : mini-réseaux, postes autonomes, recours à l'énergie solaire. Simultanément de nouvelles modalités de gestion et de maintenance ont été imaginées, qui tiennent mieux compte de l'environnement économique et social, telle que la revente d'eau à partir des branchements particuliers, la concession des points d'eau publics, le recours au secteur privé pour l'entretien. Mais les expériences sont encore trop diverses et trop récentes pour que des modèles reproductibles puissent être proposés.

Peut-on dès présent cependant dégager quelques principes qui puissent permettre d'orienter des actions à grande échelle sur ce secteur clé ? La Coopération française s'y efforce. C'est ainsi, après avoir réalisé, sur financement FAC et CCCE, des opérations pilotes, que ce soit par exemple la création de postes autonomes à la périphérie de Ouagadougou ou la desserte des zones lacustres au Bénin, elle finance plusieurs études à objectifs méthodologiques concernant la desserte de 100 centres de 2000 à 5000 habitants au Mali, l'alimentation en eau des zones périurbaines de 2 villes, toujours au Mali, l'alimentation d'une vingtaine de centres secondaires au Niger.

1.2 Des enjeux considérables pour un milieu en pleine mutation

L'explosion démographique des zones périurbaines pose des problèmes sociaux et politiques évidents. L'amélioration de la desserte en eau y est prioritaire.

L'enjeu que représente la desserte des centres secondaires est d'un autre ordre. Lieux d'échange entre la campagne et la ville, entre le monde traditionnel et le monde moderne, ces agglomérations constituent des centres privilégiés dans la diffusion du développement économique des Etats. Le secteur informel y est très dynamique et répond instantanément à toute sollicitation.

D'autre part, améliorer les conditions de vie dans ces centres secondaires peut contribuer à y fixer l'inévitable émigration rurale et réduire ainsi l'expansion des zones périurbaines, où chaque nouvel arrivant représente pour le futur des investissements considérables.

La difficulté principale d'intervention dans ces agglomérations provient sans doute qu'il s'agit de milieux fragiles, en déséquilibre, non ou peu organisés, à l'avenir incertain.

Ici, la mutation affecte tous les aspects de la vie des hommes : le type d'habitat, la structure sociale, le plan d'occupation de l'espace, les activités économiques, la distribution des revenus, la répartition des responsablités collectives et de l'autorité administrative. En comparaison, les villages traditionnels ou les centres des grandes villes apparaissent particulièrement stables, ou évoluent de manière prévisible.

On ne peut donc intervenir, surtout pour des investissements de long terme, sans se placer résolument dans une perspective dynamique, afin d'anticiper l'évolution probable, ou mieux de l'orienter en fonction d'une stratégie, d'une politique de développement.

Il faut concevoir en premier lieu des systèmes et des modèles de gestion dont la viabilité puisse être garantie tout au long de l'évolution de ces centres, ce qui sous-entend qu'ils soient eux-mêmes évolutifs. Mais ces aménagements doivent être eux-mêmes des moteurs du développement socio-économique des localités et éviter les effets pervers, qu'ils soient d'ordre :

- économique, charges récurrentes prohibitives,
- technique, oubli des contraintes d'urbanisme ou des sujétions d'assainissement ,
- social, élimination des métiers de l'ancienne filière de l'eau au sein de la collectivité sans création de nouvelles activités ou amélioration du service,
- politique enfin si les nouveaux équipements ne répondent pas à l'attente des usagers et que ceux-ci, déçus, ne perdent à nouveau confiance dans les capacités de l'Etat à répondre à leurs besoins.

C'est pourquoi une approche globale, plus politique qu'économique est certainement nécessaire pour réussir l'insertion d'équipements collectifs dans un secteur difficile.

2 - LES LIMITES DE L'HYDRAULIQUE URBAINE

2.1 Des contraintes financières strictes

Les sociétés distributrices sont astreintes à un équilibre financier, prenant en compte l'intégralité des coûts (remboursement des prêts compris).

Compte tenu du caractère stratégique de leur domaine d'intervention et d'une tarification imposée, par des raisons sociales ou politiques, toute extension de leur activité qui serait susceptible de porter atteinte à cet équilibre financier ne peut être envisagée.

Or les coûts d'investissement et de fonctionnement de réseaux de type urbain deviennent vite prohibitifs notamment lorsque :

- l'occupation de l'espace n'est pas maîtrisé : habitat de densité trop réduite ou mal urbanisée,
- le volume d'eau distribué est trop faible et surtout le nombre d'abonnés trop faible (quelques centaines de branchements),
- l'éloignement du point central de distribution génère des pertes de charges onéreuses ,
- le recouvrement des coûts est trop aléatoire, que ce soit en zone périurbaine ou lorsque la concurrence des points d'eau traditionnels est trop forte (centres secondaires),
- les centres sont trop dispersés pour justifier une gestion centralisée.

2.2. La leçon des expériences passées

Diverses mesures ont permis cependant l'extension du nombre de centres et de quartiers desservis :

- la péréquation des prix à l'échelle d'un pays, mais ses effets sont souvent absorbés par la seule desserte des zones péri-urbaines,
- la conjonction de la distribution de l'eau et de l'électricité, accroissant le chiffre d'affaires de l'exploitant,
- la reconnaissance du caractère social de ce type d'équipement, en y réservant les financements aux conditions les plus avantageuses, et en transférant au secteur urbain une partie du remboursement des prêts.

Mais les marges de manoeuvre sont faibles et l'expérience de la Sodeci en Cote d'Ivoire dans la période 1980-1985 a montré les contraintes financières de ces mesures.

Il faut également garder à l'esprit que les programme de développement des services urbains devront rapidement intégrer l'assainissement et la collecte des déchets, secteurs dépourvus de ressources financières, à la desserte en eau. En effet, seule une surtaxe sur l'eau vendue, complé-

tée par une surtaxe foncière, peut assurer la couverture des frais de fonctionnement correspondant et peut-être une partie des investissements, majorant d'autant le coût de l'eau pour les zones à la marge et ne répondant pas aux demandes des populations.

Force est donc de constater les limites du modèle urbain centralisé pour la desserte des centres secondaire et des zones périurbaines et la nécessité d'explorer de nouvelles voies

3 - LES LIMITES DE L'HYDRAULIQUE VILLAGEOISE

3.1 Un modèle bien au point

L'hydraulique villageoise s'adresse essentiellement aux villages à structure sociale traditionnelle, comportant quelques centaines d'habitants. Son développement s'est fondé sur un modèle , plus ou moins rapidement adopté par tous les Etats :

- le point d'eau type est le forage, équipé d'une pompe à main ; le recours au forage marteau fond de trou a permis la réalisation en série, dans le cas de grands programmes;

- la collectivité se voit confier la gestion de l'ouvrage ; la responsabilité est attribuée à un comité de points d'eau, dont l'activité est presque toujours bénévole ;

- une participation financière à l'investissement est fréquemment exigée ; mais elle est le plus souvent réduite (1 à 5% du coût global) ; son objectif est de tester la motivation et la solidarité des usagers ;

- l'entretien des pompes est assuré par des artisans (1 pour 10 à 30 pompes), sélectionnés parmi les professionnels du milieu rural ; ils sont rémunérés à l'intervention ;

- un réseau privé de commercialisation de pièces de rechange est mis en place ;

- les coûts récurrents sont intégralement pris en charge par les usagers, le plus souvent sous forme de contributions sollicitées au fur et à mesure des dépenses, plus rarement sous forme de vente directe au récipient.

Ce modèle, s'il est mis en oeuvre avec rigueur, fonctionne de manière satisfaisante, sans intervention de l'Etat. Son premier atout est le faible investissement par personne desservie (de l'ordre de 300 FF). La raison de son succès est une bonne adéquation, entre la demande et l'offre, entre un équipement et les capacités humaines , technologique et financières du milieu.

Son point faible est presque toujours l'approvisionnement extérieur du réseau commercial : c'est aussi le maillon qui relie le monde traditionnel au monde moderne.

3.2 Extension et limites

Le faible débit d'une pompe manuelle (1 m3/h) limite à 200 ou 300 le nombre des usagers qu'elle peut prétendre desservir. Aussi faut-il, pour des villages d'une population supérieure, mettre en place une desserte par quartier, en conservant presque toujours le principe d'un comité par pompe. Rien n'interdit alors d'équiper, selon ce modèle, de gros villages de plus de 2000 habitants, pour autant que les habitants conservent, ou adoptent, l'esprit associatif indispensable.

C'est ainsi qu'une étude réalisée par le SERHAU au Bénin (financement FAC) a montré que certains quartiers, bien qu'enclavés dans un tissu urbain, y compris de grande ville (Porto Novo) conservaient des structures traditionnelles suffisamment fortes pour que la gestion d'un point d'eau puisse être déléguée à un comité.

A l'inverse, ce modèle trouve ses limites lorsque la collectivité perd sa cohésion sociale. Certains pays tentent alors, comme le Niger, de substituer à la gestion associative une concession de type informelle à un particulier. Une vente d'eau au volume est instituée. Cette forme de distribution ainsi que la discrétisation de la monnaie accroissent fortement le coût de l'eau qui passe pour les usagers de moins de 50 FCFA le m3 à 250 voir 500 FCFA le m3. On retrouve alors une situation très analogue à celle qui prévaut en secteur périurbain, avec la revente de l'eau à des branchements particuliers.

Une seconde difficulté apparaît : la demande d'une partie des membres de la collectivité, la plus influente, s'oriente vers une meilleure qualité de service. L'exigence porte soit sur des branchements privés ,que l'équipement ne peut satisfaire, soit sur un portage d'eau à domicile, qui entraine une perte de qualité irréversible.

Force est, là encore, de constater qu'il faut poursuivre les recherches de modèles adaptés .

4 - LA DESSERTE DES CENTRES SECONDAIRES ET DU SECTEUR PERIURBAIN : LES NOUVELLES VOIES

4.1 Les éléments d'une stratégie

Pour être adaptée à un secteur aussi mouvant, une stratégie devrait être fermement orientée, dans ses principes, sur le long terme en fonction de choix politiques, mais être conçue pour en permettre une application souple, évolutive.

Une telle stratégie doit de plus :

- s'appuyer sur les besoins réels des usagers, au delà des besoins de base, et sur la valeur de leur satisfaction ou sur les demandes solvables pur les biens et services demandés,

- être globale, c'est à dire au delà d'un modèle technique, proposer des modalités de gestion et des procédures financières viable sur la durée de vie des équipements proposés,

- intégrer l'environnement social du point d'eau, assoçiant les capacités des artisans, créant une dynamique de gestion collective responsable, véritable apprentissage de la démocratie.

4.1.1. Le contexte institutionnel

Différencier un secteur urbain et un secteur rural est certes indispensable, ne serait-ce que pour la planification des investissements.

Le secteur urbain sensu stricto doit sans doute continuer à être délimité par les contraintes qui lui sont habituellement fixées, concernant la récupération intégrale des coûts. La viabilité économique est un critère essentiel.

Pour le secteur villageois à caractère social, l'essentiel est de préserver la viabilité financière des équipements : le fonctionnement ainsi que le renouvellement des équipements doit être à la charge des usagers, l'Etat prenant en charge l'essentiel des investissements.

Pour le secteur intermédiaire, périurbain ou centre rural, un système mixte pourrait être mis en place. Des subventions venant compléter une participation non négligeable des béneficiaires aux investissents, appliquées aux infrastructures à durée de vie longue (forages) permettrait de maintenir l'objectif de viabilité financière et de récupération des coûts, sur les équipements à durée e vie plus courte (matériel de pompage). L'équipement de tels

centres pourrait relever de l'hydraulique villageoise, secteur plus expérimenté dans l'organisation des collectivités.

Dans l'immédiat, l'essentiel est sans doute de mettre sur pied une structure de coordination pour l'ensemble des secteurs, à l'échelle nationale, ce qui n'est que rarement le cas.

4.1.2 La promotion des collectivités locales

Plus dynamique sans doute qu'une analyse des contraintes institutionnelles actuelles serait de se placer dans une perspective de désengagement de l'Etat et de promotion des collectivités locales. Il est en effet certain qu'à terme la création de communes s'imposera inévitablement. Les prérogatives des municipalités recouvriront les fonctions de maître d'ouvrage.

Dès à présent, une politique de décentralisation peut être instaurée et les différentes tutelles, administratives et techniques, des collectivités peuvent être mises progressivement en place.

L'aménagement d'un point d'eau est bien souvent le premier équipement collectif d'une collectivité et peut jouer le role de promotion des responsabilités locales.

Les usagers, par le biais de leurs représentants (autorités traditionnelles, groupements associatifs, élus...) doivent être associés dès le stade de la conception des aménagements (ce qui sous entend que des choix doivent être proposés), comme ils le sont actuellement, dans la plupart des pays, pour l'hydraulique villageoise (choix entre puits ou forage, sélection des quartiers bénéficiaires, implantation des pompes, modalités de recouvrement des coûts, sélection des artisans ...).

Pour les centres secondaires et les zones périurbaines, la participation des collectivités, par l'organisation des bénéficiaires, est sans doute l'une des seules voies pour améliorer leur cadre de vie. On peut penser qu'ainsi seront pris en compte tous les aspects de l'organisation de la vie urbaine, incluant l'assainissement et l'urbanisme, le financement et la gestion des équipements. La participation des bénéficiaires à l'investissement et son appropriation effective seront alors faciliter. L'exemple des premiers équipements d'hydraulique villageoise améliorée de Cote d'Ivoire (mini-adduction électrifiée, prticipation à hauteur de 30% des coûts) le confirme.

4.1.3 De nouvelles modalités de gestion

Ce qui est commun aux modèles urbain ou rural actuels est l'"autonomie" des entités chargées de la gestion des équipements, que cette gestion soit de type :

- industriel, pour les sociétés distributrices d'eau,

- associatif, pour les comités de point d'eau,

- privé informel, comme c'est le cas pour les concessions de fait lorsque la revente d'eau est assurée à partir des branchements particuliers, ou pour les concessions de droit lorsque la gestion des bornes-fontaines ou celles des pompes à main, comme c'est le cas au Niger, est concédée à des particuliers.

Ces entités ont de fait toutes les caractéristiques d'une entreprise, fut-elle une micro-entreprise du secteur informel. Elles disposent en effet :

- d'un produit, de première nécessité, l'eau,

- d'un marché, puisque partout ou presque l'eau a une valeur, qu'elle soit marchande, celle des porteurs d'eau, ou "d'usage", c'est à dire le prix que les usagers sont prêts à accepter, compte tenu d'une part du coût de leur approvisionnement actuel et d'autre part de l'amélioration apporté à la qualité du service,

- d'un outil de production, dont il faut assurer le fonctionnement et la maintenance,

- d'un compte d'exploitation, obligatoirement équilibré.

Si l'on retient cette logique de micro-entreprise, deux tendances apparaissent comme des déviations peut-être fâcheuses.

La première consiste à intégrer le comité de point d'eau dans un comité plus vaste, regroupant l'essentiel des activités économiques de la collectivité, comme par exemple un comité de développement, axé sur telle ou telle spéculation agricole. Acceptable pour de petits villages, lorsque tous les villageois sont sont concernés et qu'inversement tous les membres peuvent être desservis par l'équipement envisagé (villages concentrés, sans hameau de culture), ce système ne l'est plus pour des centres aux activités diversifiées.

La seconde revient à laisser la collectivité gérer elle-même l'équipement dans le cadre des procédure de la comptabilité publique. L'expérience montre que les recettes liées à la vente de l'eau et nécessaires à l'équilibre financier du secteur, sont alors inévitablement affectées à d'autres fins, où elles sont diluées et comblent d'autres

déficits. Il est facile d'imaginer le coût des ajustements structurels que pourrait exiger à terme la réhabilitation de tels services s'ils étaient généralisés.

Il faut maintenir une approche de type entreprise , qui peut être particulièrement féconde pour la desserte de l'interface urbain/rural. Elle peut-être applicable aussi bien pour l'alimentation d'un mini-réseau (structure gérant la production) que pour la distribution aux bornes-fontaines. L'exemple du projet des zones lacustres au Bénin où plusieurs villages se regroupent pour gérer un réseau commun en est l'illustration.

Elle pourrait aller jusqu'à la concession ou l'affermage des équipementsà des opérateurs spécialisés, voire même dans certains cas à la prise en charge des investissements par un opérateur. L'approvisionnement en eau des sites d'orpaillage offre effectivement de telles opportunités d'investissement, compte tenu des prix de vente de l'eau (2500 FCFA/m3 et plus).

Le manque de professionnalisme dans la maintenance des équipement est une contrainte majeure pour les collectivités; elle peut-être pratiquement partout surmonté, grâce au recours au secteur privé, surtout s'il peut-être rattaché à la commercialisation même des équipements. Cela exige de prévoir un service après-vente, associé à la fourniture des équipements lors des appels d'offres, passés autant que possible à l'échelle nationale.

Beaucoup plus contraignante sont les sujétions de maîtrise de la trésorerie, sur une longue période. Il s'agit, en effet, d'avoir accès à un dispositif d'épargne-crédit, que le système bancaire actuel n'offre que très exceptionnellement. Les progrès du crédit mutualiste sont encore très lents, mais offrent des perspectives partout encourageantes. Là encore, l'expérience des colllectivité lacustres du Bénin mérite d'être suivie avec attention.

4.2 Différents systèmes de gestion des centres secondaires et des zones périurbaines

Quel que soit l'équipement, pompe à main, poste autonome, mini-réseau, ou réseau inter-collectivité, c'est par le système de gestion qu'il faut approcher la classification des centres.

4.2.1 La gestion associative

Le recouvrement des coûts peut en général être fait sous forme de cotisation régulières, d'abonnement à un droit d'usage des équipements. La vente d'eau au volume peut-être pratiquée (notamment vis-à-vis des usagers temporaires), mais la gestion relève d'un comité classique.

Cette gestion est souhaitable lorsque :

- les infrastructures modernes (équipement, habitat, communications) en sont absentes ou très peu développées,
- la structure sociale traditionnelle y reste prédominante (organisation familiale, hiérarchie politique),
- le salariat y est absent de la vie économique, restée centrée sur les activités du secteur primaire, et notamment la fonction publique (enseignement, santé, sécurité, administration) y est peu représentée,
- les brassages de population ne l'affectent pas.

Il s'agit très souvent de gros villages qui se sont développés parce que bien situés, mais qui n'ont pas été érigés en chefs-lieux administratifs. Bien qu'il soit difficile de fixer une limite supérieure à la taille de ces localités, elle n'excède en général pas 5.000 habitants, et très rarement 10.000.

Les gros villages groupés du Guidimakha en Mauritanie, de la région de Kayes au Mali, de la bordure du Fleuve au Sénégal, ou du plateau Mossi au Burkina, constituent le type de cette catégorie.

4.2.2 La gestion privée informelle

Le recouvrement des coûts se fait de façon systématique par la vente d'eau au volume.

La collectivité concède à un particulier ou à une entreprise locale, commerciale ou autre, la gestion de l'exploitation et de la distribution. Des tarifs spécifiques peuvent être appliquées pour des branchements particuliers, la vente en kiosque, ou la vente par des porteurs d'eau.

Les centres qui a priori relèvent de cette formule sont caractérisés :

- soit par la présence d'un secteur d'activités moderne, le plus souvent lié à l'administration territoriale qui a érigé ces centres en chef-lieu ; cela implique la substitution de l'autorité administrative aux structures traditionnelles, et la présence de fonctionnaires "étrangers", aux exigences de confort supérieures, d'où le développement du portage de l'eau à domicile,
- soit par la présence, due à des mouvements de populations, d'étrangers à la zone, sans terre et sans troupeau, et en situation souvent précaire (alimentation,

santé, habitat) : c'est le cas en particulier du nord du Sahel (Mauritanie, Mali, Burkina, Tchad) où les nomades se sont sédentarisés à la périphérie de chefs-lieux où leur survie est assurée par les distributions d'aide alimentaire et de menus emplois salariés.

Les zones périurbaines sont également à classer dans cette catégorie. La collectivité concédante étant le quartier.

4.2.3 Combinaison des deux systèmes

Dans le cas de mini-réseaux, on peut parfaitement imaginer d'individualiser l'exploitation, c'est à dire la production, et la distribution. La première fonction est concédée, que ce soit au secteur informel (en fait à un particulier qualifié ou dynamique) ou au secteur moderne, entreprise régionale, voir société nationale de distribution d'eau. La seconde est assurée selon le mode associatif, notamment pour la gestion des bornes-fontaines.

De telles modalités sont souvent souhaitées par des centres secondaires, notamment au Tchad, notamment dans le souci d'abaisser le coût rapidement prohibitif de la distribution.

5 - Essai de conclusion

Les expériences variées d'équipement d'adduction en milieu rural ou périurbain et de vente d'eau, financées ou suivies par l'aide française montrent l'existence dans ces milieux moins structurés socialement, d'une demande solvable, d'autant plus prête à payer l'eau que lui est offert un meilleur service.

A côté de la poursuite de programme d'investissement nouveaux du type forage et pompe à motricité humaine, qui sont des infrastructures de base de type social, il y a des perspectives importantes pour des investissements de type mini-adductions.

