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NATIONAL WATER AND SANITATION FAIR 1996 REPORT



PROGRAMME CO-ORDINATION UNIT

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THE DEBATE SERIES

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THE DEBATE SERIES

The Debate Series was held to give participants the opportunity to take part in provocative discussion about key issues in the sector.

The Debate Series included

Debate Series 1 : Water Sector Reforms Explained
Community Participation in the

Management of Rural/Peri Urban
Water Use.

Debate Series 2 . Participation in the Context of
Commercial Utilities

Ownership Issues in Rural Water
Supply

Debate Series 3 : On-Site Sanitation in Peri-Urban
Settlements

Volunteer Involvement in the Sector -
Development or Dependency ?

Debate Series 4 . Community Contribution in Rural
Sanitation

Integrating Commercialisation and
Community Participation in Peri-Urban
Water Supplies

Debate Series 5 : Know WHAT you are doing and How
you should do it : The need for Parallel
Investment in Research and Training

Commercialisation and Community
Participation : Complimentary and
Contradictory

Debate Series 6 : WASHE : Integrating Health Sector

The Role of GIS in Commercial and
Community Based Water Supplies

Presented and moderated by key facilitators in the sector
the debates were of an extremely high standard.
This section contains all the papers that were presented.

DEBATE SERIES : 1

TITLE : Water Sector Reforms : Explained

DATE : 15th May 1996

TIME : 15.15 to 16.45 hrs

VENUE : Room 1

ABSTRACT :

This paper attempts to explain the water sector reforms in Zambia. The processes followed various options and considered Government policy on commercialisation, decentralisation and cash recovery for both urban and rural water supply

Abstract :

This paper attempts to explain the water sector reforms in Zambia. The processes followed various options and considered Government policy on commercialisation, decentralisation and cash recovery for both urban and rural water supply

1.0 INTRODUCTION

The Zambian Water Supply and Sanitation Sector is being re-organised. This is in recognition that the sector is unable to meet its service delivery obligations resulting from general under financing and lack of qualified and experienced personnel.

The Government of the Republic of Zambia (GRZ) has recognised that ultimately local authorities need to be able to provide local services, and that delivery effectiveness depends not only on technical competence but also on cost recovery and financial viability. Because this conclusion applies not only to water supply and sanitation, GRZ is implementing a general policy of decentralisation and devolution of responsibility to local authorities. Presently, despite GRZ decentralisation policies the sector depends heavily on central Government for two reasons :

i Over time, councils have come to depend heavily on central Government financial support for all of their activities, and so the GRZ decentralisation policies have not yet had a significant impact.

ii Water and Sanitation assets have deteriorated so badly over the years as a result of neglect that officials presently responsible for the service are unable to restore them to even a semblance of adequacy. Revenues from the provision of the services are therefore minimal and totally inadequate to operate and maintenance of the facilities

Improving the existing situation in conformity with GRZ commitments to enable councils to assume their proper

The Organisation :

Water Sector Development group is the secretariat to the Programme Co-ordination Unit (PCU) established by the Zambian Government in 1993. The specific objective of the PCU is to make recommendations to the Government on the restructuring of the water sector and oversee their implementation.

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role in the provision of services requires optimising the use of scarce financial and human resources. This implies a shift of responsibility to the councils, and a co-operative effort of councils to share the scarce resources for the benefit of all. It is clear that human resources are not available to provide each council with its own competent professional staff. A method has to be found which both respects councils' responsibilities delegated to them by GRZ and gives them access to staff resources

GRZ has decided to examine and address the above. One of them is to address the need to reduce the often conflicting responsibilities for the sector of various ministries and agencies and determine what structural and policy changes would make the sector more effective.

This paper presents some insights into the Water Sector reforms, necessary for the sector to reach sustainability and efficiency in service.

2.0 BACK GROUND TO THE REFORMS

Since as far back as 1976 the Government of Zambia has been attempting to divorce the executive (operational) responsibilities of the Water Supply and Sanitation Sector from Water Resources Management. In the Third National Development Plan (1979-1983) it was proposed that a National Water Authority be created to operate and manage the Water Supply and Sewerage in the country. Regional Water Authorities were to be created to manage Zambia's water resources.

Subsequently a number of studies were undertaken regarding improvement of the sector but little has so far been achieved in improving it.

The previous administration regrettably chose not to implement the almost unanimous recommendations for sector improvements. Not surprisingly, the sector is in disarray, unable to provide its customers with an adequate supply of safe water and appropriate sanitation facilities. Today there is almost no town in Zambia with an assured 24 hours water supply. This is evidenced by the daily reports of water shortages in some part of the country in the local press.

2.1 THE PROGRAMME CO-ORDINATION UNIT(PCU)

Aware that without rapid improvements in all social services the citizens of Zambia cannot become productive

members of society and will be unable to improve their standard of living, the Government has initiated major efforts to overcome past neglect and promote improvements. Recognising the need to achieve long-term improvements in the sector's performance, and to improve the sector's attractiveness for foreign investments, the Government created an inter ministerial committee, the "Programme Co-ordination Unit" (PCU).

The PCU was established on 8th March 1993 by the Zambian Government. The main objective of the PCU is to make recommendations to Government on the reorganisation of the water supply and sanitation sector in Zambia. The tasks of the PCU were defined as follows :

- 1 Recommend policy reforms of water supply and sanitation sector.
- 2 Define the responsibilities of ministries and other organisations in the water supply and sanitation sector.
- 3 Determine and recommend necessary reforms and reorganisation of the sector.
- 4 Propose the creation of a framework for planning, development, operation and maintenance of the infrastructure in the water supply and sanitation sector which will encourage and optimise donor support.
- 5 Make proposals for reforming and strengthening of various institutions with a responsibility for water supply and sanitation services.

For administrative purposes the PCU reports to the Permanent Secretary, Ministry of Energy and Water Development. Thus for all intents the PCU operates independently, but reports to government for approval of various recommendations through MEWD. The PCU is chaired by the Permanent Secretary of MEWD and the secretariat is the Water Supply and Sanitation Sector Development Group (WSDG).

2.1.1 Composition of PCU

PCU comprises of representatives from the following institutions.

- Ministry of Energy and Water Development (MEWD)
- Ministry of Local Government and Housing (MLGH)

- National Commission for Development Planning (NCDP)
- Ministry of Health (MOH)
- Ministry of Environment and Natural Resources (MENR)
- Environmental Council of Zambia (ECZ)
- National Council for Scientific Research (NCSR)
- Ministry of Works and Supply (MWS)
- Ministry of Agriculture, Food and Fisheries (MAFF).

The PCU is composed of members who have full time responsibilities in their respective government ministries and departments. A substantial amount of technical, financial, organisational and management planning and preparatory work is required to re-organise the sector and to advise on policy reforms

The Water Supply and Sanitation Sector Development Group (WSDG) was created as the secretariat to undertake this work under the direction of the PCU. This was preceded by a consultancy team which prepared the work plan of the WSDG and drafted the Sector Principles which were adopted by PCU and forwarded to Cabinet for approval.

The WSDG started its work on the 1 February 1994.

2.2 OVERALL GOAL FOR THE WATER SUPPLY AND SANITATION SECTOR

Zambia's water supply and sanitation policies and strategies are aimed at improving the quality of life and productivity of all people by ensuring an equitable provision of an adequate quantity and quality of water to all competing user groups and sanitation services to all, at acceptable cost, on a sustainable basis.

3.0 EXISTING SITUATION

Deficiencies in water and sanitation are a significant and growing problem, substantially lowering the quality of life for many people and creating dangerous health hazards. High morbidity and mortality from diarrhoeal diseases and parasitic infections are particularly critical in densely populated squatter compounds. The consequences can be devastating, as illustrated by the recent outbreak of cholera in various parts of the country.

Accessibility to adequate and safe drinking water supply among the Zambian people is very low.

3.1 MANAGEMENT OF THE WATER AND SANITATION SCHEMES

Currently Operation and Management of the Water Supply Schemes is in mainly two Government wings. The Department of Water Affairs in the Ministry of Energy and Water Development runs and maintains about 46 mainly rural District centre schemes. Until October 1993 what ever revenue was collected in the even remotest district centre had to be forwarded to the Government treasury. Operational and Maintenance costs had to come from the Headquarters. The Ministry of Local Government and Housing has been responsible for 22 mainly Municipal and City Councils including some smaller councils like Mbala, Mpika, Monze. There are two water companies responsible for Water Supply and Sewerage and these are Lusaka Water and Sewerage Company for Lusaka City Council and Chipata Water and Sewerage Company for Chipata Municipal Council.

4.0 PROPOSED INSTITUTIONAL REFORMS

4.1 POLICY

In November 1994, the Government adopted a forward looking National Water Policy that spells out priorities for the contribution of the Water Sector to the overall economic development of our country. The main aim of the policy document is to promote holistic management approach that will result in the restoration of customer confidence in the water and sanitation sector. During the same time the Government adopted new institutional framework that will ensure effective and efficient service delivery systems.

4.2 SECTOR PRINCIPLES

In order to arrive at these changes the Government first adopted what have been termed as the Seven Sector principles. The principles served as a basis for the proposed restructuring. These basic principles which are the foundation of success in the efficient provision of water supply and sanitation services are.

Based on the above sector principles, Government in November 1994 decided to restructure the Water Supply and Sanitation in the following manner :

i The Programme Co-ordination Unit (PCU) will be transformed into a statutory body to be called National Water and Sanitation Council (NWASCO) to perform the required regulatory functions. NWASCO will be

The seven sector principles .

1. Separation of water resource management from water supply sanitation.
2. Separation of regulatory and executive functions.
3. Devolution of authority to local authorities and private enterprises.
4. Full cost recovery in the long run
5. Human resources development leading to more effective institutions.
6. Technology appropriate to local conditions.
7. Increased Government priority and budgetary allocation to the sector.

responsible to the Ministry of Energy and Water Development.

ii The executive (operational) functions of water supply and sanitation currently undertaken by the Department of Water Affairs of the Ministry of Energy and Water Development and the Buildings Department of the Ministry of Works and Supply respectively will be transferred to the Local Authorities under the overall supervision of the Ministry of Local Government and Housing (MLGH). To assist the Local Authorities with the water supply and sanitation service delivery obligation they should form commercially viable water utilities. A number of councils could either come together and form a company or an individual council may decide to do so.

iii MLGH should create a Department of Infrastructure and Support Services (DISS) to monitor and co-ordinate investment into the sector. DISS would not only be for water supply and sanitation but other municipal functions like roads, markets e.t.c.

iv As an initial step, a feasibility study followed by pilot programmes will be commissioned in the Copperbelt Provinces and North Western. This is with an aim of establishing Commercially viable Water Supply and Sanitation utilities to assist Local Authorities (councils) in the performance of their water and sanitation service delivery functions in the urban, peri-urban and rural areas, subject to the overall supervision of MLGH.

5.0 NEW LEGISLATION

The Government is currently preparing legislation for the establishment of the regulatory body called the National Water Supply and Sanitation Council (NWASCO). The legislation will also create an enabling environment for the formation of the commercially viable water supply and sanitation utilities.

The PCU through its secretariat the WSDG conducted country-wide consultations with stakeholders to ensure that the final document embraces the interest of the widest possible spectrum of affected groups. The stakeholders among others included all Local Authorities MLGH, Department of Water Affairs officials, Ministry of Health officials and planning officers. The final national consultative meeting was held on 22nd November 1995. The consultation for the primary legislation is now over

and the final draft has been forwarded to the Ministry of Legal Affairs.

The legislation provides for the establishment of the National Water Supply and Sanitation Council (NWASCO).

Some salient points on NWASCO

- A regulatory body which is a statutory body It will report to the Ministry of Energy and Water Development.
- Composition, it will be composed of members from different institutions and GRZ will be in advisory capacity only. This is the similar arrangement with the National Roads Board.
- Functions of NWASCO include- to do all such things as are necessary to promote and ensure by regulation the adequate provision of water supply and sanitation services. The detailed functions are as contained in first schedule of the draft act..

Powers of NWASCO, These include :

- Issuing of Enforcement notices to the utilities to ensure that the standards set are followed.
- Funding arrangements for NWASCO. This will be like any statutory body i.e. the Environmental Council of Zambia.

UTILITIES

The Act provides for the establishment of Water Supply and Sanitation utilities.

- The establishment shall be subject to the approval of NWASCO on the basis of their commercial viability. This shall be by a statutory instrument specifying the area for which the Water Supply and Sanitation utility shall be responsible and shall specify any other matters.
- Status of Lusaka Water and Sewerage Company and Chipata Water and Sewerage Company. These shall be allowed to be transformed into a water supply and sanitation utility subject to provisions of NWASCO. The shareholders of these two utility companies would decide to take such a step.
- An option of not being part of utility would imply the local Authority may sign a service contract with the company. In this case all the assets will belong to the Local Authority and the Company will merely use them.
- Companies Act No. 26 of 1994 to apply. But for any conflict this Act prevails.

- Financial arrangements. The utilities will be run on a commercially viable basis. However GRZ will have to continue funding rural and peri-urban areas for water supply. This is for capital investments only.
- Transfer of assets, liabilities and charges. It has been suggested that all assets belonging to the Department of Water Affairs will be transferred to the utilities.
- Shareholding arrangement - Local Authorities will have equal shares. For Lusaka Water and Sewerage Company and Chipata Water and Sewerage Company the respective Local Authority will transfer the assets to the utility.
- Directors - Chief Executives of Local Authorities, Managing Director, and others as provided for in the draft.
- Functions of the utilities: to do all such things as are necessary to develop and sustain the adequate provision of water supply and sanitation services to all consumers in its area of responsibility. Functions contained in second schedule.
- Possibility of contracting out services to public sector bodies, private sector organisations and companies for i.e. billing, construction etc. has been provided for.
- Power to establish bye-laws following model bye-laws prepared by NWASCO.
- New development areas, squatter areas. Development for these will be done with consultation of the utility.
- Charges for services - A utility shall establish and publish charges for the provision of water supply service, imposition of penalties, disconnection of services.

6.0 FORMATION OF COMMERCIALY VIABLE WATER UTILITIES

To decentralise water supply and sanitation functions, the Government is encouraging local authorities to form commercially viable water supply and sanitation utilities to undertake the water supply and sanitation service delivery.

The utilities are to be autonomous bodies and operate on commercial lines. After considering several alternative organisational scenarios, the PCU concluded that a Commercially viable water utility would be the most effective means to overcome present institutional and service delivery deficiencies. One option for the Local Authorities (particularly the smaller councils) is for them to come together on regional level and form water companies.

These Companies would initially be owned by the Local Authorities. With time each Local Authority may sell up to 49% of its initial share capital to any private individuals, organisations, companies and any such grouping.

Commercialisation will help achieve efficiencies expected from private enterprises. The company would be free to hire and compensate personnel as it sees fit, and to enter into contracts, all governed by its constitution or articles of association.

While the decision to form the utilities entirely lies in the hands of the Local Authorities they will be guided by the PCU. The guidance will be through a management options study which will recommend the best institutional arrangement to achieve commercial viability

In addition to responsibilities for township piped water supply, the utilities would provide for implementation of village point water supplies and sanitation.

Health and hygiene education would remain a responsibility of the primary health care system at community level.

7.0 RURAL WATER SUPPLY AND SANITATION

Rural water supply (point source supplies) and sanitation has its own unique problems which need special attention. For many years rural water supply and sanitation projects have not been very successful for reasons similar to those which negatively affected urban systems. The arrangement for rural water supply and sanitation will be as follows :

7.1 FUNDING

The Government with possible external assistance i.e. donors and NGOs will continue being responsible for the funding of rural water supply. The water supply and sanitation utilities will essentially be responsible for implementation of the rural water supply projects.

7.2 PLANNING

Planning of rural water supply and sanitation will be through the communities. Communities will present their requirements to the District Water, Sanitation and Health Education (DWASHE) committees who will in turn present to the District Development Co-ordinating Committees. Utilities will not plan or prioritise the implementation of

rural water supply. However the utilities will sit on the DWASHE committees.

7.3 IMPLEMENTATION

Utilities will not provide any funds for rural water supply but will be paid by the Government or any funding agent to implement rural water supply. The aim is not to overload the utility with paying for rural water supply. To expect the utilities pay for rural water supply and sanitation would be a pipe dream. Rural water supply and sanitation will be implemented using the principle of community participation. CMMU is currently working on guidelines on how best communities should be organised for their participation to be usefully achieved.

7.4 AT NATIONAL LEVEL

The Community Management and Monitoring Unit (CMMU) will become a unit of N/WASCO and be responsible for guiding the development of rural water supply and sanitation. These responsibilities include :

a setting guidelines for RWS project implementation, i.e. community participation, including financial obligations of the rural communities;

b strengthening the standardisation efforts already initiated; and

c serving as a co-ordinating unit as well as clearing house for RWS projects.

8.0 NATIONAL INVESTMENT AND REHABILITATION STUDY

It is a recognised fact that most of the water supply and sanitation infrastructure in the country is run down. It would therefore be a pipe dream to ask Local Authorities to form CUs on such infrastructure. The Government has therefore started working on an investment programme for the sector. The initial step is through an inventory and rehabilitation study. Consultants will soon be appointed to undertake this study under funding from NORAD. It is hoped with an investment plan it will be easier to explain the magnitude of the need for support in the sector. The study has been termed as a National Investment and Rehabilitation Study of the water supply and sanitation systems. The aim of the study is to determine how much investment is required in the sector to bring the water systems into good operational order.

9.0 FORMATION OF CU IN NORTH WESTERN PROVINCE

The Local Authorities in North Western Province have decided to form one water supply and sanitation utility. This was after much consultations with the Local Authorities and the Water Affairs personnel. Before the decision was made a commercial viability study was commissioned in April 1995 with the final report being presented to the PCU in July 1995. Should the Water Supply and Sanitation legislation be in place by June next year, then the utility in North Western Province should be operational by September 1996. The German Government through the KfW are assisting in rehabilitation all the water and sanitation schemes in the province.

10.0 CONCLUSION

It is important to clearly understand the Government policy on management of the water supply systems in the country. What needs to be emphasised is the purpose of restructuring of the water sector. One major purpose is to improve service delivery obligation, increase efficiency. These can only be achieved through developing a commercial approach to the sector. The approach should assure self sustaining of the sector. There is no need for Central Government or indeed Local Authority to subsidise the sector when it can be self financing.

While commercialisation may be the solution for the sector, privatisation can not be. At least not in the foreseeable future for Zambia. This is because of the large portion of the population that is in the low income group that would still need some form of support from government.

DEBATE SERIES : 1

TITLE : Community Participation in the Management of Rural/peri urban water use

DATE : 15th May 1996

TIME : 15:15 to 16:45 hrs

VENUE : Room 2

INTRODUCTION

Abstract :

The debate will identify and contrast different management issues faced by peri-urban and rural communities over the control and use of limited water resources. This will examine some of the different participatory methods and techniques presently being employed to assist community decision making and planning in areas of water resource operation and management.

The Organisation :

CARE is presently active in both peri-urban and rural water and sanitation sectors. Project activities support appropriate community operated and managed household and agricultural usage.

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Water is one of the most abundant resources on the earth with 97% forming oceans and 2.2% as ice and snow in the polar regions. About 0.7% of the global supply of water is available as freshwater for domestic, industrial and agricultural purposes, and it is unevenly distributed. The combination of uneven distribution, expanding populations, and a lack of capital and recurrent investment are putting increasing pressure on available water resources in a number of countries, Zambia being one of them.

At the macro level Zambia is considered by many to have abundant water resources to meet growing demands and usage. However, as demand increases, and the most available sources have already been utilised, the cost of further exploitation and use of new sources are increasing due to a number of limiting factors. At the micro level the lack and reduction of water resources are causing increasing concern based on availability and equitable use amongst many rural and peri-urban communities. In recent years this has been attributed to the increasing occurrence of drought, particularly in the more drought prone rural areas of the southern half of Zambia. In addition, a lack of capital and recurrent investment has led to the collapse of many water systems, especially in peri-urban areas. This, coupled with the lack of a sense of ownership, and hence responsibility by a number of parties, has led to the withdrawal of many water related services. For many, obtaining water has become time consuming and tiring work, causing both a direct and indirect financial burden. In most cases this has directly effected women, who as a result, have little or no time for other household and productive activities which are so important to household livelihood security.

There are currently many gaps in our knowledge of the interactions between water and the wide macro and micro environment, and of the economic and social impacts that water related interactions can have on society as a whole, therefore it has become increasingly important to actively involve stakeholders as users of resources in identifying and understanding these interactions if viable and sustainable solutions are to be found.

An environmental, social, and economic analysis of community problems and needs related to water shortages challenges us to come to terms with the complexity of local community livelihood strategies in

diverse and risk-prone environments. Water resource initiatives should be seen as a means to an end, and not an end in itself. Hence more attention needs to be paid to the more diverse issues in the context of the ecological, economic, and social frameworks that communities form part of.

Most people agree that a lack of access to clean and uncontaminated water sources adversely effect the livelihoods of all, both directly through consumption and indirectly through production and future development. Contaminated water is the cause of a number of diseases resulting in a persons inability to be productive, by which the survival of many households and their dependants rely upon. It can therefore be establish that a lack of reliable water resources can restricts both economical and social growth at every level.

Although few people will disagree with the issue of a growing shortage of available water facilities, many do not perhaps appreciate the seriousness of the problem and its effects on such a large and diverse population. In the water sector, Government and Donors are often seen as the 'deciders' and 'providers' of water facilities, whilst communities have become merely the 'receivers' of these decisions rather than having the opportunity to become the initiators of their own inspired decisions. This paper will explain how communities have taken on the role of decision makers and have been able to identify and solve problems themselves. Participation is often spoken about as a way of creating a sense of ownership and sustained development through beneficiary decision making, planning, implementation, and management. What follows are two such examples where community participation has been facilitated by CARE in the peri-urban and rural environment in an effort to allow communities the opportunity to solve many of their own water related problems.

COMMUNITY PARTICIPATION IN PERI-URBAN WATER RESOURCE USE AND MANAGEMENT.

INTRODUCTION.

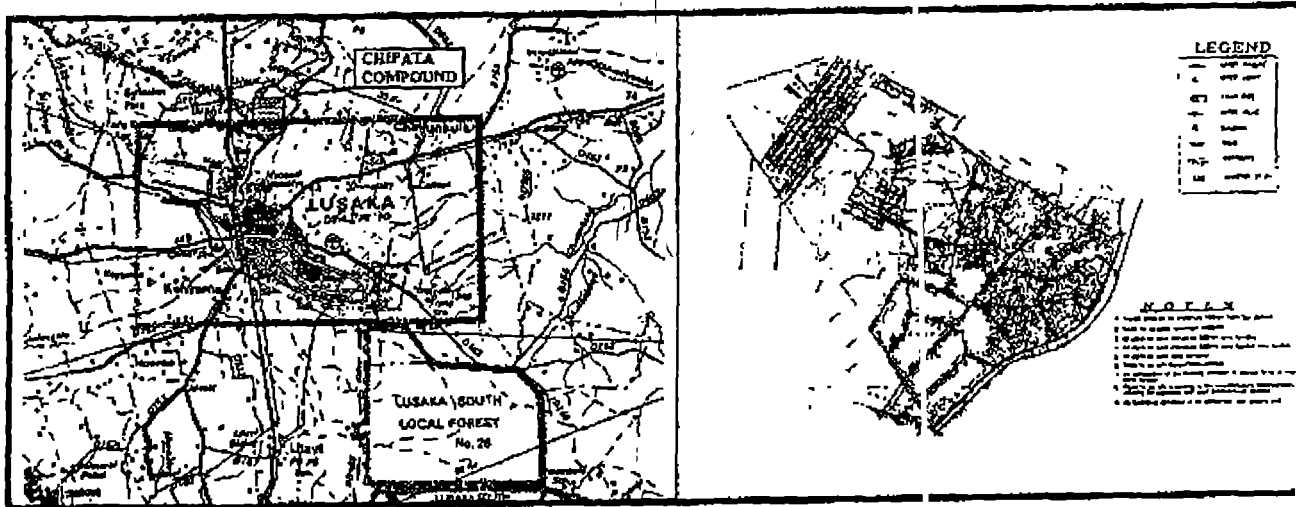
Chipata Compound is one of Lusaka's unplanned settlements which have mushroomed around the city perimeter. It is situated east of the Great North Road and, according to CARE's own census completed in early 1996, has a population of 43,393, comprising of 7,324 families with an average family size of 6.

Figure (a) And (b) : Location Plans.

Funded by World Food Programme and the Canadian International Development Agency, CARE-PUSH began operating in Chipata in 1992 as a food-for-work project, implementing road and drainage rehabilitation, sanitation, pre-schools, literacy and health education projects. In 1994, a second phase of PUSH began, funded by the British Overseas Development Administration, to transform the food-for-work program to one where participants (mostly women) have an opportunity to

Figure 1(a) : Chipata Compound In Relation To Lusaka City.

Figure 1(b) : Chipata Compound And Proposed Water Supply Scheme.



graduate into sustainable livelihoods through training, savings and credit programs. The scale of impact was also increased by broadening the basis of community participation and institution-building, and by undertaking larger, and more sustainable social and infrastructure projects for livelihood improvement.

Chipata Compound, like many other compounds in Lusaka, suffers from a severe shortage of water. During PUSH I, it was noted that water facilities that had been installed during the 1970's had deteriorated to such an extent that supply had become intermittent or non-existent. Thus, when an extensive appraisal and needs assessment exercise was undertaken by residents and PUSH staff in late 1994, Chipata residents clearly identified that water system improvement was their top priority. It also was evident that the water project would need to invest more time and resources than previous attempts in order to foster a participatory and

institution-building process before new facilities were installed, and hence maximise the sustainability of the project. Water was seen as a 'mobilising issue' that would generate enough interest to allow the development of capabilities that could then be applied to other projects. The goals of the project would need to include the learning and development of resident capabilities, the formation of effective local institutions, as well as the implementation of a viable financial management system.

Thus, in mid-1995, a group of residents and Council officials began planning with CARE-PUSH a process that would mobilise wide participation leading towards the implementation of a new water supply. From the beginning, the concept was that local residents would not only directly construct the system, but would manage its operation and maintenance, including its financial management. The role of the City Council and the Lusaka Water and Sewerage Co. Would be very important, but the balance of responsibility would be with the residents themselves. Now, in May 1996, the participatory process has resulted in a well -organised network of community institutions, designs and plans that residents were instrumental in shaping, and the beginning of construction works. Plans are for water to begin flowing in July 1996, and for the entire compound to be supplied by October 1996.

The Chipata water project is being implemented in parallel with the Jack water project, under CARE's PURCH project, and will serve as a model for future smaller-scale projects in Kanyama and Malota Compounds. Simultaneously, CARE-PUSH is working in partnership with the JICA/LWSC/LCC consortium on the George water supply project, CARE playing the role of facilitating the development of community institutions and community participatory training.

PARTICIPATORY APPRAISAL AND NEEDS ASSESSMENT

The Participatory Appraisal And Needs Assessment (PANA) began with workshops for CARE staff, members of Residents' Development Committees, PUSH workforce, and some other community members. Training was provided in the concepts and methods of 'Training for Transformation' and PRA (Participatory Rapid Appraisal). The PANA teams analysed problems and trends with seasonal calendars, conducted livelihood interviews and well-being rankings, carried out 'listening surveys' in

public locations, and performed dramatic codes to stimulate discussions with residents on their problems and how they felt they could address them. In a series of focus group discussions, the following were ranked as critical concerns of Chipata residents :

- i) Water.
- ii) Burial sites.
- iii) Bad roads.
- iv) High school fees.
- v) High medical fees.
- vi) Property grabbing (from widows).

These were analysed in terms of a framework called the Web of Life.

Aside from allowing residents to participate in setting the directions for the project in Phase II, the PANA exercise highlighted a number of considerations that needed to be taken into account in all future activities, such as the income levels (averaging K21,000) for the lowest well-being category, employment status, and the gender dimensions of poverty; where for example, female-headed households comprised of almost half of the lowest well-being categories.

The PANA exercise held in 1994 gave a clear mandate to CARE-PUSH to work with residents implement the water supply project. In keeping with the overall focus, the water project focused on following objectives :

- To contribute to livelihood improvement by reducing the money and time residents spend water collection.
- To improve residents access to safe drinking water, with corresponding improvements health.
- To mobilise residents towards the development of community-based organisation strengthening the management capacity of residents
- To empower women to be active in community development activities

These objectives are illustrated below by Figure 2 in the form of a targeted model.

Figure 2 : The Targeted Development Of Participatory Water System

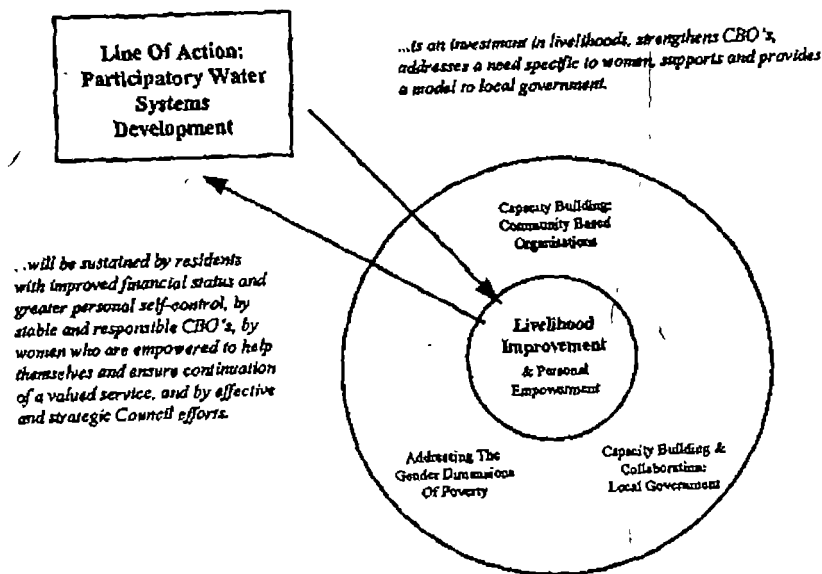
2.3 OVERVIEW OF LEARNING PROCESS APPROACH

2.3. 1 THE LEARNING PROCESS

Two key requirements have shaped the PUSH approach to water system development :

- i) It should be- a learning process rather than as a blueprint project.
- ii) It should focus on sustainability.

