



**Between Rural and Urban:  
Towards sustainable management of water  
supply systems in small towns in Africa**

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Towards sustainable management of water supply  
systems in small towns in Africa

*Working paper*

*P.B. Moriarty  
G. Patricot  
T. Bastemeijer  
J. Smet  
C. van der Voorden*

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IRC International Water and Sanitation Centre  
PO Box 2869  
2601 CW Delft  
The Netherlands

Tel: +31 (0)15 2192939  
Fax: +31 (0)15 2190955  
E-mail: [general@irc.nl](mailto:general@irc.nl)  
Website: <http://www.irc.nl>

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## Executive summary

Small towns in Africa face an uncertain future due to their increasing populations, limited water resources, and ineffective water supply and sanitation systems. Current approaches to water supply are often inappropriate consisting of an ad-hoc mix of rural and urban technologies.

While a hard definition of small towns was avoided, they are seen as being essentially dynamic entities lying in the fuzzy region between the truly rural and the fully urban, they are frequently fast expanding villages on the way to becoming towns. Water supply systems also range from rural to urban, from private or neighbourhood hand-pumps through gravity fed piped distribution systems with tapstands and house connections, to motorised boreholes and pumps also leading to tapstands and house connections. In addition there are a range of alternative water sources such as rivers, pools and ponds, water from rooftop rainwater harvesting and water bought from vendors (kiosks and independent service providers).

In many African countries a large proportion of the population lives in emerging small towns and ill defined peri-urban centres, where poverty is widespread, and where the capacity of local government is generally very weak. Management options have tended to be community based, frequently by passing local government altogether.

Small towns are experiencing the same trends that have affected the rest of the water sector, particularly the worldwide move towards decentralisation and increased involvement of the private sector, as part of which communities, local government and sometimes the private sector are given the ultimate responsibility for ensuring the upkeep and functioning of their infrastructure services.

However, if there is one overriding lesson from this survey of experiences it is that **the key to effective management of both resources and systems is the capacity (technical, institutional and financial) of 'local' level organisations (government, community and private sector)**. Much else is also important, an enabling environment, appropriate technologies, etc. but without greatly increased local level ability it will be impossible to make progress towards improved and sustainable management.

Other key findings include:

1. There are currently a wide variety of management models being applied in small towns. Many are at least partially reliant on the informal sector, with a tendency to isolate users from both water authorities (formal or traditional) and local government.
2. There are widespread examples of small town communities forming water user associations, water committees, and other community based organisations where users develop and manage their own supplies in parallel to, or as extensions of, official town supplies. These alternative supplies are often seen as competing with town distribution networks and can lead to conflicts.
3. Small town inhabitants are often less educated, and less wealthy, than urban dwellers. In addition, where there is a strong rural-urban dynamic their communities are less cohesive and homogenous than either rural or urban ones. They lack the possibilities to make economies of scale, and to cross-subsidise poorer members of the community, and in general are less able to undertake community management.
4. A wide range of management options have been tried including: small scale service providers; co-operation between municipal government and water user associations; small scale forms of public-private partnerships and delegated management options; autonomous municipal management options; and amalgamation of small towns under a regional service provider. All require an effective and efficient local government structure. This in turn must be based on 'good governance', demand-responsiveness, ability to deal with rapid change, financial autonomy and comprehensive financial arrangements.

5. There is often competition between official and alternative sources of water. Small town dwellers will use a (paid for) town water service if it can be shown to be competitive against the prevailing alternative sources of water (in terms of cost *and* reliability).
6. The initial role of capacity building and facilitating organisations should be to build consensus amongst various stakeholders, local authorities, municipal service managers, informal sector companies, local entrepreneurs and community representatives as to what is the most appropriate level and means of delivery of service.
7. The crucial issue in developing sustainable services for small towns is the fast growing population. Different approaches were encountered, such as over-designing supply systems, expanding already existing systems to unconnected households through a sound financial management policy, specifying performance objectives and expansion mandates to all supplying stakeholders and building partnership approaches between various local entrepreneurs and the municipal authority.
8. There is a lack of well researched, properly validated experience of different approaches to the management of water supplies in small towns. Much of the experience that exists is anecdotal, and there are few if any longitudinal studies that have sought to identify the main constraints and bottlenecks to management over an extended period. Identification, validation and dissemination of the lessons from interesting pilot approaches is therefore essential for progress.