La demande existe. Cependant, les nouveaux investissements qui concernent des zones ou situation plus difficiles devaient, pour justifier leurs meilleures chances de succès, être conduites dans les conditions suivantes :

- une programmation détaillée appuyée sur les enquêtes précises concernant : habitat rural, besoins, ressources confirmant l'existence d'une demande solvable prête à payer un m3 d'eau distribué à une borne (ou un robinet) à 250 FCFA/m3 (ou 5 F la bassine de 20 litres) ;

- un programme précis, justifié par des requêtes des collectivités concernées, justifiant leur choix d'ouvrages et intégrant dans le programme les modes existants de distribution d'eau. Le choix du mode d'exhaure en fonction

des conditions hydrauliques (débit, profondeur) des besoins (courbe d'appel, besoin de pointe) et des coûts d'exploitation. L'existence de matériel solaire opérationnel modulaire permet l'élargissement de la gamme des solutions technologiques intéressant le pompage ;

- un projet qui inclut dès sa phase initiale (factibilité) un volet sanitaire (analyse de la qualité des points d'eau existants) et propose un message hygiène et éducation sanitaire, base d'un processus d'éducation sanitaire fiable, simple et motivant, concourant à l'utilisation rationnelle et économique du point d'eau ;

- la définition des conditions d'exploitation garantissant bien sûr la bonne exploitation, mais aussi le renouvellement des matériels d'exhaure et des équipements hydrauliques. Les cahiers des charges des concessions, affermage, maintenance liant collectivité et opérateur (exploitation et/ou maintenance) doivent être adaptés à partir des modèles existants.
  Des processus financiers adoptés doivent être mis en place en fonction de l'environnement bancaire pour garantir la transformation de flux monétaires quotidiens en ressources importantes disponibles à moyen.
  Les solutions d'ingéniérie financières adoptées sont une condition nécessaire à la pérennité de ces équipements.

Une dernière perspective novatrice qu'il ne faut pas exclure est de confier l'entière conduite des opérations de ce type, périurbain et rural, à des opérateurs privés. Si la vente d'eau est une opération économique qui assure l'équilibre du compte d'exploitation (y inclut le renouvellement ou le remboursement d'emprunt), pourquoi ne pas pousser la logique jusqu'à confier au secteur privé (démarche à la mode s'il en est), le financement de la prestation de service vente de l'eau à la borne, dans un cadre tarifaire et contractuel, libérant les services de l'Etat et ses finances d'autant de contraintes.

Et pourquoi ne pas imaginer que, par un retour aux sources, émergent dans les villages des agents économiques prenant en charge contre la vente de l'eau la prestation complète du service eau potable et pompe ?

Rêve ou réussite du développement ?

Water Supply and Sanitation Collaborative Council

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Additional paper :

BUILDING WATER SUPPLY AND SANITATION CAPACITY THROUGH NATIONAL PROFESSIONAL ASSOCIATIONS

by C. Rietveld (World Bank) and J.G. Janssens (IWSA Foundation)

Abstract

During the International Drinking Water Supply and Sanitation Decade large-scale investments have been made in new facilities resulting in a welcome expansion of WS&S service coverage in many countries. However, inefficient operation and poor maintenance of systems continue to present serious problems in many developing countries calling into question the long-term sustainability of the gains that have been made. The problems are rooted in the continuing weakness of sector institutions, both public and private, in terms of general management capability, development and management of human resources and financial viability. Unless the capacity of sector agencies to deal with these problems is steadily built up, systems will continue to deteriorate, resulting in declining levels of service and wastage of investment funds.

Experience in developed countries over the past several decades has shown that well-established National Professional Water Associations can play a major role in enhancing national capacities for service improvement and sustained maintenance of assets. They have contributed to this goal in the following principal ways:

(a) by providing a mechanism for the continuous updating of sector professionals' knowledge and skills in all aspects of sector development;

(b) by working in close collaboration with national decision makers in defining national sector policies and realistic targets and standards; and in bringing about needed reforms in the legal and regulatory framework which constitute the enabling environment within which sector institutions operate;

(c) by acting as a link between public water and sanitation agencies and private manufacturing, consulting and other companies active in the sector;

(d) by promoting national and international exchange and cooperation in the areas of research training, technology and overall sector development strategy.

The aim of a 3-year project described in this paper is to develop in participating countries well organized and financially viable Associations of Water and Sanitation Sector Professionals capable of performing the above functions.

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16 August 1991
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Water Supply & Sanitation Collaborative Council
Global Forum

Oslo, Norway
18-20 September 1991

OPERATION AND MAINTENANCE FOR SUSTAINABLE AND IMPROVED WATER SUPPLY AND SANITATION SERVICES

by

J.G. JANSSENS (*), H.J. MCPHERSON (**) and J. HUEB (***)

(*) IWSA-Foundation for the Transfer of Knowledge, Brussels (Belgium)
(**) University of Alberta, Edmonton (Canada)
(***) CWS Unit, Div. Environmental Health, WHO, Geneva (Switzerland)

Synopsis

In spite of repeated statements resulting from international meetings and a general recognition of the need to improve the operation and maintenance of existing and planned water supply and sanitation systems, progress in establishing viable and successful operation and maintenance programmes is discouragingly slow.
As a result, levels of service are lower than planned and access to reliable drinking water and waste disposal systems are not assured on a continuous basis.

A concerted effort is urgently required to improve operation and maintenance as quickly as possible. If such action is not taken, the benefits of improved water supply and sanitation systems will be progressively lost in spite of reported successes in extending coverage and creating more access to improved water and sanitation services in rural, urban and peri-urban areas. New investments do not seem justified if the operation and maintenance issue is not dealt with and if sustainability of existing systems is not guarantied before investing in and constructing new systems which in their turn will rapidly deteriorate.

A Working Group on Operation and Maintenance (O&M) of water supply and sanitation (WS&S) systems was established by the World Health Organization (WHO), on an ad hoc basis, as a result of deliberations involving External Support Agencies (bilateral donors and NGO's) and representatives of selected water and sanitation agencies and organizations.

An Advisory Committee to the Working Group was also created, whose major role consists in the definition and implementation of actions derived from the major lines of action defined by the Working Group.

The main objective of the O&M Working Group is to promote and facilitate the improvement of water and sanitation services world-wide through the development of better levels of Operation and Maintenance and through actions aimed at the optimization of the performance of water supply and sanitation undertakings.
This would be achieved by increasing awareness, generating support and providing information on the magnitude and nature of O&M problems.
A forum should be established to encourage the collaboration and coordination of ESA's and national governments at the country level in order to achieve common policies, unified approaches, compatible technologies and standardized equipment within the framework of national policies.

Four major principles for operation and maintenance were adopted by the Working Group which may be summarized as follows :

1. The provision of water is recognized as a service which requires a service orientated attitude by the agencies involved. To ensure long term sustainability, water should be managed as a commodity in the same way as any other resource. Its use and exploitation should be on a financially sound and cost effective basis subject to the same legal and regulatory controls as other resources to ensure its conservation, protection and wise use.

2. The supply of water to consumers should normally be based on the principle of effective demand which can be defined as the standard of service that the users are willing to maintain, operate and finance to ensure adequate public health standards. The effective demand has to satisfy the priorities of the community at large.

3. Water systems should be managed and operated following the principles of good business practices. The form of management will vary depending on the local situation: i.e. rural, urban, peri-urban, location, demographic structures etc. The responsible agency will be autonomous from government but manage the system under technical, financial and administrative guide-lines set by national governments.

4. Sanitation is recognized as an undervalued item in the sector and emphasis is required for sanitation development and for forging closer links between water supply and environmental sanitation (solid and liquid waste management) in the planning of new programmes.

Key issues constraining good operation and maintenance performance are identified as :

- Inadequate policies, legal frameworks and overlapping responsibilities;
- Political interference;
- Low profile of operation and maintenance;
- Inadequate data on operation and maintenance;
- Insufficient and inefficient use of funds;
- Poor management of water supply facilities;
- Inappropriate system design.

Priority activities to be undertaken by the Working Group in order to improve the performance of operation and maintenance, are :

1. To contribute to the creation of a favourable policy environment in participating countries, as well as the overall enabling legal and regulatory framework which is a major determinant of institutional performance;

2. To enhance the profile of operation and maintenance at global and national levels : promotion of an awareness raising campaign and promotion of a higher profile for operation and maintenance to professional associations, training establishments and other organizations through guide-lines, workshops, seminars and conferences;

3. To improve management and to support the strengthening of agencies to enhance their ability to sustain adequate operation and maintenance activities; the basic objective is to improve the quality of decision making and of managerial performance by strengthening institutions at all levels and the creation of a favourable policy environment.

4. To implement monitoring systems for operation and maintenance costs and performance at the national level, and to develop international methodologies for the establishment of

O&M performance indicators, as tools for O&M assessment in order to allow a rapid comparative analysis, and the definition of constraints and needs; to improve data collection and monitoring of operation and maintenance.

Five priority proposals are proposed by the Working Group and Advisory Committee:

- Preparation of a global position paper on operation and maintenance;
- Assessment of operational and maintenance status of water supply and sanitation systems;
- Assessment of needs and resources, for training and human resources development in operation and maintenance;
- Development of implementation strategies for operation and maintenance in rural and urban water programmes;
- Development of guide-lines for improving operation and maintenance in the water supply and sanitation sector.

The complexity of arrangements and great number of activities involved in the formulation and implementation of Operation and Maintenance programmes requires very well concerted efforts amongst the involved organizations at the country and international levels.

As a proposed strategy, the following are logical steps to be followed in the process of involvement of External Support Agencies and developing countries for the organizing of actions aimed at the implementation of programmes of this nature:

- Promotion of Operation and Maintenance Programmes
- Formulation of Operation and Maintenance Programmes
- Implementation of Operation and Maintenance Programmes
- Training Activities
- Required Financial Resources
- Monitoring of Operation and Maintenance Progress
- Resources Mobilization - External Cooperation

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This would be achieved by increasing awareness, generating support and providing information on the magnitude and nature of O&M problems.
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Key issues constraining good operation and maintenance performance are identified as :

- Inadequate policies, legal frameworks and overlapping responsibilities;
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This would be achieved by increasing awareness, generating support and providing information on the magnitude and nature of O&M problems.
A forum should be established to encourage the collaboration and coordination of ESA's and national governments at the country level in order to achieve common policies, unified approaches, compatible technologies and standardized equipment within the framework of national policies.

1. Background

During the International Drinking Water Supply and Sanitation Decade large-scale investments have been made in new facilities resulting in a welcome expansion of service coverage in many countries. However, inefficient operation and poor maintenance of systems continue to present serious problems calling into question the long-term sustainability of the gains that have been made the past years.

The problems are rooted in the continuing weakness of sector institutions in many developing countries in terms of development and management of human resources and financial viability. Unless the capacity of sector agencies to deal with these problems is built up, systems will continue to deteriorate resulting in declining levels of service and wastage of investment funds.

The operation and maintenance of water and sanitation systems has therefore become an urgent priority for the sector in lesser developed countries (LDC's). In spite of repeated statements resulting from international meetings and a general recognition of the need to improve the operation and maintenance of existing and planned water supply and sanitation systems, progress in establishing viable and successful operation and maintenance programmes is still discouragingly slow. Systems are failing at an alarming rate and statistics indicate that more than 50 percent of the existing systems in LDC's are not reliable, not sustainable or inefficient as a result of poor operation and maintenance both in the rural and urban areas. In some countries, even higher rates have been reported.

Sanitation should moreover be taken into account as a factor affecting the O&M of drinking water supply systems. Taking into account the low service coverage in sanitation, nevertheless there is to-day less scope for a similar exercise in sanitation at the present stage.

As a result levels of service are lower than planned and access to reliable drinking water and waste disposal systems are not assured on a continuous basis.
A concerted action is urgently required to improve operation and maintenance as quickly as possible. If such action is not taken, the benefits of improved water supply and sanitation systems will be progressively lost in spite of reported successes in extending coverage and creating more access to improved water and sanitation services in rural, urban and peri urban areas.
New investments do not seem justified if the operation and maintenance issue is not dealt with and if the sustainability of existing systems is not guarantied before investing in and constructing new systems which in their turn will rapidly deteriorate.

The general acknowledged problem at the water sector level is the broad need to upgrade the managerial capacity of water supply and sewerage agencies with particular attention to operations and maintenance, financial management and human resource development.

The specific problems affecting many sector agencies at the present time include :

(a) inadequate attention to the maintenance of systems resulting in poor service and heavy repair costs;
(b) high volumes of unaccounted for water;
(c) water losses due to leakage;
(d) poor quality of water resulting in consumer reluctance to pay for service;
(e) financial weakness of agencies due to low water and sewerage tariffs.

The main causes of these problems can be identified as follows :

(a) shortage of middle management staff trained in modern management methods, and resulting reliance on out-of-date methods unsuited to present day demands of large utilities;
(c) shortage of trained and experienced operating and maintenance personnel;
(d) lack of information on successful approaches to the solution of problems.

The evidence for the existence of the above problems is contained in many surveys and studies of sector agencies in developing countries carried out by the World Bank, Asian Development Bank, the IWSA Foundation and others.

2. Working Group on Operation and Maintenance (O&M) of Water Supply and Sanitation (WS&S) Systems

The importance of adequate operation and maintenance in order to ensure the sustainability of water and sanitation systems has however increasingly been recognized by external support agencies and stresses in a series of major consultations of external support agencies which began with the Asian Regional Consultation in Manila in 1985. This meeting concluded that "while analysis has shown improvement between 1980 and 1984 in the percentage of people having access to safe water supply and sanitation, the functioning of water supply and sanitation systems was often disrupted by inadequate operation and maintenance."

Succeeding consultations - the African Regional Consultation in Abidjan in November 1986, the Interlaken meeting of 1987, and the first collaborative council meeting in The Hague in 1988 stressed the need for operation and maintenance. A preoccupation at the recent Global Consultation in New Delhi in September 1990 was a concern with sustainability and this consultation reaffirmed and focused on the need to ensure the long term operation and maintenance of water supply and sanitation facilities.

In 1988, to focus attention on the operation and maintenance issue, the World Heath Organization assisted by the International Reference Centre held a one day informal working session in The Hague with external support agencies representatives.

A working group on Operation and Maintenance (O&M) of water supply and sanitation (WS&S) systems was established by the World Health Organization (WHO), on an ad hoc basis, as a result of the above deliberations involving External Support Agencies (bilateral donors and NGO's) and representatives of selected water and sanitation agencies and organizations.
The working group held its first meeting in Geneva in February 1989, organized by the World Health Organization and supported by GTZ. At the first working group meeting, a list of key issues were identified and a methodology for joint cooperation adopted.

A second meeting of this working group was held in Geneva in June 1990 and the attendees from some 25 different countries were all water and sanitation specialists, involved in operation and maintenance in their respective countries. The objectives of the Geneva meeting were to seek ways and propose concrete initiatives to improve the operation and maintenance of water and sanitation supply facilities in the developing world.

Four major principles for operation and maintenance were adopted by the Working Group which may be summarized as follows :

1. The provision of water is recognized as a service which requires a service orientated attitude by the agencies involved. To ensure long term sustainability, water should be managed as a commodity in the same way as any other resource. Its use and exploitation should be on a financially sound and cost effective basis subject to the same legal and regulatory controls as other resources to ensure its conservation, protection and wise use.

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4. Sanitation is recognized as an undervalued item in the sector and emphasis is required for sanitation development and for forging closer links between water supply and environmental sanitation (solid and liquid waste management) in the planning of new programmes.

The legitimate concerns of government to satisfy the basic needs of the disadvantaged segments of the population was also recognized. Governments may require agencies to provide service at lifeline tariffs for such groups or to institute temporary subsidies to promote public health and economic development.

The participants in Geneva also identified the key issues constraining good operation and maintenance performance and suggested a series of activities which should be implemented to address these. The key issues were identified as :

- Inadequate policies, legal frameworks and overlapping responsibilities;
- Political interference;
- Low profile of operation and maintenance;
- Inadequate data on operation and maintenance;
- Insufficient and inefficient use of funds;
- Poor management of water supply facilities;
- Inappropriate system design.

The working group in Geneva proposed that four sets of priority activities be undertaken in order to improve the performance of operation and maintenance. These sets of activities were :

1. To contribute to the creation of a favourable policy environment in participating countries, as well as the overall enabling legal and regulatory framework which is a major determinant of institutional performance;

2. To enhance the profile of operation and maintenance at global and national levels : promotion of an awareness raising campaign and promotion of a higher profile for operation and maintenance to professional associations, training establishments and other organizations through guide-lines, workshops, seminars and conferences;

3. To improve management and to support the strengthening of agencies to enhance their ability to sustain adequate operation and maintenance activities; the basic objective is to improve the quality of decision making and of managerial performance by strengthening institutions at all levels and the creation of a favourable policy environment.

4. To implement monitoring systems for operation and maintenance costs and performance at the national level, and to develop international methodologies for the establishment of O&M performance indicators, as tools for O&M assessment in order to allow a rapid comparative analysis, and the definition of constraints and needs; to improve data collection and monitoring of operation and maintenance.

An Advisory Committee to the Working Group was created, whose major role consists in the definition and implementation of actions derived from the major lines of action defined by the Working Group.
In February 1991, the Advisory Committee of the Operation and Maintenance Working Group met in Geneva and developed a series of specific proposals to translate the activities suggested by the Working Group into concrete actions. Five priority proposals were developed. These were :

- Preparation of a global position paper on operation and maintenance;
- Assessment of operational and maintenance status of water supply and sanitation systems;
- Assessment of needs and resources, for training and human resources development in operation and maintenance;
- Development of implementation strategies for operation and maintenance in rural and urban water programmes;
- Development of guide-lines for improving operation and maintenance in the water supply and sanitation sector.

These proposals when implemented, will provide valuable basic data which will assist external support agencies and national governments to better plan their operation and maintenance programmes. They will also contribute to raising the level of awareness of sector professionals and agencies as to the urgent need to improve operation and maintenance performance.

Objectives

The main general objective of the O&M Working Group is to promote and facilitate the improvement of water and sanitation services world-wide through the development of better levels of Operation and Maintenance and through actions aimed at the optimization of the performance of water undertakings.

This would be achieved by increasing awareness, generating support and providing information on the magnitude and nature of O&M problems.

Studies should be initiated to determine the extent of cost saving and/or improvements to efficiency that will result from improved operations and maintenance and the use of locally or

regionally manufactured spare parts. This may necessitate the rehabilitation of facilities before improved operations and maintenance methods can be applied.

Operation and maintenance concerns should be included in the project design right from the projects' initiation. Legislation should be enacted to restrict the discharge of pollutants and to restrict the use of materials that would cause operation and maintenance problems.

A forum should be established to encourage the collaboration and coordination of ESA's and national governments at the country level in order to achieve common policies, unified approaches, compatible technologies and standardized equipment within the framework of national policies.

The proposed strategy

The complexity of arrangements and great number of activities involved in the formulation and implementation of Operation and Maintenance programmes requires very well concerted efforts amongst the involved organizations at the country and international levels.

The following are logical steps to be followed in the process of involvement of External Support Agencies and developing countries for the organizing of actions aimed at the implementation of programmes of this nature:

Promotion of Operation and Maintenance Programmes

The resolute support of Sector representatives is an essential condition to the sustainability of the Operation and Maintenance programmes. Therefore the first major achievement to be sought is the involvement and commitment of top managers dealing with water authorities and national agencies. A political decision should be taken which will precede concrete actions directed towards programmes formulation and implementation.

Formulation of Operation and Maintenance Programmes

The Operation and Maintenance programmes should be managed at a national level under the coordination of a leading sector institution. The programmes formulation and implementation should be selective and gradual and at the start of the process they should cover only a few water agencies. During this phase, the infrastructure of technological and human resources will be established and then expanded on a national level.

Implementation of Operation and Maintenance Programmes

The implementation of the programme should be undertaken through the coordination of a leading national sector agency, initially in a few water services and later at the national level. Depending upon the country's experience of similar programmes, an external project manager may be required.
The manager could be assigned with resources from an external support agency to assist the national institutions in the programme's implementation.

At the first phase of the implementation process other water agencies could join the original agencies in the development of the programme. The duration of this first phase would be defined in accordance with each situation but it should not last for more than 5 years.

Once a core group of agencies have developed experience, the second phase would gradually include other water authorities until the whole sector would interact in a common effort to achieve the programme's objectives.

Training Activities

The infrastructure to be generated in the water and sanitation agencies will include skilled personnel who will apply the new technology in their own institutions and also disseminate such technology to other institutions in order to achieve a multiplying effect.

The support supplied by training packages will be important for the technology transfer process. The training activities should be included in the programme's implementation strategies and should embrace managerial and operational areas.

The external cooperating agencies will play an important role in the process of training trainers and creating the critical mass of resources in the base institutions for the programme's implementation at the country level.

Required Financial Resources

Although the Operation and Maintenance programmes are aimed at improving the efficiency and effectiveness of the water agencies to extend the coverage to fringe and poor areas and reducing their operational costs, a significant amount of investment is required to achieve the set objectives.

The amount of work and financial resources involved in this kind of programme are substantial. However, the benefits expressed in terms of both financial aspects and improvement of health mainly for those people living in fringe and poor areas easily compensate for the required efforts.

Monitoring of Operation and Maintenance Progress

The progress of the Operation and Maintenance programmes should be monitored. An evaluation manual should be prepared whose objective is to support the activities directed towards the monitoring of the programmes. This manual would be applied to the water agencies in which Operation and Maintenance programmes are to be implemented.

Resources Mobilization - External Cooperation

The international support agencies should play an important role in the process of promotion, formulation and implementation of Operation and Maintenance and optimization of programmes.

The water supply and sanitation sector authorities should organize efforts for the Operation and Maintenance programme's implementation at a national level. It includes the adoption of national policies, definition of responsible institutions and managers, description of functions, promotion of training and motivation events, identification of available national financial resources, technology dissemination.