This learning process is embodied in the diagram of a line of action illustrated by Figure 3. The appraisal and needs assessment led into strategic planning and the development of a shared vision for the development of the



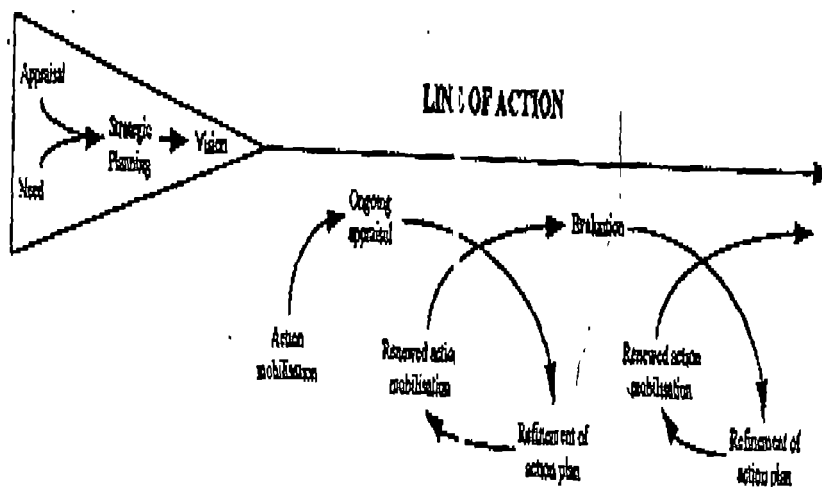
Chipata water scheme. As action is mobilised towards this vision, there would need to be ongoing appraisal and periodic refinement of the action plan, to incorporate learning that takes place throughout the project. This is distinguished from a blueprint approach to projects, which starts with a blueprint emanating from the mind of one architect, and requires everyone to adhere rigidly to this blueprint. Thus, as PUSH staff began planning the water project with residents and Council, the adoption of the idea of 'process planning' rather than 'blueprint planning' was used.

Figure 3 : The Line Of Action Seen As A Learning Process

The approach to water programming taken by PUSH required establishing mechanisms and tools to encourage participation, learning, and institution-building.

These included :

- Use of participatory appraisal and needs assessment methodologies, such as mapping, codes, and focused problem/strategy analysis.
- Adoption by staff of a problem-posing orientation through dialoguing with residents.
- Involvement of residents in basic design from the outset of the project.
- Particular encouragement given to women to participate.



Developing appropriate process planning tools.

- Formation of committees with specific responsibilities.
- Involving higher levels of LCDC and LWSC officials in meetings with residents, to build community capacity to communicate with officials.

2.3.2 THE PROBLEM POSING APPROACH

The problem-posing approach, contrasted with a problem-solving approach, is one in which facilitators pose problems to residents in such a way that they are guided to think their way through a problem and arrive at their own decisions and strategies. While the distinction is simple to state, it is very difficult practice for facilitators to sit back and avoid giving the answers to residents; there is a certain authority, power and recognition associated with being the one to come up with a 'good answer'.

A common objective of any development project is to actively involve residents in the design of project, but in such a technically-demanding project, this provided its

own challenges. The problem posing approach has helped, because from the first meetings residents are asked questions about why water systems have failed, treating their input as an important aspect of project design. As participating residents proceed through a series of meetings, they are faced with questions regarding technical parameters of the project, and are able to discuss openly as equals with project engineers staff.

From the beginning of the project, attempts were made to acquaint residents with the overall plan articulated as a 'process plan', that remained flexible without becoming too rigid or too complicated to allow participation of residents. Process planning involved participation by a number of key actors, to lay out the 'elements' which need to be included in the plan, actions to be taken, decisions to be made, knowledge or information that has to be understood by a certain group. The group then asks what the process really is, what they are trying to accomplish, and the reason behind each element. This allows planning, monitoring & evaluation, and the adjustment of the project at periodic intervals through elements that become an inter-twined line of action. Figure 4 illustrates this process.

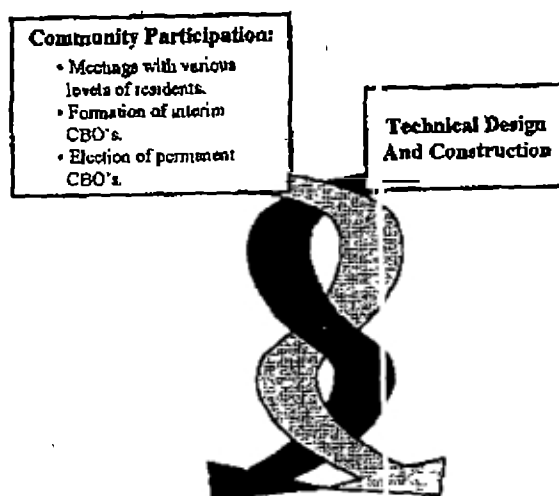
Figure 4 : The Water Supply Project As An Intertwined Line Of Action.

Thus, as meetings and workshops were begun in 1995, time was taken to allow residents to think of the elements that they felt the implementation process would need to include. Then, the dictate of the Chinese philosopher, Lao Tzu would be followed: 'The role of the educator is to take what the people give in a confused form, and give it back to them in an organised form'. To facilitate this, a list of technical parameters and participation requirements were set out. Often the residents could quite readily come up with many of these parameters on their own, but seeing the connections and sequence was more difficult.

2.4 COMMUNITY MOBILIZATION AND ORGANIZATION

2.4. 1 COMPOUND WIDE MEETINGS

In May 1995, planning meetings were held with key



stakeholders, including the Assistant Director and Chief Housing Officer of the Housing and Social Services Department of LCC, Peri-Urban Officer for Lusaka Water and Sewerage Company, and members of the Residents Development Committee (RDC). These meetings were crucial to ensure clear lines of communication and joint ownership among the key agencies from the beginning.

The next step was to convene several 'compound-wide meetings' of over 50 key organisations and leaders, and all other interested parties, to give broad assent to how the project should proceed. The first meeting was introduced by the chairman of the RDC, and began with an analysis of the water problem - questions asked included :

- What is the problem? What are its different effects? Who does it affect? To what extent does it effect?
- Why does the problem exist?
- What can be done?

By analysing how problems effect different people, it made public the amount of money and time being spent on water collection, and it brings to the forefront of people's awareness that it is women in particular who are most concerned. Both of these would be crucial to the successful implementation of the project.

To increase the degree of residents' ownership of the meetings, and to build some momentum, some RDC

members and several other interested individuals began working on an assignment to begin drafting demarcations of zones. The rationale for dividing the compound into zones was suggested by CARE and the Council, based partly on experiences in George compound and elsewhere. The main rationale behind zoning was that zone-level meetings would allow more people to be reached and drawn into the process. Take for example conducting a meeting that is advertised by beating a drum, having dancers or by conducting a drama 'code'. If such a meeting was held in one location, the attendance would possibly be 50 to 100 people from one single area. If 5 meetings are held at different locations the total attendance would increase to 250 to 500 people. These zones would become units for organisation, construction, operations and maintenance of the water project.

The results of the zoning exercise were presented to a Compound-wide meeting, together with some more detailed information on aspects of the technical design. The question was asked as to the kinds of contributions residents should make to the project. Small groups were formed amongst the participants each representing the three regions of Chipata, to discuss the level of cash contributions they felt be appropriate. The same small groups elected three people to be members of a working group.

The Water Working Group became a focal point for participation of the residents, and as a core group received more training, took part in planning, helped with compound zoning and siting of boreholes became the leaders of zone-level meetings, reporting back periodically to Compound wide meeting mid-1995, sufficient planning and design work had been completed, with the full participation of Working Group, to obtain an outline of the construction, operations and maintenance, and finance that residents could obtain a clear vision of the project. Based on an initial approximation of capital costs, the Working Group decided that each family should contribute K3,000 towards project capital costs, K500-1,000 as a monthly user fee. This was then discussed with and accepted at a Compound meeting.

At another Compound-wide meeting, a community institutions model was proposed, showing how Z level meetings would lead to election of Zone Development Committees, a Forum of Representatives, and then into a

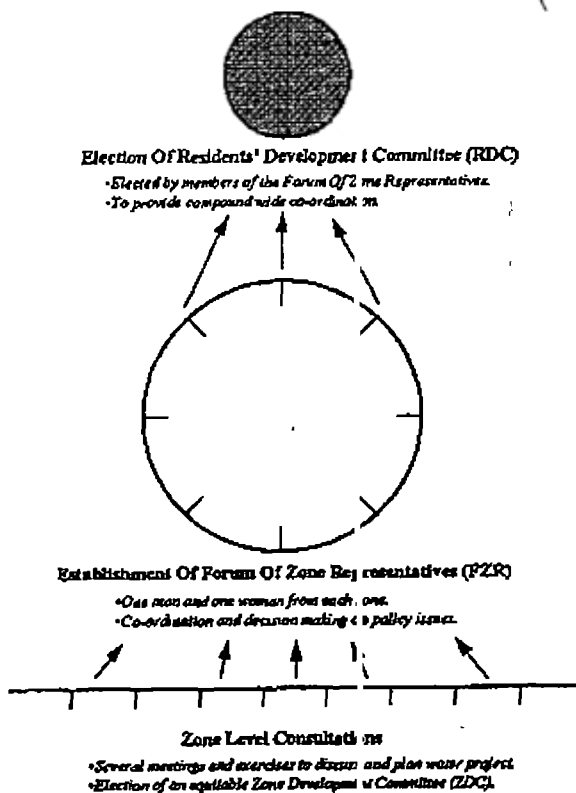
new Residents' Development Committee. This is illustrated below Figure 5.

Figure 5 : Structure For The Formation Of Area Based Community Organisation

This model allows a wide participation of residents, with emphasis on women, and clear accountability links between the grass-roots, Zone Development Committee (ZDC), and the overall Chipata Residents' Development Committee (RDC). The concept was approved by everyone attending, including the existing RDC which realised that the process would lead to its own replacement.

ZONE LEVEL MEETINGS.

The cornerstone and major activity of this whole phase of the project was the holding of zone-level meetings. In August and September, trial run zone-level meetings were conducted by members of the Water Working Group, which included a registration exercises to obtain detailed



demographic information.

The first trial run zone-level meeting, was attended by 98 people, most of whom were women. Chaired by the RDC

Chairman the meeting discussed the 'what happened?, why?, and what can be done?' with the water problem, and the roles of community, Working Group and CARE. As expected, the initial response to the idea of a cash contribution was that payment would only be made once water had been seen. However, one Working Group member replied that when you apply for a plot, you pay your money and then trust that eventually you will get it, hence the same should apply for water. Residents' payment up-front is seen as an important sign of their commitment, and staff frequently explained that progress would be dependent on the residents preparedness to do so.

Some momentum was lost in September-October, as by-elections in Mandevu created tensions and confusion over the water project, water being one of the main election issues. At several zone-level meetings, residents avoided attending, saying that they were tired of political meetings. An emergency meeting of the Working Group together with a Council official decided to avoid meetings until after the political election.

Meanwhile, a baseline study commenced in late 1995, which added considerable detail to the information already gathered. It showed clearly that residents were paying K50 for a 20 litre bucket of water, and with over half of families consuming over 100 litres/day (a very modest amount), this results in a monthly expenditure of over K7,500. Another group of residents, numbering over 40% of respondents, paid K150 for boys to collect 20 litres of water for them, so one such family consuming 100 litres/day would spend K22,250 per month on water alone. This amount of monthly financial outgoings has an obvious negative impact in terms of household livelihood security. In addition many household members, mainly women, were found to be spending many hours collecting water each day.

In order to quickly implement the zone-level meetings, and establish the FZR and RDC, which was a prerequisite to other aspects of the implementation, volunteers were sought from the Compound-wide meetings to join the Working Group. Appeals were made, in particular to the churches. The Working Group had decided on using the same demarcations for zoning as the Catholic Church uses, because they were logically-laid out, matched the required criteria, and were already recognised by many

residents. Because of their organised network of neighbourhood groups, the Catholic community sent many volunteers to help with zone-level meetings.

After training and organising, full zone-level meetings were carried out in late 1995 and early 1996. The general format used was to introduce the water project and the idea of Zone Development Committees (ZDC), getting residents to discuss their ideas for the project, including its cost to them. Although interest was initially low in Southern Chipata due to the fact that water was still intermittently available, and confusion over previous water-related meetings which had been held with another organisation, persistent efforts eventually resulted in the election of ZDC's in all 39 zones.

As a contrast to direct election of the RDC, the model of tiered elections has the following strengths :

- An increased number of residents are likely to participate -feeling a sense of ownership they are more likely to pay for and sustain any future water system.
- Elections are held at a lower level, so are not perceived as a threat to Councilors.
- People have an opportunity to interact, so they can vote on the basis of knowledge of each other, to avoid making the elections partisan, allowing people to concentrate on the local development issues rather than being caught up in side issues.
- Gives people a chance to participate in consultation before a committee is formed, so they begin to get a sense of their roles as individuals.

One factor which had inhibited all meetings in 1995 was the habitual scepticism of residents, born of many years of experience of broken promises. Thus, one factor which greatly aided the second wave of zone-level meetings was the sight of borehole being drilled. Sitings were done in a number of locations around Chipata Compound, and boreholes were drilled to test yields in three main sections of the compound. Adequate yields were eventually obtained in Northern Chipata. The activity finally put to rest any remaining doubts, and established the fact that this project was a reality.

Plate 1 : Borehole Being Drilled By Contractor Watched Closely By Compound Residents.

COMPOUND ORIENTATION

While the final ZDC elections were being held, the existing Committees nominated their representatives to the Forum of Zone Representatives (FZR), which then began meeting to review and approve aspects of the technical design which needed urgent attention. For example, the siting of water points which had been conducted by the Water Working Group in late 1995 had to be revised, and this was discussed with, and approved by, the FZR. Other issues were raised which led to activities for ZDC's, such as the drawing of large maps of their own zones to assist residents to understand demarcations. Those remaining zones which had not completed a family registration exercise carried out this exercise. At the same time, all members of the FZR attended a 2-week CBO training



course, which was seen as an important preparation for the election of the RDC.

Once all ZDC's were elected, a 2-day orientation meeting was held with the FZR, to ensure that everyone had at least a basic level of understanding of the water project, and to prepare for the RDC election. This was seen as a crucial meeting, since the FZR will need to remain as a strong body able to oversee development in Chipata, and resist the temptation to relax, leaving everything to the RDC. The main aspects of this orientation included :

- Understanding each of the components of the water system.
- Envisioning likely threats to systems, going through section by section.

- Thinking about particular capabilities that will be needed by the institutions who will be encountering these threats.
- Then thinking about roles and responsibilities of the various institutions
- Exercises to focus on these subjects were devised by staff, which drew on a number of participatory tools, such as mapping, SWOT analysis, and force-field analysis. The residents worked in groups to compose a complete water system using cards with different component parts drawn on them.

Plate 2 : Residents Joining Individual Cards Together To Form A Complete Water System

Once they had completed this, with the accompanying discussion about individual parts, the residents then looked at each section, trying to predict the kinds of threats likely to occur. By discussing the capabilities needed to counter the threats, residents focused on the kinds of qualities they would look for in a potential RDC member, and it also served to remind themselves of what kind of educating the compound at large would require. This served as a basis for discussing the roles that would be required of the ZDC, FZR, and RDC.

Towards the end of the orientation, the FZR was visited by Lusaka City Council Director of Engineering (Acting Director of Housing & Social Services), the Assistant Director of Housing and Chief Housing Officer, who were



given a presentation on the contents of the orientation by the residents. Council officials asked probing questions,

which residents were able to answer to everyone's satisfaction.

A similar exercise will be used to derive monitoring & evaluation indicators, which in a participatory manner, will allow the key indicators to monitor operations and maintenance to be worked out in consultation with the FZR.

INSTITUTION-BUILDING

The concept of community-owned and managed water supply is relatively new, particularly in peri-urban areas. Both policy-makers and citizens have always looked up to government and local authority to supply the service, so the shift implies a redefinition of roles and responsibilities for all actors involved.

One question that immediately rises is the role of governmental agencies. Lusaka City Council and Lusaka Water & Sewerage Co. have both been involved from the beginning of the Chipata water project, and the relationship has been solidified with a Tender Board which reviewed and approved major procurements, and which is now becoming known as a 'Steering Committee' that will continue to provide guidance to the project in the future. In the water project, as with all other aspects of PUSH programs, LCC Housing Department has been a constant and key ally. Lusaka Water and Sewerage Co. have freely offered assistance in reviewing designs and providing an additional counter-check to their appropriateness. Their future general role will be to lend technical support and be an objective reference point for the RDC whenever necessary, especially after CARE pulls out.

The general roles and responsibilities of community institutions have been agreed as follows :

i) ZDC :

- Grassroots connection with residents
- Primary point for encouraging participation. Primary point of accountability of RDC structure to residents.
- Co-ordinate implementation of water project at zone level (volunteers for construction, revenue collection).
- Carry out appraisals and consult with zone residents to come up with future zone-level projects.

- Gather ideas with zone residents to take to the Forum of Zone Representatives for future compound level project.

ii) FZR :

- Make compound policy decisions.
- Receive reports from RDC and review progress of compound-wide projects, give input, and evaluate.
- Periodically hold meetings that are open to other residents who are not members of ZDC's, e.g. leaders from other CBO's such as churches, associations, etc.
- Compound-wide meeting of representatives to bring ideas from the grassroots, to make decisions on major projects to undertake in the future.

iii) RDC :

- Co-ordinating major compound projects on a day-to-day, week-to-week basis, and providing leadership to ZDC's in taking on development roles.
- Reporting to the Forum of Zone Representatives.
- Representing the compound with outside agencies.

Roles and responsibilities deal mainly with the question of: 'what are we supposed to do?', or 'what are we allowed to do?'. Perhaps more important, is the question of vision, of having a desire and the capabilities to do something. What often holds back people from fulfilling new roles may be a persistent attitude towards apathy, fatalism, or a tendency to too harshly judge or be jealous of others who attempt to make a change in the community. Perhaps more consideration should be given to this, rather than just roles alone.

Thus, greater emphasis is being given in all PUSH compounds to 'CBO Training', especially for members of ZDC's, which has been developed in-house, drawing on materials from a number of different sources. The topics covered include: group expectations and rules, what is 'PUSH', brief history of peri-urban development in Zambia, participation, voluntary service to the community, involving women and men, community-based organisations, vision, servant leadership, partnerships, how to hold effective meetings, consultation and communication, project cycles, monitoring and evaluation, coping with witchcraft and jealousy, enthusiasm, conflict resolution, and participatory tools.

The experience during the first few months of training has shown a high level of enthusiasm amongst residents, and the achievement of a higher level of maturity in all activities. By discussing the need for institution-building for long-term benefits leads to the moderation of attitudes which had been holding back progress, such as the insistence by some on receiving payment for doing anything for the community. A number of ZDC's have undertaken activities independently, drawing on themes learnt in the CBO training.

CONSTRUCTION, OPERATIONS & MAINTENANCE, & FINANCIAL MANAGEMENT

The Chipata Water Project is now at the point of beginning construction of a distribution centre, and most major equipment, such as borehole pumps, pipes, and tanks have been procured. Some of the suppliers have agreed to include training and follow-up monitoring in their contracts. Water sources have been determined and are able to provide 35 litres/person/day for the Chipata population until the year 2006. Supervision is being carried out by Ranking Engineering Consultants, who have also prepared the technical designs, which are presently being reviewed by Lusaka Water & Sewerage Co. and Lusaka City Council.

The basic system will consist of submersible pumps pushing water through a rising main into ground storage tanks at a centrally-located distribution centre, and booster-pumped into an overhead tank for gravity distribution to each zone. One water point will be located in each zone, with between 2 and 6 taps at each point. One point per zone was eventually chosen by staff and residents, for ease of consumption control and maintenance. Much of the system operation relies on the continued service of volunteers, whilst there are a number of full-time jobs envisaged for several operators and plumbers, as well as one revenue collector/tap supervisor for each zone (an option which has been discussed with the Water Working Group but needs final agreement by the FZR).

Draft manuals and procedures have been prepared for construction, operation and maintenance, as well as financial management. Specific teams for O&M, finance, construction, and health education have been formed from among FZR members who will be trained, and help

refine the procedures, and organise residents for participation.

The future revenue collection and financial management system has been developed over many meetings and workshops in 1995 with residents from Chipata, as well as from George, Kanyama, and Malota. It is currently being formed into a complete package, with accounting forms, training materials, and guiding manuals, which will be presented to the community for final approval before the training of individuals begins. Additional work is being done on budgeting and setting prices, based on revised replacement costs. This work is being done by Management Services Board in conjunction from Lusaka Water & Sewerage Co. officials, and field staff from George Compound. A great deal of thought is going into developing numerous checks and balances to protect the system and the residents from future abuse. Key aspects of this system include :

- i) Revenue will be collected by elected Revenue Collectors from each zone, at 5 offices throughout the compound, during a designated period in each month.
- ii) A membership list will be maintained by the ZDC (from the registration exercise already completed).
- iii) A specially-printed and stamped card will be issued each month to users by the Revenue Collectors, which serves as a proof of payment.
- iv) The ZDC's will supervise and counter-check Revenue Collectors.
- v) The Revenue Collector and assistant will restrict consumption at water point to a maximum level based on 35 litre/person, and an average family size of 6) for those who are paid up, making a note on spaces on card of how much water is consumed.
- vi) List of defaulters are publicly displayed to disallow consumption.
- vii) Users can only consume water in their own zone.
- viii) The Revenue Collectors will hand over fees on each collection day to the RDC Treasurer, who issues a

receipt, and then goes accompanied to bank the money.

- ix) An account is held in the name of RDC, CARE, LWSC and LCC, with the use of 2 panels of signatories.
- x) Both the RDC and the Finance Team have the authority to review the financial books of the RDC Treasurer.
- xi) Updated data on number of users, default rates, and monthly revenue will be displayed publicly at the Compound Planning Office (to be constructed at current LCC/PUSH office complex), and discussed at monthly FZR meetings.

CONCLUSIONS

A number of important conclusions can be drawn based on the experiences gained by CARE in the Peri-urban environment to date, these include :

- Whilst one appreciates that water is life and should be made available to all, the reality is that it is not currently available to all. Reformed public institutions may be able to do something, and should not be relieved of their responsibilities, but realism suggests that even the most revitalised public institutions will still be far from capable to meet the needs, at least in the short term.
- Surveys and consultations indicate that the community is willing to pay for water services.
- Through participatory methodologies and flexible planning mechanisms the community have actively participated in shaping the design, so the chances of taking over the responsibility for future operation and maintenance is maximised.
- The process adopted, although slow, is nonetheless indispensable for effective implementation and sustainability.
- The revenue generation aspect of the water project is crucial to its future sustainability.

COMMUNITY PARTICIPATION IN RURAL WATER RESOURCE USE AND MANAGEMENT.

INTRODUCTION.

CARE is presently working with rural communities in the Kalomo South District in the Southern Province through its Livingstone Food Security Project (LFSP), and South West Drought Relief Project (SWDRP). In particular the LFSP has distributed a variety of drought resistant crops

which, after two seasons, now covers some 8,500 participating farmers managed by 180 Village Management Committees (VMC's).

The project area should receive an average annual rainfall of some 700mm, although in past years as little as half this amount has fallen, distributed unevenly throughout the rainy season. Inevitably, the scarcity of water in the area has created a number of serious problems, with water tables consistently dropping. Over a number of years, life has become incredibly harsh for the majority of the rural population, who presently lack acceptable access to the most essential life sustaining resource - water. This makes the availability of water resources a major issue amongst communities in the area, and as such both Projects are focusing on water resource related activities for both household and drought mitigation activities in attempts to secure and improve the livelihoods of rural communities to acceptable and sustainable levels.

In our role as 'experts' facing new and unrivalled challenges, we often overlook, misunderstand and neglect to fully appreciate problems that are commonly faced by communities based on years of cultural and traditional practices and coping strategies, all too often becoming involved ourselves as the decision makers and initiators of inappropriate projects. We have to learn to appreciate that, given the appropriate opportunity, communities can identify problems and manipulate their own solutions themselves.

In an attempt to alleviate the current water shortage problem, and at the same time increase the institutional management capacity of rural communities, CARE has adopted a strategy that focuses on community resource management in 'key resource areas'. This paper outlines an appropriate participatory approach that has been used to identify and appreciate a multitude of complex social, economic, and environmental problems in one such 'key resource area'. This resulted in community inspired action plans for a variety of activities, including water resource use and management implemented through appropriate management strategies.

This whole process was 'facilitated' by a PRA team using a variety of PRA tools and techniques that attempted not to 'manipulate' and 'impose' a number of predetermined interventions.

KEY RESOURCE AREAS.

During March this year a series of participatory rural appraisal (PRA) exercises were conducted in a number of 'key resource areas' in Kalomo South District. The term 'key resource area', or 'libala' as referred to locally, is defined as an ecologically and environmentally delicate area or flood plain consisting of rich, dark alluvial soils, which when managed correctly are ideal for a variety of sustainable uses such as smallscale agricultural production, upon which community livelihoods depend.

This paper focuses on one such 'libala' located approximately 50 kilometres west of Livingstone where one of the four day PRA exercises was conducted. The PRA exercise was conducted with Kooma and Mooka village communities, located on opposite ends of the Libala. Both communities use the Libala for a variety of livelihood activities, though some such as fishing, have disappeared over the years. Today, the Libala is used by communities :

- As a source of limited water for household use
- To produce a variety of agricultural crops
- As a source of limited grazing and water for livestock.

Figure 6 (a) And (b): Location Plans**COMMUNITY SOCIAL, ECONOMIC, AND ENVIRONMENTAL PROBLEMS.**

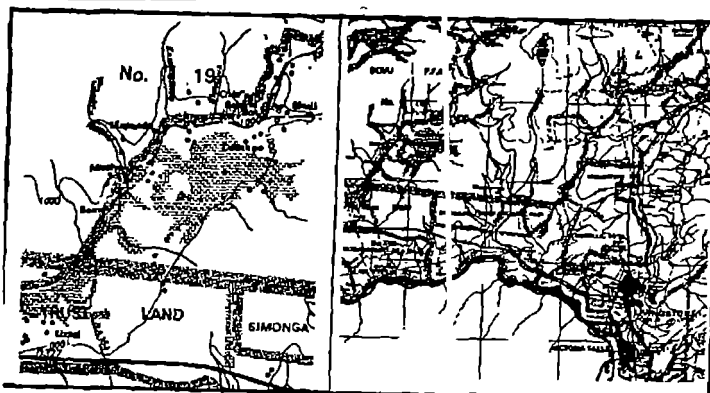
A large proportion of the time spent carrying out the PRA exercise was concentrated on gathering historical information from the participating communities, facilitated through the use of a number of appropriate participatory methods and techniques. This sharing of information allowed the PRA team, as outsiders, to become slowly acquainted with, and develop a thorough understanding of a series of complex social, economic, and environmental problems which face communities today.

The first exercise was the modelling of a resource map using local materials to detail the Libala and its surrounding area, identifying land use features such as, streams, forest areas, villages, roads, fields, and water points. Almost immediately this exercise highlighted a

very fundamental social problem existing between the

Figure 6(a): The 'Libala' Utilized By The
Kooma And Mooka Community.

Figure 6(b): The 'Libala' In Relation to Livingstone
Town.



Kooma and Mooka village communities. It had previously been assumed by the PRA team that the utilisation and management of the whole Libala was equitably divided amongst the two communities. This assumption was soon proved wrong by a clearly defined boundary that separated the two communities, dividing the Libala roughly in half. The Kooma community had very quickly started to map their resource area incorporating only their part of the Libala, which did not include the Mooka community. Without prompting, the Mooka community broke off from the group and proceeded to model their half of the Libala.

The result of this was very important for the remainder of the PRA exercise which had implications on the different types of problems and subsequent action plans that would be conceived through very different management strategies as identified by each of the two community groups. This strong, obvious social division meant that the PRA team had to divide into two, and facilitate the two communities separately in their respective areas for the remainder of the exercise.

It soon became apparent that a clear relationship existed between many of the communities' problems and a reduction of available water resources in the Libala. The interesting point here was how the reduction of water resources has had a long term effect on the development of the area over the past 70 years and not only during the most recent drought period.

Figures 7(a), (b), and (c) illustrate three different historical resource maps that were drawn by the community to show how the character of the Libala has been transformed from an area that was abundant with water all

year round in 1926, to that of today when it is completely dry all year round.

It is interesting to note how the 1996 resource map bears a startling resemblance to the topological map in Figure 6(a). This is clear evidence of the detail and knowledge that communities command of their own resource areas.