In conclusion, while small towns face many challenges, much is possible. To achieve it calls for changes, and for the development of new abilities and capacities. The key to successful management of small towns water supplies lies in an ability to plan and manage adaptively. To realise that change is inevitable and rapid and to reflect this reality in new management models. In particular there is a need to develop new abilities in those responsible for managing small towns water resources, particularly:

- the ability to assess water resource availability and to foresee the incremental costs of developing new resource and producing new supplies to meet future demand
- the ability to assess and project future demand taking account of changes in demography and water's uses and economic potential.

In addition to the skills needed to manage their water resources, small towns must be given the necessary financial means. This implies identifying sources for new investment and creating policies that allow the re-investment of money raised through the sale of services.



## Abbreviations and Acronyms

AEV	Village Water Supply (Adduction d'Eau Villageois)
AMM	Autonomous Municipal Management
AUE	Water User Association (Association d'Utilisateurs de l'Eau)
CBO	Community Based Organisation
CM	Co-operative Management
DMM	Direct Municipal Management
DRA	Demand Responsive Approach
DWSP	Domestic Water Supply Programme
IRC	IRC International Water and Sanitation Centre
IWRM	Integrated Water Resource Management
MAU	Management Advice Unit
MEC	Mixed Economy Company
MM	Municipal Management
NGO	Non Governmental Organisation
O&M	Operation and Maintenance
PAGE	Water Supply (Programme d'Appui à la Gestion de l'Eau)
PSP	Private Sector Participation
SSIP	Small Scale Independent Providers
SWAP	Sector Wide Approach
WATSAN	Water and Sanitation
WB	Water Board
WSC	Water Supply Company
WSDB	Water Supply Distribution Board
WSSCC	Water Supply and Sanitation Collaborative Council
WWC	World Water Council



# Introduction

Small towns host a large and fast increasing proportion of Africa's population, yet to date they have received little attention in terms of their specific needs and requirements. Their rapid growth has implications for both present and future demands on water resources, and the services to deliver them. Increasingly, it will be necessary not only to maintain an adequate supply from existing systems, but to address the overall sustainability and wise use of the resource.

In terms of water supply infrastructure, small towns present a mix of adjacent and sometimes competing water supply systems, ranging from traditional sources to pumped, mechanised and piped systems.

## What are small towns, and what are their water supply needs?

Conceptually 'small towns' are difficult. They exist somewhere in the continuum between the truly rural (villages) and the truly urban (towns and cities, with the infrastructure and institutions which go with them). In our vision African small towns are transitional entities, defined as much by their dynamics of change and growth as by their institutions or infrastructure. In terms of systems they are at the transition between 'water points' or 'standpipes' and piped networks

A recent definition emphasises the technological aspects, focussing primarily on the type of supply. *"Small towns are settlements that are sufficiently large and dense to benefit from the economies of scale offered by piped supply systems, but too small and dispersed to be efficiently managed by a conventional urban utility. They require formal management arrangements, a legal basis for ownership and management, and the ability to expand to meet the growing demand for water and sanitation."* (de Jong, 2000)

While technical issues are indeed important, this definition also misses out on some important aspects of small towns, in particular the rapid growth that puts existing systems under strain and that makes strong planning ability essential. In addition the focus on piped systems excludes many situations that while recognisable as small towns lack a single network. In fact, a typical feature of small towns is a mix of sources – piped networks, point sources, traditional sources: public and private – often designed in a haphazard and ad-hoc manner.

The main issues to consider when intervening in them is that they are fragile and strongly dynamic environments, often with little or no organisational capacity, and an ill defined legal standing (CEFOC, 1999). Both rural villages and established urban centres are by comparison much more stable, and it is often possible to make reasonably clear predictions as to their evolution over time.