The water agencies should make use of the results achieved by international and national efforts. They will thus play the most important and complex role in the action chain aimed at improving efficiency and effectiveness of the service provided to the population.
With the support of infrastructure developed at international and country level, the water agency would perform its operational situation diagnosis, formulate the programmes of Operation and Maintenance and optimization of water supply and sanitation systems, survey and strengthen the organizational structure, promote the development of human resources, develop a managerial information system for Operation and Maintenance and implement a process of programme implementation, evaluation and adjustment.

Acknowledgement

Much of this paper is based on the discussions and proceedings of the Working Group on Operation and Maintenance and the Advisory Committee of the Operation and Maintenance Working Group of which the authors are a member. Special thanks are given to Dr. D. Warner of WHO for his encouragement in the preparation of this paper.

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150 R - WHO / O&M

COLLABORATIVE COUNCIL GLOBAL FORUM
OSLO, 18-20 SEPTEMBER 1991

From training to Institutional Development

by Denis Robert*

Training in any sector, is unanimously regarded as an essential activity. Nowadays, nobody denies that institutions - either public or private - cannot operate properly and in a sustainable manner without well-trained personnel at all levels, from skilled workers, water users to top management and politicians. But, if training is more than necessary, it is far from sufficient to generate, only by itself, a significant improvement within any institutions.

Training is part of a development process. It is a major component of Human Resources Development which is, as emphasised in the New Delhi Statement , "an essential component of Institutionnal Development". Both Human Resources Development and Institutional Development are, according to the Delft Declaration key elements of Capacity Building.

Since information, sensitization and training at household and community level have already been addressed by other speakers, I will concentrate this short reflection on training and Human Resources Development in government and commercial agencies.

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* Director General, CEFIGRE
International Training Center for Water Resources Management
BP 113 - Sophia-Antipolis
06561 Valbonne Cedex, France

In the water and sanitation sector, probably as in the other sectors, training has never been - and will never be - very successful and profitable for any institution without a human resources policy and sound institutional framework. Individuals can possibly benefit from training, but the impact on the institutions is directly related to its capacity and resolution to develop and promote its human resources. If not, training will simply help the institution to lose its best employees. Although fortunately, those defectors are generally not lost for the sector, this potential risk has led, in some extreme cases, some weak institutions to ban any training for fear of losing the best of their staff !

However, the picture is singularly different between government agencies responsible for water and sanitation in rural areas and therefore strongly dependent on government liberalities, and public, parastatal or private water utilities in charge of the water supply in urban areas, and operating on a commercial basis, i.e generating regular revenues.

In the first case, ministries or government agencies almost never have training structures, funds for training or even a training policy. Regrettably human resources development seems to be difficult to reconcile with the rigid constraints of the civil service. Therefore, too often, training is conducted in an irrational manner generally at the mercy of externally supported projects, and without regard to the actual needs. Initiatives such as the International Training Network implemented by the UNDP / World Bank Water and Sanitation Programme, try to help countries streamline their training and human resources development policies.

In the commercial sector, during the past decade, a number of water utilities have developed their own training structures, focusing on middle management, technicians and workers. Bilateral aid generally supported these initiatives and training institutions like CEFIGRE, brought technical assistance through training needs assessment, preparation of training materials, training of trainers, etc...

But it became rapidly evident that, if all training centers then established are still alive, some of them wither and might vanish sooner or later. The reason is essentially that these institutions do not have the financial capacity to implement their human resources development policy. It is worth mentioning that, in case of budgetary constraints, training is too often the first victim of cuts by the management, the second being invevitably maintenance. This reflects the lack of commitment to human resources development. But it is to be feared that in a vicious circle, lack of attention to human resources will worsen the financial situation of those institutions . Fortunately, on the other hand, human resources have been developed smoothly in some institutions and have allowed the strengthening of their financial viability and sustainability.

The conclusions from this short reflection are well known but deserve repetition. Human resources development, financial viability, managerial capacity interrelate tightly and in a complex manner. Training, which is an expensive activity, can only be cost-effective if implemented within a dynamic human resources development policy and a sound institutional framework allowing long-term financial viability.

Therefore, I am sorry to say that training, by itself, is definitely not a panacea. That is why, we, in CEFIGRE, try to integrate our training programmes and projects into institutional development processes. Training is, however, an essential tool for sector development and sustainability, and, believe me , a very exciting challenge .

A Presentation on the

IDRC GLOBAL HANDPUMP NETWORK

at the Oslo Forum (18 - 20 Sept 1991)

By

FOO LAI KHIM
Network Co-ordinator
IDRC Global Handpump Network

1.0 BACKGROUND

Since 1976, the International Development Research Centre (IDRC) has been sponsoring research and development of a low-cost water pumping device that can be fabricated and assembled in-country, and installed and maintained by villagers themselves.

Phase I consisted of a network of projects in six countries (Ethiopia, Malawi, Malaysia, Philippines, Sri Lanka and Thailand) which examined the technical viability of a unique handpump design incorporating plastic (PVC) below-ground components. It revealed that the introduction of a new technology has to take into account the perceptions, needs and resources of users, to be effective over the long term.

A second network **(Phase II)** comprising of projects in Malaysia, Indonesia, Thailand, Philippines, Sri Lanka, Mali, Cameroon, Ethiopia, Costa Rica, Kenya, China, India and Egypt was subsequently established. Extensive field trials of the PVC handpump with community participation showed that these pumps are easily adapted to varying social and environmental conditions, are affordable and can be mass-produced in-country.

A third and final phase **(Phase III)** commenced on 1st May 1988 with a view to deriving maximum benefits from the results of the research and development activities over the previous 2 phases. A Research & Training (R & T) Centre has been set up at the University of Malaya to develop the support framework for a Phase III network of projects aimed at promoting the PVC handpump technology and at establishing self-sustaining manufacturing units in developing countries. The project will aim to bridge the gap between research and utilization by providing non-governmental organisations, entrepreneurs and private enterprises with research, development and support services which are otherwise outside their reach.

Please see **APPENDIX I** for a matrix showing the activities and results within the 3 different phases.

2.0 DESCRIPTION OF THE NETWORK

2.1 Name of Network : IDRC Global Handpump Network

2.2 Purpose of network :

(i) to undertake ongoing research and development in handpumps and other water delivery systems at the Research & Training (R & T) Centre, University of Malaya (UM);

(ii) to disseminate research results to members of the network as well as to interested parties keen to mass-produce the handpumps;

(iii) to provide a forum for members to share experiences and problems encountered in designing, modifying, manufacturing, installing and using the UNIMADE handpumps, so that solutions might be collectively addressed.

2.3 No. of members: 13 countries throughout Asia (China, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand), Africa (Cameroon, Egypt, Ethiopia, Kenya, Mali) and Central America (Costa Rica).

Please see **APPENDIX II** for the distribution of pumps within the network.

2.4 Means of communication : Mail, Telex, Telefax, Telephone calls, and through circulation of Waternet News, a quarterly newsletter published by the R & T Centre. Additionally, Philippines and Indonesia have been linked to the R & T Centre via Telematics, a pilot computerised telecommunications network.

2.5 Contact person and address :

Prof. Goh Sing Yau
IDRC/UM Handpump Project
Mechanical Engineering Department
University of Malaya
Pantai Valley
59100 Kuala Lumpur
MALAYSIA

2.6 Criteria for membership :

(i) If handpump project of the intending member is sponsored by IDRC, or

(ii) if the person or organisation takes up a licence from IDRC/UM to produce and market UNIMADE handpumps.

2.7 Membership fee: currently, no fee is charged for membership.

3.0 NETWORK ISSUES

3.1 Communication between members

The IDRC Global Handpump Network has grown in size and presently covers 13 countries spread throughout Asia, Africa and Central America. In order for members to keep abreast of news and developments within the network, an efficient and effective means of communication is vital. The main modes of communications are :

a. Mail (air mail, courier service)
b. Telex
c. Telefax
d. Telephone
e. Telegram

Communication by mail is slow and not too reliable as letters very often go astray in transit. On the other hand, communication by telephone, telex, telegram and fax are costly and limited to discussion of non-technical issues. Furthermore, we frequently faced difficulties in communicating with some of our network members because of a lack of sophisticated telecommunication facilities in their respective countries. Also, differences in time zones (and hence working hours) have compounded our difficulties in contacting each other.

To overcome these practical problems, the IDRC Handpump Network has introduced 4 innovative measures: -

3.1.1 Telematics system

This is one of the sub-components of the Phase III project. It involves the implementation, use and evaluation of a pilot **computerised telecommunication system** to provide timely dissemination of information to participating organisations. Those who are linked into the system can share information (both graphics and text) and experiences related to using, modifying, adapting and producing the PVC handpump.

The accumulated knowledge will be very useful to new organisations which come in at a later stage as it will help them to jump the learning curve considerably.

The pilot test network is to be established with the R & T Centre as the central mode and projects in Thailand, Indonesia and Philippines as the other 3 modes. So far, the R & T Centre has successfully established links with Indonesia and Philippines. A third link is to be established with China in the near future. Evaluation of the telematics system is on-going to determine if it is more cost-effective and reliable than the other means of communication.

3.1.2 Annual Network Meeting

There is a provision in the Phase III project for annual meetings to be held among the network members and other parties (by invitation) to discuss and share :

a. problems encountered
b. solutions found for different problems
c. results of analyses
d. information on social acceptance schemes, financing programs and maintenance programs

We have found the meetings to be effective in pooling the resources and knowledge of the participants in an organised way.

3.1.3 Network Co-ordinator

The appointment of a Network Co-ordinator under Phase III to monitor IDRC - supported projects and assist in data collection and evaluation has facilitated the flow of information among network members. The co-ordinator, in his travels and meetings with project leaders, is able to gather a wealth of information from them. The data so collected are properly documented and made available to those who are interested. This contributes to mutual learning and progress.

3.1.4 Waternet News

The R & T Centre has been publishing a quarterly newsletter entitled Waternet News since 1988. It carries news, views and developments taking place within the network.

By having this newsletter, members can stay in touch at least once in 3 months.

3.2 Sustainability of network

At the moment, membership to the IDRC Handpump Network is obtained through either having one's project sponsored by IDRC or obtaining a manufacturing licence from IDRC/UM to produce handpumps. All the current members belong to the first category even though there are several parties who will be admitted under the second category shortly. We do not charge any membership or subscription fee currently.

A number of the members' projects have been completed but the project leaders are now keen to go for mass-production of PVC handpumps in their respective countries. We are at the same time actively promoting the commercialisation of PVC pumps among NGOs and entrepreneurs.

As we see it, **the sustainability of the network hinges on the following:**

a. our ability to bring in new members under the second category;

b. how successful the project leaders (of completed projects) are in obtaining funding for the establishment of their production units; if they are unsuccessful, they may soon lose interest in continuing to be a network member;

c. how much money is available from IDRC for the maintenance and support of the network;

d. the viability of our charging membership and subscription fees.

4.0 LESSONS LEARNED & FUTURE PLANS

4.1 Lessons Learned

Among the many lessons we have learned over the years are :-

i. the experiences of our network members show that **handpump technology cannot simply be "parachuted in";** it must be examined to determine its strengths and weaknesses, and modified to suit local needs, available resources and expertise. Furthermore, the potential health benefits associated with the introduction of handpumps can only be realized if the pumps are utilized. Sustained hygiene education programs that address habits related to water collection, transportation and storage are also essential for a successful introduction of this technology.

ii. **in order for networking to be successful, members have to play their part in freely contributing their knowledge and experiences for the benefit of all.** We are fortunate to have in the Phase III project a network co-ordinator who, besides facilitating exchange of information among network members, actually travels to each of the member countries to find out what is happening there. The experiences and lessons learned by a particular member are then disseminated to others via the quarterly newsletter, Waternet News.

iii. **it takes time to successfully promote mass-production of handpump and the introduction and utilization of the technology to those who need it most, the rural poor.** Handpumps have been around for centuries and our experience in promoting the UNIMADE handpump technology has shown that the handpump markets in virtually all the developing countries are quite well-entrenched.

Past and on-going handpump projects by network members are therefore useful and serve as demonstration models to promote a better understanding of the technology an in turn to encourage its widespread adoption by communities throughout the developing world.

4.2 Future Plans

We will continue to work closely with those members whose projects have been completed but who are now keen to obtain a licence to produce PVC handpumps in their respective countries. When they are able to obtain funding for their production units, they will be attracted to remain as a network member.

At the same time, we will seek to promote the mass-production and distribution of PVC pumps among other NGOs and entrepreneurs in developing countries. The successful licencees will form the new membership in the network.

We will, at some opportune time, look into the feasibility of introducing entrance and annual/ monthly subscription fees. This will lessen the need for external funding and eventually make the network self-sustaining.

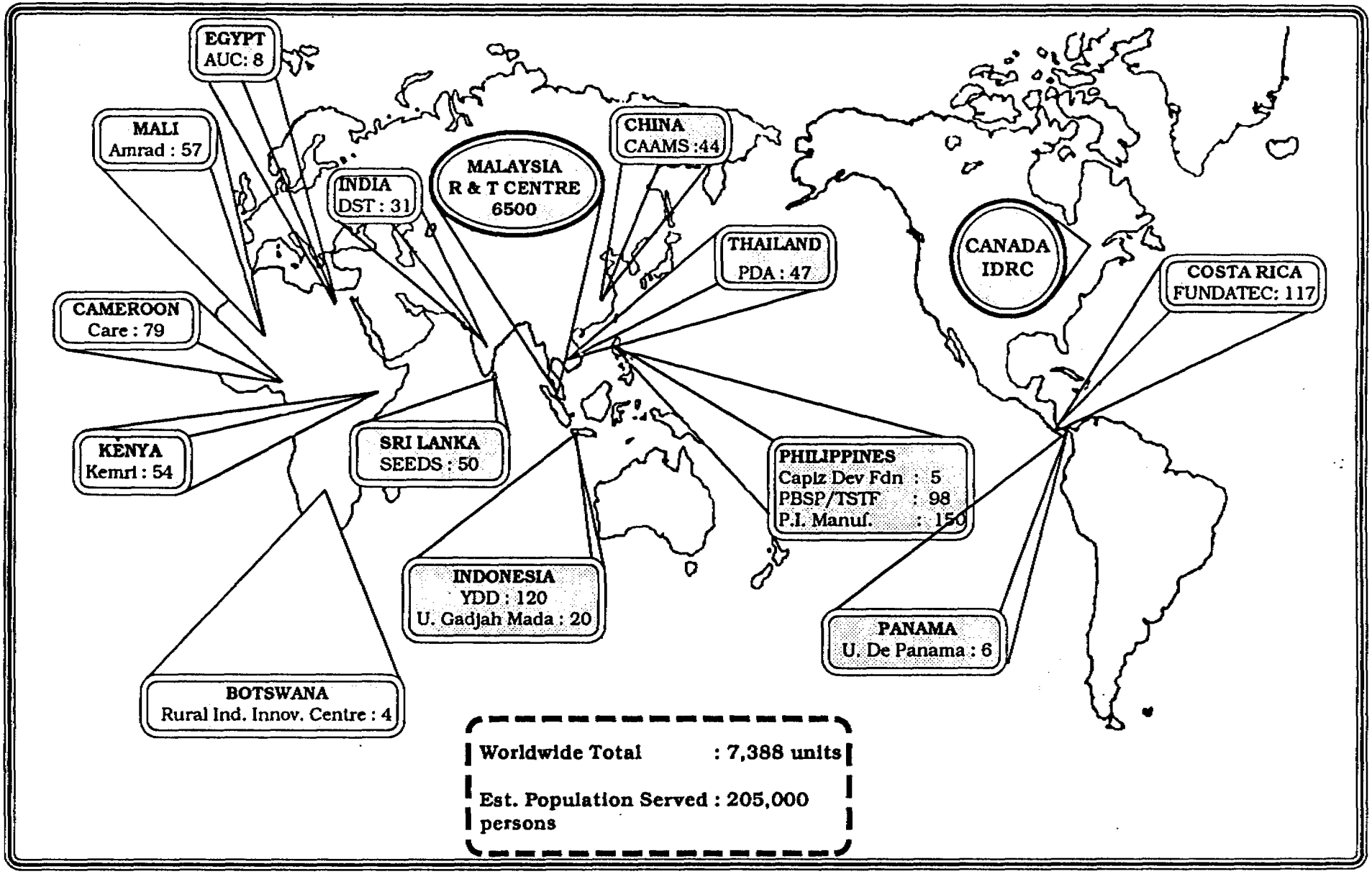
5.0 CONCLUSION

It is IDRC/UM's desire to see that at the end of the third phase, a technology which had originated in Canada will have been introduced and institutionalised as a self-sustaining enterprise within developing countries for the delivery of safe water to disadvantaged populations, the ultimate beneficiaries of IDRC support.

By the same token, IDRC/UM would like to see the IDRC Global Handpump Network growing in strength and influence, and contributing to the welfare of not only its members but also to the global handpump fraternity.

STAGE	STRUCTURE	OBJECTIVE	RESULTS	REMARKS
Phase I : Creation	Network of 6 projects Ethiopia, Malawi, Malaysia, Philippines, Sri Lanka, Thailand.	To carry out further laboratory and field tests on the basic design concept under varying social, economic and environmental conditions.	The outcome of the testing programs showed the PVC handpump to be well accepted by the various communities and to be viable for production on a commercial scale.	Three different variations of the original Waterloo design were developed: Ethiopian, Sri Lankan and Malaysian.
Phase II : Evolution	Network of 13 projects : Asia (China, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand), Africa (Cameroon, Egypt, Ethiopia, Kenya, Mali) and Central America (Costa Rica).	To carry out extensive field trials of the modified designs with community participation and conduct detailed investigation of the manu-facturing process in preparation for mass-(production).	The tests showed that the pumps are easily adapted to varying social and environmental conditions, are affordable and can be produced in-country.	The Malaysian project became the focal point of a new Phase II research network comprising 13 countries. Sri Lanka and Ethiopia however, are developing their own range of handpumps.
Phase III : Maturity	Network of Phase II projects and Phase III commercial enterprises .	To establish a Research & Training (R & T) Centre at University of Malaya to provide the support framework for a Phase III network of projects aimed at promoting the technology and establishing self-sustaining local manufacturing units.	The Phase II projects continue to receive strong technical support from the R & T Centre. Satisfactory results have also been obtained in regard to handpump commercialisation	Handpump markets in most developing countries are well-entrenched. Having a superior product does not necessarily mean the battle is won; on the contrary,we find we have to fight an uphill battle all the way.

Distribution of UNIMADE Handpumps Worldwide (in units)



WATER SUPPLY AND SANITATION
COLLABORATIVE COUNCIL
GLOBAL FORUM

THE CONSTRAINTS ON THE WATER SUPPLY AND SANITATION SECTOR IN DEVELOPING COUNTRIES

by

T. A. Dabbagh,
Senior Engineering Adviser
Kuwait Fund for Arab Economic Development

Global Forum, NORAD
Oslo, Norway, September 18-20, 1991

THE CONSTRAINTS ON WATER SUPPLY AND SANITATION SECTOR IN DEVELOPING COUNTRIES

T. A. Dabbagh

Senior Engineering Adviser

Kuwait Fund for Arab Economic Development *

SUMMARY

This paper attempts to highlight the main constraints on the water and sanitation sector and to outline the concerted efforts required to tackle them. It makes use of data published in December 1990 by WHO, but adopts a different approach to the analysis of the data. A comparison of the results of this reassessment with field experience makes it clear that the most serious constraint is the "inadequacy of cost recovery frameworks" rather than "funding limitations". Hence, there is a need for funding for operation and maintenance rather than for the construction of new projects. Funding for these appears to be readily available.

The constraints are also classified within regions, showing that problems of "operation and maintenance" and of "logistics" were the most common acute constraints after "inadequacy of cost recovery". These three constraints are all interrelated and are intensified by the high cost of water which prevails in some developing countries. However, some other acute constraints which require particular attention become apparent from the analysis. These relate to the availability of personnel involved in the water

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* The views expressed in this paper are not necessarily those of Kuwait Fund for Arab Economic Development.

sector and the inadequacy of the institutional set-ups. The paper argues that there is no lack of trained staff but that suitable personnel are discouraged from working for the sector by poor employment conditions and a lack of incentives. The institutional set-ups need to be remodelled along lines similar to those of the water authorities successfully established in industrial countries.

The paper concludes that there are two main tasks to be tackled: the first one is to reduce the cost of producing and distributing water so that it becomes affordable to the consumers; the second one is to attract local trained personnel to work for the sector rather than to seek employment in the private sector, or to emigrate. Five major areas which may have contributed to the serious situation faced by the sector, seem always to have been overlooked: the lack of indigenous manufacturing capacity, the selection of inappropriate technology; inefficient management, unrealistic estimates of operation and maintenance costs, and poor co-operation between external supporting agencies (ESA's) and developing countries.

The paper warns that unless genuine and concerted efforts are made to improve the situation, the water and sanitation sector will become the focus of discontent, and unless the basic human need for water is satisfied, no economic growth will be achieved. The ESA's must be aware of the risks of adopting the sector as an expanding market for their goods and materials, while the governments of the developing countries, on the other hand, must spread the benefits of an improved water sector to all sections of the population, avoid making ambitious promises, and be strong enough to take apparently unpopular actions if necessary. Without such understanding and co-operation, frustration will prevail, which may

result in political and social upheavals affecting both developing and industrial countries.

1.0 INTRODUCTION

1.1 The WHO report entitled "The International Drinking Water Supply and Sanitation Decade - Review of Decade Progress" (Ref. 1) is of prime importance for planners in the water and sanitation sector, whether in developing countries or financing institutions, since it is compiled from primary data obtained first-hand from more than a hundred developing countries representing all the regions of the world except Europe, which has been dealt with in a separate report.