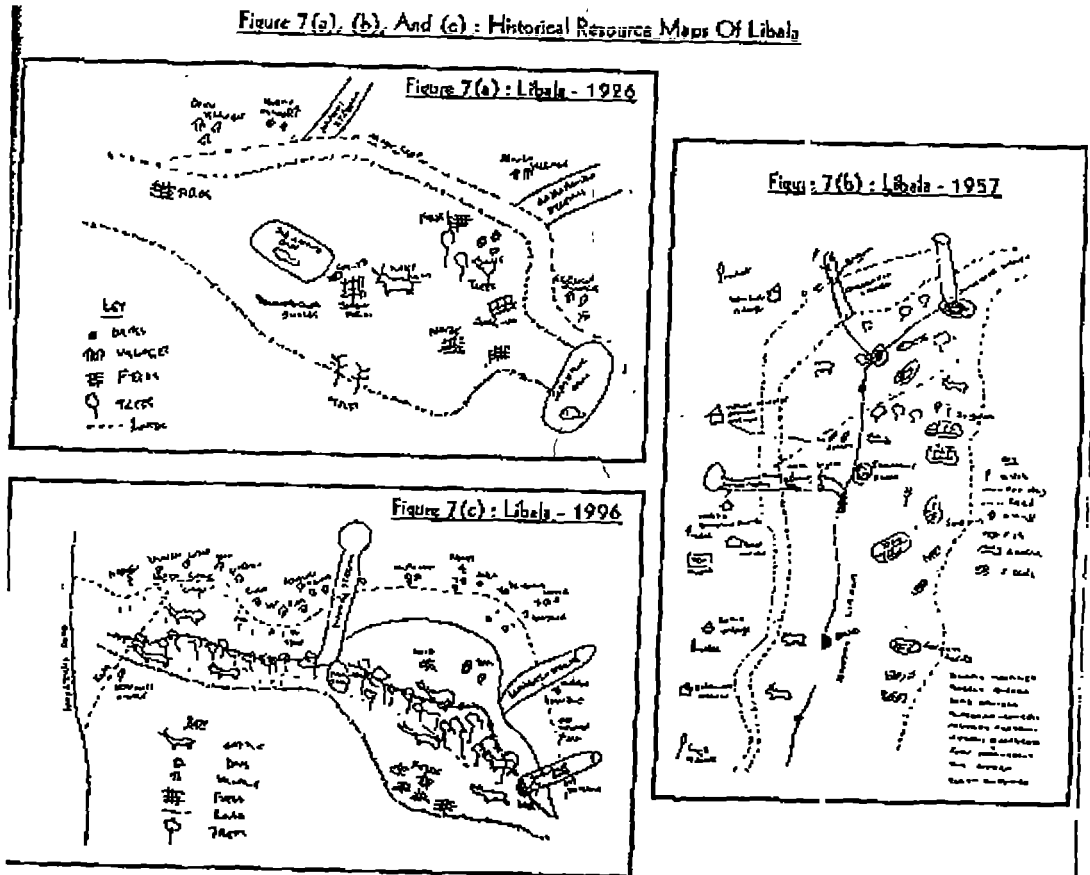
Historical events that have led to the reduction of water resources and how this has adversely effected the economic and social development of the area were further highlighted in detail when the community were able to produce a historical time line of the events in the area dating back as far as 1934.

Figure 8 details the historical time line and the seriousness of the reduction in the size of the Libala resulting in :

- i) The loss of fish and wildlife.
- ii) The loss of social facilities such as schools.
- iii) People migrating out of the area.
- iv) The loss of traders in the area.
- v) A reduction in livestock (in the dry season cattle travel 12 hours for water which results in receiving water every 1 in 2 days).
- vi) The loss of vegetable gardens.
- vii) An increase in waterborne diseases.
- viii) Long hours spent travelling and waiting for water.
- ix) The fall in water table levels and eventual drying up of wells.

Figure 8 : Historial Time Line For The Kooma

Figure 7(a), (b), And (c) : Historical Resource Maps Of Libala



And Mooka Areas

A simple trend analysis was used by the community to illustrate how a number of major indicators have changed from 1926 to 1996, as reproduced in Figure 9. The majority of these indicators have decreased in line with the change in form of the Libala due to a reduction in water. The only two indicators to have increased were the number of villages and trees. The number of villages have increased as a result of the migration of people out of the area which has allowed those remaining to spread out into the surrounding areas. The community reported that the number of trees in the Libala have increased as a result and sign of continued drought. In past years of normal rains and flooding of the Libala, trees would rot and are

unable to regenerate. The increase in number of trees in the Libala is seen by the community as a key indicator of

Date	Events
1944	• Attack by 'muyo' (similar to locusts) which cleared all types of plants
1944-1960	• The Libala was full of water and had lots of fish. • There were a lot of diseases such as measles and chicken pox. • Food was also in abundance. • Crops grown away from the Libala, on the slopes. • Three Government wells built in area.
1950	• Prices increased • Water levels in the Libala decreased
1960	• Mocha Chiefs were merged with Sekute • Government sprayed area against insects
1962	• The school was moved from Kooora to Mwalala due to the decline in water, this led to most people leaving the area and moving to Mwalala • Nukalindi road was constructed
1964	• Independence
1968	• People stopped living in big clusters, started to separate because they wanted more land for growing crops • Continued to graze grazing land.
1970	• Libala getting smaller • Started growing crops in the Libala • Water levels started declining
1971	• Cattle numbers reduced due to a number of diseases. • People sold a lot of food to cope with reduction in cattle.
1973	• Traders left the area • Grocery left the area • People left area due to water shortages
1979	• Rodyfoll rebellion. • Poor crop harvests • Use of Mungongo (wild fruit) as a food. • Diseases (measles and chicken pox) reduced. • Most wells dried up. • Last pigs in villages sold for food. • Wild animals left.
1980	• Aids cases were reported in the area • More trees in the Libala • Government wells dried up
1983	• No more small gardens as a result of lack of water.
1988	• Diseases amongst people and cattle increased
1990	• Charcoal burning started in the area in order to raise income due to loss of crops because of drought. • More people coming in search of cheap cattle
1992	• There was an increase in land prices. • Commodity prices increased
1993	• The worst hunger ever remembered • Introduction of relief food from Sekute • Fish disappeared
1994	• Forest killed insect plagues. This caused a reduction in wild fruits. • Started receiving relief food from Kooora PEM Centre • Poor harvests • Dunes drying up • No grass for grazing • Reduction of wild fruits in the forest
1995	• No water at all in the area.

NOTE: Bursts in italics refer to water related events.

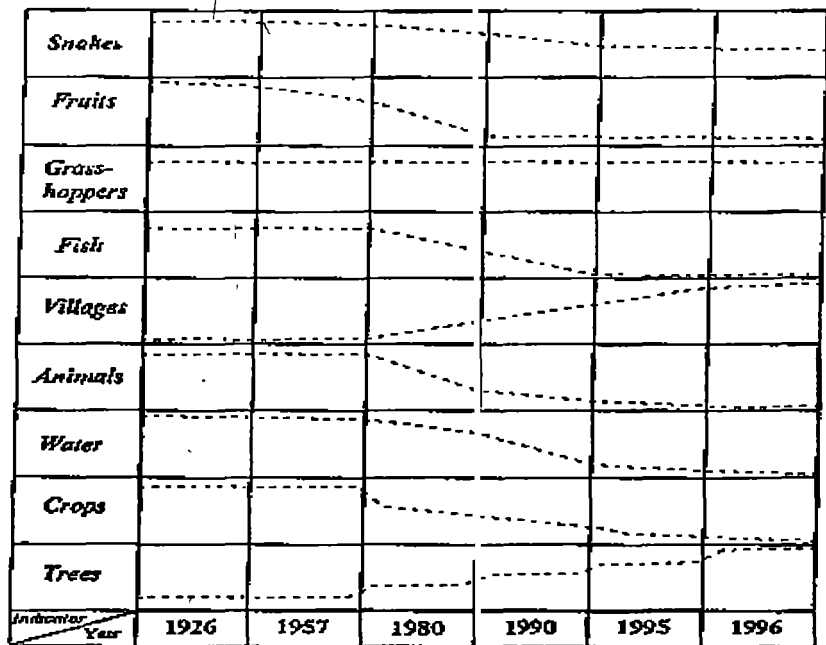
drought. Many of these trends, such as the increase in trees, are backed up by the historical resource maps in Figure 7 above.

Figure 9 : Trend Analysis For Major Indicators Selected By The Mooka Community

The pairwise matrix ranking technique was used as a means to prioritise problems faced by the community as a result of a growing shortage of water. A number of specific problems were first identified and listed in matrix form. In turn each of these problems were compared with each other noting which was of highest priority. Table 1 and 2 illustrate the results from a men's and women's group.

Table 1 : Pairwise Matrix Ranking Results From The Men's Group.

The men identified the reduction of water in existing wells and a reduction in the numbers of cattle and crop production as their highest prioritised problems as a result of a growing shortage of water.



----- Indicates of a relative level over the years

Table 2 : Pairwise Matrix Ranking Results From The Women's Group.

The women identified the reduction of water in existing wells and the growing increase in disease and lack of social infrastructure as their highest prioritised problems as a result of a growing shortage of water.

Combining the results from the two groups gives an overall priority to the reduction of water levels in existing

Problems Due To Water Shortage	1	2	3	4	5	6	7	8	9	Score	RANK
Decrease in number of cattle	1	1	1	1	1	6	1	8	1	6	2nd
Decrease in crop production	2		2	2	2	6	2	2	2	6	2nd
Decrease in vegetable gardens	3			4	3	6	3	8	3	3	6th
Lack of social infrastructure	4				4	6	4	4	4	5	4th
Relying on alternative sources of income	5					6	5	8	5	2	7th
Reduction of water in existing wells	6						6	6	6	8	1st
Reduced wild fruits	7							8	7	1	8th
Increased disease	8								8	5	4th
Reduced wild animals	9									0	9th

wells, and an increase in diseases, closely followed by the decrease in numbers of cattle and lack of social infrastructure. Table 3 summarises these results.

Problems Due To Water Shortage	1	2	3	4	5	6	7	8	9	Score	RANK
Decrease in number of cattle	1	1	1	4	1	6	1	8	1	5	4th
Decrease in crop production	2		2	4	2	6	2	8	2	4	5th
Decrease in vegetable gardens	3			4	3	6	3	8	3	3	6th
Lack of social infrastructure	4				4	6	4	8	4	6	3rd
Relying on alternative sources of income	5					6	5	8	5	2	7th
Reduction of water in existing wells	6						6	6	6	8	1st
Reduced wild fruits	7							8	7	1	8th
Increased disease	8								8	7	2nd
Reduced wild animals	9									0	9th

Table 3 : Final Community Ranking Of Problems Due To Water Shortage.

The results of this prioritisation exercise clearly indicate the major problem areas resulting from a growing shortage of water, and would be used later by the community when considering a number of possible solutions and as part of the preparation of their action plans.

During the course of the PRA exercise a number of individual interviews were held with participants as a means to explore in depth the extent and impact of the water shortage problem, and its impact on day to day livelihood security at a household level. Box 1 and 2

summarises the results of two of these interviews, highlighting a number of issues common amongst all

Problems Due To Water Shortage	Group Scores		Total Score	Final Rank
	Men	Women		
Decrease in number of cattle	6	5	11	3rd
Decrease in crop production	6	4	10	5th
Decrease in vegetable gardens	3	3	6	6th
Lack of social infrastructure	3	6	9	3rd
Relying on alternative sources of income	2	2	4	7th
Reduction of water in existing wells	8	8	16	1st
Reduced wild fruits	1	1	2	8th
Increased disease	3	7	10	2nd
Reduced wild animals	0	0	0	9th

those interviewed.

BOX 1 : Community Water Uses And Problems.

Case Study No. 1 : Irene Sitengu.

Irene lives in Musiya Village as part of a household of eight people. Water for domestic use is drawn from Mokosi Village. During the rainy season (November - March) water is collected from open 'ponds' near her village. From April to October water becomes a big problem.

On a typical day, say in September, Irene wakes up at 6.00hrs and walks to a well which is about a kilometre away, where she waits for water. She has to sometimes wait up to half the day for water. On this day she was

BOX 1 : Community Water Uses And Problems.**Case Study No.1: Irene Sitengu.**

Irene lives in Musiya Village as part of a household of eight people. Water for domestic use is drawn from Makoci Village. During the rainy season (November - March) water is collected from open 'ponds' near her village. From April to October water becomes a big problem.

On a typical day, say in September, Irene wakes up at 6.00hrs and walks to a well which is about a kilometre away, where she waits for water. She has to sometimes wait up to half the day for water. On this day she was lucky and only waited 3 hours and was at home by 10.00hrs. Every day she has to go to the well 4 times.

Irene uses water for drinking, cooking, cleaning plates, bathing, brewing beer, food processing, and for massaging bodies when ill. This list is endless when there is plenty of water. On days when water is scarce it is only used for drinking and cooking.

Among the problems that Irene faces due to insufficient water in her household are, skin diseases (scabies) on all her children, feeling too tired to do other jobs such as looking for relish, and being unable to carry enough water at one time to use for all her household needs.

done, such as cooking, looking for food, and sweeping the

BOX 2 : Community Water Uses And Problems.**Case Study No.2: Mevis Mate.**

Mevis has three children and draws her water from Posa well (which is approximately 5 kilometres away). Mevis starts her journey at 6.00hrs every morning and arrives at the well some 3 hours later, having rested twice on the way. Having waited for water, she will finally reach home at about 18.00hrs. She has to go to the well twice every day, which means starting off again at night time.

As a result of the time spent collecting water, many of Mevis's other household activities suffer and are often not done, such as cooking, looking for food, and sweeping the house. What little water she collects is used first for cooking, cleaning plates and drinking. If there is any water remaining, then she will use it to bath her children. Mevis faces many problems with having to travel such a long distance for water, these include being bitten by snakes, being attacked by wild animals, becoming very tired and hunger.

In light of the apparent difference in the traditional management of the Libala that was highlighted at the beginning of the PRA exercise, solutions and action plans were developed independently by the Kooma and Mooka communities to suit their own individual problems, needs, and abilities to plan, implement, and manage.

KOOMA COMMUNITY SOLUTIONS AND ACTION PLANS.

The construction of a 'problem and solution tree' was used by the Kooma community as a means to first establish a structured overview of the communities problems and identify possible project interventions given by groupings of similar solutions. This was done by writing a number of different problems on individual cards which were then arranged on the ground in the form of a tree connected by lines showing how one problem leads to another. Then, by taking each of these problem cards in turn, solutions were written on the back of the cards and put back in exactly the same place in the tree. By looking carefully at the final arrangement of the cards the community drew around cards that were common to a particular project intervention. Each of these clusters of cards were labelled with a community project intervention that could attempt to respond to some of the communities problems. Plate 2 shows the community constructing their problem tree. Plate 3 shows the completed solution tree from which a number of possible appropriate project interventions were identified.

Plate 3 : The Construction Of The Problem Tree Cards Using Individual Problem Cards And Sticks Connecting Problems As They Lead Onto Other Problems.

Plate 4 : The Completed Solution Tree From Which Appropriate Project Interventions Were Identified.

The detailed results of the 'problem and solution tree' are illustrated below in Figure 10(a) and (b). Figure 10(a) illustrates the problem tree and Figure 10(b) illustrates the solution tree showing the clusters of similar solution cards and possible project interventions.

Figure 10(a) And (b) : Results Of The Problem And Solution Tree Exercise.

Without external influence or prompting, the Kooma community were very easily able to identify the following



community project interventions :

- Water programme.



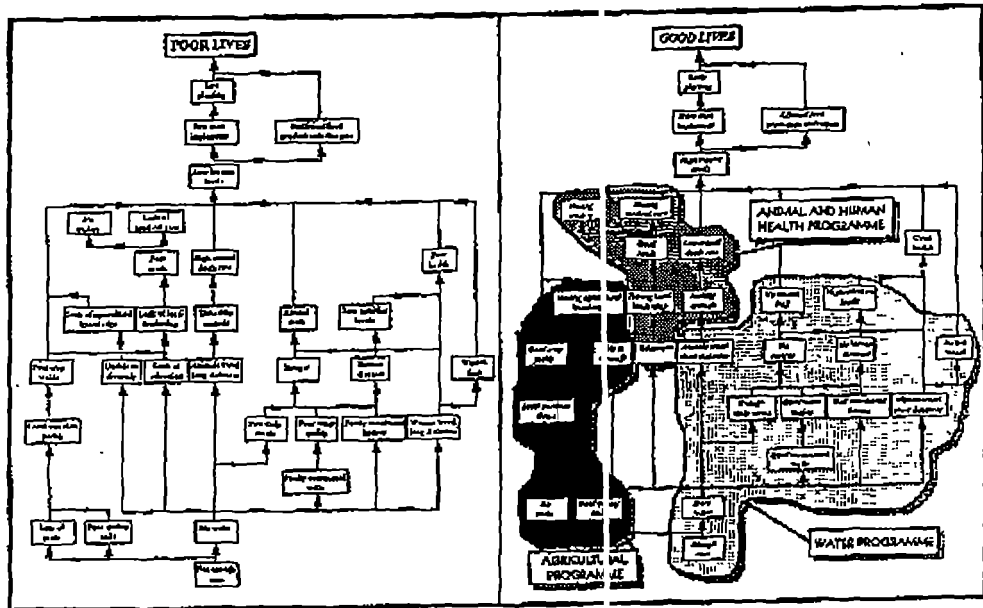
- Agricultural programme.
- Animal and human health programme.

Through discussion the Kooma community were able to produce an action plan for the implementation of a future

water programme. This has been summarised below in Box 2.

Figure 10(a) : Results Of The Problem Tree

Figure 10(b) : Results Of The Solution Tree



BOX 2 : Kooma Water Programme Action Plan.

Dam

- 1) Work will be carried out on the existing Sibandwe Dam due to its central location and use by a number of different villages.
- 2) The dam will need to be widened and deepened.
- 3) Work will start in July to September after people finish harvesting in June.
- 4) Five villages can use the dam for vegetable gardens, namely : i) Mutoiwa. ii) Musiya. iii) Kalokela. iv) Molosi. v) Kooma.

Wells

- 1) All labour requirements will be provided.

BOX 2 : Kooma Water Programme Action Plan.**Dam**

- 1) Work will be carried out on the existing Sibandwe Dam due to its central location and use by a number of different villages.
- 2) The dam will need to be widened and deepened.
- 3) Work will start in July to September after people finish harvesting in June.
- 4) Five villages can use the dam for vegetable gardens, namely : i) Mutoiwa. ii) Musiya. iii) Kalokela. iv) Molosi.
- v) Kooma.

Wells

- 1) All labour requirements will be provided.
- 2) Advise and technical assistance will be required and sought.
- 3) Wells will be deepened between May and October.
- 4) Six wells will be required at:
 - i) Posa.
 - ii) Musiya.
 - iii) Molosi.
 - iv) Champion.
 - v) Kooma.
 - vi) Kokwe.
- 5) Each of these wells will serve 2 to 4 villages.
- 6) Each village will be responsible for working on their own well.

Borehole

- 1) If assisted with boreholes then they would be located in the following way :
 - If 3 boreholes available they would be sited at Molosi, Bovu and Kokwe.
 - If 2 boreholes available they would be sited at Molosi and between Champion and Kokwe.
 - If 1 borehole available it would be sited at the clinic.

- 2) A person from the community would need to be trained in maintenance and repair skills.

Community Management Structure

- 1) A committee will be formed using members from the existing Village Management Committees.
- 2) Water programmes will be managed in a similar way as the seed scheme.
- 3) Rules and regulations over use and maintenance of facilities will be developed.
- 4) Financial contributions will be made.

that the PRA team would provide whatever intervention the community requested.

- 1) Choose new sites instead of using existing because the side walls of existing wells tend to collapse.
- 2) New sites for communal wells should be used since existing wells have been dug by individuals and if lined their use will lead to conflict.
- 3) Selection of 3 new well sites to serve a large number of villages at : i) Sikokwani. ii) Kanyoka. iii) Maimbwe.
- 4) Form a water committee whose members will be drawn from the existing village management committees. Will supervise the construction of the new wells. Will develop rules and regulations for the future

BOX 3 : Mooka Action Plan For The Construction Of New Wells.

- 1) Choose new sites instead of using existing because the side walls of existing wells tend to collapse.
- 2) New sites for communal wells should be used since existing wells have been dug by individuals and if lined their use will lead to conflict.
- 3) Selection of 3 new well sites to serve a large number of villages at : i) Sikokwani. ii) Kanyoka. iii) Maimbwe.
- 4) Form a water committee whose members will be drawn from the existing village management committees. Will supervise the construction of the new wells. Will develop rules and regulations for the future management and maintenance of new wells.
- 5) Work on digging wells will start immediately, with a list of people who will work at each well site to be drawn up. The name of each person, his village, and the number of days that he is required to work will be recorded.
- 6) People working on the wells will be divided into groups of 10 people.
- 7) Each well should take approximately 2 weeks to dig.
- 8) The community can provide some tools however they will need to look for assistance for others.
- 9) The community can provide materials such as sand and stones, but will need to look for assistance for cement.

problems that would appear almost impossible to reverse.

The identification and concentration of rural development issues in 'key resource areas' should allow a combination of interventions to develop in a more sustainable and

holistic manner, with the growth of benefits seen and felt over a period of time. In such delicate ecological environments other crucial concerns such as inappropriate land use, soil degradation, and deforestation need to be very carefully analysed and taken into account, and integrated into future overall programme approaches. In the case of Kooma and Mooka appropriate interventions need to look further than just providing a water source, but in addition developing ways and means of recharging natural water courses as a means to sustaining and conserving future water resources.

The need for integrated water resource management approaches will become even more crucial in the future as water continues to become a scarce and even luxury resource to many communities in their day to day lives. In many instances interventions such as the sinking of boreholes and wells will do little to solve this water scarcity problem. In addition it is approaches and practices such as water conservation and water harvesting techniques that attempt to raise water table levels that will in the future ensure an equitable share of water for a variety of water uses and demands.

In such 'key resource areas' where the forces of nature have created such harsh and fragile environments over the years, appropriate interventions need careful planning - for example it is conceivable that the provision of a number of reliable water sources may increase the numbers of livestock, encourage overgrazing, contribute to soil erosion, reduce rainfall infiltration, and thus in time reduce groundwater levels. In this way a short term technological improvement may continue to cause irreversible ecological deterioration, causing people to continue migrating out of the area. New technical interventions must be developed to find a new balance within evolving ecological environments. In addition appropriate solutions need to be sought that are understood, controlled, and operated by local people, even if this means, in the case of water, lower levels of production and quantities of water.

The utilisation of appropriate participatory methods and techniques should allow participating communities to understand, visualise, and develop their own appropriate solutions that are adaptable to their own complex social structures. The PRA exercise at Kooma and Mooka is an example of the need to understand the social dynamics

that exist between communities living in the same area. Conflicts between neighbouring communities, can very easily be overlooked and misunderstood by practitioners in their role as experts. The conflict that exists between Kooma and Mooka in the use and informal ownership of the 'libala' highlights this problems and those which could occur should we as experts impose our 'in good faith' and with 'the best intention' solutions such as indiscriminately located boreholes and wells.

For CARE the next stage for the Kooma and Mooka communities will be the facilitation of the implementation of their individual action plans. Assistance will be given in the formation and establishment of V-WASHE committees in these areas. The PRA exercise marked the beginning of a number of new integrated development approaches and practices for the area, such as the growth of the seed programme, now running for the past two seasons, into one that can continue independently through appropriate community management mechanisms. In addition appropriate water related interventions will be introduced that will be integrated within a framework of soil and water conservation techniques, which themselves will relate to appropriate land use and farming practices. It is hoped that many of these approaches will help to reverse the trends of recent years increasing the productivity of the Libala, and increasing present levels of household livelihood security to a level of sustainability that is able to resist 'shocks' such as drought.

COMMERCIALISATION AND COMMUNITY PARTICIPATION : COMPLEMENTARY OR CONTRADICTIONARY IN THE PERI-URBAN AND RURAL ENVIRONMENT

With reference to the theme 'Commercialisation And Community Participation : Complementary Or Contradictory'. Without exception it goes without saying that in its appropriate form, community participation is an approach that must be adopted in order to facilitate community decision making in the planning and development of appropriate water related interventions and their future sustainable development. However, the question of commercialisation needs to be considered very carefully, especially with regards to its appropriate use in relation to different economic, social, and environmental conditions.

In such delicate environmental situations as those given in the example of Kooma and Mooka, one would question the appropriateness of commercialisation. Is it possible for

DEBATE SERIES : 2

TITLE : Participation in the Context of Commercial Utilities

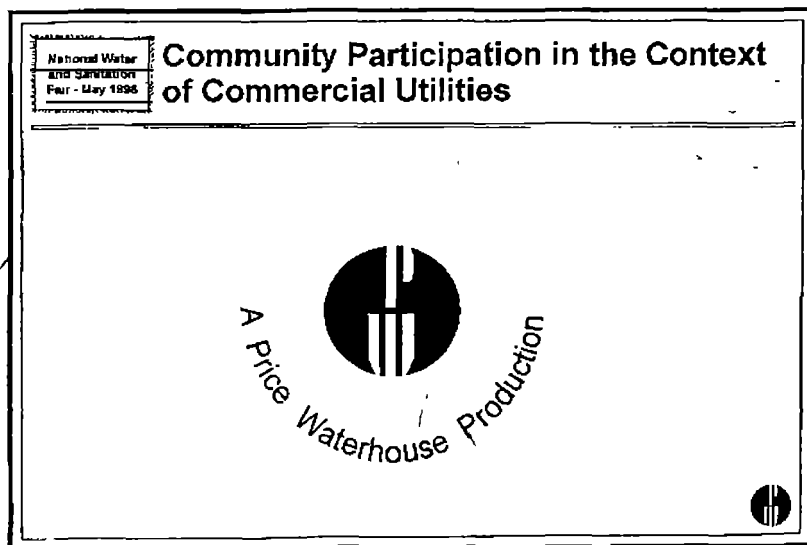
DATE : 16th May 1996

TIME : 8:30 to 10:00

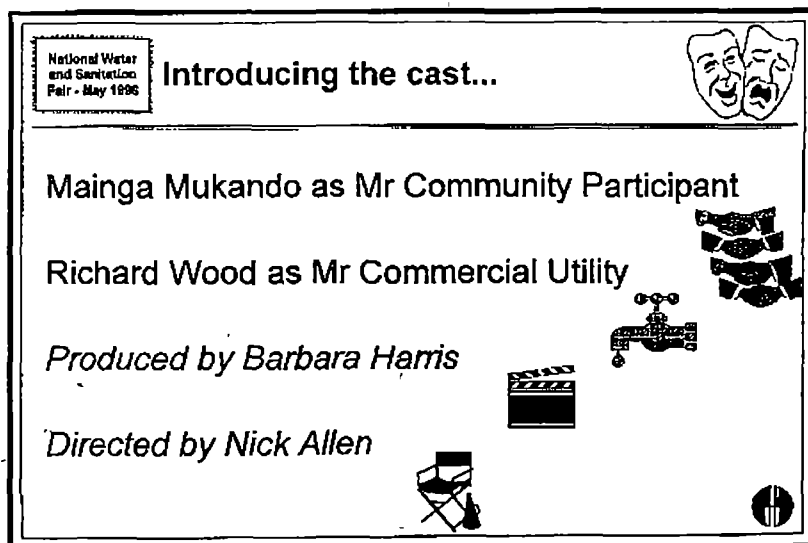
VENUE : Room 1

Abstract :

Can the culture of a commercially run organisation with its focus on profitability and financial viability accommodate social objectives achieved through community involvement relying on financial contributions such as time, labour and peer pressure? This debate looks at the issue from the community's and utility's point of view.




The Organisation: Price Waterhouse plays a significant role providing financial consultancy and business advisory services to the water sector in Zambia. Recent ongoing assignments include a tariff study at Lusaka Water, capacity building in ten local Governments under URWSP, and the Southern Province project designed to determine the nature and number of commercial utilities to be set up in the region.




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Price Waterhouse
P.o. Box 30942
Lusaka

National Water and Sanitation Fair - May 1996





More about the cast...




Nick Allen, a Cambridge graduate and Chartered Accountant, made his debut into the water sector in Zambia when he directed the tariff study for the Lusaka Water and Sewerage Company earlier this year. He is also currently directing the institutional and financial aspects of the feasibility study for establishing commercial utilities for 15 towns in the Southern Province. In his spare time he is the resident director of Price Waterhouse in Lusaka with responsibility for all management consultancy services provided to our clients.

Barbara Harris, a graduate Chartered Accountant, has been involved in many productions in the water sector in Africa during her 10 years based in East and Central Africa, particularly in Kenya, (*National Water Conservation and Pipeline Corporation, Mombasa Municipal Council*) Ethiopia (*Addis Ababa Water and Sewerage Authority*) and Zambia. Of particular interest to the Zambian public is her recently completed tariff work at Lusaka Water and Sewerage Company and her involvement in the institutional and financial aspects of the feasibility study for establishing commercial utilities for 15 towns in the Southern Province.






National Water and Sanitation Fair - May 1996





More about the cast...




This is Richard Wood's first major appearance in the water sector in Zambia, after a walk on role at Lusaka Water and Sewerage Company. His next role will be looking at the financial aspects of the feasibility study for establishing commercial utilities for 15 towns in the Southern Province. As a Cambridge graduate and Chartered Accountant he made regular appearances at Anglian Water in the UK.

Malnga Mukando comes to this performance straight from a major long running role at Lusaka Water and Sewerage Company where he applied his financial skills in the tariff study. As a Zambian graduate in Political Science he plans to increase his involvement in the water sector in the future.







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Setting the scene...



Messrs Community Participant and Commercial Utility meet under an acacia tree to discuss the culture of a community. Its objectives achieved through community involvement rely on non financial contributions such as time, labour, and peer pressure.





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What are the characteristics of community participation?

Objective	→ To install and operate appropriate water supply and sanitation facilities to suit the needs of a group of individuals
Key motivators	→ The need to have access (or easier access) to water supply and sanitation facilities and thereby improve the quality of life for the community
Philosophy	→ Self help but on a collective basis
Evaluation criteria	→ Sustainability of planned water and sanitation schemes/facilities

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What are the characteristics of a commercial utility?

Objective	→ To achieve financial viability through the provision of water supply and sanitation services to its customers (domestic and business)
Key motivators	→ Profitability and liquidity together with service levels
Philosophy	→ Commercial business principles
Evaluation criteria	→ Preset financial and operational performance measures and targets

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Key distinctive features of commercial utilities and community participation

Philosophy	
■ commercial business principles	■ self help, community based
Ownership and management	
■ Public sector though potential for private sector participation	■ Community participants
Structure	
■ formal, legal entity under Act of Government	■ Informal and flexible
Key motivating factors	
■ profitability and liquidity	■ access to and use of service

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Key distinctive features of commercial utilities and community participation

Technology

- may range from simple to sophisticated systems - piped networks
- tends to be basic, simple and unsophisticated - water pumps, boreholes, pit latrines

Population served


- large scale usually in urban areas
- small scale, often in rural areas, sometimes in peri-urban areas



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"Community participation always fails" says Mr Commercial Utility. "Not always" retorts Mr Community Participant


- Mismanagement of community resources
- Power struggles
- No technical resources
- Inability to pay for services
- Inadequate maintenance
- Vandallism and sabotage
- Community involvement required from the outset and throughout the life of the scheme
- Officers elected and held accountable, with rotation of duties
- Training of selected participants
- Link cash payments to revenue earning and deduct at source
- Value non financial contributions
- Peer pressure



National Water and Sanitation Fair - May 1998

"What proof is there that commercial utilities are successful?" asks Mr Community Participant

- Current approach is not working
- Commercially run organisations exist successfully elsewhere
- Chipata Water and Sewerage Company
- Feasibility studies
- Commitment from the GRZ through WSDG



National Water and Sanitation Fair - May 1996

If community participation and commercial utilities can be successful what issues should be addressed for them to cooperate successfully?

Payment

"We don't have much cash but we do have community spirit, time and muscle power"

"We need to make a financial return so we must recover our costs at a minimum"

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What should the basis of the charges to the community be?

stockholding costs

labour

repairs and maintenance

transport

overheads

management time

Full cost recovery

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What should the basis of the charges to the community be?

materials and equipment

spare parts

direct transport costs

Marginal costs

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If community participation and commercial utilities can be successful what issues should be addressed for them to cooperate successfully?

Technology

"We know our requirements, what we can afford and our technical and managerial ability to build, operate and maintain the scheme"

"It impacts our skills base, our manpower levels, our stocks and our ability to integrate our system with the community's at a later date"

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What services and support does the community want and what is the commercial utility prepared to offer?

planning and design

equipment

training

repairs and maintenance

construction

National Water and Sanitation Fair - May 1996

If community participation and commercial utilities can be successful what factors should be addressed for them to cooperate successfully?

Technology

People

Costs

Maintenance

Communication

Demands of the community

Impact on costs of installation and operations

Ability to maintain the scheme/facilities

Costs of maintenance

Technical skills

Training needs

Ability to manage resources

Communication

Self help with emphasis on payment in

Commercial principles with financial return on activities

Consistent with that offered to CU's customers

Level of start up support

Types and Volumes of stocks

Stock holding costs

Level of maintenance support

Artisan and management time

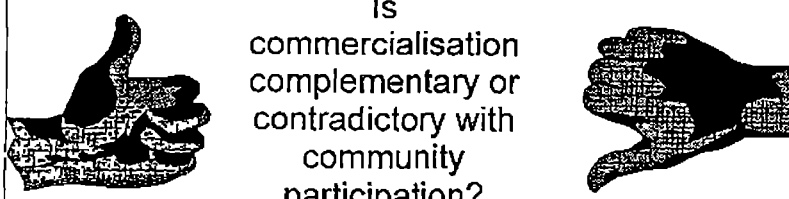
Employee skills


Communication

National Water and Sanitation Fair - May 1998

Over to you as the Judges....

Is commercialisation complementary or contradictory with community participation?



Price Waterhouse 

DEBATE SERIES : 2

Abstract :

Abstract for GTZ regional meeting
Commercialisation and Community
Ownership in urban and Rural areas
of Eritrea

Commercialisation requires an enterprise to market its services to potential customers to achieve cost recovery, at a minimum. This is just one approach which can be used during reform in the water and sanitation sector, others being contracting out, corporatisation and privatisation. Like all Government reform, the primary objective of changes in the water and sanitation sector is long term public benefit.

The purpose of this paper is to examine the type of commercialisation currently occurring in Eritrea, and to identify, where appropriate, mechanisms for community participation and ownership, both in urban and rural areas.

The Organisation :

The ministry of Water, Operation and Maintenance in Dar es Salaam, Tanzania co-ordinates the Improvement of water operation throughout the country and the introduction of a commercial approach.

Tel/Fax No:

Address: P.O. Box 2 000
Dar es Salaam,
Tanzania

TITLE : Ownership Issues in Rural Water Supply

DATE : 16th May 1996

TIME : 8:30 to 10:30

VENUE : Room 2

In the urban sector, it is relatively easy to describe the major potential benefits of the commercialisation of water and sanitation services :

- financial savings to customers through economies of scale; greater efficiencies through a focus on core business; pricing reflecting on the true cost of supply; and greater access to expertise (technical, financial etc.); better allocation of capital investment of scarce resources; improved customer service; and improved leading to further improvements in efficiency, quality and service.

These benefits accrue because of the concentrated population in urban areas, economies of scale, the high numbers of customers willing and able to pay for good water and sanitation services, the availability and willingness of skilled staff to work in an urban water and sanitation organisation etc. These same factors enable customer groups to become established in urban centres and for these groups to participate in planning and implementation, to make sure that service levels are continually improved, that pricing is reasonable and that any investment decisions are supported by the community. An interesting example of complementary (partial) commercialisation and community participation is that of the Ad Habab communal water supply system in Keren, the second largest urban area in Eritrea (case study 1). Indeed, it has been found that in order to ensure the long term sustainability of water and sanitation schemes in Eritrea? there must be community ownership, rather than just participation.

However, even though urban centres are an easily identified; vocal and demanding component of the water and sanitation sector, they comprise only a very small percentage of water consumption. Let us now consider that larger and more diverse component, the rural sector. In Eritrea, the following factors apply in its rural areas:

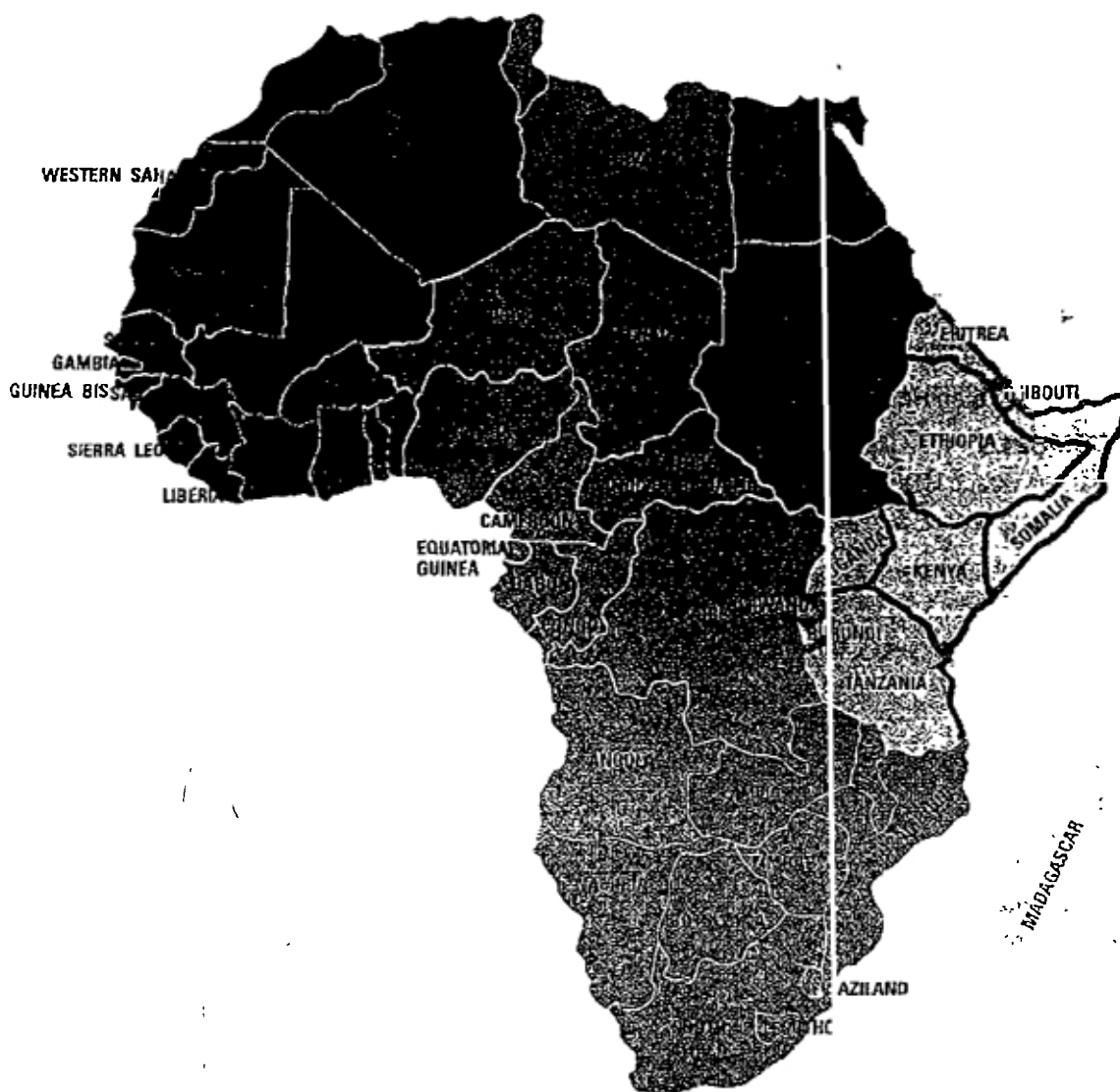
- many nomad communities ;
resettlement of returnees after the liberation in 1991;

limited water resources ;

- very poor communities;
- high levels of water borne diseases;
- new administration (new country, new Government);
- low level or non-existent infrastructure;
and rural communities often paying far higher prices for water, to private vendors, than do their urban counterparts.

In these communities, many of the conventional concepts of commercialisation are not applicable at this moment. However, the people are prepared to pay a reasonable price for their water' as long as the technology is appropriate to their situation and that they are not liable for prohibitive establishment costs. So there is usually a partnership between the Government (through an implementing agency such as the Water Resources Department), a donor organisation (which covers the planning and implementation of a scheme) and the community which will benefit from that scheme. Many rural communities (see case study 2) are now involved in water and sanitation schemes where partnership approaches to the planning process, the siting of facilities, the type of scheme chosen and the operation and long term maintenance of the system are seen as the only solution to the problem of providing a sustainable service for the rural people. Indeed, the continued operation and maintenance of a system by the community itself, using contributions both of cash and kind, is usually a requirement of any agreed partnership project. Hence, commercialisation, in a limited sense, is perceived as being integrally linked with community ownership.

Overall, then, in Eritrea there are innovative approaches being made in water and sanitation provision. While these are not commercial in the strictest economic sense' the approaches combine "pay for use" principles along with "ability to pay" and community ownership in every aspect of a scheme, from planning through to the actual operation and maintenance of the service. Such a practical solution could well be called a compromise' since complete cost recovery is not sought' but this downplays the very real advantages in its application to providing improved and (partially) commercialised water and sanitation to both urban and rural communities in Eritrea.



BRIEF HISTORICAL OUTLINE :

Modern Eritrea came into being during the European colonial period. Prior to this time different peoples occupied Eritrea but no one controlled the entire area.

- Ptolemaic Egyptian [3rd century B.C]
- Axumite Kingdom [1st - 9th century A.D.]
- The seven Beja Kingdoms [8th - 13th century A.D.]
- The Bellou Kingdom [13th - 16th century A.D.].

The Abyssinian Kingdom [14th - 18th century and 19th century A.D.]

The Siennar Kingdom [6th - 9th century A.D.]

Aclal sultanate [5th - 6th century A. D.]

- Aussa Sullanate [6th -19th century A.D]
- Ottoman Turks [16th - 19th century A.D.]
- Egypt under Muhammed Ali [8th century A D.]

1869 ~1890

Italian rule; Decree, creating Eritrea on January 1, 1890.

1941 ~ 1952

During World War II, defeat of the Italian army British protectorate of Eritrea

1952

the United Nations resolution of 1950 federating Eritrea with Ethiopia went into effect.

1961

Begin of armed struggle for independence Ethiopia's emperor, Haile Sellassie, unilaterally dissolves the Eritrean parliament and annexed the country in 1962

1974 ~ 1978

A coup in Ethiopia ended the rule of Emperor Haile Sellassie

In 1978, faced with the new scale of warfare, the Eritrean Peoples liberation front [EPUF] made a strategic withdrawal.

1978 - 1986

Eight major offensives by the Derg against the independence movement. All ended in failure.

1988

The EPUF captured the headquarters of the Ethiopian army EPLF fighters moved into Keren Eritrea, second largest city.

1990

In February; the EPLF captured the port of Mitsiwe' [Massawa]

1991

The EPLF liberated the entire country in May and established the Provisional Government of Eritrea.

1993

Referendum in; April, 99.8% of voters in favour of independence.

May 24, Eritrea became a fully independent state

May 28, the country was admitted to full membership in the United Nations as the 182nd member nation

June 2, full member of OAU

September 7, member of the IGADD

October 22, member of the ACP EU

1994

On July 6, Eritrea became a member of the IBRD/IMF

BRIEF HISTORICAL OUTLINE

Like most other African States, Eritrea came into being during the European colonial period. Prior to this time, a number of different people occupied present-day Eritrea, though none of them controlled the entire area.

Some of these people established powerful kingdoms. Among them were the Axumite Kingdom (1st - 9th century A.D.), the seven Beja Kingdoms (8th - 13th century A.D.) and the Bellou Kingdom (13th - 15th century A.D.).

Over the centuries, other kingdoms and empires also established outposts or exercised control over various parts of present day Eritrea. These included the Ptolemaic Egyptians (3rd century B.C.), the Sennar Kingdom (16th - 19th century A.D.), the Abyssinian Kingdom (14th - 18th century and 19th century A.D.), the Adal Sultanate (15th - 16th century A.D.), the Aussa Sultanate (16th - 19th century A.D.) Egypt under Muhammed Ali (18th century A.D.), and the Ottoman Turks (16th - 19th century A.D.) significant events in recent Eritrean history are outlined below.

1869 - 1890

All of the area now known as Eritrea was gradually united under Italian rule. The king of Italy issued a decree creating Eritrea on January 1, 1890.

1890 - 1941

During this period, the borders of Eritrea were gradually demarcated and defined by protocols, conventions and treaties between Italy, Britain, Ethiopia and France.

The boundary between Eritrea and Sudan was negotiated on 15th April, 1891, 7th December 1898, 1st June 1899, 16th April 1901 and 15th May 1902. The boundary between Eritrea and Ethiopia was negotiated on 10th July 1900 and 16th May 1908.

The boundary between Eritrea and Djibouti was negotiated on 7th January 1935. Italy established an administrative structure and a transport and communications network in Eritrea, and Italian settlers set up plantations and industries.

1941 - 1952

During World War II, the British defeated the Italians and established a protectorate over Eritrea. Eritrea became an important centre for British and American operations in the region during the war. In 1952 the United Nations resolution of 1950 federating Eritrea with Ethiopia went into effect. The resolution ignored Eritrean's desire for independence but guaranteed them some democratic rights and autonomy.

1961

Armed struggle for independence began after years of peaceful protest against Ethiopians violations of Eritrean democratic rights and autonomy produced no improvement in a deteriorating situation. Using armed forces, Ethiopia's emperor, Haile Sellassie, unilaterally dissolved the Eritrean parliament and annexed the country in 1962.

1974 - 1978

A coup in Ethiopia ended the rule of Emperor Haile Sellassie, replacing it with a military junta, called the Derg. The Soviet Union began supplying military aid to the Derg for warfare against Eritrea. In 1978, faced with the new scale of warfare, the Eritrean people Liberation front (EPLF) made a strategic withdrawal from the cities which it had controlled.

1978 - 1987

In this period the Derg launched eight major offensives against the independence movement. All ended in failure.

1988

The EPLF captured Afabet, headquarters of the Ethiopian army on the north-eastern front in Eritrea. EPLF fighters moved into the area around Keren, Eritrea's second

largest city. In the face of these losses, the Ethiopian army withdrew from several cities and towns in the western lowlands.

1990

In February, the EPLF captured the port of Mitsiwa'e (Massawa). The EPLF offered to open the port for relief aid shipments but - because of Derg objections and continued bombing, shipments did not start until January 1991.

1991

The EPLF liberated the entire country in May and established the Provisional Government of Eritrea.

1993

In April, 98.5% of registered voters turned out for an internationally monitored referendum.

The result was a resounding vote of 99.8% in favour of independence. The head of the United Nations observer mission said the referendum was "free and fair at every stage". Other observer groups confirmed this assessment. On May 24, Eritrea became a fully independent state. On May 28, the country was admitted to full membership in the United Nations as the 182nd member nation. On June 2, it became a full member of OAU, on September 7, of the IGADD, and on 22nd October of the ACP-EU.

1994

On July 6, Eritrea became a member of the IBRD/IMF.

CASE STUDY 1

AD HABAB COMMUNAL WATER

SUPPLY SYSTEM, KEREN, ERITREA

Ad Habab is one of the zones of Keren, the second largest urban area in Eritrea.

About a quarter of Keren's 60 000 people live in Ad Habab, a hilly area with few amenities: no roads, no electricity and, in Iggi, no water supply. The nearest water was 2 hours walk away from Ad Habab.

At that time, the community had 43 000 birr at its disposal and decided to allocate 20 000 birr to the MartyrSt

children fund and the remaining 23 000 birr to building a water reservoir.

The necessary access road was built by the community on a voluntary basis. No less than 300 people worked each Sunday for 3 hours, and the road was completed in 15 months.

An additional 15 000 birr was collected and a local (Contractor agreed to build a 113 cubic metre reservoir for 35 000 birr)

Upon inspection by the town engineer, the reservoir was redesigned, and a new contractor asked for 46 000 to build this stronger structure.

Extra assistance was provided by former residents and by Unicef who allocated 600 metres of PVC pipes to the Ad Habab zone.

The community completed the digging and back filling on a voluntary basis and the system became operational in July, 1994.

From the beginning, an 8 man committee ran the project and continues to do so to this day. Three employees, including one woman, work at two water distribution centres in Ad Habab, each of which had 6 water taps.

Water is bought from the Keren water supply administration for 0.5 birr per cubic metre and sold for 0.05 birr per jerry can at the taps. The money is being used for operation and maintenance of the system.

Even though there are problems with the present system (e.g. only 30% of people in Ad Habab benefit, general water shortages), the community is very positive in its attitude to the service.

Benefits include the lack of vandalism, better service, partial commercialisation, generation of employment and the high degree of community ownership.

“ HOW DO THEY TAKE OWNERSHIP ?? ”

1 No ownership is transferred to them after the completion of projects they are the owners from the start

BUT :

It is at the peoples own idea and initiative (demand driven)

It is without government interference

It is with Government facilitating and providing

Training for O&M

Provide some engineering and material inputs (subsidy)

A transfer of ownership is not necessary, they

are the owners from the start, due to the fact

that the township was the 'buyer' of the project.

- They are the planners themselves
- They place the contracts for planning
- Engineering, and the building contractor.

CASE STUDY 2

Eritrean rural water supply and environmental sanitation programme (ERIWESP)

The majority of rural people in Eritrea have no access to a safe water supply and no sanitation facilities

This results in a broad range of health problems including diarrhoea, Malaria, schistosomiasis.

Many rural people, usually women and children, spend much of their day walking to and queuing at water sources. ERIWESP is a one year project, jointly funded by UNDP and Unicef.

ERIWESP'S PRIMARY OBJECTIVES ARE:

1. To review and evaluate Government plans, policies and strategies for water supply and environmental sanitation projects;
2. To establish groundwater and surface data bases;

3. To train counterpart staff in data establishment, policy and programming;;
4. To establish guidelines for proper development of RWSS; and
5. To produce reports on the ERIWESP objectives, short- and long-term ssectoral policies, strategies, institutional development and a national action plan for programme implementation.

ERIWESP'S POLICY PRINCIPLES

These were formulated at a planning and programming workshop held in Asmara, 16-20 April, 1996. Participants included UNDP and Unicef representatives, invited experts from other African countries, people from the relevant ministries in Eritea as well as people working on current rural water supply and environmental sanitation programmes in Eritrea (including Technical, Financial and Social workers).

1. Water is a basic human need
2. Water and environmental sanitation development should be demand driven (that is, from the bottom up)
3. There should be equity (both geographic and social-economic) in basic service provision
4. Community empowerment should be a priority
5. Water and environmental sanitation should follow an integrated approach

CURRENT APPROACHES TO PROVIDING SUSTAINABLE WATER AND SANITATION SERVICES IN ERITREA

- Partnership among government, donor and community, starting with the planning process
- Agreement on location of services and types of technology
- Appropriate pricing of services
- Community responsibility for long-term operation and maintenance of schemes
- Community ownership of services

CONCLUSION :

Community ownership, complemented by Partial commercialisation, has great advantages in the provision of effective, efficient and long-term water and sanitation services to both urban and rural communities in Eritrea

THE GINDA & THE HANDING OVER CASE**1993 :**

All Mayors of all towns expect the capital town had a meeting and resolved to raise the tariff. The water supplies were still Government owned at that time.

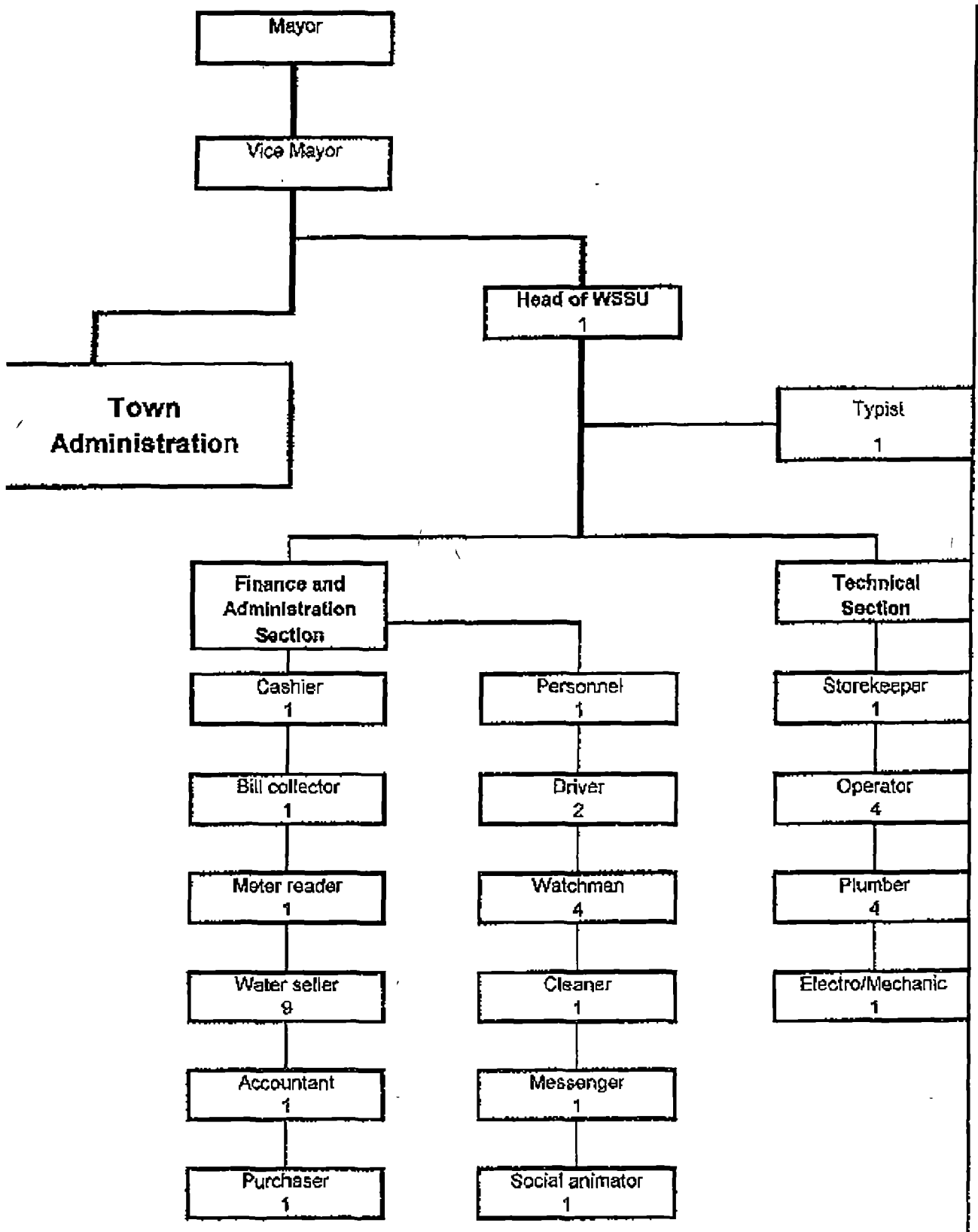
In practice, no Mayor and no Town-assembly was raising the tariff.

1994 :

The ministry of Local Government informs the 16 towns, that their water supplies are to be run autonomously under the umbrella of the town mayor, running separate accounts, and that no government subsidy in cash for the budget, nor in kind by providing materials will be provided in the future.

1995 :

Due to the responsibility and the powers conferred: each town according to economic situation of their inhabitants has adjusted the tariffs to at least the break-even point.



DEBATE SERIES : 3

TITLE : On-site Sanitation in Peri Urban Settlements

DATE : 16th May 1996

TIME : 10:30 to 12:00 hrs

VENUE : Room 1



MANUS COFFEY ASSOCIATES LTD

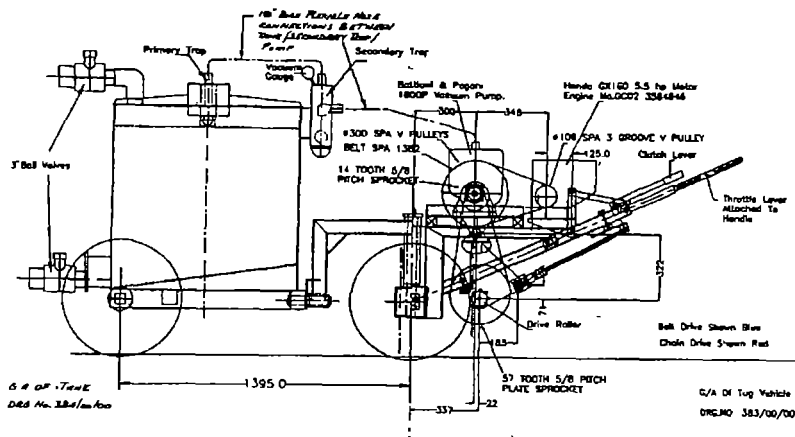
WASTE MANAGEMENT CONSULTANTS
 Kiltipper Road Tallaght, Dublin 24 Ireland
 International Code 353 - 1 Tel (01) 451 1188 / 451 1929 Fax (01) 451 9604



Abstract :
 Research carried out over the past 15 years into on-site sanitation has shown the need for a mechanical latrine emptying system which:

- can reach into areas with different access
- can suck out the dense wastes found in Latrine pits
- can transport the wastes away for disposal
- is fully sustainable without any undue dependence on imported equipment and spare parts

This paper will describe work on latrine pit emptying which has been carried out in Botswana, Kenya and Tanzania in the past and on-going research project in Kenya with relevance to many other African countries.



The Organisation :
 Manus Coffey Association Ltd,
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UNCHS (Habitat) VACUUM TUG LATRINE EMPTYING VEHICLE BACKGROUND

The UNCHS (Habitat) Vacuum Tug Latrine emptying system is the culmination of 14 years work involving the World Bank/UNDP Technology Advisory Group and government aid agencies from five different countries. Early developments included the BREVAC high capacity vacuum truck, the MICRAVAC specialised latrine emptying vehicle and the MAFET manually operated latrine emptying pump. The studies showed that although each of these systems has a role to play, none of them fulfilled all the requirements.