1.2 A specially designed questionnaire was used to elicit data regarding the constraints on water sector development, information which is essential for identifying the present situation and predicting the main trends. By helping to identify these trends, the report can provide a base for the decision makers to exert a major influence on the sector's development.

1.3 The responses were analysed and the constraints ranked both regionally and globally. Seventeen main constraints had been identified and the developing countries had been requested to indicate whether each was "very severe", "severe" or "moderate". A ranking index was calculated as follows:

Ranking index = (No. very severe X 3) + (No. severe X 2) + (No. moderate X 1)

1.4 A study of these results showed that some rankings did not tally with those noted since the inception of the Water Decade.

It seemed that this might be the result of the way in which the data had been interpreted and, indeed, the preface to the WHO report implies that scope exists for a different interpretation when it states that the collection and collation of data on water supply and sanitation services pose many difficulties and often depend on value judgements.

2.0 ALTERNATIVE ANALYSIS

2.1 Since up to now there has been a dearth of data available from which to make an overall assessment of the situation, it is vital that this new data should be interpreted as realistically as possible. To this end, an alternative simplified approach to its analysis is suggested so that the major constraints may be highlighted in a way which accords more closely with experience gained while appraising and following-up water and sanitation projects financed by Kuwait Fund for Arab Economic Development and during discussions at meetings with co-financiers and ESA's.

2.2 Two issues seemed to deserve re-examination: first, the WHO ranking of each constraint as "very severe", "severe" and "moderate" and second, the ranking formula. It can be argued that it is more difficult to differentiate between "severe" and "very severe" than between these two categories and "moderate", so it was decided to combine the first two categories to form just one category called "severe". Moreover, instead of the WHO ranking formula, the percentage of "moderate" to "severe" was calculated and used to create a new ranking. The lower the percentage, the lower was the rank, with rank "1" indicating the worst situation. Table 1 compares the ranking positions of the constraints according to this alternative simplified approach with the ranking given in the WHO report.

TABLE 1: Comparison of the ranking positions of constraints on the water supply and sanitation sector according to the World Health Organisation's interpretation and the Kuwait Fund's interpretaton of WHO data

Constraints	African Region		East Med. Region		American Region		South East Asia		Western Pacific	
	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO
Inadequate cost-recovery framework	1	6	3	6	3	2	6	6	2	1
Funding limitations	2	1	4	1	1	1	1	1	3	3
Logistics	3	2	7	16	2	6	2	3	1	6
Insufficiency of trained personnel (sub-professional)	4	4	R 8	4	R 5	3	5	5	9	5
Inadequate or outmoded legal framework	5	8	R 10	8	R 10	11	R 16	12	R 10	11
Operation and maintenance	6	3	1	2	4	7	2	2	4	2
Insufficiency of trained personnel (professional)	7	5	6	5	9	5	10	4	5	4
Insufficient health education efforts	8	9	15	9	12	9	11	11	8	12
Intermittent water service	9	7	5	10	R 7	8	4	8	6	10

R = Repeat

= considered equal ranking

Table continues next page

TABLE 1 continued

Constraints	African Region		East Med. Region		American Region		South East Asia		Western Pacific	
	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO	K.Fund	WHO
Insufficient knowledge of water resources	10	10	14	13	16	16	14	15	R 10	9
Inappropriate institutional framework	11	12	R 8	12	R 5	10	12	10	16	13
Import restrictions	12	17	R 12	15	R 7	4	R 8	9	R 14	17
Inappropriate technology	13	14	16	17	15	17	R 14	16	R 10	8
Non-involvement of communities	14	11	R 10	7	13	12	R 6	14	13	15
Lack of planning and design criteria	15	16	R 12	11	R 10	13	R 16	13	7	7
Inadequate water resources	16	15	2	3	17	15	R 8	7	R 14	14
Lack of definite government policy for sector	17	13	17	14	14	14	13	17	17	16

R = Repeat = considered equal ranking

3.0 COMPARISON OF THE RANKING FROM THE TWO ANALYSES

3.1 A difference of one rank between the original and the revised rank was regarded as close enough for them to rank the same under both analyses. Although there is a considerable consensus in the ranking of many constraints, when the major constraints are considered there are substantial differences which are outlined for each region as follows:

Africa: The revised analysis rates "inadequate cost recovery framework" as the most serious constraint in Africa, whereas it comes sixth in the WHO analysis. At the other end of the scale, "import restrictions", which ranks as least important in the WHO report, moves up to twelfth position. The position of nine other constraints is effectively unchanged and the differences between the rest are unsubstantial except that "lack of definite government policy for sector" becomes the least improtant constraint in the revised analysis instead of being in the thirteenth position. The importance of "inadequate cost recovery framework" in the revised ranking projects its role as a leading constraint which increases the limiting effects of other constraints, in particular "logistics" and "operation and maintenance". This indicates that in Africa funding may not be required as much for new projects as for dealing with the constraints affecting existing projects.

Eastern Mediterranean: The emphasis on the crucial issues for this region is changed by the revised analysis in that the funding constraint drops from the top

position to fourth. The first three constraints then become "operation and maintenance", "inadequate water resources" and "inadequate cost recovery framework", an order which reflects the situation observed in this region where inadequate water resources are undoubtedly a major constraint. Funding would be expected to be less important in a region which includes a considerable number of oil-producing countries.

Two other constraints show a marked change in ranking: "intermittent water service" moves up to fifth instead of tenth position and "insufficient health education efforts" drops to fifteenth from ninth. This conforms with the experience in Eastern Mediterranean countries where an intermittent water supply is widespread and health education is regarded as already available. The ranking of six other constraints in this region is virtually unchanged and that of the rest does not differ substantially.

America: The revised analysis raised important constraints such as "logistics" from sixth position to second and "operation and maintenance" from seventh to fourth. Six constraints stay virtually the same and there are no substantial differences in the ranking of the rest except for "inappropriate institutional framework" which moves up to fifth instead of tenth position.

South-East Asia: The most significant change of ranking is that of the "insufficiency of trained personnel (professional)". This constraint comes fourth in the WHO

report, but drops to tenth in the revised analysis reflecting the observation that this region has been a major source for the recruitment of professional personnel and has, in fact, supplied the main body of expatriate engineers in most oil-producing countries. Most financing institutions are often inundated with applications from professional engineers from this region requesting employment abroad. Thus it is probably not the insufficiency of professional staff that is a major constraint in this region so much as their unsatisfactory employment conditions.

Another constraint that changes rank, moving up to sixth place from being among the least important constraint in fourteenth place, is the "non-involvement of communities". This new position fits in better with other serious constraints in this region: "operation and maintenance", "logistics" and "intermittent water service". The ranking of nine constraints is virtually unchanged.

Western Pacific: As in the American region, the suggested analysis brings the constraint "logistics" into greater prominence, in this case up from sixth position to first. For eight constraints the ranking stays virtually the same and the difference between the rest is not substantial except that "insufficiency of trained personnel (sub-professional)" moves down to ninth position from fourth, indicating yet again that it may be the unsatisfactory employment conditions that cause the shortage of applicants for this sector rather than lack of suitable personnel.

4.0 MAJOR CONSTRAINTS

4.1 Overall, the ranking of the alternative analysis gives the most important constraint as "inadequate cost recovery framework". This is not surprising as the vast majority of the developing countries admit that the average tariff for water is well below the cost of producing and distributing it. Therefore most water authorities in developing countries are short of funds. In Europe, by contrast, some water authorities have proved able to operate on a commercial basis and have been privatised.

4.2 The two other most important constraints in the revised analysis are "operation and maintenance" and "logistics". This is also the conclusion reached by various international authorities some of whom believe that "in developing countries, 50% of the existing systems are not reliable, not sustainable or inefficient as a result of poor operation and maintenance both in rural and urban areas".

4.3 However, the ranking of two constraints in the WHO report and the alternative simplified approach did not seem to reflect the observed situation: "funding limitations" which topped the WHO report's list in almost all regions and "inappropriate technology" which came last in most regions. The alternative ranking changed the position of the former so that it was no longer the top constraint except in South East Asia and the American region, but "inappropriate technology" remained among the least important in all regions. In view of this, these two constraints merit special consideration.

4.4 Funding limitations: From the experience of most financing institutions, funding for capital investment often remains undisbursed for several years. The inability of developing countries to absorb available funding contrasts with the speed with which donors from financing institutions or industrial countries can make it available. In Kuwait Fund's experience withdrawals are rarely completed within the period estimated during project appraisal and some countries have outstanding balances on their loans for years, even though these could be used for the procurement of spare parts or other ancillaries. For example, concessionary loan agreements for rural water supply projects were signed by the Kuwait Fund with six developing countries in February 1988 and January 1989 for a total of about 63 million US$; although the terms of these loans included a calculated grant element of about 60%, so far only one of the countries has made a withdrawal from its loan and then only for a small amount.

4.5 In seeking an explanation for the unexpectedly low ranking of the constraint "funding limitations" it seems that the question on the questionnaire may have been far too general and tempted the respondents to blame funding for all the ills of the water sector; it did not specify whether funding was required for the capital cost of new projects or to cope with the cost of running existing projects. The data collected suggests that in addition to the revenue from tariff collection, funding is increasingly required from other sources for operational costs, rather than for capital costs, since "inadequate cost recovery framework" comes out as the main constraint.

4.6 In fact in recent years most ESA's have been giving the water and sanitation sector priority over other sectors in their financing plans and may even chase developing countries to generate

water supply and sanitation projects, with the result that some ill conceived schems have been implemented. The sector has provided an ever expanding market for equipment and materials most of which have to be imported from the countries of the ESA's. However, although the need for additional funding has been promoted internationally, Kuwait Fund has received a reduced number of requests to finance projects. In fact the demand in recent years has been less than for other sectors with water supply and sanitation projects representing 6.6% of the total loans committed by the Fund. The transport and communications sector ranked first with a share of 30.5%, followed by electricity 23.3%, agriculture 21.2% and industry 17.7%. Kuwait Fund does not allocate sectoral budgets, but leaves the choice of the sector to the developing countries, also the Fund has no interest in promoting manufactured goods. Therefore the low number of requests indicates that developing countries can easily obtain finance for the water and sanitation sector from other ESA's unlike the transport and communications sector which has been allocated reduced budgets by a considerable number of ESA's.

4.7 Inappropriate technology: The technology used in developing countries has been frequently criticised for its unsuitability and its often extensive dependence on imported equipment and machinery. The lack of spare parts and materials required for efficient operation and maintenance result in accelerated depreciation. A simple but typical example is the widespread use of numerous types of hand pumps for small diameter tube wells in Africa. Having been rapidly installed at the inception of the water decade to provide potable water to remote villages and hamlets, these pumps have often failed after only a short time, especially if they have been designed originally for domestic use. The frustration of the rural population, deprived of

its newly acquired potable water supply, has reflected negatively on efforts to raise funds from consumers to cover the cost of operation and maintenance of the new technology. Instead, a renewed enthusiasm has developed for the use of improved traditional reinforced concrete open dug wells which rely mainly on the manual abstraction of ground water and have minimal maintenance and operation costs.

4.8 The unexpectedly high ranking for "inappropriate technology" under both analyses contrasts with the low ranking for "operation and maintenance" and "logistics" in the alternative analysis. Surely these should not present a problem if the appropriate technology is being used. It seems that the ability of the questionnaire's respondents to assess whether the technology being used is appropriate or not requires a wider range of experience than is normally available to personnel in developing countries. It is, in most cases, difficult for them to blame the technology they are using when they are unaware of alternatives.

5.0 CLASSIFICATION OF CONSTRAINTS WITHIN REGIONS

5.1 To show more clearly the relative severity of the other constraints within rather than between the regions, Table 2 was prepared. The constraints giving a percentage score of "moderate" to "severe" of less than 50% were considered to be "very acute", those between 51% and 100% as "acute", 101% and 200% as "serious", 201% to 400% as "moderate" and over 401% as "manageable".

5.2 In this table the two constraints "funding limitations" and "inappropriate technology" have been ignored since, as discussed above, the data collected for them is contradicted by

TABLE 2: Comparison of the relative severity of constraints on the water supply and sanitation sector in developing countries on a regional basis according to Kuwait Fund's suggested revised interpretation of WHO data

Region	Very acute	Acute	Severe	Moderate	Manageable
AFRICA	. Inadequate cost recovery framework . Logistics . Unsatisfactory employment conditions for trained personnel (sub-professional) . Inadequate or outmoded legal framework . Operation and maintenance	. Unsatisfactory employment conditions for trained personnel (professional) . Insufficient health education efforts . Intermittent water services	. Insufficient knowledge of water resources . Inappropriate institutional framework . Import restrictions	. Non-involvement of communities . Lack of planning and design criteria . Inadequate water resources . Lack of definite government policy for sector	
EAST MED.	. Operation and maintenance . Inadequate water resources . Inadequate cost-recovery framework	. Intermittent water services . Unsatisfactory employment conditions for trained personnel (professional) . Logistics . Unsatisfactory employment conditions for trained personnel (sub-professional) . Inappropriate institutional framework . Insufficient knowledge of water resources	. Inadequate or outmoded legal framework . Non-involvement of communities . Lack of planning and design criteria . Import restrictions	. Insufficient health education efforts	. Lack of definite government policy for sector
AMERICAN REGION	. Logistics . Inadequate cost recovery . Operation and maintenance . Unsatisfactory employment conditions for trained personnel (sub-professional) . Inappropriate institutional framework	. Intermittent water services . Import restrictions . Unsatisfactory employment conditions for trained personnel (professional) . Inadequate or outmoded legal framework . Lack of planning and design criteria	. Insufficient health education . Non-involvement of communities . Lack of definite government policy for the sector		. Insufficient knowledge of water resources . Inadequate water resources

Table continues next page

TABLE 2 continued

Region	Very acute	Acute	Severe	Moderate	Manageable
SOUTH EAST ASIA	. Logistics . Operation & maintenance . Intermittent water service	. Unsatisfactory employment conditions for trained personnel (sub-professional) . Inadequate cost recovery . Non-involvement of communities	. Import restrictions . Inadequate water resources . Unsatisfactory employment conditions for trained personnel (professional)	. Insufficient health education efforts . Inappropriate institutional framework	. Lack of definite government policy for sector . Insuffieient knowledge or water resources . Inadequate or outmoded legal framework . Lack of planning and design criteria.
WESTERN PACIFIC	. Logistics . Inadequate cost recovery framework . Operation & maintenance . Unsatisfactory employment conditions for trained personnel (professional)	. Intermittent water service	. Lack of planning and design criteria . Insufficient health education efforts . Unsatisfactory employment conditions for trained personnel (sub-professional) . Inadequate or outmoded legal framework . Insufficient knowledge of water resources	. Non-involement of communities . Import restrictions . Inadequate water resources . Inappropriate institutional framework	. Lack of definite government policy for the sector

the data collected for other constraints. Another feature of Table 2 arising out of the foregoing discussion is that the "insufficiency of trained personnel" has been renamed "unsatisfactory employment conditions for trained personnel" as this seems to reflect the situation more accurately.

5.3 It is easy to use this table to compare the relative severity of constraints in different regions. for instance, it can be seen that whereas "inadequate water resources" is a very acute constraint in the East Mediterranean region, it is manageable in the American region. This table also shows that "insufficient knowledge of water resources" is either "acute" or "severe" in all regions except in the American region and South East Asia where it is "manageable". It is also worth noting, from Table 1 that "insufficient knowledge of water resources" and "inadequate water resources" have virtually the same ranking according to either analysis in all regions. Therefore the situation regarding these two constraints is fully endorsed by the two analyses.

6.0 OVERCOMING THE MAJOR CONSTRAINTS

6.1 While all the constraints on the water and sanitation sector need to be tackled, efforts should be concentrated on the most acute. The preceding analysis indicates that the three most acute constraints for all the regions are "inadequate cost recovery framework", "operation and maintenance" and "logistics". These constraints are inter-related, but one of the most important underlying factors, in some developing countries, is the high cost of water while the inability of the institutional set ups to attract suitably qualified personnel is another important factor. The personnel should have the authority to provide consistant administrative procedures and the efficiency needed for

establishing sound and viable enterprise capable of achieving income sufficient to cover at least the cost of operation and maintenance.

6.2 There are therefore two tasks to be tackled: the first is to reduce the cost of water by using the appropriate technology and the second is to strengthen the institutional set up by attracting local trained personnel. No cost-recovery framework can be successfully adopted unless water is provided at an affordable price. This has not been achieved even in developing countries with a high rate of rainfall and substantial surface water such as Gabon, Brunei, Tanzania, Zaire and Angola. In these countries the average cost of water production* varies between 1.37 and 1.0 US$/m3. In contrast, other developing countries, some of which may not enjoy abundant water resources, have managed to reduce the cost of water production. For instance, in Tunisia, Morocco, Zimbabwe, Ghana, Madagascar, Malaysia and the Philippines, the average cost is between 0.20 and 0.08 US$/m3. Considering that water produced mainly by desalination in Qatar, Kuwait and Bahrain costs between 2.2 and 0.95 US$/m3, it is clear that serious problems prevent some developing countries from providing water at a reasonable price by conventional methods. The nature of some of these problems is outlined below:

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* It is not clear from WHO's reports whether the cost of water in the various countries has been calculated on the same basis. Some countries show substantial differences in the cost of water from year to year without giving reasons, while a considerable number has not bothered to work out the cost.

(i) **Indigenous manufacturing capacity:** A comparison of the above two groups of countries shows that those with a higher cost of water production have little indigenous manufacturing capacity and rely heavily on foreign expertise, while those with a lower cost of water production are not only able to manufacture some equipment, machinery and spare parts, but are also less dependent on foreign expertise. In a recently awarded contract for the construction of 80 tube wells in a country in West Africa, similar to those in the first group, the cost of constructing one production well, including exploratory work and installation, was 144,000 US$. The cost of operating and maintaining such a well may represent 10% to 30% of the per capita income of the villagers concerned, a burden which condemns the project to immense difficulties and almost inevitable failure, particularly if it is in a remote area.

(ii) **Selection of appropriate technology:** The construction of plant that may burden consumers with costs they cannot afford must be avoided by making an objective evaluation of the facilities available and selecting the technology accordingly. Therefore, promoters of designs and components for water supply and sanitation systems must consider carefully the possibility of adverse effects. There are numerous instances of such effects. For example:

(a) effective small capacity cisterns for flush lavatories reduce domestic water consumption, but if widely used in a large city with an established sewerage system they increase the density of the sewage, upset the treatment process and give rise to foul smells as a result of rapid fermentation. Rectifying such an unsatisfactory situation may require overwhelming

capital expenditure.

(b) The cost of energy for pumping water from wells may be reduced by installing very expensive solar energy pumps. However, these may impose a sudden major expense on villagers if a photocell panel breaks suddenly or the pump burns out due to prolonged operation in dry conditions.

(c) The capital cost of a water network is lower if pumping is used for distribution rather than gravity, since a pumped system requires shorter routes and less excavation. However, the pumps may break down frequently and, if there is a shortage of spare parts and the foreign currency to replace them, an intermittent water supply will result.

(d) Rapid sand filters are widely used for water treatment in developing countries, as they have the advantage over slow sand filters of producing large amounts of water more efficiently and of taking up much less space. However, they need pumps and air compressors whereas slow sand filters, which have proved to be satisfactory in European countries for over a century, are free from complicated mechanisation and are simple and cheap to operate and maintain. For this reason they may be preferable in some developing countries in spite of the drawbacks of a slow filtration rate, high cost of construction and large area required.

(iii) **Improving management efficiency:** It is a widespread belief that one of the main problems of operation and maintenance in

developing countries is that professional and skilled local personnel are not available. This is not necessarily the case. However, unsatisfactory working conditions are faced by the personnel of most water authorities in developing countries and they may leave the public sector for the private sector to better themselves. Their problems include a lack of adequate communication and transport facilities and inadequate remuneration. By contrast, most expatriate staff from industrial countries working for the same authorities enjoy far better working conditions and remuneration that may be several times greater than that of the senior national staff to whom they report the outcome of their services. This situation is demoralising and generates resentment by local staff, particularly when some of them may have better qualifications and experience than the expatriates.

In such an atmosphere, the national staff are deprived of incentives and feel that they would fare better outside their home country. According to recent reports, the ratio of per capita income between India and Europe one hundred years ago was 1:2, now it is about 1:70. This is causing an unprecedented brain drain from developing countries to industrial countries, surpassing the one experienced in the sixties between Europe and the USA at the height of the Space Development Programme. At the time, the Euro-American brain drain caused an uproar in some parts of the European press. The South-North brain drain needs to be tackled if operation and maintenance are to be improved or indeed, if, economic growth is to be achieved. One possibility is to increase the use of less expensive expatriate staff from other developing countries. This could be done without great difficulty as some developing countries have increasing numbers of unemployed professional engineers. The staff should also be given incentives linked to improvements in the efficiency of the water supply and

sanitation systems, especially if they increase the income of the authority concerned and reduce the amount of unaccounted-for water.

(iv) **Cost of operation and maintenance:** A widespread practice that is becoming increasingly unsatisfactory in developing countries is that of calculating the cost of operation and maintenance as a percentage of the total cost. This can be very misleading. It can, for instance, make the operation and maintenance of a reinforced concrete dug well with manual abstraction facilities seem more expensive than that of a tube well with a hand pump which is liable to break down, since the capital cost of the former is several times that of the latter. In fact, schemes with high initial costs are often less expensive to operate and maintain than highly mechanised, relatively low cost alternatives which may not be able to provide a continuous supply of water at an acceptable cost.