UNCHS (Habitat) requested proposals from a number of consultants for an effective solution to the problems of the overflowing latrine pits in unplanned urban areas where access may be restricted and affordability and sustainability are of prime concern

Manus Coffey Association Ltd put forward a proposal which was accepted by UNCHS (Habitat) for a latrine emptying vehicle which would meet the following requirements :

- Reach into areas with difficult access including travel on rough ground and access to pits via narrow tracks between houses.
- Suck out the very dense wastes found in latrine pits.
- Transport the wastes from the latrine pit to a disposal site or to a main road for transfer to a larger haul vehicle.
- Provide a sustainable latrine emptying service which is affordable by low income communities.
- Have a low enough capital cost to enable the local entrepreneurs working in unplanned urban settlements to enter this service area.
- Be capable of local manufacture in developing countries with a minimal dependence on imported parts.

VACUUM TUG LATRINE EMPTYING VEHICLE

The VACUUM TUG latrine emptying vehicle is pedestrian controlled with a maximum speed of 5 kph. It consists of a two wheeled tug unit attached to: an articulated vacuum tank with a capacity of 500 litres of sludge. A sliding vane vacuum pump evacuates the tank for sucking and pressurises the tank for discharge wherever gravity discharge is not practical (e.g. for discharging into a

tanker truck). The 5 hp (3.7kw) engine uses a vee belt to drive either the vacuum pump or the wheels of the tug unit as required. The vee belt drive enables any locally available 5 hp air cooled engine to be used and the wheels and axle are made from commonly available car parts. Used car parts may be used where available.

The only part of the machine which may have to be imported is the vacuum pump and perhaps the hoses but these are low cost items. The vacuum pump used on the prototype costs around US \$ 220 ex Italian factory.

A prototype VACUUM TUG was manufactured in Ireland with a total material cost of US \$ 1 690 including a new engine, pump and hose pipes and fittings but using used car wheels, rear hubs and remoulded tyres. The manufacturing times were around 200 man hours using simple tools readily available throughout the world.

The prototype trials are under way at Kibera on the outskirts of Nairobi in association with a local NGO the Kenya Water for Health organisation (KWAHO). Kibera is an un-planned settlement of around 350 000 people. It has been found that typical round trip times to travel to the latrine site, suck up a 500 litre tanker load of wastes and travel a short distance to the disposal point are in the order of 40 minutes. A fully sustainable latrine emptying service can be provided at a cost of around US \$ 3.0 per 500 litre tank load.

LOCAL MANUFACTURE

The Vacuum Tug is designed for local manufacture in developing countries. It is intended that following completion of the trials in Kibera, a local manufacturer should be sought in Kenya and provided with full specifications and detailed drawings of the Vacuum Tug. Technical assistance may also be provided to make any minor changes necessary to suit the local availability of engines and oar parts. Local entrepreneurs will be encouraged to provide latrine emptying services in Kenya using the Vacuum Tugs and suitable agencies will be sought in other countries around the world who will purchase a trial machine from Kenya and will encourage local NGOs, community groups or entrepreneurs to provide a sustainable latrine emptying service on a profit making basis. Drawings and technical assistance can then be provided to encourage local manufacture of subsequent vehicles.

IMPROVED LATRINE DESIGNS

Typically each person will produce between 40 and 50 litres of sludge per annum. Thus where dry pits are used with good ground conditions where there is no ingress of ground water 500 litre tank load should provide a latrine service for a family of 10 people for one year.

It has been traditional in many African countries for deep latrine pits with a capacity of perhaps 5 m³ of wastes to be used on the basis that they will not require emptying for perhaps ten years. Thus, wherever a reliable latrine emptying service can be made available it becomes practical and much more cost effective, to consider the use of small family sized latrine pits with a regular annual emptying service instead of the traditional large pits. Precast concrete latrine pits could be manufactured with only a fraction of the materials costs of conventional lined pits and would be light enough to be man handled into place. Designs are available from Manus Coffey Associates for such pits

CONTACTS

For further information on this project the following may be contacted :

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**NATIONAL WATER AND SANITATION FAIR, LIVINGSTONE
1st - 17th MAY 1996.**

ON SITE SANITATION IN PERT-URBAN SETTLEMENTS

PAPER PRESENTED BY WANUS COFFEY OF M NUS COFFEY ASSOCIATES LTD**BACKGROUND.**

The 1980's Decade for Water and Sanitation was initiated in 1982 with the setting up of the World Bank/U DP Technology Advisory Group (Tag) and started off with a target of providing affordable sanitation for 1.6 billion people around the world. By the end of the Decade it was estimated that 600 million people had been provided with services but the target had been increased to 2.0 billion. Thus the services were not keeping up with the problem.

VENTILATED IMPROVED PIT LATRINES (VIP)

A lot of early work was devoted to rural sanitation problems in the hopes that by improving conditions in the rural communities people would be encouraged to remain in their home areas and relieve the pressures of urban migration. Early work by the Blair Institute in Zimbabwe included the development of the Ventilated Improved Pit Latrine (VIP). However, whereas in a rural area these systems can be constructed using local materials and the householders own labour and when the pit is full it can be abandoned and a new pit dug alongside, in a congested urban environment all the materials must be purchased and transported to the site. Frequently there is simply not enough space to take to build a new latrine.

DOUBLE COMPARTMENT PIT LATRINES

The Double Compartment Latrine, also developed by the Blair Institute, enabled a latrine to be constructed which could be emptied by hand when it is full. This system however requires more space than the single compartment VIP and involves a much higher initial investment by the householder for the second compartment which may not be required for four or five years. The Double compartment latrine produces a compost material which is of value in a rural area but has no value in a peri-urban area where the people do not have gardens. Thus this system has seldom proved effective.

MECHANICAL LATRINE PIT EMPTYING.

It was recognised early on that for urban and in particular peri urban situations, some means of mechanically emptying pit latrines when they are full would be required. The World Bank/U DP Tag, together with the International Reference Centre for Wastes Disposal in Switzerland

(IRCWD) initiated a series of trials in Botswana in 1983 into the problems of sucking out the wastes from latrine pits.

BOTSWANA TRIAL

Machines from all over the world were brought to Gabarone for the trials including conventional septic tank emptiers from South Africa and Italy a high powered vacuum tanker from Norway, the experimental BRSVAC tanker designed by the British Building Research Establishment an engine driven pump from the U.K. and a manually operated pump from Zimbabwe. The trials showed that none of the systems then available could combine the requirements of :

- Reaching into areas with difficult access
- Sucking out the dense and thixotropic wastes found in latrine pits
- Was affordable by low income communities
- Was sustainable in the countries where it was required with a minimum dependence on service and imported parts.

However, the technical problems of pumping out latrines were clearly defined during the Botswana trials and my company, who had been working on similar problems in Trinidad, were asked by the Tag to develop an appropriate latrine emptying vehicle. We started by studying the conditions in a number of peri urban settlements on the outskirts of Nairobi and drew up a specification for the "Micravac" latrine emptying vehicle.

MICRAVAC LATRINE EMPTYING VEHICLE

The first prototype Micravac was manufactured in the U.K. with support from Norwegian, Irish and British aid agencies. The Micravac can travel over rough ground, has an overall width of 1.75 metres (compared to 2.5 metres for conventional truck tankers), a tank capacity of 2.0 m³ and a road speed of 30 km/hr. It also has the low tank height, high pump capacity and pump protection features essential for pumping dense sludge and costs around one third the cost of the BREVAC and other high capacity truck mounted vehicles. The Micravac is powered by a 32 hp (24 Kw) diesel engine.

In 1987 trials were set up in Kibera township a periurban settlement of around 220,000 people at that time, near

Nairobi. A local NGO, the Kenya Water for Health Organisation (KWAHO) were later supplied with a Micravac vehicle by Danish aid and started operating a latrine emptying service. Nairobi City Council then obtained a number of vehicles which are still operating and other vehicles are working in Tanzania, Lesotho, South Africa, Malawi, Haiti, Sri Lanka, etc.

MAPET LATRINE EMPTYING SYSTEM

Around 1989 Waste Consultants of the Netherlands started study the problems in Dar es Salaam where large and costly lined pits are commonly used. In an area with a very high water table during the rainy season. Traditionally these pits are emptied by hand by people who dig a hole alongside the latrine and then go into the latrine pit with spades and buckets to dig out the wastes which are buried in the hole. This is an extremely unpleasant and hazardous job and Waste Consultants set out to develop a manually operated pump the MAPET to enable this work to be done in a less hazardous way. However, the MAPET pump still uses the old system of burying the wastes in a hole alongside the pit and, particularly in high water table areas this is considered an unacceptable practice by many people.

Unfortunately the very dedicated Dutch person responsible for the development of the MAPET pump, Jan Van Ouden, died around 1992 and no further development of this system has taken place to enable it to transport wastes from the latrine pits to a disposal point. Small hand pushed tanks can be used for very short distances on level ground (perhaps 200 metres or so) but the MAPET pump cannot transfer the wastes from its own 200 litre tank into any larger tank at a higher level for transport over longer distances. Thus the MAPET system is only relevant for a very few situations. This system costs around US \$ 3,000..

Requirement for alternative system

A lot of lessons had been learnt during the trials in Botswana, Kenya, Lesotho and Tanzanian including:

- The technology of sucking latrine pit wastes is now well documented and it is possible to make effective machines.
- Whereas in 1988 the population of Kibera was around 220,000 this has now increased to between 350,000 and 500,000 (no one is quite sure which estimate is right). The area of the settlement has not increased but housing densities have increased greatly in Kibera as well as most

other such areas. Thus, whereas in 1988 a vehicle with a width of 1.75 metres could reach within hose distance of around 36% of the Kibera latrines by 1996 this vehicle can only reach perhaps 50% of the latrines and a much more manoeuvrable system is required.

- In both Tanzania and Kenya there is a "willingness to pay" quite high charges for a latrine emptying service. Thus a fully sustainable system can in theory be set up.
- Where a latrine emptying service is available people using individual household latrines are quite happy if around 1 m³ of wastes is removed and do not require large pits to be fully emptied.
- The Micravac requires very little maintenance during the first two or three years and can show substantial operating profits during this period. However, the City Council and WGO agencies have so many demands on their resources that they are not able to retain these profits for when they are required in three years time or so. The lack of maintenance requirements is often accompanied by a lack of regular servicing so that eventually the machines need major overhauls. Thus when it is necessary to refurbish the engine after perhaps three years the funds are not available and the system is not sustainable.
- A quotation from the local Lister engine dealers in Nairobi for refurbishing the engine on one machine was more than three times what the engine had cost new in Europe due to the monopoly situation on spares parts and import duties. Although the parts can be obtained through the manufacturers of the Micravac in the U.K. this involves the complications of obtaining import licences and foreign exchange and neither the City Councils nor the WGOs are accustomed to these procedures.
- Although only one third the cost of sophisticated latrine emptying vehicles, the Micravac, at around US \$ 35,000 is still outside the reach of the small entrepreneurs who are providing services in townships such as Kibera. Thus the hoped for privatised latrine emptying services did not materialise for low income communities except in South Africa where the private contractor is working.

NCHS (Habitat) INITIATIVE

As a result of all the lessons learned since the original Botswana trials the United Nations Centre for Human Settlements (UNCHS/Habitat) requested proposals from a number of consultants and agencies for the development of an alternative latrine emptying vehicle. My company put forward proposals for the "Vacuum Tug" system which can :

- Reach into areas with very difficult access including travelling over rough ground and narrow tracks between houses down to 1.1 metres wide
- Suck out the dense wastes found in pit latrines
- Transport the wastes from the latrine pit to a disposal site or to a main road
- Transfer the wastes where required into transfer tanks at ground level or mounted on a truck
- Provide a sustainable latrine emptying service at cost which is affordable by low income communities
- Has a low enough capital cost to enable local entrepreneurs already working in low income areas to provide a latrine emptying service on a profit making basis.
- Can be manufactured locally in developing countries with a minimum dependence on imported parts.

VACUUM TUG LATRINE EMPTYING VEHICLE

The Vacuum Tug latrine emptying vehicle is pedestrian controlled but provides its own power for pulling itself along at speeds of up to 5 kph. It uses a 5 hp petrol engine to drive the vacuum pump or the tug wheels as required and tows a 500 litre trailed tank behind it. It can turn within its own length and has an overall width down to 1.1m. The engine uses a "vee" belt to drive the pump and wheels so that any readily available small engine can be fitted. It uses standard car wheels and tyres and can be made using second hand rear wheel hubs and brakes from almost any small car. The only item which may not be available locally in any developing country is the vacuum pump and this costs around US \$ 220 from the factory in Italy.

I made the prototype myself in Ireland with a total parts cost of less than US \$ 1,700 and around 200 hours of my time using only the simple facilities in my own workshop which are readily available throughout the world. Trials are now under way in Kibera and a workshop is planned by UNCHS (Habitat) in Nairobi to discuss the results and any.

LOCAL MANUFACTURE.

The Vacuum Tug is intended for local manufacture in each country where its use is relevant. A small batch of machines will be manufactured in Kenya by one of a number of small engineering companies who are interested. At this stage the cost has not been accurately

defined but one manufacturer has said that he would expect to sell the machine for between US \$ 4,000 and \$5,000. It is hoped that agencies from different countries can then be found who will purchase and operate one of these vehicles in each country on a trial basis and drawings will then be provided to facilitate local manufacture.

I will be available if required to assist any manufacturer to make changes which may be required locally following the initial tests. Small changes may be required, for example, to adapt the machine to take whatever small (5 hp) engine is available locally with a good parts and service back up. Other countries in that region will then be encouraged to buy a single vehicle from their neighbouring country with a view to following with local manufacture.

It is also hoped that each country will share its experiences with other countries through UNCES (Eabitat) and in this way any technical, operational, sociological and other experiences will expand the overall knowledge in this field building a pyramid of technology transfer.

LATRINE DESIGNS FOR MECHANICAL EMPTYING.

Wherever a latrine emptying service is provided consideration can be given to the design of future latrines. Smaller latrine pits for individual households may be relevant. Typically a pit with a capacity of 1.0 m³ of wastes will provide capacity for a family of eight people for two years and there is little point in exceeding this capacity.

The Botswana trials showed that latrine wastes up to two years old are easy to pump but sedimentation after this period increases the emptying problems considerably and may require the addition of water and agitation of the wastes prior to emptying. Thus a maximum two year emptying frequency is recommended for easy mechanised emptying.

DEBATE SERIES : 3

TITLE : Volunteer Involvement in the Sector - Development or Dependency ?

DATE : 16th May 1996

TIME : 10:30 to 12:00 hrs

VENUE : Room 2

Introduction:

Peace Corps is a United States Volunteer organization that is dedicated to grassroots development and economic growth in developing countries. At the request of the host governments, Volunteers have worked in over 100 countries through out Eastern Europe, Asia, Africa and South America. Over the past 35 years, over 135,000 Volunteers have served in Peace Corps. During this coming year we will be in 97 countries around the world.

Peace Corps concentrates, however, its efforts on rural development. We emphasize on the transfer of skills to host country counterparts and the use of appropriate technology. Volunteers are placed at grassroots level to live and work with the people we serve. Although Peace Corps is a governmental organization we function as a Non Governmental Organization (NGO), and we are strictly Non political. We are guided by three principles.

- Help populations of interested countries to satisfy their need for qualified manpower,
- Promote a better understanding of the Americans on behalf of other people of the world.
- Promote a better understanding of other people in the world on behalf of the Americans

These three principles have guided us into Zambia.

Zambia expressed an interest in Peace Corps in 1992, and an Agreement was signed on September 14, 1993. The first group of Volunteers who were in the Water and Sanitation program arrived in January 1994. Currently we have two programs since adding Community Health Education. These two programs together are designed to implement WASHE related activities comprehensively. With the addition of 29 new Volunteers, we will have 50 Volunteers serving in three (3) provinces within Zambia (Eastern, Northern and Luapula) and two special requested Law lecturers from the University of Zambia school of Law.

What will the new Volunteers do now ?, ideally speaking, once these Volunteers have arrived at their sites they will try to integrate themselves into the community as much as

Abstract

U S Peace Corps Volunteer involvement in the water and sanitation sector promotes sustainable development and project ownership by the community participation. This reduces dependency on foreign aid. Volunteers provide human resources for capacity building in skills transfer to the community, implementing and monitoring projects. What have we learnt during the two and a half years of involvement?

The Organisation

Peace Corps Volunteers assist the community to construct their own water and sanitation facility, assist and teach community health and hygiene education related to water related diseases.

Tel/Fax No: 260377/263243

Address: Peace Corps
P.o Box 31617
Lusaka

possible. This means we will spend the first few months learning about our new environment, learning about the people and about the community itself, because this becomes the basic foundation for our understanding. After gaining that basic and essential knowledge then we attempt to work within existing development structures (i.e. water committees or resident advisory committees). In the event that no development structures exist then we try to become a catalyst behind establishing those structures. The purpose in establishing a development committee is to identify, prioritize and devise solutions to the problems within the community. We as Volunteers, assist by facilitating a process that leads to that end. When facilitating, the community should ultimately decide two types of criteria before deciding on the solutions to problems

- 1) What tasks could the community itself realistically undertake without outside assistance
- 2) What tasks could the community undertake that can not realistically be accomplished by the community itself.

Reference to the two sketches on (PRA) Ujififi; the village community

At this juncture, we Volunteers, can assist communities by providing a line between relevant ministries and Organizations that could work in mutual cooperation towards the communities' goals. Additionally, if their problems can be solved within the community, then Volunteers can supplement skills that already exist or train people in new skills to create long term sustainability of development projects within communities. Creating, however, long term sustainability requires that we integrate ourselves effectively into the National WASHE Policy within Zambia.

The restructuring of the Water Sector in the Zambian Government and the formation of WASHE committees has provided Peace Corps Volunteers with an opportunity to be involved at many levels, primarily working in the Districts and at Village levels. So, we would like to briefly outline where we as Peace Corps Volunteers can potentially be used with regards to WASHE activities. First, at the National level, Volunteers could facilitate sharing of knowledge between National, District and

Village WASHE's. At the same time they can be additional manpower (extension workers) in the field.

Second, at the District level, Volunteers would participate in the training of the District WASHE Committees, advocating the importance of District WASHE with regards to water and sanitation activities within their respective Districts. Volunteers could also function as a constant presence in working towards active, functioning District WASHE Committees. In addition we can offer, and/or participate in the transfer of information and knowledge between the District and the Village. Volunteers can also assist to improve management documentation and organizational systems of the District WASHE.

Thirdly, the last way Peace Corps Volunteers can assist with WASHE activities is at the Village level. Because it is here where Volunteers live and work. At the grass roots level they could promote an awareness of the WASHE concepts while working with traditional leaders and Zambian Counterparts in the formation of village WASHE Committees. They can also assist with training Village WASHE Committees to maintain water and sanitation facilities and to undertake health education in their respective areas. This is done primarily through Baseline Surveys, Mapping of the areas, Water and sanitation ladders, Prioritization of the village problems; problem solving techniques; introducing record keeping or accountability and any other participatory methodologies that might be relevant to their specific areas.

Last, the Volunteers could inform Committees who could therefore disseminate information regarding proposed District WASHE activities to their committees. And likewise this information would be reciprocated from village level to the District. Therefore it would be a two way channel of information exchange.

As the WASHE concept is still new there is a great need for the ideas and information behind it to be spread through out the many players. This is where the Volunteers can be an additional information channel, assisting in the dissemination of this knowledge. As the diagram shows there are many players and many ways for them to interact

Reference to sketch number three.

So where is all this leading Dependency or Development ??? Are we as Volunteers perpetuating dependency or promoting development. It is probably a bit of both ?

When a foreign concept is introduced into a culture this necessarily creates dependency.

The recipient culture is handicapped by the need to be taught by the introducing force

Once the culture understands the concept it has the chance to accept or reject.

If the ideas are accepted the transfer of the technical knowledge can empower the recipients towards self reliance.

Then the ability to implement that knowledge is in the hands of the communities who will benefit in the long run

We have heard how Peace Corps came about, its objectives, where they operate from and what they are able to do, and their potential to integrate in WASHE activities. But before I tell you what Volunteers are able to do together with the villages communities, let me show you some background information which should guide you and judge whether volunteers involvement in the Water and sanitation sector promotes dependency or is actual sustainable development.

Zambia's Water and sanitation sector has experienced some more that 30 years of GRZ Donor funding dependency

Lack of Community participation in the construction and maintenance of water points. This has led to breakdown of progress. There's no ownership of the infrastructure. There is evidence that many donor driven water points throughout Zambia were done without the user input.

Water Policy, advocates that rural water and sanitation should be undertaken on the basis of Community Participation. However there is no capacity at village level to educate the community. They will continue to look towards GRZ/Donor for assistance.

Volunteers at Village site : At the first sight the community look at the Volunteer in the village as a source of money

or employment Communities are frustrated when they find out that Peace Corps does not fund projects

The Volunteers find the 30 years' dependency hang over within the community. They encounter enormous difficulties for the communities to listen to change

Actual Volunteer Experience :

A few months later in the village, the Volunteers have great potential and strategies (speaking the local language and living with the community in similar environment) They are quickly accepted Together with the community identify, prioritize, plan and implement programs

They undertake community development and assist in the formation of Water and health committees where none does exist They also help communities to raise maintenance funds which is kept by their Treasurer (banked) Volunteers train their counterparts in skills transfer and these counterparts train more people in their respective communities/areas They are facilitators.

As a result of this, now many communities in the areas where Volunteers are placed are able to identify, construct and maintain their own water infrastructures without outside assistance

Typical examples of this achievement is in Nchelenge District where communities now can construct their own spring Boxes for sustainable, protected clean water supply. The Volunteer who initially conducted the community training has since left for the States, but the work goes on.

I am of the view that if some one can train others of how to build their own water points and live to maintain them on their own, could happily call this development.

With the introduction of WASHE Concept, Volunteers can assist in DWASHE formation in many districts where WASHE does not exist.

Before the presentation is thrown for the debate, wish to refer to the two sketches that denote interfacing (Networking) for dependency and anteraclring for development.

In networking, the problem is that if you remove one component the whole system fails, while in the interacting situation, if a segment is removed the remainder can exist. We (Peace Corps) are creating a situation that when Volunteers leave the community can continue to build structures on their own through community participation.

EXPLANATION :

Ladies and gentlemen, having looked at the two sketches and listened to our presentation, we now invite you to a debate/discussion on whether Volunteers are perpetuating dependency or is it development?.

On behalf of my other two colleagues, thank you all for listening to us

DEBATE SERIES : 4

TITLE : Community Contribution in Rural Sanitation

DATE : 16th May 1996

TIME : 13:30 to 15:00 hrs

VENUE : Room 1

I. CONTEXT

I.1 'Every year 2.5 million children die from diarrhoea that could have been prevented by good sanitation, millions more suffer the nutritional, educational and economic loss through diarrhoeal disease which sanitation can prevent. Poor sanitation has led to the infestation of nearly a billion people, largely children, with a variety of worm infections, with corresponding costs in health and energy. Human excrete are also responsible for the transmission of schistosomiasis, cholera, typhoid and many other infectious diseases affecting hundreds of millions. Heavy investments have been made in water supply since 1980, but the resulting health benefits have been severely limited by the poor progress in sanitation. Besides this toll of sickness and disease, lack of sanitation is a major environmental threat to water resource: systems and a fundamental denial of human dignity' (Excerpted from "The Problem of Sanitation", a paper prepared by the Water Supply and Sanitation Collaborative Council's Working Group on Promotion of Sanitation March 1994.

2.0 WHY COMMUNITY CONTRIBUTIONS?

2.1 Community contributions are seen as an essential outcome from a participatory approach to the development of any rural sanitation project. Therefore if such contributions are to be seen in this context, we must ask ourselves, why is such a context necessary?

A more complete title of this debate Could be Community Contributions as Part of a Participatory Rural Sanitation Project'.

2.2 In order for any community based sanitation project to have a positive impact in a community, it must be seen by the community as providing an answer to a need felt and expressed by that community. It is often taken for granted that a community is a homogenous group of people living one area; people are often grouped together in terms of

Abstract :

- Why community participation?
- Nature of community participation in a sanitation project
- Technology options for a community oriented sanitation project
- Resource mobilisation/implementation strategies
- Institutional support of community sanitation projects
- Strengths/weaknesses of community participation in a
- Sustainability
- Community participation in hygiene education component of a sanitation project
- Gender aspects of a community oriented sanitation project

THE ORGANISATION :

Irish Aid has been involved in the Water Sector in Zambia since 1983. Through a philosophy supporting community participation

Irish Aid supports water projects in five districts in Northern Province in addition to a sanitation in one district and two urban water schemes

Tel: (04) 221530, 221260

Address: Irish Aid Zambia,
Northern Province Development
Programme, P.O. Box 410221,
Kasama

ethnic/tribal origin, religious and social, cultural affiliations etc.. In terms of a rural village in Zambia and elsewhere, while most people fit into village structures in terms of the above characteristics, people are also divided into groupings such as those who are widows, married, polygamous, single, orphans living with grandparents, extended families etc. The capacity of these units to participate in a rural sanitation project often depends on their states (whether married, divorced etc), and the degree of support provided by a community to them. Community contributions within the framework of a participatory sanitation programme, can help strengthen community structures and lead to an improved quality of life for rural people.

2.3 Individual contributions within a community (grouped together to form a community contribution) towards a sanitation project, is a measure of the value or worth a community places on a certain intervention. Such a value can only be ascertained through community dialogue taking into account community resources. In order for the full benefits of a sanitation project to be maximised, there should be full coverage within a village and its associated institutions. Care needs to be taken that levels of contribution agreed upon, do not exclude the poorer members of a community from participating in, and benefiting from, a sanitation project.

2.4 It can be argued that community participation is one of the ultimate forms of decentralisation and privatisation; Once people are empowered to address their own needs, dependency on government decreases, and sustainable development emerges. Community contributions, as part of the participatory process, help bring about a realisation within communities that change for the better is possible, but that such change requires commitment. A Donor can only act as a catalyst, supporting and encouraging local initiatives; as such, in order for a rural sanitation project to be effective, substantial initiatives must be encouraged from communities. The outcome of such community borne initiatives (of which contributions will form a part), will further strengthen and assist communities to plan and implement other development projects in their environment.

3.0. NATURE OF COMMUNITY CONTRIBUTIONS

3.1 Community contributions should be seen within the whole setting of community participation. A breakdown of contributions which communities can be expected to provide to a rural sanitation project include the following

- Time
- Labour
- Materials
- Finances

3.1.1 In order to integrate the planning and implementation of a rural sanitation project into other ongoing community activities, considerable time needs to be set aside by villagers to appraise proposals related to sanitation. Any such project needs to compete for time with issues such as food production and preparation, health needs, other infrastructural improvement projects etc. Due to the gender roles within rural communities it may sometimes be difficult to meet with most stakeholders in order to ensure that representative decisions are made in a village. As most agriculture practices take place in the morning with food preparation in the afternoon, it is not always possible to arrange meetings with women in rural areas during these periods. In addition the seasonality of rural living tends to make people more accessible in one season than in another. It is therefore felt that time is a very important contribution which (though often assumed) significantly affects the quality of planning, implementation and management of any rural sanitation project. Perhaps it would not be altogether out of place to suggest that any donor/institution intending to assist with a sanitation intervention in a rural area, should first understand the time constraints facing some communities, and might even plan activities in line with a communities' time frame of activities, rather than in accordance with project objectives.

3.1.2 In order for any sanitation project to be implemented with maximum community inputs (thereby increasing the sense of ownership and promoting understanding of issues), it is necessary to fully utilise resources within the community. One of the most available resources is normally labour, especially in male headed households. Normally such labour can be utilised for digging pits, preparing the superstructure, collecting

building materials etc. The utilisation of village labour should always be accompanied with appropriate, thereby increasing capacity within villages. It is felt that the production of slabs etc. within rural villages is an achievable objective and as such all latrine components should essentially come from within the environment of the community. The planning of a sanitation intervention should specifically provide for the identification of ways in which contributions from women can be focused. Where households are headed by a woman and where the labour input into a project may be significant, it is important that such requirements do not prevent women from benefiting from the intervention. Rather than imposing a solution on this problem, it should be recognised that there are a number of different alternatives which can be considered. It is felt that the most appropriate course of action would be to encourage communities to identify and become part of the solution to such issues.

3.1.3 It is important that the construction of sanitation units takes full advantage of local knowledge and materials. In order to make informed decisions on the type of latrine most appropriate for a given area, local people and implementation personnel must recognise the possibilities of utilising local materials in the construction of latrines. Indeed the availability or otherwise of certain materials may help determine the type of units which can be most readily constructed. Implementing agencies may wish to supplement local materials, especially where the quality of such may not be very good (e.g., sand), with materials brought in from outside the immediate catchment area. In Chilangwa village in Kasama District where Irish Aid has been assisting with a sanitation Project, 13 out of 15 households chose to purchase Asbestos roofing sheets rather than using local grass as a roof cladding material, even though their houses were grass thatched.

3.1.4 The cost of a sanitation programme can broadly be divided into three categories namely institutional/project delivery costs, material and labour costs, and operation and maintenance costs (IRC Paper 161). The often tremendous financial constraints facing rural communities must be appreciated by any funding agency planning to get involved in a sanitation project. The level of poverty in rural areas is one of the key factors negatively affecting development initiatives. The World Bank has used an

upper poverty line of US\$ 370 per capital per year as a cutoff, implying that anyone below this level is classified as poor. Those who are very poor are defined as those whose annual income is below US\$ 275. In Zambia approximately 55% of the population were categorised as core poor (this is a definition of people whose income is sufficient to cater only for basic nutritional needs) In 1991, and of these 75% were in rural areas (Reducing Poverty in Zambia). The competing demands which communities often face insofar as allocation of resources is concerned, often make it difficult to contribute financially, thus necessitating programmes to target (and cost) other forms of contributions such as those listed above. Whatever levels of contribution are agreed upon, the proportion of income set aside should not lead to neglect of areas such as health care etc. within a household.

3.15 In general terms, the financial resources within households and communities in rural areas are determined by factors such as;

- location of village, its relative isolation from the main District town etc.;
- Time of year, the amount of cash in hand varies considerably from harvest season to planting season etc.;
- Type of agricultural practices favoured by community and marketability of its produce,
- General climatic conditions prevailing in area, i.e. whether there is drought, flooding etc,
- Other developments taking place in locality and the financial demands of same on the community;
- Health of the target population i.e. the relative morbidity rates within the community as a whole and the levels of sickness experienced by individual households. This is particularly relevant when the main income earner (s) fall ill;

3.1.5 It is very important that adequate discussions are held with communities concerning all aspects of the costs associated with a sanitation proposal. It is also important to recognise that while a community may not have cash readily available, the currency of agricultural produce is a suitable alternative, and may be more readily acceptable as a means of payment by communities than cash. The issue of deferring payments until harvest time should also be considered. The timing of a proposed intervention in a community, and the community's response to such a

proposal can be dependent on the factors outlined above; for example a community may express unwillingness to participate in any such project at one particular time of year or in any particular year, whereas as the local environment improves, it may be more eager to benefit from the programme

3 1.5.2 Even if cash resources are available within a community, the competing demands on those resources may determine the level of financial support people are willing to provide to a sanitation intervention. Such contributions can vary from one household to another, but are often dictated by factors such as

- Value placed on intervention by community;
- Cost of intervention;
- financial arrangements for implementation,
- Amount of time institution/project has spent with community promoting the intervention;
- Previous experience(s) of community with similar or other related donor/institution related programmes,

4.0 TECHNOLOGY OPTIONS

4.1 Seen in the context of a participatory approach to sanitation, the type of technology to be adopted for a community programme should ultimately be decided upon by the community. This should be facilitated by the project through consultation, discussions, use of models/visual tools (e.g.. sanitation ladder) etc.. As in any construction programme, it is often easy to see the construction process as an end in itself, rather than as a means to an end. Sanitation technologies should be seen in the context of an overall programme approach, aimed at providing improved health in a community. As such the importance of a well focused participatory hygiene education programme cannot be over emphasized. In addition a learning approach should be adopted when designing sanitation units, where through monitoring and evaluation, designs can be regularly improved upon. Set against the background of optimum community involvement in the programme, institutions/projects should recognise the need for individualising interventions so as to make the technology affordable and accessible to all sections of a community. Thought should therefore be given to introducing more than one option within a community, for example interventions aimed at improving

existing structures through to constructing new facilities should be considered.

4 2 Interventions aimed at providing minimum requirements are listed below, and it is felt that these technologies readily lend themselves to community contributions as listed in the previous section of this paper:

- Pit Latrines (lined and unlined);
- Ventilated Improved Pit Latrines (VIP lined/unlined);
- Improved Pit Latrines (IPL lined/unlined),
- Twin Pit Latrine,
- Compost Latrine,
- Pour Flush (over pit or offset),

4 3 It is not intended to provide a description of these units in this report, however some diagrams are presented giving details of the above latrine types (see appendix 1)

5. 0 RESOURCE MOBILISATION/IMPLEMENTATION STRATEGIES

5 1. Table 1 provides an indication of the scale of the problem facing planners wishing to improve current sanitation coverage. Coverage levels are often difficult to accurately quantify, but insofar as global sanitation is concerned, the UN estimated that in 1995, 2.87 billion people had no sanitation. (Report of S G. E/1995/87 8/6/95) In Zambia levels of coverage lie at about 30%, in many instances however, the presence of a latrine does not imply that it is utilised by all members of a family. In many parts of rural Zambia it is not uncommon to see villages of 20 households without any sanitation facilities. The general trend in rural communities seems to suggest a pattern of latrine coverage in more established villages, while more recent villages take some time to construct such facilities. In addition the location of a village can have a bearing on the no. of latrines it has; where more intensive agricultural practices predominate, the removal of natural vegetation including trees is noticeable. In such instances latrines are often constructed more out of a need for privacy than anything else. Insofar as the benefits from a sanitation project are concerned, it is not unusual for communities to adopt a project for reasons of convenience, privacy, fashion etc. rather than for health purposes

5.2 Faced with the problem of inadequate sanitation coverage and apparent inadequate resources to solve the problem, agencies often adopt the attitude of 'having a go' at solving the issues. This can lead to defeat from the start and may even have a negative impact on other efforts being promulgated for a solution to the dilemma. In order to effectively adopt solutions to the problems associated with inadequate sanitation facilities in rural areas, implementing agencies and proposed beneficiaries need to realise the various issues involved in the execution of a sanitation project. There needs to be an understanding that positive change is possible, that worthwhile improvements can be made when an effective partnership of equals is developed. In the context of the promotion of community contributions it is important that communities realise the costs associated with the provision of the intervention, and also the costs associated with the lack of adequate sanitation. It is often easy to focus attention on the cost of a latrine per household with a promotion of its associated benefits as a means of introducing improved sanitation practices in a village. Just as inadequate water supplies have a cost to a community (this can be measured in terms of time, energy, productivity, health care costs etc), the cost of inadequate sanitation can also be addressed by a community based sanitation programme in a similar way. It is therefore necessary in order to maximise the content and effectiveness of community contributions, to set aside resources for community mobilisation exercises.

5.3 In order to optimise the outcome of a sanitation programme, much thought has to be given to implementation strategies. The flow chart on the next page outlines some of the critical areas which need to be covered at the planning and implementation stages of a project. In order to carry out a programme in a logical and sustainable fashion, the following steps should be given particular attention :

- A sanitation programme should have a clearly defined set of achievable objectives within the context of an overall goal
- The roles and responsibilities of community and supporting agency must be clearly set out and agreed upon by both parties,
- The programme must be implemented within a strategy of 'inclusiveness' i.e. ensuring that no household is excluded for reasons of poverty, social status etc;

Table 1: Water Supply and Sanitation Coverage by Region, 1980-1990, and Coverage for 2000 at Current Rates of Progress (Population in Millions)

Region/Sector	1980				1990				2000			
	Population	% coverage	No. served	No. unserved	Population	% coverage	No. served	No. unserved	Population	% coverage	No. served	No. unserved
<i>Africa</i>												
Urban water	119.77	83	99.41	30.36	202.54	87	176.21	26.33	332.49	76	253.01	79.48
Rural water	332.83	33	109.83	223.00	409.64	42	172.05	237.59	496.59	47	234.27	262.32
Urban sanitation	119.77	65	77.85	41.92	202.54	79	160.01	42.53	332.49	73	242.17	90.32
Rural sanitation	332.83	18	59.91	272.92	409.64	26	106.51	303.13	496.59	31	153.11	343.48
<i>Latin America and the Caribbean</i>												
Urban water	236.72	82	194.11	42.61	326.08	87	281.95	44.13	416.79	89	369.79	47.00
Rural water	124.91	47	58.71	66.20	123.87	62	76.80	47.07	122.84	77	94.89	27.95
Urban sanitation	236.72	78	184.64	52.08	326.08	79	256.02	68.06	416.79	79	327.40	89.39
Rural sanitation	124.91	22	27.48	97.43	123.87	37	45.83	78.04	122.84	52	64.18	58.66
<i>Asia and the Pacific</i>												
Urban water	549.44	73	401.09	148.35	761.18	77	586.11	175.07	1 085.56	71	771.71	314.43
Rural water	1 823.30	28	510.52	1 312.78	2 099.40	67	1 406.60	692.80	2 320.79	99	2 302.68	10.11
Urban sanitation	549.44	65	357.14	192.30	761.18	65	494.77	266.41	1 085.56	58	632.40	453.16
Rural sanitation	1 823.30	42	765.79	1 057.51	2 099.40	54	1 133.68	965.72	2 320.79	63	1 501.57	819.22
<i>Western Asia</i>												
Urban water	27.54	95	26.16	1.38	44.42	100	44.25	0.17	67.26	100	67.26	0.00
Rural water	21.95	51	11.39	10.76	25.60	56	14.34	11.26	30.66	57	17.48	13.18
Urban sanitation	27.54	79	21.76	5.78	44.42	100	44.42	0.00	67.26	100	67.26	0.00
Rural sanitation	21.95	34	7.46	14.49	25.60	34	8.70	16.90	30.66	32	9.94	20.72
<i>Global totals</i>												
Urban water	933.47	77	720.77	212.70	1 332.32	82	1 088.52	243.70	1 992.10	77	1 456.27	445.83
Rural water	2 302.99	30	690.25	1 612.74	2 638.51	63	1 659.79	988.72	2 970.88	89	2 649.33	321.55
Urban sanitation	933.47	69	641.39	292.08	1 332.32	72	935.22	377.00	1 902.10	67	1 269.05	633.05
Rural sanitation	2 302.99	37	860.64	1 442.35	2 638.51	49	1 294.72	1 363.79	2 970.88	58	1 728.80	1 242.88

(Source: UN General Assembly (1990). Achievements of the International Drinking Water Supply and Sanitation Decade 1981-1990. Report of the Secretary-General).

- Capacity building within communities must be central to the programme, a strategy for empowering people within and beyond the context of the programme should be developed.
- Monitoring and reporting procedures should be put in place to ensure that a comprehensive evaluation of the intervention can be undertaken. This will also assist any ongoing planning exercises and will help in the continuing implementation of the existing project.
- The hygiene education component of the Project should be designed in such a way as to induce rather than force behavioural change.
- The role of women in the project should be particularly well planned for and formulated, and an attempt made to integrate them into all aspects of project implementation.

6.0 ADVANTAGES/DISADVANTAGES OF COMMUNITY PARTICIPATION IN A SANITATION PROJECT

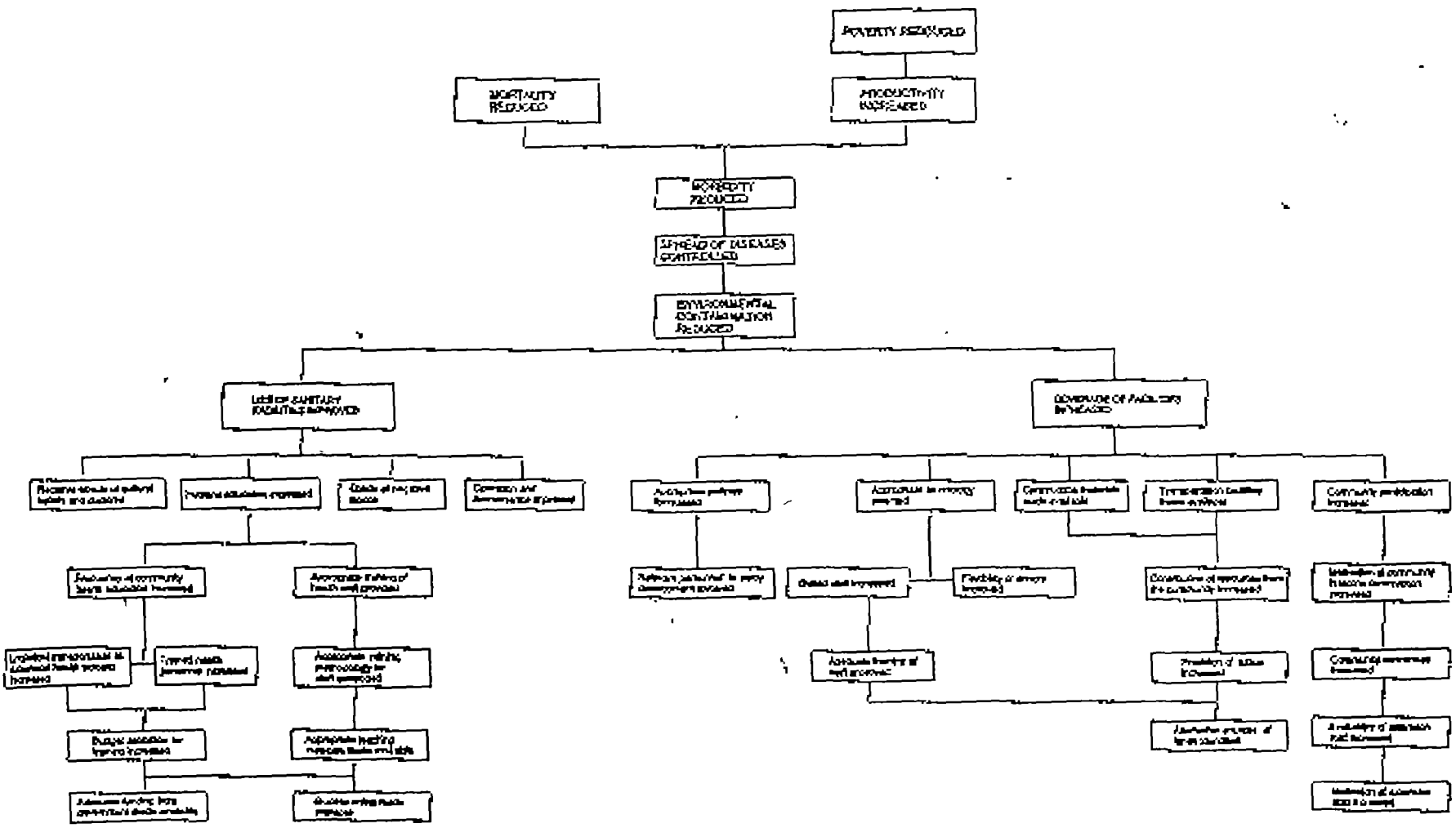
6.1 As was mentioned in the first section of this Discussion Paper, community contributions will be dealt with within the context of community participation. It should be understood that within the framework of this paper, community participation does not mean a passive acceptance of responsibilities, but an active involvement in all aspects of project activities. As an environment is created within which this can take place, people become empowered which in turn leads to increased motivation, assertiveness, self esteem, and capacity. In this regard community participation should not merely be seen as a means to facilitate the construction of latrines but as a means to improve the overall quality of life within a community.

6.2 It should not be assumed that community contributions within the boundaries of a participatory programme will ensure the success of a programme. Community participation is only one ingredient of many, all of which must coherently work together to form the body which in essence constitutes the project. In order to focus attention on the weaknesses as well as the strengths of a participatory sanitation project, the following points are presented;

6.3 DISADVANTAGES

1. In rural areas where communities are scattered and accessibility difficult, participatory programmes require a lot of time to plan and implement;

OBJECTIVES ANALYSIS : ENTITY : SUSTAINABLE SANITATION PROGRAMMES



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2 Such projects can prove divisive within communities, and traditional authorities can feel their power undermined;

3. Communities may not be willing to support disadvantaged members: within the target group who may become excluded from the programme. This can occur at implementation and maintenance phases;

4 Some members of a village may be forced to contribute if most of the village, or even an influential figure such as a headman instructs them to do so. Making such contributions may prevent a family from making other commitments, such as paying school fees, utilising health facilities etc ,

5. The labour aspects of community contributions can place an excessive burden on women in villages' and may greatly add to their existing responsibilities. This in turn can have a negative effect on their roles within the home and their capacity to look after children etc ;

6 Community participation programmes can be viewed by villagers as a way in which donors/institutions are merely using them to carry out activities which communities see as being the responsibility of the Government'

7. Community contributions can negatively impact upon agricultural production within a village' especially when project activities coincide with planting and land preparation times.

8. The quality of work, particularly of construction activities can be very poor due to inadequate skills levels within communities and implementing agencies.

6.4 ADVANTAGES

1. Community capacity is enhanced so that people can more effectively manage issues which concern them. This can occur through a more productive use of existing resources (human, material etc.), or through a community becoming aware of the possibilities of resource mobilisation in order to improve its quality of life.

2. Decentralisation of planning and decision making processes leading to improved communication and the utilisation of more appropriate technologies;

- 4 Increased potential for sustainability of intervention since sense of ownership increases;
5. Intervention becomes 'people focused' rather than 'project focused';
- 6 Other interventions can be readily accommodated within a community on the basis of a successful participation programme;
- 7 Specific attention can be given to gender issues within the programme and a bias introduced towards increasing the role of women in project planning, implementation and monitoring;
- 8 Sense of partnership within the community and between community and implementing body enhanced/developed,
- 9 Opportunity given for individual members within the community, who might otherwise be neglected, to hold and profess an opinion on an issue of communal importance;
- 10 Potential to spread intervention enhanced since inter relationships between communities can promote project objectives;
11. Dependency on central Government decreased;
12. Potential for small scale business enterprise can be developed

7 . 0 COMMUNITY CONTRIBUTIONS AND SUSTAINABILITY

7.1 The issue of sustainability is often given cursory attention in the planning and design of sanitation and other basic needs projects. Sustainability is often expected to automatically happen once the implementation phase of a programme ceases and a handover has been effected. The reality of the situation in all countries of the world is that there is no sustainable sanitation system; In more developed countries particularly, the cost of maintaining sanitation systems including waste treatment costs is extremely high. It should be recognised however that there are degrees of sustainability , and that generally the simpler the system the more sustainable it is likely to be. In more advanced sanitation systems, particularly of a communal nature,

sustainability through maintenance is usually paid for by Central or Local Government. Insofar as rural sanitation is concerned, the maintenance of whatever system is put in place becomes the responsibility of the owner. It is therefore important that from the planning stage, the issue of maintenance is considered and that it becomes a topic for discussion during the mobilisation phases of the project.

7.2 In light of the foregoing it is important that community contributions are not merely linked with the implementation phase of a project, but also that communities are encouraged to support ongoing maintenance and improvements to their sanitation systems. What is of paramount importance is that behavioural change continues and is backed by reductions in parasitic infections etc.,. In order for benefits from any proposed intervention to be maximised, changes in attitudes amongst all participating partners is necessary. 'Against the background of increasing populations, decreasing resources, increased levels of pollution etc. the Ministerial Conference on Drinking Water and Environmental Sanitation, held at Noordwijk, the Netherlands in March 1994 concluded that Water supply and sanitation decisions must be based on a dialogue about the attitudes and needs of people in rural and urban communities, and on what they can manage, maintain and pay for. Behaviour at political and governmental level, as well as in the water supply and sanitation sector, must change as required' (Water and Environmental Sanitation A programme approach on a new footing UNICEF/IRC May 1995. Change takes time, and witnessing the fruit of change can take even longer; Very often projects with short life spans of three or so years cannot seriously countenance the issue of sustainability in their design. Neither can long term sustainability be guaranteed simply by adopting a component of institutional capacity building within project design. Rather, a holistic and realistic approach has to be taken, with a recognition that the whole process of increasing sustainability is an ongoing one, and requires long term commitment from all parties. Some of the key questions to be asked in order to optimise inputs and increase levels of sustainability are given below. This is not a comprehensive check list but merely an acknowledgment of the many factors needing to be considered when approaching the issue of project sustainability :

1. How supportive is the macro environment to the intervention? Is there an overall policy framework within which the sanitation project fits? Is this framework flexible enough to respond to the growing sectoral needs and does it allow latitude in implementation strategies?

2. How committed are relevant Government Ministries through their Departments and Directorates to ensuring that sanitation interventions are supported practically? What budgetary allocation is made annually by ministries such as Health, Local Government, Community Development etc to support sanitation projects? How are health and educational institutions etc being accommodated in the programme and what roles are staff from these institutions expected to play in the project

3. What percentage of overall project costs are allocated for social mobilisation, hygiene education and other associated activities? what percentage of overall project costs will provide no discernible benefit to the community (such costs normally include certain administration expenditure, costs related to external support personnel etc). What levels of contributions will beneficiaries be expected pay and on what basis?

4. How was the technology decided upon for the project and what previous experiences have been recorded over its use? Can this technology be replicated in the village at a later date without any external support? What maintenance costs (in terms of finance or labour etc.) are likely to be associated with the system and how will these be covered?

5. How was the hygiene education programme designed and has it been tried elsewhere? How can behaviour change be encouraged and be seen to occur after the project has 'finished'?

6. How have the roles and responsibilities of men and women been defined insofar as project implementation and maintenance is concerned? How have children been accounted for in project design?

7. What extension personnel are to be employed by/for the programme and what post implementation activities are planned? What training/orientation of programme staff is being proposed and what are the expected benefits (short and long term from such training) How will

monitoring be conducted and how will resultant reports feed the evaluation system?

8 What specific benefits are envisaged by the project for the communities from the intervention and what specific benefits are envisaged by the communities from the proposed intervention?

9 How will failures (if any) be rectified in a community sanitation project and by whom (i.e. what if the technology fails? people lose interest during the programme, implementation and support personnel leave etc.)?

10 What is the economic situation like for rural communities supported by the programme? Is this situation likely to improve or disimprove over the next few years?

8. COMMUNITY CONTRIBUTIONS AND GENDER

8.1 Just as the issue of sustainability is often given inadequate attention in the planning and implementation of projects, so too the issue of gender is often given meagre regard in programme policies. This often stems from certain assumptions being made about communities along with inadequate planning and preparations being undertaken before the implementation stage of a sanitation project. It may also stem from the very large gap which sometimes exists between gender theories and the realities of life faced by rural communities, such that the implementation of certain gender strategies becomes almost impossible if not counter productive. As in other aspects of project implementation, various issues of gender should be addressed within the context of the community itself, and this could best be done by holding a number of participatory meetings in selected communities at which a number of issues including gender are tackled. Therefore identification of inconsistencies in gender issues within a village along with solutions aimed at addressing these problems should substantially fall on the community.

8.2 Irish Aid has proposed some key actions to be incorporated in its water and sanitation activities (Draft 'Irish Aid Policy on Gender on an Operational Footing, Feb. 1996) and these are listed below :

+ Since water and sanitation are traditionally a female responsibility, then women should be specifically targeted

in such projects. This should not be to the exclusion of men who should share responsibility for water and hygiene in the family and Community .

- + Consult and involve women as well as men at the earliest stages of water or sanitation project identification;
- + Train women to undertake non traditional tasks and seek ways to gain men's support for changed roles;
- + Provide leadership training to women which will promote equal participation to men in decision making on water and sanitation committees;
- + Ensure that technical staff engaged in water and sanitation projects have an understanding of gender and the capacity to incorporate women's as well as men's needs;
- + Consider how to ensure women's ongoing control and involvement once physical structures are in place. This will involve strengthening gender aware local institutional capacity;
- + Monitor and report on progress regarding impact on and benefits to women and men.

8.3 One of the dangers inherent in addressing gender issues within a community is that of isolating it as a single issue, rather than placing it within the framework of village life. This in turn can lead to misunderstandings and may even prove detrimental to the promotion of the concepts being forwarded. As women bear primary responsibility for health and hygiene issues within communities, it is important that such roles are enhanced by the programme and due recognition of such given by the community. It is also important that the capacity of women as equal partners in the development of the village be recognised and strengthened and that capacity building within a community sanitation programme targets women as well as men in traditional and non traditional roles.

8.4 As in the issue of sustainability, there should be recognition by implementing agencies that change takes time: often short term projects can become so implementation and construction orientated that they rush social mobilization, community awareness raising etc. to the great detriment of issues such as gender. 'Sanitation

improvements concern men and women. Both categories have their own areas of work, needs, responsibility and authority. Gender roles are variable within cultures and change over time. Therefore situational recognition of men and women's roles, the differences between public and private roles and their interface is needed' (Unicef: Woman, Water, Sanitation - AAJ.4/94). Insofar as community contributions are concerned, it would be worthwhile for any implementing agency to consider the link between the promotion of gender within a sanitation project and the level and nature of such contributions. It is felt that the integration of an appropriate gender component within a sanitation project can positively affect community contributions and improve sustainability.