More realistic calculations of the cost of operation and maintenance need to take into consideration the availability of skilled personnel, the expected frequency of breakdown over the lifespan of the plant, the rapid rate of depreciation, the availability of spare parts, the source of required manufactured goods, the presence and reliability of local agents and, last but not least, the ability to purchase materials and goods in foreign currency and the adequacy of the procedures involved.

(v) **Co-operation with ESA's:** Tackling the issues involved may seem to lead to a conflict of interest between external supporting agencies (ESA's) and developing countries. For instance, to reduce the cost of water, locally manufactured materials should be used and reliance should be placed on expertise from other developing countries in the form of contractors and personnel. This means

that the ESA's would need to provide the required funding and overall surveillance for a project, but then bar their associated contractors and manufacturers from participating in its implementation. In spite of this apparent conflict of interests, such collaboration should be attempted and, in fact, it should not have an adverse effect on the countries of the ESA's in the long run, since improving the water supply and sanitation of the developing countries should help to boost their economies and increase their demand for consumer goods.

7.0 CONCLUSION

7.1 The efficiency of the water supply and sanitation sector is closely linked to the social conditions and political outlook of the countries concerned. These two elements may have contradictory demands. Normally, the social demand is for potable water to be made available to all sectors of the population, but the politicians tend to ensure that water is provided for the influential sector of society while they exploit the social demand by making ambitious promises. Instead, efforts should be made to provide water at an affordable cost by choosing a water supply and sanitation system after considering its potential for generating income to cover the cost of operation and maintenance. The governments concerned should be made fully aware by the ESA's of the alternative actions required to achieve this. Indeed, it may require the developing countries to take unpopular actions. The ESA's in turn need to strengthen local capabilities, develop joint policies and appropriate research and development programmes that they can coordinate with developing countries in place of their individual areas of influence.

7.2 In future the water and sanitation sector will face increasing difficulties, mainly with regard to the availability of natural water resources which will constitute a major constraint, especially in arid and semi-arid regions. The cost of water will increase substantially, to the extent that it may cause social and political upheavals affecting both the developing and industrial countries. With this prospect in view, the need for collaboration between all concerned with the water supply and sanitation sector is vital.

REFERENCE

1. World Health Organisation, The International Drinking Water Supply and Sanitation Decade, Review of Decade Progress (as at December 1988), CWS Unit, Division of Environmental Health, December 1990.

REPUBLICA ARGENTINA

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Consejo Federal de Agua Potable

y

Saneamiento

SUSTAINABLE DEVELOPMENT OF THE SANITATION SECTOR IN ARGENTINA

Lic. Elsa Correa de Pavon

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SUSTAINABLE DEVELOPMENT OF THE SANITATION SECTOR IN ARGENTINA

I.- BRIEF DESCRIPTION OF THE SANITATION SECTOR

Argentina is a republican and federal country, inhabited by 32.000.000 people and covered by 279.000.000 ha. Its climate ranges from subtropical to anctartic, but in most populated areas temperate climate prevails.

The density of population is varied and it is concentrated in the following cities:

1.- Capital Federal and Greater Buenos Aires

inhab./km2	2.805,0
Pob.	10.887.375

2.- Buenos Aires

inhab./km2	15.2
Pob.	4.611.628

3.- Cordoba

inhab./km2	14.8
Pob.	2.764.146

4.- Mendoza

inhab./km2	9.4
Pob.	1.400.142

5.- Santa Fe

inhab./km2	20.9
Pob.	2.782.809

Water resources are abundant in the central and eastern region and very scarce in the northwestern area.

Water quality varies throughout the country: water contains a high sediment load, high salt content in some rivers, high concentration of salts in groundwater supplies and high man-made pollution levels.

By comparing the availability of water resources, INCYTH carried out a projection analysis of water requirements for the year 2000 and it concluded that by 2040 water extractions will equal water availability. This situation is different in arid areas where the physical aspect is the factor that will condition the localization of future demands and the technology to be applied to different uses.

In brief, it can be said that although water supplies in Argentina are abundant, their irregular spatial distribution and their temporal variability pose difficult management problems. These problems are in turn increased by accumulative processes such as the rapid urbanization rate. Thus, we are faced not only with natural problems but also with highly complex social processes.

1.2. CHARACTERISTICS OF THE DRINKING WATER AND SANITATION SECTOR: POLITICAL JURISDICTION

The provincial states, according to the Constitution, are responsible for managing renewable natural resources, where water is considered a "public good".

Up to 1980, the provision of drinking water and sanitation services was in the hands of "Obras Santarias de la Nación". Since then, these services are provided by the provinces, with the exception of Capital Federal and 13 municipalities of the Province of Buenos Aires where these services are still rendered by Obras Sanitarias de la Nación (currently in the process of privatization).

PUBLIC UTILITIES

There are different public utilities in charge of providing drinking water supply and sanitation services. In the urban areas (with more then 15.000 inhabitants) they are distributed as follows:

	N°	WATERSUPPLY	SEWERAGE
STATE ENTERPRISES	5	1.866.000	690.000
COUNTY ENTERPRISES	1	271.000	201.000
STATE INSTITUTIONS	14	4.431.000	1.980.000
COUNTY INSTITUTIONS	70	2.341.000	1.229.000
PRIVATE COOPERATIVES	34	571.000	81.000
PRIVATE ENTERPRISES	1	148.000	53.000
COUNCIL OF NEIGHBORS	1	7.000	------
TOTAL	126	9.635.000	4.234.000

In rural areas, these services are provided by community commissions or cooperatives, though in those areas that have easy access to acquifers, groundwater wells and natural water springs or surface water courses, they are individually exploited without any minimal treatment.

SERVICE COVERAGE

WATER

The average percentage of people served in urban areas is 66,9%. There are nine provinces which exceed this figure (80%): Entre Ríos, Jujuy, La Rioja, Mendoza, Neuquén, San Luis and Tierra del Fuego.

The percentage in rural areas is 45,6%. In this respect, it should be pointed out that only 7% of the population belongs to the rural sector, made up of small agricultural and livestock landowners incorporated into the market economy.

These percentages only refer to domestic services supplied with conventional connections.

The highest deficit occurs in urban areas on account of the rapid urbanization process that took place during the last 40 years and which was not followed by a parallel expansion of the infrastructure (in fact, investments during this period were negative).

SEWERAGE

The percentage of sewerage services provided to urban areas is 37,2 %. This figure is exceeded by two provinces (70%): Tierra del Fuego and Capital Federal. The average percentage in rural areas is 0,6%.

FUTURE TREND

If the target for the year 2000 is to provide drinking water to 90% of the population and sewerage services to 70%, the growth rates to be attained are:

Water - growth rate 54%

Sewerage - Growth rate 139%

II. MAIN OBSTACLES TO SUSTAINABLE DEVELOPMENT

2.1. Technological obstacles

Overdimensioned technical services: In the main capital cities of the country, technical services were developed according to the concepts that prevailed during the 40s and 50s. Since these concepts were based on economies of scale, large and costly plants were set up.
Distribution systems kept on expanding with population growth following a radial pattern but in smaller subsectors they could not expand. The obsolescence of the networks (with more than 70 years in operation) constitutes a serious problem to such complex and interdependent systems.

Technological Obsolescence: The sector did not incorporate adequate technology and restricted itself to "design and construct hydraulic and distribution works", disregarding the concepts of operation, maintenance and management.

There is such a technological lag that the water produced or distributed is not measured; there are no reliable research works on systems' safety available and the most primitive methods are used in the treatment of effluents.

Water treament is carried out in settling tanks with flocculants and filtration (lime, aluminium sulphate) and chlorination. Effluents only receive primary treatment.

This technological obsolescense is serious and paradoxical. The country has many universities and research institutes staffed with highly specialized professionals, but due to this technological lag, they have not been attracted into the water supply and sanitation sector. (See institutional aspects).

2.2.1. LEGAL AND INSTITUTIONAL OBSTACLES

The crisis of Argentina: Since more than 90% of the services are provided by state agencies (municipal, provincial, national) they were also affected by the crisis of Argentina: long-term financial deficit, wastage of scarce resources, very low productivity levels, generalized inefficiency, institutional isolation, a totally disfunctional burocratic model and an irreversible image of corruption. The level of credibility of the legitimacy of the government's administration is well below 30%.

Lack of regulatory frameworks: As the state has been solely devoted to carrying out multiple execution activities (planning, design, execution, operation and control of water and sewarage systems), it did not take into account the control and surveillance of services. The lack of regulatory frameworks on water uses, water quality, water rates and environmental conservation, constitutes a most serious

obstacle to the future development of the sector.

Only a few provincial states have water laws and in most cases services are controlled by the same utilities that provide them and which are sometimes responsible for polluting water resources. A national legislation on sanitation or environmental conservation is lacking.

Lack of interest on the part of the gobernment: Up to 1990, governmental decision-makers did not pay much attention to this subject. This was due to the institutional disorganization existing at the different decision-making levels (national, provincial, municipal).

2.3.1. ECONOMIC OBSTACLES

Socio-economic concepts of water supply as a free good: Up to the 1980's, there prevailed the concept of water as a free good and the population did not pay for it. This "protectionist" concept brought about serious problems to the sustainability of the systems, because when the state's general revenues collapsed they could not even cover replacement costs. Another factor that contributed to this situation was the use of an unmeasured tariff system which acted as a tax and promoted water wastage.

Water wastage: More than 30% of the water produced is wasted due to deficiencies in the tariff system and more than 25% is wasted due to the obsolescence of the system. These percentages are awfully high, especially if we take into account that almost 50% of the population does not have house connections.

Financing sources: As 80% of the current water supply and excreta disposal systems was financed by the National and Provincial government in the form of "subsidies" (lost fund), the current generations have not paid directly for the systems which provide the services. This type of investments took place mainly in the urban centers, to the detriment of the rural areas which obtained their water supply and sanitation systems through the Water Supply National Plan (with funds from the IDB) and where the population had to pay for the loans obtained.

At present, the National Goverment, subsidizes 20% of the investments in rural areas (of less than 15,000 inhabitants) but most of the investments are drawn from international loans.

Estimates show that 6 billion dollars will be required to meet 90% of water demand and 70% of sewers demand.

International funding will only suffice to cover 15% of this figure, so the sector will have to depend on domestic financial sources. Such domestic sources can only be ensured by improving and increasing productivity, management efficiency of the services, population's income and the productive economic structure.

Salaries in Argentina average U$S 300/month, with high unemployment rates. Water and sewerage rates average U$S 10/month. This figure does not suffice to cover operation costs, which are subsidized by the State.

2.4.4. ADMINISTRATIVE OBSTACLES

Culture of a closed monopolist system: Public utilities have shown a closed monopolist culture, that is, they are based on the limited supply-production approach, disregarding the quantitative characteristics of the demand. The concepts of market segmentation, identification of users, differentiated supply according to population strata, promotion and publicity and tariff differentiation are not promotion taken into account. Thus, commercial and industrial users were strongly benefitted because they had a greater negotiation and lobbying capacity, to the detriment of poorer users who had to pay regressive taxes and face serious structural service problems.

To achieve the "status" of user entails a series of formalities, requirements and demands wich discourage people from trying to attain such status, even though in most cases there are potential technical water shares which could be managed more efficiently.

Culture of "works" to the detriment of "services": The historical origin of water supply and sanitation public utilities paved the way for a culture directed by engineers and large construction companies. The target was to plan an construct works, while operation, maintenance and marketing were considered minor tasks. This, together with the concept of water as a public free good, gave rise to the setting up of organizations which could hardly be considered as "public utilities". To this we should add that there were no economic-financial evaluations in resource allocation because most large urban system were built with funds provided by the state. Public utilties do not have adequate economic-financial information systems, which are essential for decision-making (costs accounting, budgets, accounting and balances) but they do have sophisticated engineering handbooks.

Isolation from and lack of coordination with those areas responsible for issuing urban policies: Water supply and sanitation organizations, on account of their closed monopolist characteristics, have been isolated from urbanization problems. The lack of coordination of a state organizational model of "feuds" or "organitational islands" constitutes an obstacle to the solution of enviromental problems. Argentina, with a high urbanization growth rate (86% of the people lives in cities of more than 2.000 persons) has not had adequate urban policies. This situation brought about serious structural inequities which hinder the possibility of providing adequate services to the population, unless sanitation services management is incorporated into the planning, management and control of housing policies and of other services (gas, electricity, roads, health care centers, etc).

Lack of trained human resources: The personnel currently working in the sector is not properly trained to carry out their tasks efficiently, though the country has well-trained professionals who, for various reasons (low salaries) have not been attracted to the sector.

Public utilities do not consider that human resources management is essential for their improvement and personnel policies base promotion on years of service rather than on merit or development.

Low efficacy and efficiency levels: Water supply and sanitation services show extremely low efficacy and efficiency levels (50-70% of unsatisfied demand) (deficits of more than 50% over total production costs). The ratio between employees/1000 users ranges from 6 to 20 . D#efaults in payment of water and sanitation services are, in the best of cases, in the order of 20% and sometimes they reach 50% in many public utilities. A clear indicator of this situation is the fact that most public utilities lack users' cadastres or accounting systems that would make it possible to detect these inequities.

The suplies acquisition systems are based on a complicated burocratic model by means of which inputs are charged 200% more than current market prices.

In brief, it can be concluded that public utilities do not exercise control over their costs or revenues and they possess slow and overdimensioned burocratic organizational structures.

Lack of enterpreneurial criteria and values: The fact that public utilities belong to the state, together with all the

drawbacks mentioned above, has provoked a deep crisis in the management of those systems which possess neither the necessary criteria nor the enterpreneurial values to rectify their infefficiency.

The necessary enterpreneurial values are:

1. Concept of "client" with different needs to be served (demand)

2. Concept of reduction in operation costs

3. Concept of continuous service and basic commodity

4. Concept of adequate utilization of sources and funds

5. Concept of measuring technical, economid and financial variables

6. Concept of objectives, goals and evaluation of results

Since the current legal-institutional organization and the existing organizational culture, do not value or accept these concepts, this constitutes a decisive obstacle.

2.5. ECOLOGICAL OBSTACLES

Surface and groundwater pollution: Two-thirds of the argentine territory suffer from water deficits while the rest has excess water. In addition to the spatial inequity in the distribution of surface water, there are temporal irregularities and quality problems. The causes of this deterioration are: discharge of untreated industrial effluents; recycling of drainage waters with high salinity content; pesticide drift; oil spillages and other substances, etc. Groundwater acquifers are contaminated by the filtration of liquids emanating from cesspools or from the decomposition of wastes, by the use of fertilizers and pesticides in agriculture; by reinjection of water used in oil fields; by the discharge of toxic solid wastes, etc.

Natural disasters: In the humid regions of the country there are contingent natural events. Floods affect almost 200,000 km2. Since the floods in the Plata Basin are long-lasting, large tracts of land remain flooded for 3 to 6 months a year, 37% of the population is affected and the water supply system to the poorer sectors is disarticulated (tank truchks).

The areas around the Cordillera de los Andes are subject to

devastating floods and the operation of costly hydroelectric and irrigation works is strongly affected by sedimentation processes. On the other hand, the arid region of the country is subject to desertification processes as a result of inadequate exploitation technologies.

Un-planned urbanization: The distribution of the population in Argentina is highly unbalanced. More than 70% of the 32,39 million inhabitants lives in the Humid Pampas and half of them occupy the Metropolitan Area of Buenos Aires (11,5 million).

Urban environmental problems are acused by extensive, discontinous and low population growth rates, by the occupation of inadequate areas, by the urban concentration in central areas, the non-provision of equipment to the suburbs and the performance of incompatible activities.

These problems not only affect the health of the population but also natural resources: water courses are polluted due to the discharge of untreated industrial or domestic effluents; groundwater acquifers are polluted due to inadequate sewerage disposal systems or wastes filtration; valuable ecosystems are lost due to uncontrolled growths, etc.

III. POSITIVE FORCES LEADING TO THE SUSTAINABLE DEVELOPMENT OF THE SECTOR IN ARGENTINA.

POLITICAL FORCES

3.1.6. State Reform: State reform entails the transfer of those activities that produce large and critical deficits and which do not respond axiologically to any public need. This is one of those erroneous state uncursions in the enterpreneurial field of commodities and services which the market can provide (enterpreneurial State). It does not mean to "reduce" the State to a minimum, but to strengthen it by developing those activities which are within its exlusive competence. In this sense, privatization, concession of services and/or indirect management of public utilities means, in the case of water supply and sanitation sector, the taking up again by the central administration of the control and police power which public utilities previously held.

3.2. Decentralization Processes

Within the State Reform process, we find the strengthening

of the constitutional powers of the local states and the decentralization towards the municipal level of many basic services and the allocation of co-participation funds. Private companies are granted the concession of those municipal services and in this way public participation is ensured through cooperatives, community associations, etc.

3.3. Productive transformation and international reinsertion

Productive transformation entails the abandonment of social unproductive practices and the setting up of clear rules of the game leading to stability and growth.

The Law of Convertibility, passed in April 1990, sets forth that no money is to be emitted unless such emission is based on foreign currency availability. In order to grant economic operators a minimum of credibility the law also determines a par of exchange with the dollar that only the Legislative Power can modify.

The international reinsertion is the reversal of a policy which for a long time kept the country in isolation. In this respect, the position that Argentina has taken on the protection of the environment within the context of cooperation with the international community is one of the priorities of our foreign policy.

3.4. THE ROLE OF NATIONAL AGENCIES CONNECTED TO THE WATER SUPPLY AND SANITATION SECTOR.

Federal Council of Water Supply and Sanitation (COFAPYS)

IN MARCH 1989, the federal agency CONSEJO FEDERAL DE AGUA POTABLE Y SANEAMIENTO (COFAPYS) (Federal Council of Water Supply and Sanitation) was set up with the participation of the State, the Provinces and the Laborer's Federation of Sanitation Works. This agency is devoted to obtaining and using loans within the sector and to promoting training, development and improvement of human resources. As a normalizing agency, it coordinates the interjurisdictional and interinstitutional activities of the sanitation sector. Since this is a highly decentralized sector, the COFAPYS ensures against atomization risks and uses the main economic and financial interests with homogeneous criteria.

As COFAPYS obtains its loans from the Interamerican Development Bank and the International Bank for Reconstruction and Development, technical environmental criteria are applied in a systematic way.

NATIONAL COMMISSION OF ENVIRONMENTAL POLICY

In 1989 the COMISION NACIONAL DE POLITICA AMBIENTAL (CONAPA) (National Commission of Environmental Policy) was set up with the aim of assisting the National Government in the design of an environmental policy. In 1990, the Federal Environmental Agency was established to coordinate and homogeneize related provincial policies.

At present, steps are being taken towards the creation of the Secretariat of Environment and Sustainable Development, at National level.

3.5. Policies of international credit agencies

The policies of international credit agencies give higher priority to operational improvement, increase in efficacy and efficiency, enterpreneurial organization, measurement of consumption, equitable rates than to investments in expansion activities. Al present, these agencies have incorporated the evaluation of environmental effects into any proyect that requires foreign funding.

CULTURAL FORCES

3.6. Increasing environmental concern of the population

Environmental conservation and control has gradually gained the attention and concern of the population. Non-governmental organizations of environmental conservation and promotion have been set up; universities and research institutions are granting priority to this subject and environmental education campaigns are being conducted in various mass communication media.

ECONOMIC FORCES

3.7. Increment private interest in public utilities

Many private enterprises are currently interesed in managing public utilities in many of the main cities of the country, after goverment a no un ced the transformation and desregulation of the economy.

IV. CONCLUSION

Although Argentine does not have irreversible natural problems faces a highly complex social processes.
To make the development of the sanitation sector sustainable

it is necesary a strong strategy concerning administrative transformation and enterpreneurial criteria and valves.
There is a vicious circle between low efficacy and efficiency levels and closed monopolistic and burocratic system.
That vicious circle constrains investment funding and technological research, and does not attract trained human resources. International cooperation will stimulate the adoption of more harmonious policies, strategies and programes.

"BUILDING ON WHAT IS THERE"

HUMAN RESOURCES DEVELOPMENT

by

Siri Melchior-Tellier
Programme Manager
PROWWESS/UNDP

Collaborative Council Global Forum
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"BUILDING ON WHAT IS THERE"

HUMAN RESOURCES DEVELOPMENT

Introduction

Colleagues and Friends, Ladies and Gentlemen, let me begin by saying how very pleased I am to be here to share in the work on human resources development. Human Resources Development, or HRD, is critical to the sustainability we all talk about so often, and yet in the past it has received too little attention, or at least too little strategic attention.

It is particularly appropriate that we have had another key-note speech on natural resources - HRD is critical to the sustainability of natural resources, but equally, natural resources are critical to the sustainability of human resources. The structure of this meeting allows us to keep this interplay always clearly in sight.

Defining the field

One of my colleague-friends once said: "I am an engineer, I want answers, not questions". We are looking for answers. However, I believe we should still begin by asking some questions, and in particular opening up some questions about definitions.

First of all, what is HRD?

In Denmark, which is where I am from, people often define things by what they are not, so let me give a Danish definition: HRD is not, or not only, training of engineers (OVERHEAD) - that is only one component.

Coming from the opposite extreme, or the top of the overhead, let us establish that HRD is only one component of that which we call human development. There is a lot of discussion these days about this rather radical concept, "human development. As a reference, one way to look at this is to say that human development is composed of:

- human resources development, (that is obvious)
- biological and maturational development, (that should also be obvious)
- spiritual and cultural development, (perhaps less obvious)

HRD in turn is defined as:

> "development of the 'contributory' capacity of human beings - policies and activities that promote, nurture and sustain individual capabilities so that they can contribute to their own and others' social and economic well-being".