APPENDIX I

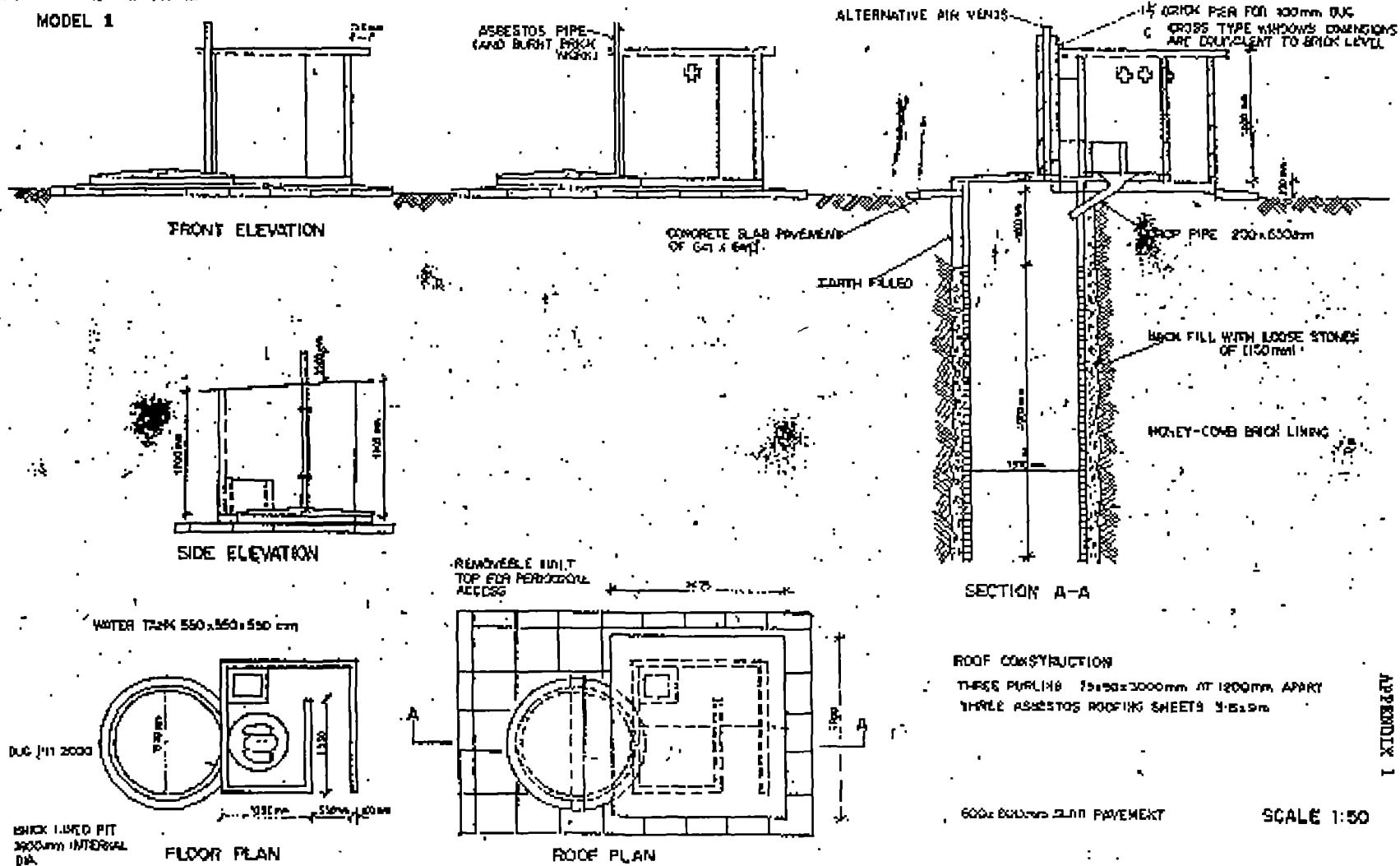
APPENDIX II

DEBATE SERIES : 4

APPENDIX 1

IRISH AID - ZAMBIA NORTHERN PROVINCE DEVELOPMENT PROGRAMME RURAL SANITATION

(1) IMPROVED LATRINE
MODEL 1

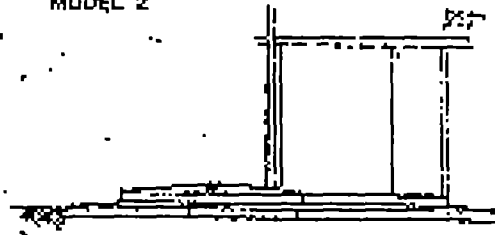


ROOF CONSTRUCTION
THREE PURLINS 75x50x3000mm AT 1200mm APART
THREE ASBESTOS ROOFING SHEETS 3.5x5m

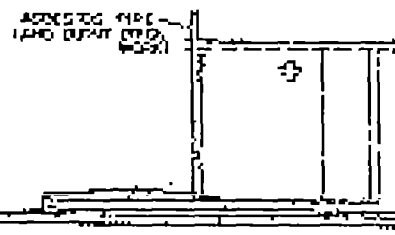
600 x 600mm SLAB PAVEMENT SCALE 1:50

IRISH AID - ZAMBIA
NORTHERN PROVINCE DEVELOPMENT PROGRAMME
RURAL SANITATION

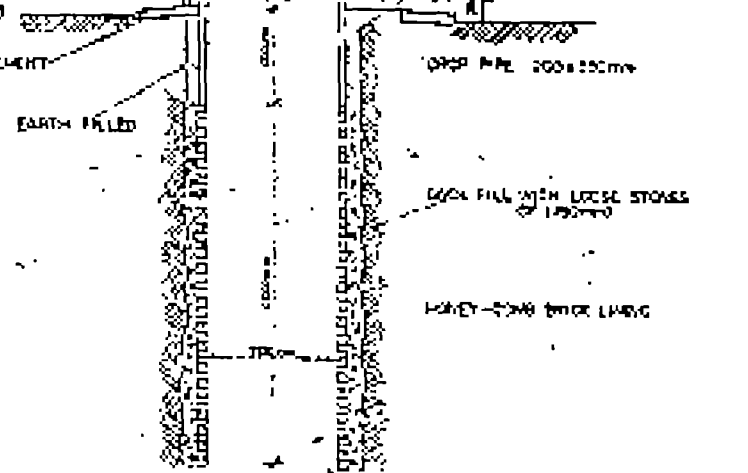
(1) IMPROVED LATRINE
MODEL 2



FRONT ELEVATION



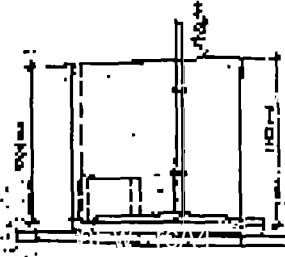
ALTERNATIVE A1 - 1973



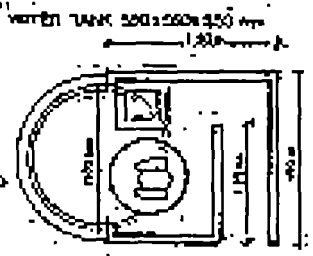
SECTION A-A

ROOF CONSTRUCTION
THREE PLANKS 75x20x3000mm AT 200mm SPACES
THREE ASPHALT ROOFING SHEETS 300x600

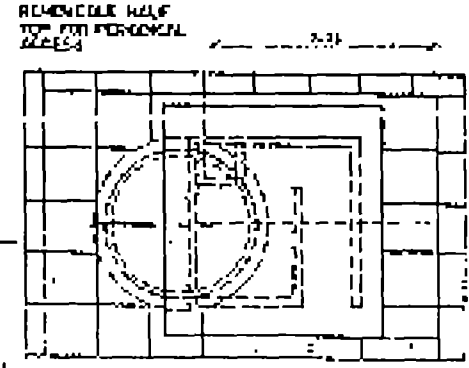
600x600 - 500mm COVER SCALE 1:50



SIDE ELEVATION



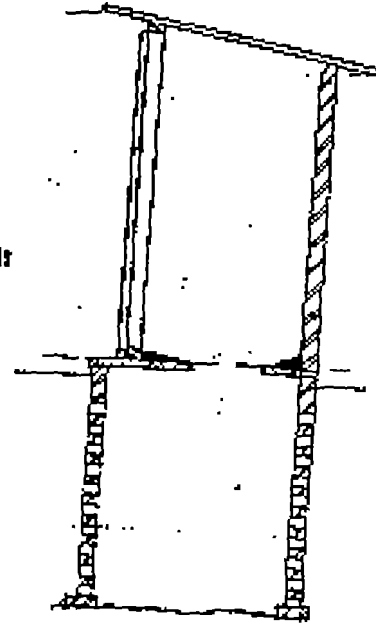
FLOOR PLAN



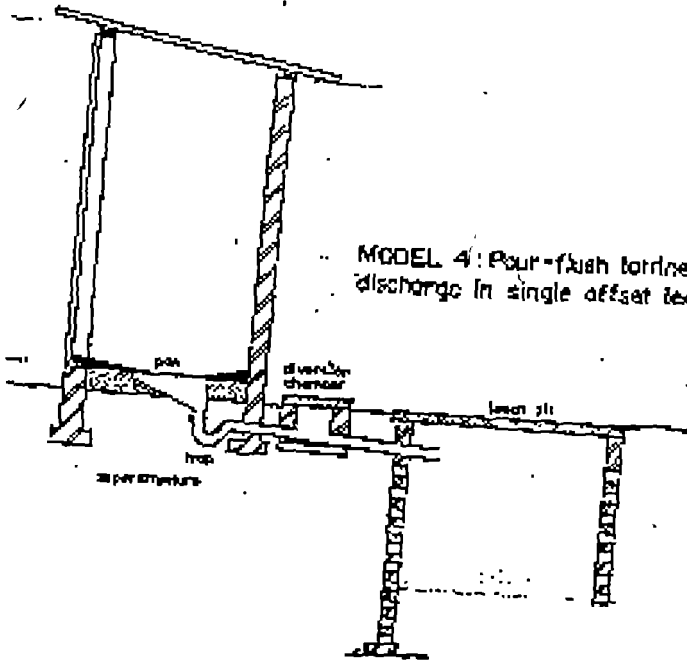
ROOF PLAN

MODEL 3

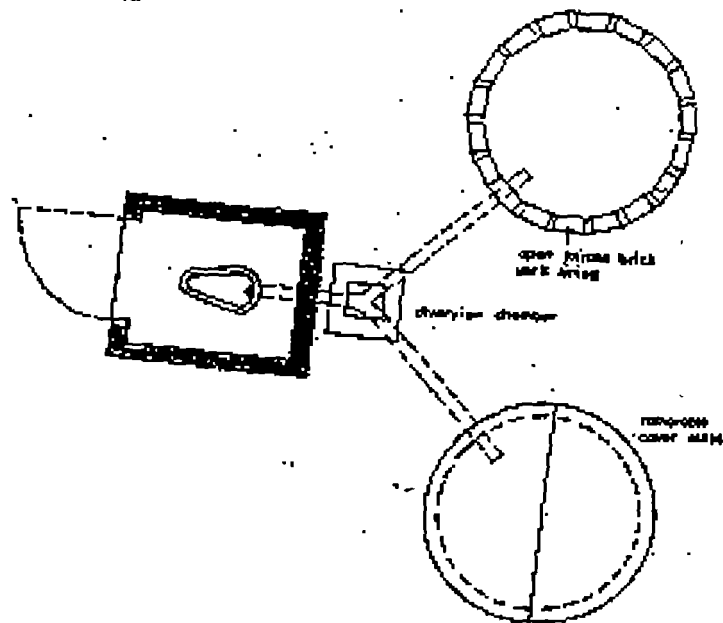
latrine with discharge directly into the leaching pit



MODEL 4: Pour-flush latrine with discharge in single offset leaching pit



MODEL 5: Twin offset leaching pits



TITLE : integrating Commercialisation and Community Participation in peri urban water supplies

NORTHERN PROVINCE DEVELOPMENT PROGRAMME

VILLAGE COMMUNITY SANITATION

COST OF COMMUNITY CONTRIBUTION PER FAMILY (TOILET)

MATERIALS	QUANTITY	UNIT COST	TOTAL COST
1 Pan Bricks	1,600	K40 per brick	K64,000.00
2 Building Sand	3.5m ³	K 9,600.00	K 9,600.00
3 Labour			
(i) Digging pits	1 pit	K 5,000.00	K 5,000.00
(ii) Drawing Water		K 5,000.00	K 5,000.00
(iii) Mixing Bricklaying		K30,000.00	K30,000.00
(iv) Roofing Materials	2 ASB Sheets	2xK21,000.00	K42,000.00
		Total	K155,600

COST OF PROJECT CONTRIBUTION

MATERIALS	QUANTITY	UNIT COST	TOTAL COST
Soft wire	12 metres	K2000	K24,000
Roofing Nails	9	K3,600.00	K32,400
Timber	5 metres	K2,800/ mt	K14,000
Cement	6 pkts	K8,000	K48,000
Co nforce Wire	1.5mts	K6,000	K 9,000
Course Aggregate	0.042	K5,000	K 2,400
Bricklayer Trainer	14 daysx3500	K49,000	K49,000
Transport	25%	K44,700	K44,700
		Totals:	K223,100

DATE : 16th May 1996

TIME : 13:30 to 15:00 hrs

VENUE : Room 2

INTRODUCTION

The Lusaka Water and Sewerage Company is a Company that was created from the Water Supply Department of the Lusaka City Council in 1988. With the increasing demand for water services in the city, the need for an independent company to manage the Water and Sewerage Services for the city was inevitable. The Water Supply and Sewerage Department was allowed to initially run as an autonomous department and later commissioned into a limited liability Company.

BACKGROUND

When the responsibility for water supply was still with Lusaka City Council which enjoyed government funding, there has been a general relaxation in the Management of the operations.

With Urban drift of the late sixties there was a proliferation of squatter settlements in the city which was left unbated. The result was the growth of unplanned settlements in the perimeters of low density areas, planned suburbs and the City Centre itself. This was the birth of the several squatter communities which number up to 26 and have a present day population of over 500,000 people.

The need for a basic water supply and sanitation was realised in the seventies and the City Council then moved in to provide water supply from public standpipes from either the existing reticulation or isolated boreholes to supply a limited reticulation. They also provided some health workers to advise on the siting of pit latrines and solid waste pits.

The water supply was provided face of charge from the standpipes and with improved conditions that seemed to exist, where free water facilities were provided the communities grew and expanded beyond the services provided. The end result has been a seemingly reduced service due to demographic movements which they could not cope with. A few of these unplanned settlements were recognised by the council and some cosmetic upgrading of the services was done but just fell short of a political gimmick.

Abstract :

The Lusaka Water and Sewerage Company has the responsibility of supplying potable water to the city of Lusaka. One of the greatest problems the company is facing today is the supply of water, cost recovery and involvement of the community in the peri urban areas which have a population of about 500,000 people

The company has put up a policy to involve the community in the management of water supply by promoting the water concession/vending schemes

The implementation of the exercise and the community perception will be evaluated. A review of a satellite ongoing water project based on community participation will also be presented.

The Organisation :

Lusaka and Sewerage Company is a company born out of the Lusaka city Council's water Supply and Sewerage Department. It was created in 1988 to operate automatically on a commercial and sustainable basis. Its responsibility is the supply of portable water and sewerage services at an appropriate economic level to the industrial, commercial and domestic user in the Lusaka Local Authority recognised areas.
Tel: 250666
Fax: 252578
Address: P.O Box 50198 Ridgeway
LUSAKA

The other medium density suburbs like Matero, Chilenje, Kaunda Square has their water rates embodied in the house rents or assumed to be embodied in rates as nobody rashed them to pay for Water and Sewerage Services. The result was a very low cost recovery and the residents of most medium density unplanned settlements have cultured their minds to assume that Water and Sewerage Services are free of charge.

With most of our city's population staying in the medium and high density areas and without paying for the services provided and with a reduced government allocation of funds, the Water and Sewerage reticulation was left with very little maintenance and went into a state of dis-repair.

It was inevitable that the Council then conceived the idea of creating a private limited liability company among other things operate on a Commercial and sustainable basis through cost recovery and an independent management.

From the foregoing it's clear that the following was the state of affairs and the challenge to the young Company :

1. Low Cost Recovery
2. Larger part of the community used to free services
3. Infrastructure in a state of dis-repair
4. Water and Sewerage Services over stretched by the normal growth of the city and demand coupled with the uncontrolled proliferation of unplanned settlement
5. Urgent need for Capital Investment for maintenance and increase of production capacities.

WATER SCHEMES

The Company through the MLGH had to secure an ADB loan on 40 million dollars to among other things :

1. Rehabilitate the distribution network
2. Rehabilitate the Storage reservoirs
3. Salvage and drill new boreholes
4. Change pumping units to major Booster Station
5. Install System and Revenue meters

6. Install Status monitoring system
7. Install a Management Information System.
8. Construct additional Chlorination plants.

The project is still on going with over 50% of the work done and has upgraded the system to a level where planned maintenance can be realised. We now have a reliable system to operated and stable ground water production depending on water levels and able to reasonably measure supply to most of our prime customers.

In its continued effort to increase water supply to the city with more reliability, the Company took advantage of the liberalised economy and promoted an investment scheme to duplicate the Kafue Water Works through private capital.

An investment seminar was held where leading investors from the region and overseas, local business houses, Zambia Agency and Citizens participated.

The response has been good and the proposals from two consortium are being studied. More details will be released a more appropriate time.

PERI-URBAN WATER SUPPLY

There are about 27 peri-urban areas (see chart) which have had a level of service from the Company.

Realising this strain the Company Water Supply from these unplanned areas and the zero cost recovery, this Company had to prepare a peri-urban water supply policy which gave guidelines on matters on peri-urban water supplies. The policy identified that community participation was the way forward in these areas and sort ways of involving the people in the management of the water supply and cultivate a sense of ownership.

THE POLICY

The policy recognises among other things that there is need to promote the provision of decent water supply in the peri-urban areas through :

- Encouragement of the residents to play an active and participatory role in the operation and maintenance of the water supply facilities within their communities.
- Encouragement of the residents to safeguard the water supply facilities against wrong usage, vandalism and thefts
- Encouragement of the residents to generate the necessary funds for the operation and maintenance of the facilities from user contributions, non-governmental organisation, public and private organisations.
- Assisting the communities in forming water management communities that are non political and would then liaise with Lusaka Water and Sewerage in all matters relating to water supply.
- Assisting the communities in introducing a practical and equitable method for cost recovery for water supplied for onward payment to LWSC whilst retaining a small profit for their general Management.

LUSAKA WATER AND SEWERAGE SUPPORT

The main support of LWSC is to

- Provide the bulk water supply to selected delivery points in the peri-urban areas, subject to limitations depending on the availability of water supply main or a borehole capable of sustaining the needs.
- Provide financial assistance, subject to availability by providing resources to construct public standpipes and associated civil works on the selected points.
- Provide wages to ward plumbers for the general maintenance of the area a role which shall be phased off with time.
- Maintain and operate the system up to this meter location.

THE CONCEPT OF CONCESSIONAIRE

To support the Peri-Urban water supply the Company promoted the concept of Concession (delegated responsibility), and under this arrangement the following were to be achieved :

1. Lusaka Water and Sewerage Company prepared a contract agreement to be entered into by an individual on behalf of himself as a trader club, water management committee etc with LWSC.
2. The concessionaire (Vendor) or licensed trader will be responsible for the settlement of water bills on volumetric basis as given by the meter reading.
3. The Company would install standpipes or other delivery facilities as appropriate with accompanying water meters.
4. In case of any abuse of the system or breach of contract the Company reserved the right to revoke the concession licence.
5. The Concessionaire (Vendor) will be responsible for the security of the standpipes or other facilities and minor repairs after the metre. The shall also be responsible for good House Keeping around the standpipes and other points of the works.

CURRENT STATUS

The concept of the concessionaire was launched in July 1995 and has been well received by most residents of Lusaka's peri-urban. To date there are five Registered Committees namely :

1. Sonadi Compound

This was registered on 10th August, 1995 with two public standpipes.

2. Ng'ombe Self Help Resident Development Committee

This was registered on 20th August 1995 with five standpipes.

3. Linda Water Management Committee

This was registered on 10th November, 1995 with twelve standpipes.

4. John Laing Water Management Committee

This was registered on 5th January, 1996 with fifteen stand pipes.

5. Chunga Water Management Committee

This was registered on 21st March, 1996 with four

standpipes. The schemes have had several successes amongst which are :

- Security provision
- Minor maintenance after the meter
- Some ability to collect some revenue
- Reduced vandalism
- Prompt reports on any leakages in the areas.
- generally improved the image of our Company in the light of the communities themselves getting involved in cost recovery and hence the company interfacing with the committees.

However, the rate of settling the bills has not been impressive and below is a chart showing date commissioned, amount paid and amount outstanding

From the foregoing its clear that they communities have an inherited problem of being :

- used to free services
- unable to collect revenue
- unable to account for money collected

We are however optimistic that with more dialogue and persuasion coupled with temporary disconnection, this is a passing phase as the communities adjust to paying for the services.

DEBATE SERIES : 5

TITLE : you are doing and HOW you should do it : the need for parallel investment in research and training

DATE : 1996

TIME : 8:30 to 10:00 hrs

VENUE : Room 1

ABSTRACT :

INTRODUCTION

There is an irresistible, almost addictive desire among donors, governments and other players in the water and sanitation sector for QUICK, VISIBLE results. In the pursuit of these quick, visible results, "sustainability" is left to take care of itself. We have had, and continue to have many projects but few programmes. All I am saying is that we can not have sustainable programmes without calculated, deliberate investment in what I will call "EDUCATION -TRAINING-RESEARCH"***. Some of you will say but....most of the projects have training components. I put it to you that those components are superficial and usually added as afterthoughts. The projects therefore amount to hit-and-run interventions. These "guerrilla" tactics can not be expected to provide sustainable systems. Now, wait a minute

What is sustainability?

There is sustainability if....the benefits of the facility continue to be realised over a prolonged period of time.

What are the key elements of sustainability?

- an enabling environment
- felt need and health awareness
- strong institutions
- supportive attitudes
- expertise and skills
- appropriate service level
- support services, O& M must be effective
- financial factors

Abstract :

There is an irresistible desire among donors, recipient government and other stakeholders in the sector for quick visible results: more running water so more wells, hand pumps and taps. The long term is left to take care of itself. In this rush for results, the real foundation for sustainability, training and local research are left to fend for themselves. Should we continue along this path? Where is the morality? Where is the professionalism?

The Organisation :

The Environmental and Water Resources Engineering Group (EWREG) is a fully fledged section within the Civil Engineering Department of the University of Zambia. The group is involved in teaching, training, research and consultancy in Environmental Engineering - water, waste water, solid waste etc.

Tel: (01) 292884

Fax: 253952

Address: Environmental & Water Resources Engineering Group Department of Civil Engineering, UNZA, P.o Box 32379 Lusaka

Now, one of the most talked about elements of sustainability is O&M.....but what is O&M? Operation is the everyday running and handling of a water facility and Maintenance involves the activities required to sustain the facility in a proper and working condition.

** Education-process by which a person's mind and character are developed- through formal instruction in school or college Training - a course of instruction or practice especially in a profession or skill Research - serious and detailed study of a subject that is aimed at learning new facts, scientific laws, testing ideas, etc.

What are the constraints on effective operation and maintenance?

- the focus on capital construction and expansion by governments and support agencies neglects the maintenance and upgrading of existing facilities
- inappropriate design and technology choice creates unnecessary operation and maintenance difficulties and increases costs. Initial design must consider long-term O &M.
- often inadequate data for planning O&M. Data are required, for example, on causes of breakdowns and the maintenance and repair costs involved. O&M can then be planned based on field experience.
- management constraint - unskilled staff
- poor funding/poor management.
- lack of training and understanding of maintenance procedures leads to poor performance of O&M staff

EDUCATION-TRAINING-RESEARCH is implicit in most of the key elements of "sustainability" as well as in the the key elements of O&M which is itself an element of sustainability.

Now, without exaggeration, there is a yawning gap in our country today between the current status of water services and the desired levels of performance. The gap can be narrowed if O&M is given its due profile and priority in the planning and management of water systems. But, if I may ask, how can O&M be given its due profile without investment in

EDUCATION-TRAINING-RESEARCH?

How can we have sustainable programmes without parallel investment in EDUCATION-TRAINING-RESEARCH? All we continue to have are hit-and-run interventions in the "cycle of ill-health" of our country. I put it to you that for as long as EDUCATION-TRAINING-RESEARCH is not given its due profile in the sector, we will simply be putting money down the drain. We do not know what we are doing and how we should do it.

What can we say about the water sector today?

Institutions Given the plethora of agencies that can claim some say in the water sector, the simplest tendency has been towards inertia. Hopefully, the on-going re-organisation will address this issue. But one wonders whether these institutions have the capacity to clearly identify training needs. See table 1.

Research. Despite her early start in alternative sanitation (with aqua privies in the 1960s), Zambia now lags behind her neighbours in East and Central Africa. The few works that have been conducted do not paint a good picture. In 1975, for example, the WHO and IBRD jointly prepared a water supply and sewerage study for Zambia. Unfortunately, this simply proposed vast expenditure to extend waterborne sanitation wherever it was needed, and the study rapidly became another shelved report of merely historical interest.

Major councils, such as the Lusaka city Council (LWSC?), have no research units worth of note.

This promotes a strong tendency to continue operating along familiar lines, which have achieved some success in the past. New developments are not given priority.

There is limited activity in the development of the VIP. UNICEF and UNCHS have done some work in the development of sanitation technologies. The critical problem still remains how to work out a sustained and consistent approach to the development and implementation of appropriate water supply and sanitation programmes throughout Zambia. See table 2.

Education/Training. The raw aspect of education/training is provided by our universities and colleges but there is need to develop short, tailored courses for operatives and plant

superintendents/managers. In this regard the professional institutions/associations naturally have a crucial role to play. The record so far has not been encouraging.

In order for us to break with this not too impressive past, it is imperative that an enabling environment which encourages sustainable systems through appropriate legal provisions, regulations, education, information other similar incentives is put in place. Clearly EDUCATION-TRAINING-RESEARCH will be the cornerstone of this transformation. There is a direct need for parallel investment in EDUCATION-TRAINING-RESEARCH. Investment is not only about physical infrastructure....which in rastructure quickly becomes white elephants anyway. Let us put a stop to this madness. Let us act now!

DEBATE SERIES : 5

TITLE : Commercialisation and Community Participation : Complimentary and Contradictory

DATE : 1996

TIME : 8:30 to 10:00 hrs

VENUE : Room 2

Mr. Chairman, delegates

Thank you for honoring me with the opportunity to address you on the creation of infrastructure for water provision and the role of the private sector in this crucial issue. This initiative has elected to deal with an issue pertinent to the development potential of the country and its people. Saur international has the experience in the provision of water over a period spanning 63 years and on the continent of Africa business links extending over 35 years

Industrial development is stifled without an efficient affordable and reliable source of water. This is also true for a healthy population. However, how can the state ensure the supply of water to the largest possible number of users at the lowest cost to the consumer and at a minimum or if possible at no cost to the state.

There are two components to this problem :

- funding the capital investment for the development of infrastructure
- paying for the service i.e. the running cost.

In experience of SAUR INTERNATIONAL these elements are best dealt with in an integrated approach. to guarantee the prudent use of donor funds and the continued delivery of the service to the customers. The interest of this approach for the state is as follows :

- The creation of infrastructure
- the efficient delivery of the service
- a tailor made package allowing for the particular circumstances of the country
- the assistance of privately owned companies to ensure a speedy delivery of the service to the customers

Abstract :

Commercialisation offers developing countries the bets of two words:

- The involvement of the people, developing their skills and rendering water and sanitation services.
- The management know-how, financial expertise and the back-up of major corporations such as SAUR INTERNATIONAL

case studies to be presented

The successful commercialisation of water services in the Ivory coast demonstrates the partnership between the state and a private sector can generate the most favourable environment for the development and economic self sufficiency of urban water services and of community involvement.

The Organisation :

SAUR INTERNATIONAL is the largest provider of water and sanitation services on the continent of Africa and has invested in such projects and managed them over a period spanning 35 years.

Tel: 320 6866/67

P.o Box 651525
Benmore 20202,
St. Floor Export House,
Cnr-West & Maude Sts,
Sandown, South Africa

- the effective use of donor funds to assist in the establishment in the infrastructure for water provision

In Africa water provision has often been viewed as a social service that has to be provided by the state on a subsidized basis or free of charge. Modernisation of the continent and the need for development are forcing governments to treat water as a commodity for which the users are billed and have to pay.

Aid to African states can be used meaningfully to enhance the development of infrastructure in collaboration with the private sector. The donor community has an important role to play in funding the infrastructure for water resources. However, the donor community needs to be assured of a continued service. For the donor community the importance of the structure set into place to manage the service and to recover costs reflects the development it has supported thus constituting a guarantee for it. Their support is channeled to the State, which consequently benefits from the effectiveness of the operations. The introduction of private sector managerial practices at this stage can meaningfully enhance the capacity of the government.

- Government is relieved of the burden and risk of managing, operating and maintaining the system that is transferred to a private, experienced and professional operator.
- **Value for money** is assured either by competitive tendering, or by the transparent negotiation of the operator's remuneration on the basis of proven cost plus profit margin. The latter can reach to lower prices and a better understanding, between the parties.
- **Service, sales and revenue** are improved as the operator depends on these for his remuneration.
- **Government receives revenue from sales** for investment in the sector and for other purposes.

THE SELLING PRICE OF WATER

For the service to be self-financing, the average unit selling price of water must cover the following:

State Part The management and associated costs of the supervising authority. Investment improvements, extensions and major repairs to the system. Taxes, levies imposed by government and other authorities.

Operator's Part The cost of managing, operating and maintaining the system and supplies to customers. The operator's profit and tax liabilities.

The operator's part is fixed by contract, often as an average unit rate, with clear price revision conditions.

Collection of revenue from the water sales is the responsibility of the operator, who retains the part relating to his functions and transfers the rest to the state or supervising authority.

If required, the investment part can be deposited directly into a specific, state controlled account.

Due to the individual needs of governments various institutional models have been developed that range from privatisation, delegated management, concession to "build, operate and transfer", BOT. I have been requested to concentrate on SODECI, our water company in Abicljjan, as an example of a concession contract. However, it is instructive to refer to the other contractual models to indicate the range of possibilities for involvement of the private sector as well as to discuss in detail the exemplary delivery of the water service through SODECI.

PRIVATISATION

Privatisation involves the transfer of :

- Assets;
- The responsibility for capital investment;
- Management and operations through the creation of a company;
- Majority shareholding in the hands of the private sector.

There is no operating contract or time limit to the water company's control of the water service. Ultimate control by the State in the event of serious default is the threat of withdrawal of its operating licence.

The British model is typical, with State regulation through OFWAT the National Office of Water.

CONCESSION (FRANCHISE)

This leaves the ownership of the infrastructure in the hands of the public sector (State, Local Government, or state asset holding company). The responsibility for capital investment in the system, management, operations and maintenance is given to an operator in terms of an operating contract.

Concession resembles a franchise because of the commitment to capital investment which amounts to the purchase of the concession or license. That is normally quantified in the contract. Ownership of the newly created and improved facilities transfers to the public sector at the end of the contract.

The operator finances the following working means through water sales to customers :

- Personnel and training;
- Offices and computers;
- Vehicles and equipment;
- Management organisation;
- Systems and running costs.

The concession must therefore be long enough to allow the operator's remuneration to amortise his investment and cover cost and profit. Concessions in France therefore typically last 20 to 30 years.

AFFERMAGE OR LEASING

This French word carries the concept of tenant farming. Infrastructure ownership and new investment (the farm) remains the responsibility of the public sector whilst a private operator is given responsibility for the management, operation and maintenance of the system (farming) under contract or lease for a set term.

The operator or "farmer" leases the facilities and is remunerated through the sale of his produce, water. Although the operator does not need to invest in the infrastructure he must provide his working means as before and takes the risk for this investment and for this remuneration. Affermage contracts which are very common in France, therefore typically last for 10 to 15 years.

GERANCE OR MANAGEMENT DELEGATION

The client takes the risk of non payment from water users, although the operator's remuneration can be performance related.

The cost of the service is normally covered by the sales but the separation of the operator's remuneration from revenue allows it to be subsidised from other sources if politically required.

In France this contract typically lasts for 10 to 12 years

THE RECOMMENDED CONTRACTUAL ARRANGEMENT FOR THE DEVELOPING COUNTRIES

Experience is showing that Affermage or lease type contracts are the most appropriate to the needs and context of most African urban water services, for the following reasons:

Government retains control of the essential political functions :

- Sector policy;
- Ownership of the infrastructure and investment planning and implementation, having access to funding sources and favorable terms that are unavailable to the private sector.
- Setting the selling price to the consumer.
- Sector supervision in terms of quality of service and maintenance through the operating contract.

"BUILD, OPERATE AND TRANSFER", BOT

The BOT concept is a scheme that has been developed to allow for a quick implementation of significant infrastructure projects through mobilisation of private resources.

A BOT project is paid by the encl users over an extended period of time at the end of which, the works can be commissioned to the Authorities.

I shall not develop this subject which has been and will be sufficiently treated by other delegates. Nonetheless, the collaboration between the Authorities and a private international operator for the rendering of the service may be extended beneficially to a BOT approach for the implementation of a related infrastructure. In this case, the image of the private operator, the guarantee of the proper

management of the service and the correlative securing of the envisaged scheme will facilitate the process and assure the lending agencies of success.

EXAMPLES IN AFRICA

Faced with the economic and often technical failure of their services, several African states, notably, Cote d'Ivoire, Guinea, the Central African Republic, Gambia and Sao Tome have restructured their water (and in some cases their electricity) sectors along the lines of lease type contracts with a private operator

Senegal has recently selected SAUR INTERNATIONAL as a private water operator. Ghana, Guinea Bissau, Congo, Morocco and others are also moving towards the restructuring of their water services with private sector participation

The ivoirian model, probably the most successful in Africa, gives an example of what can be done.

THE IVORY COAST EXPERIENCE

HISTORY

Until 1956 the water sector in Cote d'Ivoire was managed by the public sector with state supervision of local authorities who manage their water services through technical departments.

From 1956 several local authorities leased the management and operation of their services to EECI (Energie Electrique de Cote d'Ivoire) the state owned Cote d'Ivoire power company.

In 1959 the French private water operator Saur (Societe d'Amenagement Urbain et Rural) won an international tender for the provision of water services for the capital, Abidjan.

SODECI's success led local authorities to lease their services to it as an extension to the initial contract.

In 1973 a national water programme was launched under the Ministry of Planning and the sector restructured and in 1974, SODECT's lease was extended to the whole country making it the sole operator.

When the contract came to term in 1987 a new, 20 year lease contract was negotiated with the Ministry of

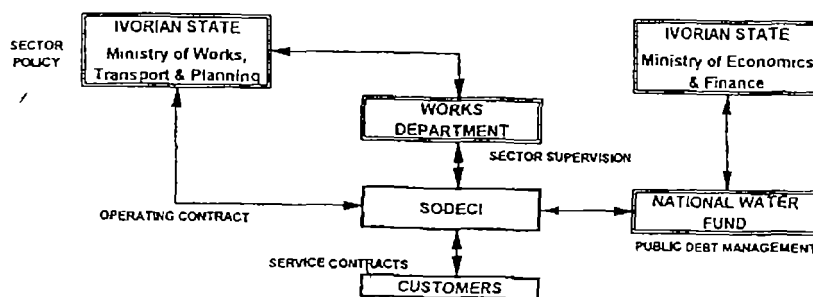
Planning, but had to be renegotiated in 1994 following the 100% devaluation of the CFA Franc.