Not everyone may agree with these definitions, why should they? But they happen to be the ones presently under discussion in UNDP.

Let us look at several dimensions of HRD.

The first dimension relates to the term "capacity building", which is also the topic of one of our working groups. Last May, an international symposium in Delft stressed the importance of looking at capacity building in the widest sense, and specifically identified three mutually dependent components:

- training
- institutions
- policies

Thus, training a person will be useless unless that person can later usefully apply the acquired skills within a favourable institutional and policy environment.

The second dimension relates to the levels of the persons concerned. Who are these humans whose resources have to be developed? (OVERHEAD):

- individuals (children, women, men)
- households
- communities
- extension workers
- field management staff
- headquarters administrators
- policy makers
- general public

A clear role can be defined for each; each has sufficient or insufficient capacity to play that role. Let us take the example of a repairman in a slum of Kingston, Jamaica. He did a great amount of business, and someone asked him how on earth he kept track of all these transactions, since he couldn't read, write or count. He showed the back of his door, where he had put little markers, which he moved around. "But what if someone denied owing you money and took you to court? How would you prove they owed you money?" "Then I will just bring my door", he said.

Clearly, financial skills are needed at each level. Clearly this man found a creative solution which pleased him. Equally clearly, many have not.

A third dimension refers to the kinds of disciplines which are involved. We may consider at least the following (OVERHEAD):

- engineers/technicians
- sociologists/anthropologists/social workers
- economists
- health professionals

A related, fourth dimension refers to linkages. We all know that community members have always seen linkages to other fields. They do not see water in isolation, but rather as something with multiple preconditions and multiple purposes. Ironically, one of the few linkages they often see rather dimly is that between water and sanitation. The villagers' view is finally being heard. Thus, the New Delhi Statement repeatedly refers to the need for institutional linkages and integrated approaches.

In fact, the water and sanitation sector is not alone in this. Take for example health. In the 1950's and '60s the emphasis was on individual diseases and the technology needed to control them. An emphasis on the larger issue of health began to emerge in the '70s, and the Alma Ata Conference in 1978 went further, defining components of Primary Health Care beyond the immediate medical sphere, e.g. water and sanitation and food. In recent health statements I repeatedly see the phrase: "Forging new alliances" for the future - emphasizing for example communications, or agriculture.

A fifth dimension relates to the type of training. Let me merely say that the type of thing we may need is not necessarily the kind of thing we classically have had. To take an example, let us mention civic-mindedness, motivation, an attitude of conservation. Let me also emphasize that, as the world becomes more and more interrelated, this does not only refer to people in developing countries.

Surely there are other dimensions to HRD, but this is enough to begin. One of the challenges is to develop a common vision out of all these components. At present, we have a confusion of visions, and let me give a few examples.

I asked the project engineer in one country about health education. He definitively said that that was impossible for the project to do - change in attitudes would take too long and it was in any case the job of the schools. I asked the person in charge of community participation, and she said indignantly: "Oh, those engineers. Of course, we are doing health education, of course it is important".

Another example. A project manager in Nigeria wanted to know how his extension workers perceived the water cycle. Since men and women extension workers did not want to speak up in the same group, they were separated. (SLIDE) This is a picture the women's group drew. You can see how the woman goes to fetch water in the stream, then puts it in the storage drum, then she takes it out to wash clothes, and some of it runs off to the river or evaporates.

The men's group drew something completely different. There were lots of pumps, and no women.

These are not intended as examples of someone being right or wrong. They are simply demonstrations that we may be wasting resources if we are not developing a little of a common vision, with the different existing components pulling in the same direction, as they say in Kenya, Harambe - pulling together.

Thus, I think one issue for the working groups is to come to a common understanding of what HRD is, its goals and scope.

Some ways and means

Now we have a framework as an input into definitions. Next, I should like to go on to some concrete examples of what we could consider some ways and means to make it more concrete.

Let us start with numbers. There is often an attitude that HRD requires massive hiring of people, at great cost, and heavy training programmes. If one uses the definitions I have thrown open, there may be an additional problem of thinking that we do not even know whom to train, how.

Here is one example, of how one project approached the question. It is a rural latrine construction programme in Lesotho.

It started with a government stipulation that, due to financial stringencies, beneficiaries would need to carry the cost of construction of latrines. We all know that total beneficiary payment for rural latrines is not an easy task.

Let us examine the field process in some detail. The project was a joint effort between the Ministries of Interior and Health. Existing extension workers from each were trained for a few weeks. They received in-depth training in their own field, whether in construction techniques, or with respect to health education and participatory techniques. They also received joint training, so they would be able to answer at least simple questions from community members. Some training sessions, were with workers from other ministries, for example some who dealt with water or agriculture. This helped address the problem "what to do if the community members do not really want latrines" - they could be referred to the other extension workers.

The extension workers began working as a team. In Lesotho, there are volunteer village health workers in every village. The extension workers would give these village volunteers a three day-course, particularly on health education and participatory techniques. Together they would convene "pitsos", which are traditional community meetings. Since women did not speak up in large meetings, they encouraged small working groups. Where a village accepted to participate, people were asked if they wanted to be local latrine builders. An average of two per village were trained for two weeks, not only in construction techniques, but also self-promotion and management. 25% of builders were women. As part of the training, these builders would build four demonstration latrines. Meanwhile, the extension workers and village health workers would help to get at least one contract for the builders to build a latrine.

Soon, university students also got involved, staging theatre socio-dramas, and in local schools the children were drawn in, mapping health problems etc.

To recapitulate, let us look at numbers again (OVERHEAD). Clearly, in this case there was hardly any additional paid staff. Clearly, resources were used on training, but it was quite limited and very directed.

So that refers to numbers. Now let us look at a second point, related to quality. What do we know about which approaches work, and which do not?

To even attempt an answer, we may for a moment have to pause, and focus on what it is that we are trying to achieve, what is it that we want to work. What would constitute success?

We are after HRD for Sustainability, if I remember correctly. What are our planning, monitoring and evaluation criteria?

In the Lesotho example above, one clear result was in the number of latrines built - after a slow start-up, the goal of 600 latrines was overshot by 50% for the pilot phase, and the programme has become national. Definitely, by all reports there is no question that by now an amazing number of latrines have been built, at a cost of about 150$ each, totally paid by beneficiaries.

An equally clear result has been qualitative reports that attendance at the pitsos, the community meetings, was much improved in numbers, and interest shown by participants. The village health workers, already respected, reported highly increased job satisfaction, having a new specific task for which they were well prepared.

One of the issues faced in monitoring was that extension workers originally saw themselves as achieving success primarily by the number of latrines built. They did not count the number of hands washed, the numbers of decisions made by pitsos, let alone the enthusiasm of any of the actors. Clearly, none of these criteria could be expected to be in the five-year plan. However, Lesotho, these criteria slowly became explicit, as part of the way the project worked.

This is not romanticism. At any of the levels and dimensions I mentioned above, one may find people who lie, cheat and murder, and are generally ill-informed and greedy. However, you may equally, or more, find people who have a profound desire to contribute, a sense of altruism even in the face of destitution, and a great desire to be respected and liked by their associates. I have seen programme after programme which was able to build upon that strength, in very down-to-earth ways, such as Lesotho.

So the issue here is, can we identify and reflect these other ways of measuring success, for the sector in general?

Having looked at some of the ways to measure success, what do we know about what works and what does not, even in the absence of clear criteria?

In general, the answer is - not enough.

It would be essential to know, for example, more about which kind of services need what level of community participation, whether pro rata tariffs affect the quantity of water consumed, what influences elasticity of demand, whether a single agency is in fact able to handle sustainable water and sanitation projects, whether the "State as enabler rather that provider" will have any effect on investments etc.

It would also be essential to know more about how to build on existing strengths - people, knowledge and institutions. People have lived in balance with their natural resources for a very long time. We all know the many cases where new technology fails to build on that, or even disturbs that balance.

Finding this out does not necessarily require sophisticated research - sometimes it is deceptively simple. Certainly it does not all need to be sent to Headquarters. If the feedback loop is short enough, it not only increases use, but actually serves to strengthen quality of work and confidence of programme staff.

This is not to say that we know nothing. We know quite a bit, but do not apply it systematically.

For example, we know that sending large numbers of people abroad to train in engineering is not always cost-effective - what they learn may not be applicable at home. This may be a case of wasted training.

We know that the classical approach often seeks to train as homogeneous a group as possible. However, the opposite can be useful. (SLIDE). This is a picture from Mali. There is a religious leader, a soldier and community members discussing garbage collection and sanitation. The purpose of the meeting is not primarily to impart technical knowledge, but also trying to understand and determine finding each person's role, finding common solutions, fostering civic-mindedness.

We might say we have learned you can codify such participation. I have brought a manual to share with you - "Tools for Community Participation" - which shows some ways of doing that. We have also learned that this can be done in explicitly non-political ways.

We know that policies can be made to support and complement field action. In the example above from Lesotho, the fact that government made an official policy of cost recovery was essential. In an example from Bolivia, a national seminar determined both handpump technology and community and women's roles, this provided the framework to make future action more efficient.

Finally, we also know that an aggregate of experience probably will not allow us to have a blue-print for local action.

So to conclude this discussion of practical approaches, before going on to some particularly thorny issues, we can say:

> We need to look at HRD in a strategic way. To do it in a piece-meal fashion is as wasteful as installing a tap in a house without a pipe connection. Done in a strategic way, we may find we have more resources than we thought.

Special Issues

Now I should like to bring up a few special issues. I do so with some trepidation, because I consider them rather thorny, and what I have to say may easily backfire. Let us look anyway.

Let me start with three issues which are often spoken of in the same breath, sometimes to the point of seeming indistinguishable: Community management, women's involvement, and Non-Governmental organizations, or NGOs.

First, community management. In the words of the New Delhi Statement: " Community Management goes beyond simple participation. It aims to empower and equip communities to own and control their own systems."

We know community management can be highly successful, releasing enormous amounts of resources and energy. This has been proven again and again; I am continuously struck by how many examples there are, and how many commonalities you can find amongst them.

However, the skills that are needed for communities to "own and control their own systems" are not always explicitly stated. When a women goes to the river to fill her bucket, she does not have to ask anyone, but when you install a handpump for 250 people, the simple fact of hauling water all of a sudden becomes a part of the public domain. Does this not require new skills?

Clearly, the whole question of finance has not been sifted through. I mentioned the case of the man with the door - financial management skills are important. Furthermore, the community may need help before and after - to help raise the money necessary, and to use the water for best economic results. This is critical for financial sustainability.

The most thorny question related to community participation, in my opinion, is that, successful as you may be with a small project, if you are looking for sustainability and replicability, it becomes increasingly dependent on administrative and political realities. This is not a revelation - the same is said repeatedly in the New Delhi Statement. But how do we break this vicious circle?

The next thorny issue is that of women. The challenge as often stated is: how do we "involve" women? How do we "mainstream" their involvement?

I am afraid this is jargon, and as is often the case with jargon, we may have stopped trying to find out what we really mean. I shall not attempt a definition,except in the Danish manner: It would be a caricature to use the body count approach: "No project is good, unless women are fixing the pumps", Mainstreaming does not simply mean that women have to do what men were doing before.

Another example. In a project in Sudan, we worked with an integrated rural development project which included water. Our special task, of course, was to see how women could be meaningfully involved. The first thing the women asked for was a meeting house. As could be expected, project management was very skeptical - could they not use existing buildings, borrowing a room in the headman's house for example? But the women were adamant that they needed their own room, and they got it. Then they began discussing what they needed, and came up with lessons in literacy, dressmaking, vegetable gardening, canning of vegetables etc. They proceeded to sell their products. In the end they never learned how to take care of pumps, because they used the money they had earned to pay men caretakers.

By the way, all of the above happened with the full involvement and support of men, who liked the project very much because their wives also took cooking lessons.

Roles of women have become cemented. By now, many seem to think that health education is women's role, exclusively. There are some exceptions - for example UNICEF's "Facts for Life" booklet specifically is addressed to both men and women.

On the other hand, the Delhi Statement repeatedly refers to the importance of women, not only at community level, but also at managerial levels.

Clearly, if women produce 80% of the food in Africa, then they are in some ways "integrated". Equally clearly, they face pervasive constraints and lack of access to the resources they need. Casting their role in cement may further marginalize them. As a NORAD report says: the challenge is to help women make use of their scarce resources, and at the same time working on some of the more structural issues. We must look at the situation in each case, strengthen ways for women to determine and express their needs, and then if necessary change project design. In other words, the issue may be one of diverting the stream, rather than mainstreaming.

aorny issue: NGOs. Let us not underestimate them - we have all engths of at least some NGOs - their flexibility, their ability egrated projects, their commitment, imagination, and close the communities they serve.

r hand, not all NGOs have these advantages. Some of them have which is not related to community priorities. Furthermore, if eived strengths is that they listen to the communities they p take care that fitting them within a fixed programme may trength. A few NGOs have been able to find a good balance. I ne governments concerned, and think we should learn from that.

know that NGOs have weaknesses. They often have a very al base. They may have flexible management, but newly placed the little management strength they have.

d to count all the invisible NGOs, or at least integrate the ed organisations (CBOs) into our discussions. For example, in we collaborated with UNICEF in Sri Lanka, the first job was to of such institutions, and only those where a majority of . The survey team found one in most communities. Many such not registered, for example mothers' clubs or women's credit

rds, we cannot just push away the issue of interface with the ting it on the shoulders of the NGO.

ny three thorny issues, concerning community management, women et me turn to one which may be less thorny, but which in my lly underestimated. The issue is children.

n talking of individuals - children, women, men.. Children 40% of individuals. They appear in all the casualty statistics from diarrhoea each year.

n are not only victims, they are also a tremendous resource. another slide from Mali. This is a school latrinization 00 children in this school had no functioning latrines. We for example here they are making stories surrounding some ory they told me was about a young boy who has diarrhoea, and go, finally pressures a neighbour into letting him use her uently, he starts action through parents and teachers, and problems with vandalism, irritation of the parents about paying s etc. The stories were used in the design of the project. They ed by traditional theatre and singers. In addition to that, dren have established norms for cleanliness of the latrines, and or this.

ildren are not only victims, they are actors, in the present. are taking on a new role. The future is coming closer. Now, fore, the future belongs to the children, and what a future it them. In the projects I have seen, as well as in my own lren are willing and able to think about all of this, and to nts. Let us not ignore or misuse this precious resource. Let erience how to involve them.

Conclusion

In conclusion, I once read that we should not be unrealistic- one could not do all this HRD, community management etc. without staff, time and money. And unfortunately, well, staff, time and money were not there.

That is not good enough.

We have to make staff time and money available.

Clearly, extrapolating from the past, merely multiplying approaches which we have no assurance will work, will not solve the problem. However, we can build on what is there, and stretch those resources with strategic planning. We may need less staff, time and money than we thought.

We are all doing HRD, the Collaborative Council itself is an exercise in HRD, building a common vision. I hope and trust we can take a step toward this in the working groups, toward a strategic planning that will operationalize the ideas set forth in the New Delhi Statement.

WATER SUPPLY AND SANITATION COLLABORATIVE COUNCIL GLOBAL FORUM

Oslo, Norway, 18-20 September 1991

URBANIZATION: WATER SUPPLY AND SANITATION SECTOR CHALLENGES

Key-note paper

Prepared by
United Nations Centre for Human Settlements (Habitat)
Nairobi, September 1991

INTRODUCTION

Urbanization, which has led to an over four-fold increase in city populations over the last 40 years, is perhaps the single most important socio-economic transformation that developing countries have experienced in recent years. This massive shift in population is not just a demographic phenomenon but corresponds to a fundamental economic transformation as a consequence of which cities have become the main catalysts of economic growth. Rapid urban growth has, however, outstripped the capacity of urban authorities to provide and maintain, amongst others things, water supply and sanitation services. The result is a lowering of the quality of urban life, an increased threat to human health and the pollution of available water resources. The impacts of these deficiencies are greatest on the urban poor. Responding adequately to the demands created by urbanization, the force of which is far from spent, presents, during the current decade, the most pressing challenge to water supply and sanitation sector professionals, governments and external support agencies alike.

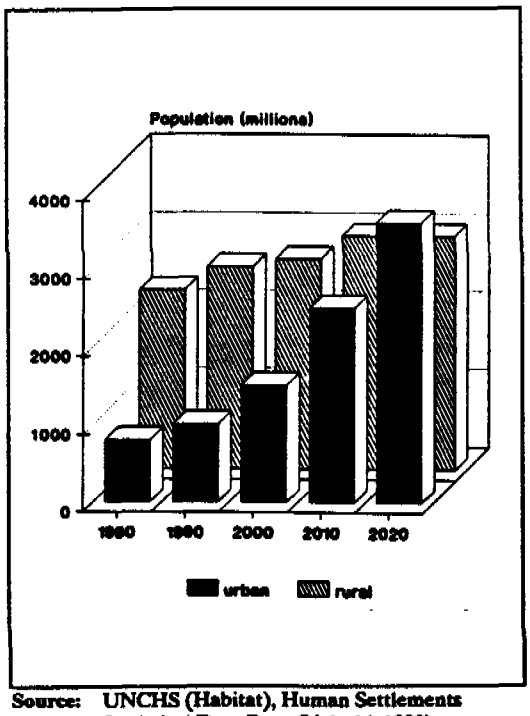
The international community gave emphasis and priority, at the start of the International Drinking Water Supply and Sanitation Decade (1981-1990), to serving rural areas: in percentage terms, three times as many urban residents as rural residents had access to safe water and five times as many had access to sanitation. Consequently, while much headway was made during the Decade in providing basic services, especially water supply, to rural communities, little has been done to meet the needs of the urban poor. These gross statistics hid the fact that water supply and sanitation service coverage in urban low- income communities was typically no better than that in rural areas. In many cases, they are now much worse. However, the consequences of deficiencies in safe water-supply and sanitation facilities for health and the environment are far more critical in densely-populated urban areas. Urgent action is required to reverse current trends in the increasing numbers of unserved urban poor.

This paper argues that due to a variety of reasons, including a lack of appreciation of the inextricable link between urban growth and national development, investments in the water- supply and sanitation sector have been unduly biased against, or have excluded, the provision of adequate services to the urban poor. The paper stresses that the provision of water-supply and sanitation services in low-income urban communities is both a health and an environmental priority and that it is precisely in these communities that demand for basic services is greatest. The paper attempts to clear some of the prevailing misconceptions on urban growth and on the ability of poor urban communities to pay for essential services and improve their living and neighbourhood conditions. Principal constraints to expanding urban service coverage are reviewed and future approaches to overcoming them suggested.

URBAN GROWTH TRENDS

Urban growth in developing countries is proceeding rapidly (see figure 1). This urban population which currently stands at 1,350 million, is expected to grow by nearly half as much and reach 2 billion by the end of this decade. By the year 2000, approximately 40 per cent of the population in developing countries will be living in urban areas. By the year 2015, half the developing world's population will live in urban areas. Beyond this point, it is anticipated that rural populations will stabilize and all further population growth will be concentrated in urban areas.

Figure 1. Population growth in developing countries



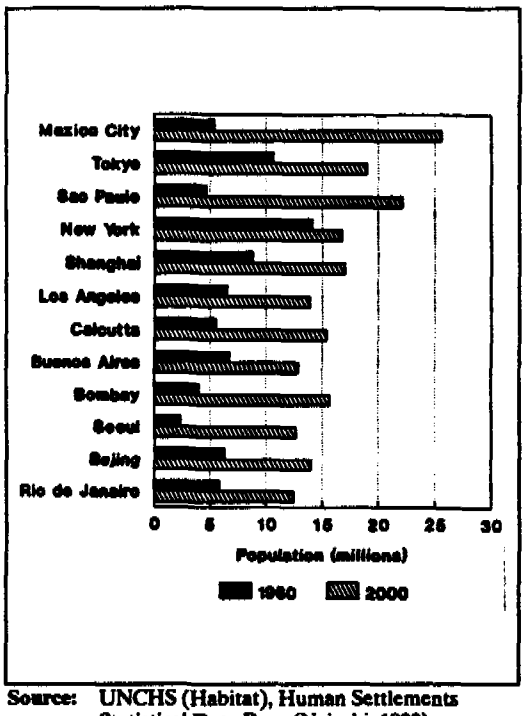
Source: UNCHS (Habitat), Human Settlements Statistical Data Base (Nairobi, 1990).

The least urbanized continent, Africa, will experience the highest urban growth rate: projected to average 4.8 per cent up to the year 2000. The urban population in many African countries such as Benin, Botswana, Kenya, Mozambique and Senegal are growing at annual rates of over 8 per cent and as much as 3 times as fast as their rural populations.

Because of its high level of urbanization, Latin America's urban population will grow by only about 1.5 per cent a year for the rest of the century. Absolute growth will be greatest in Asia, where cities will gain another 330 million people during this period. Today, natural increase rather than rural-urban migration constitutes the major source (approximately two thirds) of urban population growth in all but, perhaps, the African continent.

Accompanying the increase in urban populations of developing countries is the parallel increase in both the number and size-category of cities (see figure 2). In 1960, just three of the world's 10 largest urban agglomerations were in the developing world, and only one, Shanghai had more than 10 million people. By 2000, 18 of the 22 cities with a population of more than 10 million people will be in developing countries. The number of cities with populations over 4 million in developing countries are expected to increase from 22 in 1980 to 50 in 2000 and, then more than double to 114 by 2025. Today, over half the urban population in developing countries is concentrated in some 360 cities of over half a million inhabitants.