SODECT's lease provides for the renegotiation of its remuneration as an average unit rate every five years.

INSTITUTIONAL FRAMEWORK

The 1973 restructuring of the water sector led to a clear separation between the political and the ownership functions on the state side and the management and operation on the private side, as illustrated below :

The state determines water policy, supervises the sector



and manages ownership and investment through the Direction Central des Grands Travaux, (DCCGTx) the Works Department of the Ministry of Works, Transport, and Planning.

SODECI's operating contract is with the Ministry.

SODECI in turn has service contracts with its customers

A separate Ministry of Economics and Finance, National Water Fund manages the public debt.

SODECI listed on the AbicJjan stock exchange and has the following share structure :

Ivorian shareholders	45%
Total Ivorian shareholding	53%
Ivorian state	3%
SODECT staff (thro' staff investment fund)	5%
SAUR	46%
Total French shareholding	47%
Other French shareholding	1%

SECTOR POLICY

Two basic principles govern the urban water sector in Cote d'Ivoire since the 1973 restructuring :

Financial self sufficiency, whereby the full cost of the sector must be covered by revenue.

Uniform water prices nationally, so that areas with lower unit costs subsidise higher cost areas

SODECI statistics (1994)

Capital	2 billion
CPA Francs	4 million USD
Number of shares	400 000
Gross turnover	29.6 billion
CFA Francs	60 million USD
No. of towns & villages served	409
No. of customers	293 000
Cubic meter produced	106 million
Cubic meters billed	92 million
Total staff	1302 (1 per 225 customers)

MANAGEMENT ORGANISATION AND POLICY

SODECI had to adopt a management organisation and policy adapted to its performance and service obligations. This implied changing the culture of the majority of the staff who were largely transferred from the previous, public-sector services and is based on the following :

- **Structural decentralisation** of commercial management and related operations into clearly defined districts with management autonomy and pre negotiated annual targets and budgets. This brings management closer to the customers and generates local commitment.

- **Individual accountability**, through clearly defined job descriptions, set objectives and individual responsibility with rewards and sanctions.
- **Delegation of authority and power** in the form of clear contracts between the individual and the supervisor leading to mutual commitment and efficiency.
- **Tight control**, vital to the context of decentralisation and the considerable cultural and community pressures on the individual, is exercised through the strict application of clearly defined and workable procedures with cross checking and the daily balancing of figures.
The separation of commercial (client contact) and administrative (financial) functions.
No individual can be involved throughout the chain of transaction or operation.
The exclusive use of women for certain posts, notably customer reception, cash collection and the store keeping because of their generally better communication skills, thoroughness and reliability.
- **Close budget management**, with the fixing of general objective by General Management and the negotiation of district and functional budgets by each manager concerned with his superiors. Each manager has his budget and vice versa.
Consolidation at this district and regional level leads to the compilation of the corporate budget.
Key indicators allow a manager to monitor his performance daily, with immediate corrective action.
Monthly cost accounting statements confirm the situation.
- **Decentralisation of electronic data processing** using local network, PC based system for close to real time management with purpose developed software.

Effective communication, both internal, through regular, structured and informal meetings with concise and rapid reporting, and external through meetings, specific notices, and media.

Training, representing 11.5% of the 1994 personnel costs, covers four areas :

- Professional training, which includes behavioural and ethical aspects.
- Specialised training in SODECI's own training centre in Abidjan.
- Practical training overseas in highly specialised functions.
- Internal seminars generally relating to policy aspects.

Motivation including :

Clear job descriptions and authority, negotiated targets and budgets and personal accountability.

Incentives based on a fair assessment of the employee's performance against the pre negotiated objective, qualifications, conduct and the company's overall results (profit-sharing).

Social funds, including a solidarity fund for births, marriages and deaths, an investment fund to help employees invest and borrow and a company plan.

Sporting and cultural activities

SODECI's achievements

The achievements of the company over the years is best reflected by the following :

- A billing Ratio of 86 - 87%

System + commercial losses = 13 - 14%. This is the optimum level one can economically achieve.

- A collection ratio from private customers and industry of 97 - 98%

Only 2 - 3% of private debt remains uncovered. Again this is the normal, practical limit.

- High and consistent levels of individual productivity

For example : 300 readings per meter reader/day and connections per plumber /day

SECTOR' ACHIEVEMENTS

The following figures illustrate the success of the partnership between the Cote d'Ivoire Government through the supervising ministry and private sector SODECI since 1973 :

Year	1973	1980	1994
-------------	-------------	-------------	-------------

No. of fully equipped Districts	38	139	409
Length of network (linear km)	922	6000	10 000
Number of customers	40 071	30478	293 000
Production (000s cubic meter)	43 326	90 096	106 000
Volume billed (000s cubic meter)	35 528	72 065	92 000
Billing ratio (%)	82	80	87
Average bill consumption	887	552	314

These figures reflect not only the growth of the sector but also the education of the consumers in terms of water awareness and economy.

An increase in efficiency has been achieved as the different categories of tariffs have increased marginally in the last 7 years.

Increase from October 1st 1987 to April 4th 1994

Social tariff	+0%
Domestic tariff	+10%
Normal tariff	+20%
Industrial tariff	+ 21%
Acimistration tariff	+19%

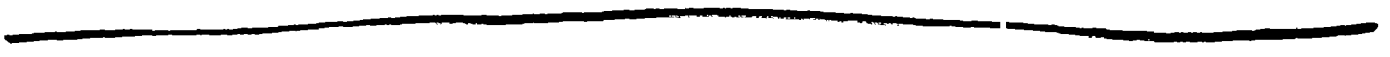
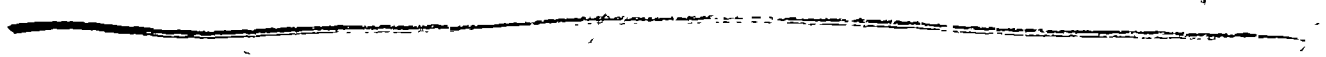
This increase takes into account the 50% (devaluation of the CFA franc.

CONCLUSION

The Coté d'Ivoire experience demonstrates that the partnership between the state and the private sector can generate the most favorable environment for the development and the economic self-sufficiency of urban water services.

The state can concentrate on its prime political functions, as policy maker, supervisor, owner, planner and investor, whilst relieving itself of management, operation and maintenance of the system to a professional, private operator.

The lease type contract commits both state and private operator to the economic success and expansion of the service.



DEBATE SERIES : 6

TITLE : WASHE : Integrating Health Sector

DATE : 17th May 1996

TIME : 13:30 to 12:00 hrs

VENUE : Room 1

WASHE - INTERGRATING THE HEALTH SECTOR

1.0 INTRODUCTION

1.1 DEFINITION OF HEALTH

A complete state of physical, mental and social (spiritual) well being of the individual and not merely the absence of disease or infirmity (WHO).

It is clear from the outset that to attain good health status in any society, requires committed and combined efforts of various sectors as equal partners. The health sector alone cannot hope to make a significant impact on health, therefore, if it opted to work independently of other sector. Mutual cooperation is needed and this fact has long been recognition and deliberate efforts at various times made to foster intersectoral collaboration. Examples of some of the efforts have included the primary health care concept, International drinking water supply and sanitation decade, the earth summit e.t.c. and now the Africa 2000 Initiatives.

1.2 NATIONAL HEALTH POLICIES AND STRATEGIES.

These are being commonly referred to as the Health Reforms and they set the tempo for multi faced approaches towards good health.

Health perceived from the holistic stand point of the WHO definition? the health policies aim at developing a health care system that will "provide Zambians with equity of access to effective quality health care as close to the family as possible" one of the fundamental percepts of the policies is the recognition of the prominence given to intersectoral collaboration.

Further the policies stress the importance of and shall promote initiatives that make the individual take responsibility for his own health. Some of the health goals enumerated by the health reforms include :

- Achieving equity in health opportunities

Abstract :

The generic state of Zambia, the legal framework structures supporting its promotion, present and future options for creating supportive environments for health.

The Organisation :

Ministry of Health by its nature and mandate has the responsibility to promote and protect public health. To do this, it enacts legislation, develops standards and supports institutions and communities develop and implement health promoting programmes. Consequently, it operates and directs community based activities under its directorate of environmental health. In addition the Ministry of Health conducts and provides health education guidelines and produces environmental sanitation guidelines in so far as water and sanitation is concerned.

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- Increasing life expectancy
- Creating environments which support health
- Encouraging health styles which support health
- Supporting public policies which support health
- *improving individual and family health through efficiently administered population control activities.*
- To give direction, the policies articulated the virtues of leadership, accountability and partnership.

THE NATIONAL WATER POLICY

Formulated towards the end of 1994. The National Water Policy by its nature addresses issues relating to water resource use, to some extent mention of sanitation as it relates to water borne is made as a matter of concern but obviously it would be expecting too much to expect it to be as elaborate on this matter as it is on water.

Sanitation in its general context therefore needs a separate policy framework to give attention to peculiar elements encompassed in it. Approaches require definition and appropriate guidelines articulated and developed to encourage and promote broad sanitation efforts

The aspect of community participation finds recognition in the water policy and like the health reforms forms the basis of community based programmes.

Clearly, the National Water Policy sets the tone for clearly elaborated guidelines on what may constitute rural water and sanitation programmes, the lead institution and the type of support individual household wishing to improve either their source of water or sanitation should expect of the institution to set them.

2.0 WATER AND SANITATION SERVICES

2.1 MAJOR ACTORS

Predominantly there are two major actors in the water and sanitation sector distinguished as follows :

2.2. 1 PRIVATE : Individual - household, companies or government department areas having no access to a public supply.

2.2.2. PUBLIC : Department of Water Affairs - mainly because of the responsible local authority having no capacity

(b) Local authority (district council) statutory authority having in terms of the local government Act No. 22 of 1991

for areas falling under the jurisdiction of a local authority it is the duty of such local authority to take lawful measures to effect adequate sanitation too. Various regulations and bye laws exist to regulate the many types and forms of sanitation

In the rural areas though, sanitation remains a matter of private concern but of great importance to public health. As in the unplanned settlements mainly within or close to towns sanitation in terms of sanitary faced waste disposal by far remains unsatisfactory requiring infusion of new approaches and initiatives to influence the status quo.

2.2. EXPERIENCES IN THE HEALTH SECTOR

2.2.1 ENACTMENT OF PUBLIC HEALTH LAWS

Some of the major concerns in the public health have evolved around environmental hygiene and sanitation prompting enactment of various public health laws. The magna carta in this regard, is the Public Health Act It provides for a number of environment health issues, prominent and relevant to this subject being :

- Protection of source of water supply and ensuring its safety and availability for the sustenance of health
- Regulations governing provision of drainage and latrines to occupied premises whether private or public.

2.2.2. PREVENTIVE AND HEALTH PROMOTION

Provision of preventive and promotive health services is by statute of the functions of a district council. As stated earlier, a good number of them have had no capacity to carry out their functions adequately. Accordingly the ministry of health has and continues to be directly involved in a number of health promoting activities.

These have included :

- Promotional activities demonstrating protection of wells and construction of improved sanitary facilities
- Water quality monitoring

- giving appropriate health talks to make people make informed decisions on issues relating to their health

2.2.3 CONSENSUS BUILDING

To foster the spirit of partnership on health developmental issues, community involvement is a requirement when developing all community based programmes

3 . WASHE - INTEGRATING HEALTH

3.1 WASHE Water Sanitation Health/ Hygiene Education

The concept appears to be founded on the understanding that individuals will make an informed decision giving the knowledge and skills. This ties up with the partnership concept espoused in the health reforms

Given people knowledge about the virtues of safe water and proper sanitation, assist/work with them to attain these and they will not only cherish the services but will also contribute to their design, operation and maintenance.

Accessibility to potable water and proper sanitation¹ remains poor to the majority of the rural communities and conventional approaches do not assure quickened action. Reaching the unreached remains a big challenge' but the question still remains, how can it be done? There may not be one answer, but one thing seems certain, working with the communities to improve their own lot.

The concept of WASHE complements the spirit of the Health Reforms in the sense that it aims at exposing people to knowledge and skills they can use to improve their health status, it is educational, motivational and instructive in nature and character and applied methodically, has potential to significantly contribute to the creation of supportive environments for health. WASHE must integrate health to attain its GOALS.

REFERENCES :

- Health Service vices Act. No. 22 of 1995
- Local Government Act No. 22 of 1991
- National Health Policies and Strategies (Health Reforms) 1991
- National Water Policy, November, 1994
- Public Health Act, Cap 535 of the laws of Zambia.

DEBATE SERIES : 6

TITLE : The Role of GIS in Commercial and Community Based Water Supplies

DATE : 17th May 1996

TIME : 10:30 to 12:00 hrs

VENUE : Room 2

INTRODUCTION

Geographic Information Systems (GIS) may be defined as a system of hardware, software and (I) procedures designed to support the capture, management, manipulation, analysis, modeling and display of spatially referenced data for solving complex planning and management problems.

Information management in any organisation and at what ever level is vital in helping make decisions especially when it comes to corporate decision making. The current situation in the water industry is of liberalisation in water sourcing, transport and water supply is bringing new investment in the water sector. As such a lot of infrastructure investment is needed in form of loans and grants, which ultimately have to be paid back. Therefore, recouping such heavy investment means good management of the organisations involved in the water industry. One of the vital inputs to such good management is information (corporate or otherwise). Currently information in different forms in many such organisations exist but the usual problem is the inability to use such information effectively because of the forms in which the data exists. Databases and spreadsheet software does not support the analysis of geographically based information on water and sewer networks. Computer Aided Design (CAD) software on the other hand have superior graphics capabilities. Unlike the Dbase and spreadsheet, information technology based on Geographic Information Systems (GIS) combines the power of Database and CAD software. Therefore technical information regarding water and sewer networks and administrative activities like customer support and accounting can be easily accessed; analysis, querying and display of results is all alone in one system. Accessibility of management to such information is vital in order to monitor, control and direct organisational effort and resources to solving problems that can be avoided.

Abstract:

Management and operation of water companies and community based water supplies requires accurate information about infrastructure. Geographic Information Systems (GIS) has become an asset in daily operations and management decision making. This paper gives an overview of GIS establishment, especially the institutional, equipment and personnel requirements. Also discussed are benefits and problems associated with GIS.

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Information relevant in any organisation for corporate decision making is usually available in different formats, that is, as computer databases, spreadsheets, engineering design plans, water and sewerage maps and more commonly as paper files in cabinets. This information relates to employees activities, purchases, financial records, maintenance schedules etc. From the administrative point this information is easily assembled to a larger extent to form what is called Management Information Systems (MIS). In most cases the technical information does not form part of the MIS, as such many corporate decisions rarely takes technical information into consideration as compared to administrative information. This is mainly because information technology is developed in parallel, from the administrative and technical point of view. The technical information technology revolves around Computer Aided Design software such as AutoCad while the administrative information technology revolves around database and spreadsheet software such as Dbase IV (and Microsoft Excel respectively).

Organisational structures generally do not permit information access to other departments within the same organisation, therefore, inhibiting vital data communication link or rather it is generally difficult for one department to access other departments' information.

Unfortunately the two information technologies cited above cannot exploit the power of the other, that is, traditional CAD software does not have the power to perform query functions available in Dbase systems while Dbase systems cannot perform CAD oriented functions.

The current information technology has advanced to such levels that a new tool in information processing exists that combines CAD and Dbase functionalities. Such technology has resulted in Geographic Information System which by the definition given above is a computer based system that captures information, processes it, manipulates it for analysis, display and reporting. The information dealt with in most cases is geographic in nature (e.g. where is the location of borehole #1, where does customer X live). Modeling of scenarios such as where, what, when etc. are easily answered in a GIS.

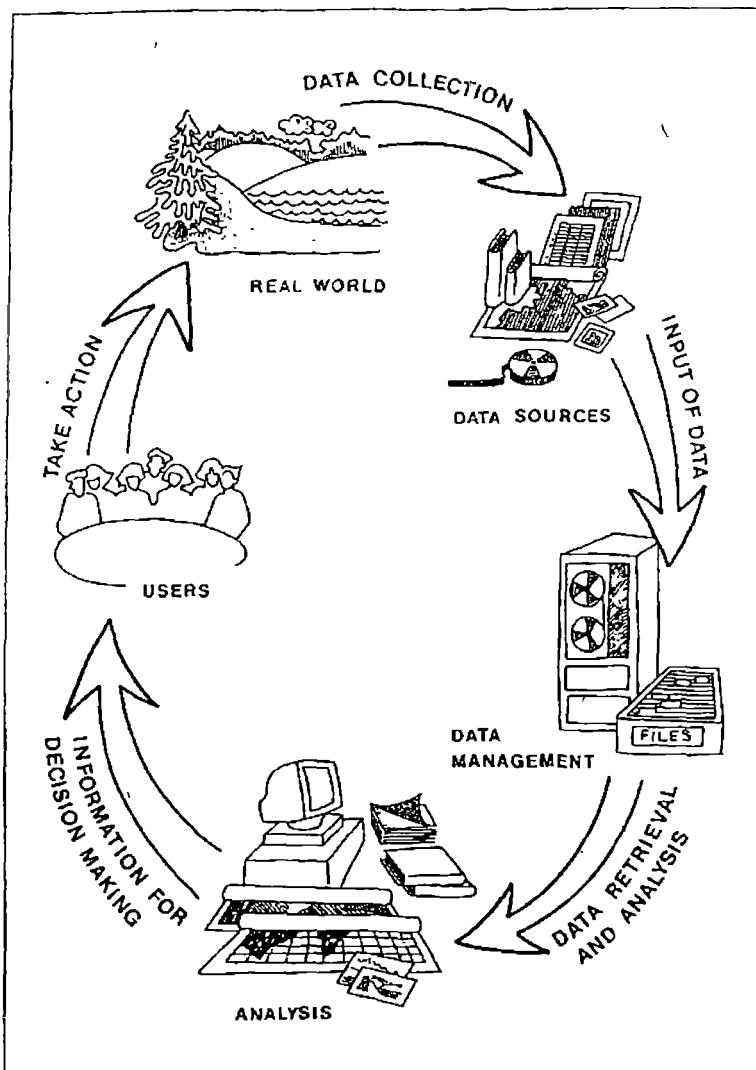
GIS OVERVIEW

GIS is designed for the collection, storage and analysis of objects and phenomena where geographic location is an important characteristic or critical to the analysis.

The major elements of GIS processing are :

- Data Collection
- Data Input
- Data Retrieval and Analysis
- Decision Making
- Action

The figure below shows the major steps involved in GIS information processing.



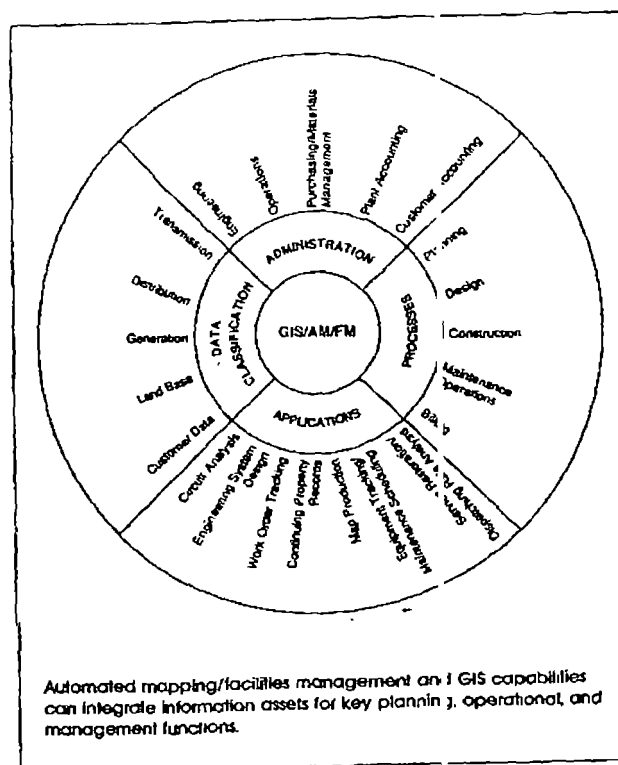
The Planning Process. Geographic information processing begins and ends with the real world

WHY USE GIS

From the foregoing it is clear that both graphic data (water/sewer network drawings, maps etc.) and non graphic data (text data such attributes of a pipe segment pipe material, size, length, construction year, no. of repairs, last repair date) can be input into a GIS with possibility of creating/updating CAD drawings as well as Dbase files containing the attribute data. Therefore a lot of gain in data communication and access is enhanced from one computer terminal. This augers well in that operations of water/sewer is done from more than one location thus a Local Area Network (LAN) can support such kind of data access. Just like in Dbase/Spreadsheet computers computer access for creation/updating of databases can be restricted, that is, access rights can be defined by the system manager.

Usually the technical department is responsible only for creation, management and updating technical data while any other department can just access the data but cannot change the integrity of the data. Vice versa, customer billing data collection and inputs left to another department.

The figure below shows the typical structure of a GIS in terms of functionality.

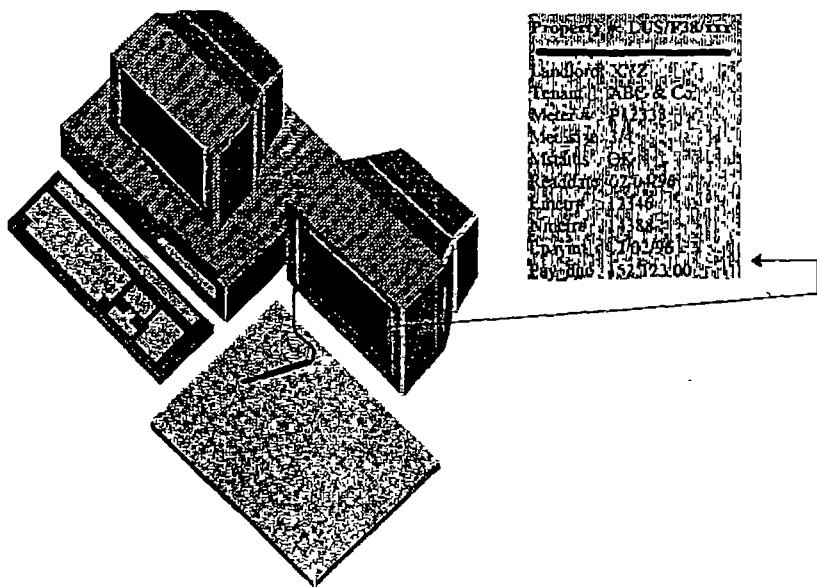


GIS IN WATER & SANITATION INDUSTRY

GIS technology though new is an extension of the information technology already existing in most organisations. GIS in the water and sanitation industry gives a boost to corporate management and day to day operations management. The data manipulation functionalities of GIS such as search, overlay, network analysis etc. can be effectively exploited in large commercial water and sewerage companies as well as in community based (rural) water supply.

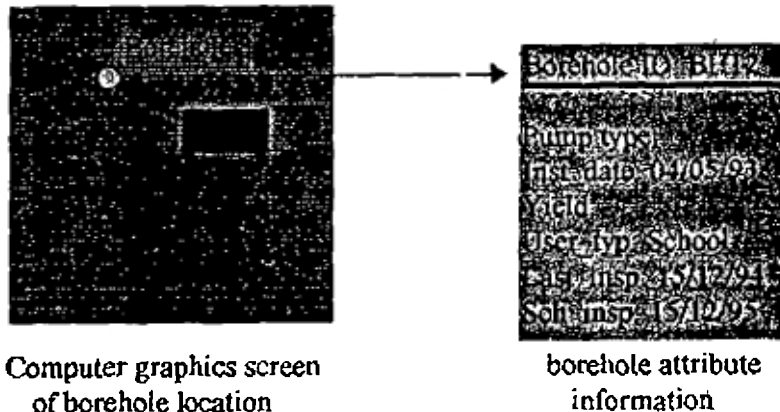
COMMERCIAL WATER & SEWERAGE SERVICES :

The commercialisation of the water sector needs concerted effort in meeting customer demands as well as maximising profit on the investment. Areas that are very critical are customer services and billing and field maintenance operations. Knowing the location of the customer or water valve or sewer manhole etc. is important in the daily operation water/sewer services. Equally important is the information (attributes) relating to the customer, water valve or sewer manhole. Because GIS combines the advantages of CAD and Databases the information showing the water and sewer network can be displayed on the computer graphics screen while the attribute information about say a valve is accessed by simply "clicking" with a pointing device on a symbol representing a valve on the computer screen. The same goes for customer information. The information of interest regarding a customer is automatically retrieved from the customer database and is displayed on the screen. Typical information retrieval is shown in the diagram below :



RURAL WATER SUPPLY & SANITATION :

Community based and rural water supply is accomplished using non piped water systems such as hand pumps and water wells. Management of such facilities entails a larger area coverage compared to water supply in planned urban centres in towns and cities. The installation of water supply in rural areas is normally point based, that is, using facilities such as water wells or borehole hand pumps. The distribution of such installations is usually influenced by the population distribution, location of community facilities such as schools, clinics etc. The type of information that is critical to the operation and management of such facilities is say the borehole type, size, yield, inspection date etc. As in the example above for use of GIS in a commercial environment such information can be accessed at the click on a button;



Computer graphics screen
of borehole location

borehole attribute
information

Sanitation issues in community based water supply is closely related to the population dynamics. GIS functionalities include overlay of different facilities like combining location of clinics, water points and population distribution in order to analyse for example the distribution of water borne disease with respect to distribution of water sources in order to determine possible contaminated water wells which may need remedial measures such as chlorination or routine cleaning. Such kind of analysis can be done in view of preventive awareness campaign to a targeted group based on results of analysis of the distribution pattern which is continuously monitored from the clinical records.

ANALYSIS CAPABILITIES OF GIS

The following is an example of the analysis that can be used operations management on a regular basis. Using the search, query, buffering and overlay capabilities one can mode the following scenario;

"Find and display on the screen all the customers residing in water zone AAA and have not paid their water bills since 12/02/96 and their accumulated unsettled bill is over one hundred thousand kwacha (K100,000.00) and their water meters are in perfect working condition".

This example shows the abilities of GIS combine graphics data (water zones, residential areas) and text data (customer names, meter condition, amount due). The above mode can be translated to the query below;

Water_zone = AAA & Lpaymt NOT= 12/04/96 & Mstatus = OK & Pay_due >100,000

IMPLEMENTING GIS IN AN ORGANISATION

GIS like any other information technology has to be appreciated in an organisation, therefore, it competes with other organisational projects for limited resources.

Introducing GIS is not easy especially if the groundwork is not there. The introduction of the technology has to be looked at from the following perspective;

- institutional preparedness
- management support
- personnel
- equipment

institutional preparedness

GIS encompasses data from different departments within an organisation therefore the introduction of the technology should be made with the whole organisational activities in mind. The technology may involve fusing certain functions of some departments thus those losing the responsibility may not welcome the change as it may result in job insecurity. A general awareness should be made to all interested parties because working patterns may be changed by the introduction of GIS.

Management

Management has a bigger part to play in the introduction of the technology both from the financial and from the administrative and technical point of view. If management sanctions the implementation, the employees will have a fair support unlike if management does not seem to support the idea administratively despite the financial commitment.

Personnel

Investment in dedicated personnel to run the technology has to be done. Where possible retraining of existing personnel in department affected by the technology should be looked into in order to cut costs in new staff recruitment as at the GTS operator (data collection/input) level.

Equipment

The equipment necessary for running a successful GIS may be available in house or a new procurement is needed altogether. The right choice of equipment is as important as the personnel that is going to run the system, this is mainly due to the fact that certain GIS software chosen by the organisation may not perform well on certain equipment thus full exploitation is limited which may result in certain shortcomings. These shortcomings may affect the general performance/efficiency of the organisation which has abandoned the old working environment for the new only to go back to the old way because the system cannot satisfy the organisational objectives.

CONCLUSION

Information technology in organisations exist in form of computerised records at some level. However, there is lack of utilisation of both administrative and technical information. The link between administrative and technical information is so vital for management decision making and operations management.

In the water and sanitation sector the link between administrative information held say for customer billing using spreadsheet/database software and technical information for design purposes and distribution network management using CAD software should be harmonised to maximise resource utilisation through GIS functionalities which offer the possibility of integrating graphic and non graphic data. GIS technology is now available for desktop computing such that even senior managers can use it just like any word processors.

Commercialisation of the water and sanitation sector needs heavy cash injection but the attraction of private cash means that management of infrastructure is vital. For infrastructure and operations management GIS can provide enhanced productivity. Customer billing is also essential in this commercial approach. Customer support

services through responding to faults is easily enhanced by GTS which has capability for work order management (maintenance work scheduling).

While the role of GIS is highly appreciated the elements outlined above when introducing GIS should be evaluated against a user needs assessment of the organisation. If well planned and implemented GIS can prove to be a vital tool that an organisation can depend on.

REFERENCES :

Aronoff Stan (1993). Geographic Information Systems A Management Perspective,

WDL Publications, Ottawa, Canada

Antenucci John et al (1991), Geographic Information Systems A guide to the Technology, Van Nostrand Reinhold, New York, USA