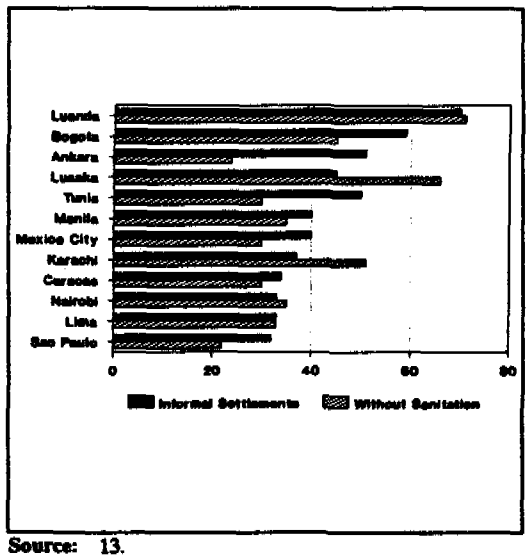
Figure 2. Growth of the world's largest agglomerations



Source: UNCHS (Habitat), Human Settlements Statistical Data Base (Nairobi, 1990).

Much of the increase in urban population will be accommodated in slum tenements and squatter communities - the so- called "informal" settlements. On average, for every new house built in compliance with formal regulations, four are built informally, with no title to the land occupied or infringing on building and land-use regulations and standards. In some least developed countries, the urban formal to informal housing ratio is as much as 1 in 10. Between 30 and 60 per cent of urban populations of developing countries are at present accommodated in informal settlements (see figure 3). While cities in developing countries are growing at an average rate of 3.6 per cent per year, some of the informal settlements within them are growing at between 1.5 and 2.0 times this rate. This means that the populations living in informal settlements are doubling every 10 to 15 years. A densification of the already crowded low- income settlements and the continued expansion of illegal settlements around the periphery of cities are, therefore, inevitable consequences of this population increase. Having tried a range of socio-economic policies, governments in most developing countries are increasingly recognizing the difficulty, or impossibility, of reversing urbanization, or even slowing its growth.[1] From an economic perspective, it is now recognized that retarding urban growth is also to accept a retardation of economic growth.

Figure 3. Urban population in informal settlements and those without sanitation (in per cent)



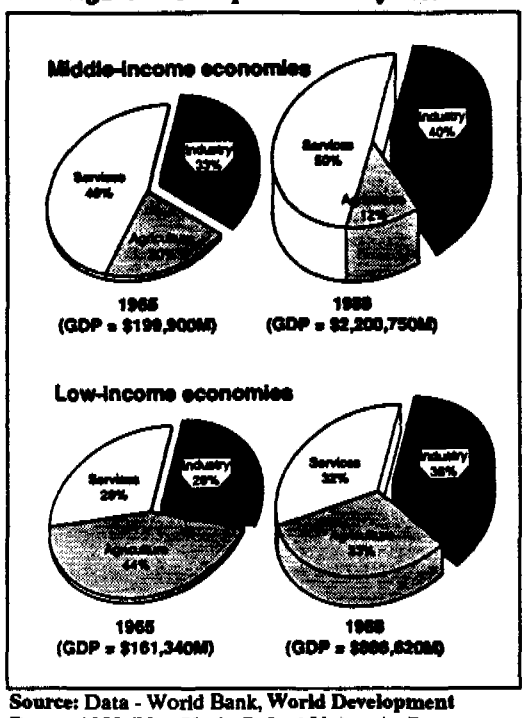
Source: 13.

ECONOMIC SIGNIFICANCE OF URBAN CENTRES

Urbanization and economic growth are mutually reinforcing and are dominant features of national economic development. Cities produce jobs and economic activity enabled by economies of scale and the development of large markets for goods and services. Just about every country has demonstrated the progressively rising proportion of GDP provided

by industrial output and services concentrated in urban areas in recent decades (see figure 4).

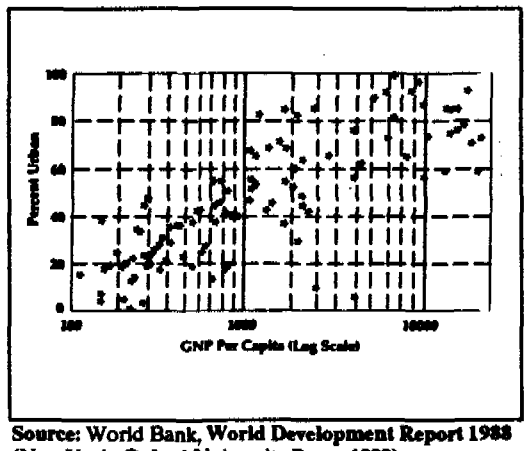
Figure 4. GDP production by sector



Source: Data - World Bank, **World Development Report 1988** (New York, Oxford University Press, 1988); analysis - UNCHS (Habitat).

By 1989 more than 60 per cent of GDP in most developing countries was generated in cities and towns, although they only accommodated a third of the total national populations. As much as three quarters of national taxes are also generated in urban centres. An estimated 80 per cent of future national economic growth is expected to come from urban economies. In addition, higher aggregate and per capita incomes are found in more urbanized countries (see figure 5). With so much of developing countries' output depending on the efficiency

Figure 5. Urbanization and development



Source: World Bank, **World Development Report 1988** (New York, Oxford University Press, 1988).

of urban centres, the provision of basic services to all populations is an investment priority. Many of those who are currently unserved live in informal settlements and provide the bulk of the labour force for industry and the informal sector. The contribution that the informal sector makes to the urban economy is increasingly recognized. In Africa, it is estimated that about 20 per cent of total outputs is produced through the informal sector which also absorbs over 20 per cent of the total labour force. Contrary to many early assertions, the urban poor make significant contributions to urban economies.

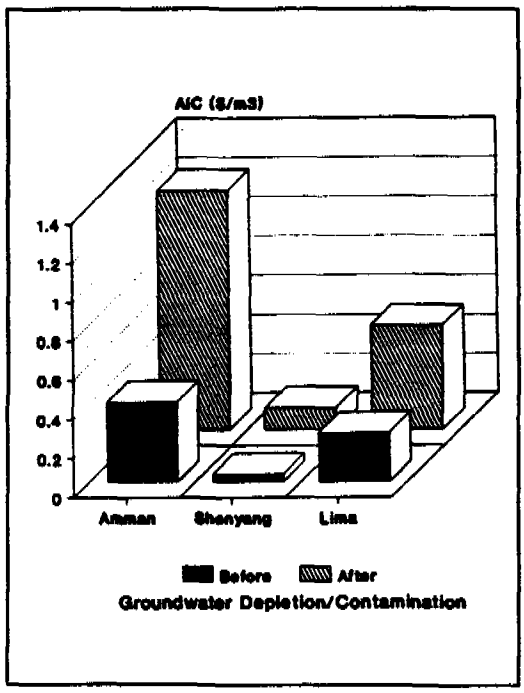
THE URBAN ENVIRONMENT

While urban areas make major contributions to the outputs, employment and incomes of developing countries, rapid growth of populations without basic services and uncontrolled industrial development are seriously degrading urban environments, placing enormous strains on the natural-resource base and undermining efficient and equitable development essential for sustained economic growth. The principal environmental impacts of relevance to the scope of this paper are the rapid depletion and contamination of available freshwater resources due to over- exploitation and pollution by wastes. Unlicensed abstraction of groundwater from deep wells in parts of eastern Bangkok, for example, are mainly to blame for continuing ground subsidence at rates up to 5 cm a year. Over half the rivers sampled in Central and South America had faecal coliform counts in excess of 1000 per 100 millilitres.[2] Pollution of the Haungpu River around Shanghai, the city's principal drinking-water source, has caused the water-transmission main to be moved 40 kilometres upstream at a cost of $US450 million. In, Lima, Peru upstream pollution has increased treatment costs by 30 per cent.[3] The rivers passing through many major cities have become open sewers devoid of aquatic life and urban water bodies and contiguous coastal waters heavily eutrified.

The results of resource depletion and contamination are the increasing price of water (see figure 6), as authorities are obliged to go further afield to more remote sources, and the loss of amenity. These impacts translate into reduced urban productivity, increased cost of manufacturing, reduced quality of life, the increased burden of health care and lowered labour productivity. The cost of cleaning-up can, in addition, prove exhorbitant: in China, for example, an estimated annual investment of 5 per cent of GNP is said to be required to

arrest and retain environmental degradation at current quality levels.[4]

Figure 6. Rising cost of urban water supply



Box 1. Pollution in Metropolitan Manila

A study of environmental problems in Metro Manila found urban pollution to originate from the following sources in order of priority and assigned relative *importance score (RIS) totalling* 100.

Solid-waste pollution (RIS = 53.4): 600 tons of a total of 4000 tons of solid wastes are left uncollected on streets or dumped in stormwater drains or other wateways each day.

Flooding (RIS = 51.7): Each year approximately 7 per cent of the total land area becomes flooded affecting 23 per cent of the population, mainly low-income communities. An estimated $US36 million in annual flood damage is inflicted.

Slum and squatter areas (RIS = 51.7): The accommodation of approximately 38 per cent of the population in informal settlements often along and within waterways with few basic services causes water pollution, flooding and river-bank erosion with local and spillover effects.

Water pollution (RIS = 51.0): the direct discharge of domestic and industrial wastes into all major rivers and watercourses is responsible for approximately 70 and 30 per cent, respectively of the organic pollutant load which has made the waters odorous and biologically dead. BOD levels in some waters reach as much as 500 mg/l. Manila Bay, into which the rivers flow, has shown a ten-fold increase in faecal coliform counts during the last five years.

The remaining environmental problems are due to air pollution (RIS = 39.9); hazardous wastes (RIS = 36.5); ecosystem degradation (RIS = 34.4); and noise pollution (RIS = 28.1).

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Source: Asian Development Bank, "Manila Metropolitan Region Environmental Improvement Study," Report T.A. No. 1057-PHI, Manila, April 1990)

Most of the major environmental pollution problems are in one way or another interrelated, and have their origin, to a large extent, in the absence of basic services and location of informal settlements (see box 1). Trying to address and solve one problem, may prove futile unless another separate, but related, problem or cause is likewise resolved. Since informal settlements are the areas lacking sanitation and solid-waste- collection services and are frequently located on low-lying land and along waterways, they are a major contributor to overall urban environmental and health problems. Protecting the health of the urban poor through the provision of basic services is, therefore, both a health and an environmental priority for the urban community as a whole.

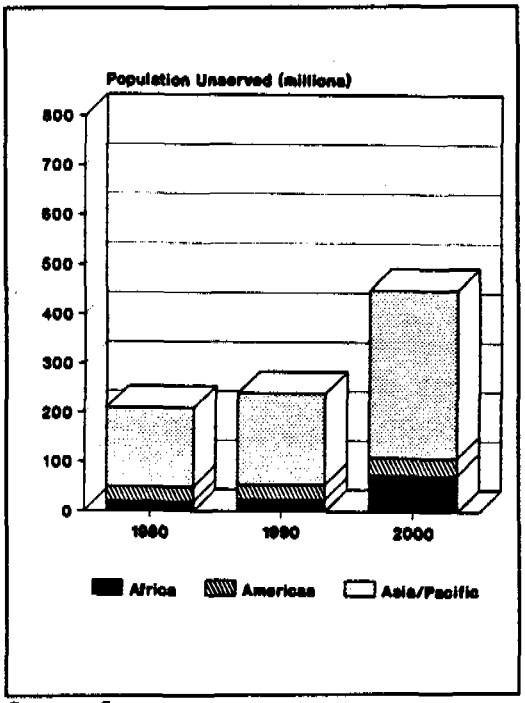
URBAN SERVICE COVERAGE

Water supply and sanitation

An outstanding achievement of the International Drinking Water Supply and Sanitation Decade was the fact that 1348 million people obtained access to water supplies and 748 million to sanitation services. Most of these gains were in rural areas which saw a substantial reduction in the numbers of those unserved. In urban areas, however, gains in service coverage were barely sufficient to keep pace with population growth. In fact, the urban populations unserved with water supply grew by some 31 million and those without sanitation grew by 85 million from 292 to 377 million during the Decade.[5] While present day programmes and investment patterns are assured to consolidate and maintain the momentum of increasing rural water supply and, to a lesser extent, sanitation coverage, the converse is true for urban areas.

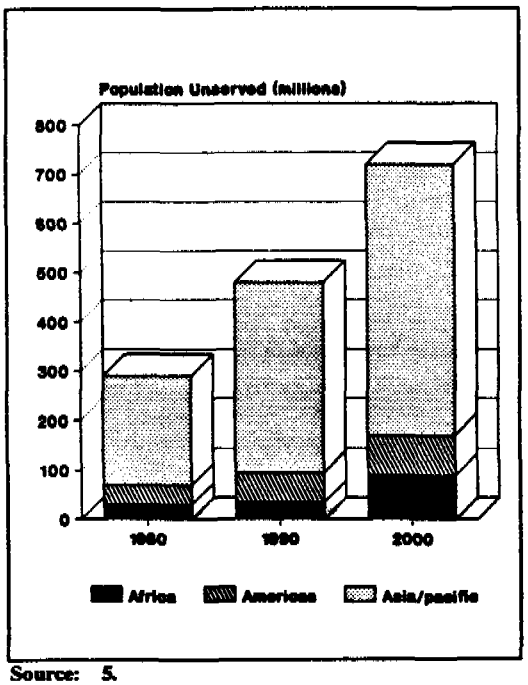
During the 1980s investments in urban infrastructure saw marked downturns in many urban centres of developing countries: In Dar es Salaam the per capita spending on urban services fell 11 per cent a year and in Nairobi the capital spending on water and sewerage fell from $28 per capita in 1981 to $2.50 in 1987 and maintenance spending from $7.30 to $2.30, an average annual decline of 28 per cent in capital and maintenance spending. Even where cities increased investments in urban basic services, few had programmes focused on improving the services for the urban poor. If present-day investment patterns continue, as much as 200 to 250 million people will be added to the numbers of urban unserved populations during the course of the present decade (see figures 7 and 8). The 625 million urban dwellers who will lack access to sanitation services will discharge some 1,350,000 tons of

Figure 7. Urban water supply



Source: 5.

Figure 8. Urban sanitation



Source: 5.

human human excreta in and around urban agglomerations each day. The scenarios for the numbers unserved beyond this century compound exponentially and could reach a billion by the year 2010. The rate of increase of the unserved populations will be most marked in Africa. The majority of urban residents without access to water supply and sanitation are concentrated in urban informal settlements. In fact, at present there is a close positive correlation between the number of those living in urban informal settlements and those without access to sanitation (see figure 3).

Solid-waste management

At best, developing-country cities collect 70 per cent of solid wastes generated each day while, at the other extreme, in low-income countries as little as 30 per cent is collected. Landfill remains the most common form of disposal and most, if not all, such landfills are run as open dumps with sanitary landfills being the exception rather than the rule. Most of those without access to solid-waste service live in low-income informal settlements. The combination of large numbers of people without access to solid-waste disposal and the poor control currently exercised over the disposal of the solid wastes collected is responsible for an increasing proportion of urban environmental degradation and, in particular, the pollution of urban water resources. Poor stormwater drainage is another factor which acts to compound the problem. Once again, it is the informal settlements which are often located on poorly-drained land that are most affected. The rapid increase in the spread of urban vector-borne diseases, such as filariasis, is closely associated with inadequate drainage.

Service needs

Initial responses by both governments and donors to urbanization were to take every conceivable measure to prevent or retard urban growth. This included a deliberate decision not to provide services to informal settlements in the belief that this would dissuade further urban in-migration. A wide range of policy instruments aimed at retarding urban growth has been tried frequently and failed consistently.[1] It is only recently that governments have begun to appreciate the close relationship between urbanization and national economic development and are beginning to take measures to address the adverse environmental and social impacts of urban growth. Such efforts are, however, still fragmented and inadequate to meet the scale of need. The single most important impact of rapid urban growth is the growth of unhealthy, unserviced informal settlements. The provision of essential basic services to these settlements, previously denied access to formal services, remains the first priority for a variety of reasons, including:

- An increasing body of literature indicates that the urban poor are susceptible to heavier burdens of a wider range of diseases, especially water- and waste-related diseases, than not only their urban counterparts but also the rural poor (see box 2).

Box 2. Health conditions of the urban poor

Nairobi, Kenya: In the informal settlement of Kibera, prevalence of parasitic worm infection is 40 per cent as compared to none in high-income settlements.

Kabul, Afganistan: Infant mortality in the old city slum is 1.5 times higher than the rest of the city.

Port au Prince, Haiti: In urban slums the infant mortality rate is almost three times that in rural areas.

Soweto, South Africa: The prevalence of roundworm (ascaris) infection among hostel dwellers in Dube was seven times that in rural areas. The incidence of tuberculosis in Soweto was more than a hundred-fold that among high-income communities.

Singapore: The prevalence of hookworm, roundworm and whipworm among squatters was more than double that found among flat dwellers.

Sao Paulo, Brazil: Infant mortality from enteritis, diarrhoea and pneumonia in the city's peripheral squatter settlements was twice as high as that in the city core.

Kuala Lumpur, Malaysia: Prevalence and intensity of roundwarm and whipworm infections among slum children were twice that among rural plantation children.

Secondary source: 6

- Demand for water-supply and sanitation services are great among informal-settlement residents. This demand stems from the need to pay less for these services and for privacy within densely-populated settlements.

- The spill-over environmental and health problems, which have their origin in poorly-serviced, urban informal settlements could have a considerable negative impact on national economic development: low-income settlements in Lima, for example, which served as the epicentre of the recent cholera epidemic that spread with little regard to local and national frontiers, cost an estimated $460 million in exports and tourism. For the equivalent amount, each of the million or so households in Lima could have been provided a high level of in-house water-supply and sanitation system. This demonstrates the false savings in limiting capital investments in basic services.

- Recent studies of fertility behaviour in the context of development have shown a widening in urban to rural fertility owing to rapid declines in urban fertility.[7] Several factors are thought to be responsible for this phenomenon but the overall effect is a far-reaching reduction in overall national population growth rates. Paradoxically, urbanization might be the most powerful long-term factor of spontaneous decrease in overall population growth rates.[8]

- The urbanization of poverty is a phenomenon increasingly noted in all developing regions. It is estimated that, globally, over 1 billion people live below the poverty line.[9] Between 1970 and 1985 the percentage increase of the world's rural poor averaged 11 per cent while that of the urban poor averaged 73 per cent.[8] In many countries, poverty has already become a predominantly urban problem.

- Urban growth, with its high densities, may also lead to a more efficient use of limited land areas with its beneficial effect in terms of the environmental conservation of over- exploited rural lands. The remittance of urban-derived earnings is known to have helped lift some of the poorest rural households out of the lowest income class and contributed to rural development.[9]

While decentralization policies and the promotion of secondary cities are clear strategies for defusing some of the urban-growth trends, such policies can make their effects felt only if sustained over prolonged periods of time and only as a result of massive investments capable of creating real alternatives to the agglomeration economies present in the largest cities. Therefore, in the light of the above trends, the unavoidable option is to prepare for the future scenario and take anticipatory action to avoid the adverse impacts on the quality of life and the urban environment. The provision of basic urban services to all populations through strengthened local institutions, improved urban water and land management and municipal finance and increased investments in waste treatment and disposal remains the priority for a better urban environment. Corresponding changes in donor and national and local government policies are, therefore, called for if the impending urban environmental and social crisis is to be avoided.

POOR MISCONCEPTIONS

Governments and donors have, in the past, pursued an unstated policy of refraining from actively promoting the provision of basic services to the urban poor. Even when some response was provided, it often failed to reach the target populations. Unfounded perceptions of the problems of the urban poor were often at the root of past inaction.

- It was thought that the provision of services to the urban poor would encourage rural-urban migration and the provision of services to rural areas would retain populations in rural areas. Recent findings question this wisdom: the probability of a person, who had access to schooling, leaving his village in East Africa is 5 to 10 times as much as one who had no

schooling. In any event, natural increase and not urban in-migration is the principal force behind current, and increasingly future, urban population growth.

- The fact that informal-settlements residents, because of their illegal status, pay no municipal taxes is often used to deprive them of essential services. It is also incorrectly thought that the urban poor are unable or unwilling to pay for such services. In fact informal-settlement residents pay many times more for far inferior services than their counterparts in the more formal parts of the city. Water vendors who supply such settlements charge many times the price charged by public water utilities (see table 1); similarly nightsoil sweepers in Karachi's squatter settlements charge between $2 and $3 per month when a twin-pit latrine costs only $45 and could be paid for in just two to three years at monthly rates currently paid to the sweepers.

Table 1. Prices charged by water vendors, mid-1970s-1980

City	Country	Multiples of price charged by public water utility
Kampala	Uganda	4-9
Lagos	Nigeria	4-10
Abidjan	Cote d'Ivoire	5
Lome	Togo	7-10
Nairobi	Kenya	7-11
Istanbul	Turkey	10
Dacca	Bangladesh	12-25
Tegucigalpa	Honduras	16-34
Lima	Peru	17
Port au Prince	Haiti	17-100
Surabaya	Indonesia	20-60
Karachi	Pakistan	28-83

Source: 10.

- The provision of serviced sites for low-income communities has proved largely unsuccessful as they are often bought over by higher income groups. It has also proved unable to respond to the scale of need. Upgrading existing informal settlements, especially through the provision of basic services and some security of tenure, has had the impact of harnessing the resources of the urban poor in dramatically improving their housing and neighbourhood conditions. The provision of credit enhances the process. Urban upgrading programmes, based on an enabling role for government, are, however, official policy only in a few countries so far. Such a policy change is often essential if investments in basic services for the poor are to be consolidated and not lost through settlement relocation or destruction.

SECTORAL CONSTRAINTS AND ANOMALIES

The almost total inaction in extending basic services to the urban poor at the scale required has meant that there is little experience upon which future programmes could be based. The focus of past efforts and investment patterns is also, in part, responsible for the current predicament. Some of the anomalies and constraints governing the sector are reviewed below:

- Past sector investment patterns have concentrated on the provision of water supply without commensurate investments in sanitation and even less on wastewater treatment. Similarly capital works instead of operation and maintenance have been the focus of past investments. Little attention has therefore been given to water-demand management capable of freeing up water for distribution to poor communities. Ways through which this might be achieved are reviewed elsewhere.[11] As countries inherit an increasingly aged infrastructure, adequate maintenance will be required to ensure that their premature replacement does not preempt available capital.

- During the course of the Decade there was a positive, gradual shift from "least-cost alternative" to "effective demand satisfaction" as the basis for technology choice. Therefore, while standpipes were initially recommended for purposes of economy, in all other respects, such as compatibility with the ensurance of minimal levels of water consumption of 30 to 40 litres per capita per day for basic health, preventing water wastage, reducing water collection time and recovering full user- charges, this level of water service was most inappropriate. The marginal increase in cost of providing a yard-tap level of service (see table 2) is often more than compensated by the increased willingness-to-pay. Given a choice, squatters in north- east Brazil opted, and paid in full, for shallow sewerage, while those in Ghana opted for pit latrines to reduce monthly water charges. Planning based on effective demand must, however, be cognizant of the fact that demand can change with time or usage of a

charges. Planning based on effective demand must, however, be cognizant of the fact that demand can change with time or usage of a demonstration unit. By its very nature the process of effective demand assessment fosters consultative planning.

Table 2. Typical costs of urban water supply (in $US per capita)

Level of service	Typical construction cost	Equivalent annual cost[a]	Typical water consumption[b]	Annual operating cost[c]	Total annual cost
Public standpost	60	8.88	20	2.55	11.55
Yard tap	80	11.84	60	7.66	19.50
Private Connection	120	17.76	150	19.16	36.92

Source: 12.

a. Converted on the basis of amortization over 10 years per cent interest.
b. In litres per person per day.
c. Calculated on the basis of $0.35 per cubic metre.

- The use of a range of low-cost, on-site alternatives to conventional sewers (see table 3), such as pit latrines and pour-flush latrines, popularized during the Decade remain perfectly suited for low-density and medium-density urban settlements but have limited application in high-density settlements.[13] Conventional sewers built in the past are in the wrong parts of the city - they are in high-income,

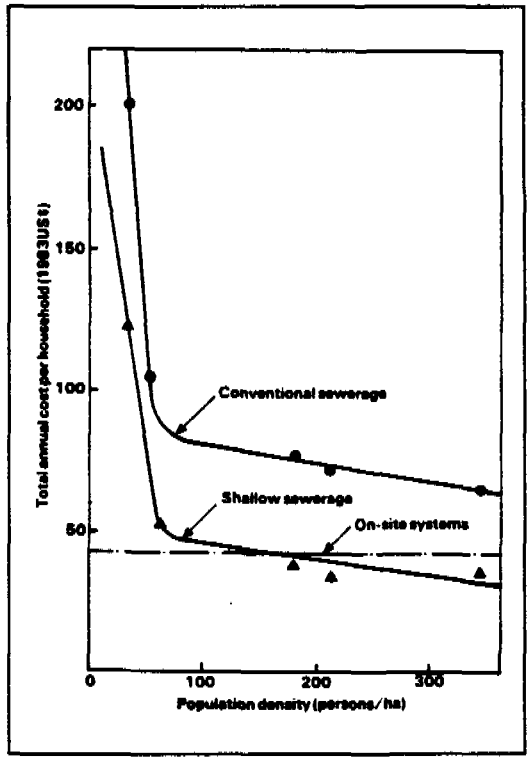
Table 3. Typical range of capital costs per household of altranative sanitation

Type of system	$US
Twin pit pour-flush latrines	75 - 150
Ventilated improved pit latrine	68 - 175
Shallow sewerage	100 - 325
Small-bore sewerage	150 - 500
Conventional septic tanks	200 - 600
Conventional sewerage	600 -1200

Source: 13.

low-density areas. It is precisely in low-density areas that low-cost alternatives to conventional sewers are most applicable and cost-effective. The costs of sewer networks reduce sharply with increased population density and are often cheaper than on-site systems for those densities common to informal settlements, especially when design standards are relaxed to suit local conditions such as the shallow-sewer system (see figure 9). Some rationalization is, therefore, required in the selection and use of low-cost technologies.

Figure 9. Variation in sanitation costs with system type and population density



Source: 13.

- Unisectoral planning, which still remains the most common approach to basic service provision, has serious limitations. Solutions thus designed are rarely cost-effective or environmentally optimal (see box 3).

- Lack of community involvement in project development has been a serious constraint on system sustainability. Delivering basic services through community consultation and participation represents, perhaps the most positive gain over the last decade. It has permitted the rapid expansion and comprehensive coverage of settlements and has enabled communities to organize and manage their own maintenance including the repair of standpipes and the upkeep of their own sewer branch.

- The lack of adequate funding mechanisms remains the most important constraint to service expansion. While communities can absorb the cost of service provision when

Box 3. Baldia squatter settlement revisited

Baldia, a squatter settlement on the periphery of Karachi, has a very successful low-cost sanitation programme based on the provision of twin-pit pour-flush toilets, but a closer evaluation of this settlement reveals serious problems in sullage disposal. Although water to the settlement is provided only through standpipes, the fact that no provision was made for sullage disposal meant that sullage was discharged into the streets. As the streets were not surfaced, many became inaccessible to pedestrians and soon the residents were obliged to seek the Karachi Municipal Council's (KMC) assistance in installing open drains. The settlement was therefore provided with open drains although the topography in the area slopes sufficiently to ensure natural drainage, and rainfall in this semi-arid region is concentrated in a period of two weeks in any single year.

With the advent of the open drains, most people now found a convenient place to discharge not only their sullage, but in many cases also their toilet wastewaters. Those who had any form of vault or septic tank discharged the contents of these into the drains to eliminate the need to have them emptied which could cost $US20 to $US30 a time. Even those who had constructed pour-flush latrines under the sanitation programme and were not conversant with their proper mode of operation soon overflowed the pits into the nearest open drain. The drains also became receptacles of household refuse as there was no regular refuse-collection service. Consequently the drains, which were not designed to facilitate dry-weather flow, soon became the focus of complaints from residents. These complaints were founded not only on the odour from the drains and public-health nuisance they presented but also on the physical danger to children, some of whom had fallen into them. The fact that most drains were also located at the front of the houses only served to reinforce the complaints. In the final analysis, adding the cost of the complementary investments in open drains to the original cost of providing sanitation to the settlement, the twin-pit pour-flush latrines proved to be much more expensive than they seemed. There were also the additional public health risks posed by the drains.

Source: 13.

charged a monthly tariff, few can absorb all capital costs in a single payment. Municipal and water authorities which arrange the financing of conventional service development have not been equally forthcoming in arranging financing for low-cost options for these services. The creation of appropriate financing mechanisms through which capital, operation and maintenance costs could be recovered in instalments is, perhaps, the most effective way in which service coverage could be expanded rapidly. Increasing the financial viability of responsible authorities, through cost recovery based on effective demand, is clearly the way to ensure sustained sector investment.

- In the absence of a clear government authority responsible for the provision of basic services to urban informal settlements, the role has often been assumed by government surrogates. Consequently, most efforts to improve services are viewed as a temporary measure until government assumes its duties. Uncertainties regarding possible settlement relocation also dissuade communities from making sizeable investments in basic service infrastructure. Some of the most successful attempts at providing urban water supply and sanitation have been recorded by government authorities that have formed special units within their institutional structures to plan and deliver these services to the poor on a "learn-by-doing" basis involving the communities. In this context there is an increasing role for non-governmental organizations in strengthening support at the interface between governments and communities. At the very least, some form of government assurance of non-eviction or security of tenure will be required to encourage investments in basic services by the poor.

- The collection and safe disposal of solid wastes generated in informal settlements has received little attention in the past. Some experience in the provision of community-based primary collection of wastes in communal containers, when supported with suitable public campaigns or incentives, have proved successful. For example, the city of Curitiba in Brazil issues municipal bus tickets to residents who bring their refuse to central collection points. Some advances have also been made in the development of refuse-collection vehicles capable of gaining access to informal settlements. Solid-waste disposal is, however, an area where considerable research is still required both from the technical and social points of view (see box 4).

THE WAY AHEAD

The provision of water-supply and sanitation services to the urban poor should form but one of the components of overall urban water-resources management which, in turn, forms a component of overall urban environmental management. The challenges facing developing-country governments in the management of water resources to achieve continuing and sustainable urban development can be presented as five key issues (see box 5). By developing and implementing nationally relevant policies to address these five issues, governments can help ensure that water resources play their optimum part in social and economic development. Policy options for addressing the problems identified under the five issues will be presented by UNCHS (Habitat) at the forthcoming International Conference on Water and the Environment to be held at Dublin, in January 1992.

Box 4. Enhancing waste management through recycling

UNCHS (Habitat) is currently investigating ways of improving solid-waste management based on waste recycling founded on the collection and reprocessing of source-separated materials. Unlike industrialized countries, where waste recycling is motivated by environmental consciousness and is, therefore, to a large extent voluntary, in developing countries, socio-economic conditions are such that for waste recycling to be widely adopted it must be financially compensating and all those involved in the waste-recycling chain must receive some return for their effort. Where returns are insufficient to interest one group, it could be targeted at an alternative group. For example, if the householder has little interest in segregating wastes for sale, it might interest school children or even domestic staff to do so. Waste-recycling programmes will, therefore, need to be targeted at the group that is most likely to cooperate.

Based on the premise of financially-motivated waste recycling, a comprehensive resource-efficient approach to solid-waste management will need to separate the organic faction (primarily food wastes) from the inorganic fraction into two mutually exclusive recycling channels. While most, if not all, of the inorganic fraction could be purchased by used-material merchants and reprocessed through small-scale waste-recycling industries (SCWRIs), the organic fraction could be converted in situ into compost. Except in multi- storey housing estates, such in situ composting could help reduce the waste stream by half. Today, city authorities are obliged to return to collect the wastes from each house once every two or three days by virtue of the fact that in warm climates the organic fraction of the refuse undergoes rapid decomposition. If a suitable on-site composter could be developed which is capable of accumulating and converting the organic wastes generated over a period of a month, then the city authorities would only need to visit each house once every one or two months. Such a composter should be capable of ensuring aerobic decomposition of the wastes and would be similar to ones commercially available for garden wastes. UNCHS (Habitat) is currently developing such an insect-proof, aerobic composter.

Consistent with the financially-motivated waste- recycling principle, city authorities could, with the avoided expenses of a less frequent collection interval, purchase the compost from the householders. The compost thus produced could either be sold or applied on green areas and in peri-urban agriculture. The quality of the purchased compost could be controlled through further reprocessing and blending with nutrients at a central plant prior to application. Much of the purchasing and reprocessing of the compost could be privatized in much the same way as the inorganic fraction is purchased and reprocessed through informal SCWRIs.

Source: 14.

Within resource-efficient water management, the objectives of the water-supply and sanitation sector should be the provision of sustainable services to all communities in an environmentally- safe way. Supporting this objective, future sector investment should focus on:

- Maintaining and better utilizing existing facilities and resources;
- Extending services to unserved areas;
- Treating and safely disposing of an increasing proportion of wastes generated.

Focus on maintenance

Maintaining and better utilizing existing facilities will require the establishment of programmes for improved systematic operation and maintenance and for water-demand management. Strengthening and building the capacity of institutions in terms of managerial capability, management of human resources and improving financial viability are areas where external support could best be focused. The transfer of technologies for reducing water loss, system rehabilitation, water conservation and recycling, wastewater re-use, and computer systems for design optimization, maintenance and administrative management of water utilities and the training of staff in these areas is urgently required in developing countries. Applied research and information dissemination analysing past experiences and practices in maximizing capacity utilization, managing demand and maintaining water-supply and sanitation systems will be indispensable.

Box 5. Priority issues in urban water resources management

Issue No. 1: Access to water, sanitation and waste-disposal services:
- Adequate water, sanitation and refuse-disposal services, particularly for the poor
- Bridging the gap between the increasing cost of water and user willingness/ability to pay
- Sustainable services and reliable supplies
- Maximizing health impacts.

Issue No. 2: Depletion and degradation of water resources:
- Preventing surface- and groundwater contamination and depletion
- Reducing environmental impacts
- Providing surface-water drainage.

Issue No. 3: Allocation of water resources:
- Balancing competitive uses
- Water demand management
- Pricing policies and instruments
- Industrial water use.

Issue No. 4: Institutional/legal/management aspects:
- Integrated water management
- Effective monitoring, surveillance and enforcement of standards
- Legal, administrative and social constraints on water use Regulatory Instruments
- Institutional capacity building.

Issue No. 5: Resource mobilization:
- Mobilizing and generating financial resources
- Management and human-resource capacity building
- User participation and involvement
- Private-sector and NGO involvement
- Economic and fiscal instruments.

Source: 15.

Maintaining and better utilizing existing facilities will require the establishment of programmes for improved systematic operation and maintenance and for water-demand management. Strengthening and building the capacity of institutions in terms of managerial

capability, management of human resources and improving financial viability are areas where external support could best be focused. The transfer of technologies for reducing water loss, system rehabilitation, water conservation and recycling, wastewater re-use, and computer systems for design optimization, maintenance and administrative management of water utilities and the training of staff in these areas is urgently required in developing countries. Applied research and information dissemination analysing past experiences and practices in maximizing capacity utilization, managing demand and maintaining water-supply and sanitation systems will be indispensable.

Focus on serving the urban poor

In order that water-supply and sanitation services can be provided to the urban poor on a sustained basis, a fundamental step is the creation of an enabling environment where governments seek to meet basic requirements of tenurial security, assume responsibilities for providing services that the poor cannot provide for themselves, and facilitate and engender new partnerships with community groups, non-governmental organizations and, where appropriate, the private sector to support government actions.[16] Within such an enabling environment the provision of water-supply and sanitation services could serve as the first step towards upgrading informal settlements, one that is likely to have the most beneficial impact on the living conditions of the poor and the quality of the urban environment as a whole.

Water-supply and sanitation services are but two of a range of environmental infrastructure services that the poor need. Some choices will have to be made where community capacity to pay is limited. This might entail a total community-development approach to bring communities to a point where the provision of water supply and sanitation becomes their next priority. Under the community-development approach, the provision of basic services might well need to be preceded by programmes to generate incomes and provide primary health care in order to meet more fundamental needs such as food and clothing. While access to water supplies features prominently among the needs of the urban poor the need for concomitant sanitation services might require the creation of demand through public education campaigns and the construction of demonstration units. In general terms, however, experience has shown that with the exception of a few cases of recent migrants, most of the urban poor, when provided an enabling environment, will harness and apply their resources in improving basic services and their own shelter.

In view of the above, water-supply and sanitation services should be provided on the basis of strategic planning. Strategic service planning entails the development of a dynamic service- provision programme that is able to take account of community needs and involve a multi-disciplinary team of engineers, behavioural scientists and communication specialists together with financial and economic management specialists. Strategic service planning and delivery embodies the following basic principles:

(a) **Broad coverage objectives**: The objective is to serve as many people as possible within the planning area with sustainable systems;

(b) **Use of multiple technologies:** A range of technologies should be used, each one selected to suit particular site conditions and in true response to community preference and affordability. High service standards can be used in cases where they are appropriate and sustainable;

(c) **Focus on service required:** The priority provision of those services that the communities want in, wherever possible, an integrated manner that will ensure the maximization of both the environmental and health impacts of service interventions. Implicit in the principle of integrated service provision is decision-making based on multi-sectoral cost-benefit analysis and environmental impact assessment and accounting and requisite project communication support;

(d) **Flexibility:** The plan should be as flexible as possible and capable of adapting to future growth patterns, perceived community needs and requirements. Reliable monitoring, evaluation and feedback processes should be built into the planning process and institutional framework;

(e) **Upgradability:** The provision of services should permit the progressive upgrading of the systems;

(f) **Community participation:** The planning, implementation and upkeep of services should be based on community consultation and participation. A gender perspective in targeting such involvement at those intimately affected or interested is essential for success, resource optimization and for ensuring sustainability;

(g) **"Effective demand" as a prime selection criterion:** The level of service, technology utilized and ways through which services are to be delivered should be selected in response to community preferences and declared

commitments and willingness to pay. Informed decision-making based on accurate information and, perhaps, user experience with demonstration units are essential for determining genuine effective demand. The role of communication support in demand stimulation might prove essential before large-scale sanitation programmes can be launched;

(h) **Sustainability:** Services provided must be both technically and financially sustainable and must be designed and operated with this clear objective in mind. Special emphasis must be placed in supporting and strengthening the anticipated weak links in sustained service provision;

(i) **Institutional framework:** Strategic service provision will require the close collaboration of many sectoral agencies. The overall responsibility for providing water supply and sanitation to informal settlements should, however, rest with a single agency. Where government authorities are willing to assume this responsibility, the creation of a special unit with existing water and sanitation authorities is usually the most effective. Considerable external support will, however, be needed to develop a cadre of professionals to plan and deliver services embodying the principles of strategic service planning.

Focus on safe waste disposal

In addition to maintaining and better utilizing existing systems and extending services to the urban poor, increasing sector investments will need to be focused on disposing of wastewaters and solid wastes. Environmentally-sound waste management need, however, to go beyond simply the safe disposal of the wastes that are generated. It should seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption. Defined thus, environmentally-sound management of solid wastes and sewage presents a unique opportunity to reconcile economic development with environmental protection. Correspondingly, an international framework for waste management has recently been established founded on a hierarchy of policy objectives: first, minimize waste generation; secondly, recycle to the extent possible the waste that cannot be avoided; and thirdly, dispose in an environmentally-safe way the non- recyclable fraction of unavoidable wastes.[17] Since current consumption levels are naturally low in most developing countries, some increases will be inevitable as these countries attain basic standards of economic welfare. The focus of waste- management programmes must, therefore, be concentrated on waste recycling and reuse and the treatment and safe disposal of the wastes to acceptable environmental-quality criteria. The instilling of sound waste-management policies and approaches now could help ensure a sustainable urban development process for the future.

CONCLUSIONS

The number of poor populations living in urban informal settlements with inadequate access to water-supply and sanitation services is growing faster than the present, unprecedented, rates of urbanization that most developing countries are experiencing. Unless there is a conscious shift in both government and donor policies to address this problem urgently, the resulting impacts on the urban environment and national development could reach crisis proportions. The creation of an enabling environment and the corresponding provision of basic services that the urban poor cannot provide for themselves, within the framework of strategic service planning, is essential if the impending crisis is to be avoided.

REFERENCES

1. United Nations Development Programme, *Human Development Report 1990* (New York, Oxford University Press, 1990).

2. United Nations Economic Commission for Latin America and the Caribbean (ECLAC), "The water resources of Latin America and the Caribbean: Water pollution," (Santiago de Chile, May 1989).

3. The World Resources Institute, *World Resources 1990-91* (New York, Oxford University Press, 1990).

4. Zhang, C., "Environmental issues in water supply and waste disposal", paper presented at the Collaborative Council Meeting, Sophia Antipolis, 28 November - 1 December, 1989.

5. United Nations Development Programme/World Bank, Background paper, presented at the Global Consultation on Safe Water and Sanitation for 1990s, New Delhi, 10-14 September, 1990.

6. United Nations Centre for Human Settlements (Habitat), "Environmental health aspects of human settlements", paper presented at the WHO-EMRO Intercountry Healthy Cities Conference, Cairo, 11-14 November, 1990.

7. United Nations, *Fertility Behaviour in the Context of Development*, Population Studies No. 100 (ST/ESA/SER.A/100) (New York, 1987).

8. United Nations Conference on Environment and Development (UNCED), "Human Settlements", (A/CONF.151/PC/L.44), (Geneva, August 1991).

9. World Bank, *World Development Report 1990* (New York, Oxford University Press, 1990.

10. World Bank, *Urban strategy paper* (draft), table 3.2, p. 70, (Washington, May 1989).

11. United Nations Centre for Human Settlements (Habitat), *The Conservation of Drinking Water Supplies: Techniques for Low- Income Settlements* (HS/175/89E) (Nairobi, 1989).

12. Cairncross, S., "Water Supply and the Urban Poor", in Hardoy, J.E., and others (eds), *The Poor Die Young: Housing and Health in Third World Cities* (London, Earthscan Publications, 1990).

13. Sinnatamby, G.S., "Low-cost Sanitation" in *The Poor Die Young: Housing and Health in Third World Cities* (London, Earthscan Publications, 1990).

14. Sinnatamby, G.S., and Dzikus, A., "The role of waste recycling and reuse in managing urban solid wastes", a paper presented at the 17th WEDC Conference on Infrastructure, Environment, Water and People, Nairobi, 19-23 August, 1991.

15. United Nations Centre for Human Settlements (Habitat), *Management of Water Resources for Urban Use*, report of an expert group meeting, Washington 22-24 April 1991 (Nairobi, 1991).

16. United Nations Centre for Human Settlements (Habitat), *The Global Strategy for Shelter to the Year 2000* (HS/185/90E), (Nairobi, 1990).

17. United Nations Conference on Environment and Development (UNCED), "Environmentally-sound management of solid wastes and Sewage-related issues: Options for Agenda 21, (A/CONF.151/PC/L.42 Add. 10), (Geneva, August 1991).