Box 1 lists a range of different types of small towns identified in work in West Africa. Here a number of other important aspects are covered, such as the inability to use conventional "community management" tools favoured in rural areas.

### Box 1 Different types of small towns in west Africa

A recent study from West Africa identified the following types of 'peri urban area and small centre':

small rural centres that are too small to develop a classical piped network, but too large to be approached with 'community management' tools;

secondary urban centres where collective investments for drinking water supply are too large given the small number of connections and solvent clients, and also given that there are other sources of water that are thought to compromise the effectiveness and sustainability of projects;

illegal settlements (irregular neighbourhoods and slums) where population density and illegal construction considerably hinder the development of piped systems;

peri-urban areas that are too far away from the central water authority and too dispersed for adequate and sustainable cost-recovery.

(Le Jalle, 2000)

The following list covers a number of the more important aspects of small towns:

- host a high proportion of the world's population which is projected to increase considerably over the coming years (Box 2)
- can be business and trade centres that attract people from rural areas, and are dynamic and constantly evolving environments;
- can be 'dormitory' settlements scattered around larger urban areas and projected to expand in the near future;
- can be the product of increasing population density in a number of rural settlements, which start to merge into a frequently unplanned town like structure;
- are frequently at the intersection of major transport links (roads, railways, rivers);
- frequently have a highly diverse population with a high proportion of transient inhabitants;
- frequently lack the 'homogenous' or 'cohesive' community of rural areas, but have yet to develop the neighbourhood structures of true towns (Wegelin-Schuringa, 1998);
- often lack a clear presence in institutional arrangements (sometimes under urban management institutions, other times rural), and can be managed at either the local municipal level or at the regional/district level;
- have a mix of different water supply systems that provide variable levels of service that are frequently struggling to cope with an increased demand for services;
- have a user base that consists mainly of people with limited income and spending power that affects their ability and willingness to pay for increased services.

## **Box 2 Population projections for urban areas – 2000-2030**

*World Urbanisation Prospects: 1999 revision* presents estimates and projections of the number of people living in rural and urban areas of the world between 1950 and 2030. Key findings of the report (which was not specifically Africa focussed) include:

- Growth will be particularly rapid in the urban areas of less developed countries, averaging 2.3% per year during 2000-2030, consistent with a doubling of populations within 30 years. In contrast the rural population of the less developed regions is expected to grow very slowly, at just 0.1% per year during the same time period. Rural – urban migration and the transformation of rural settlements into cities are important determinants of the high population growth expected in urban areas of the less developed countries.
- There are marked differences in the level and pace of urbanisation between major urban areas. Latin America and the Caribbean is highly urbanised, with 75% of its population already living in urban areas in 2000. Asia and Africa are considerably less urbanised, with 37% and 38% respectively of their populations living in urban areas. Being less urbanised, Africa and Asia are expected to experience rapid rates of urbanisation during 2000-2030. Consequently, by 2030, 55% and 53%, respectively of their inhabitants will be living in urban areas. At that time, 83% of the population of Latin America and the Caribbean will be urban.
- Small cities (of less than 1 million inhabitants) of less developed countries will account for 45% of the increase in the world's urban population growth.
- Large urban agglomerations do not necessarily experience fast population growths. In fact, some of the fastest growing cities have small populations and, as population size increases, the growth rates tends to decline (a few exceptional cases include Dhaka in Bangladesh, and Lagos in Nigeria).

This is probably as far as it is wise to go in attaching a hard definition to small towns. The main points are rapid growth, a variety of systems and the need to take a long term and flexible approach to planning their needs. What constitutes a small town is highly context dependent, perhaps the simplest way to think of them are as rural areas that are in the process of becoming urban, and that need support in making the transition!

## Water supply considerations

With continuing rapid population growth, improving infrastructure (roads, electricity), changing levels of education and expectation and economic growth there continues to be a powerful dynamic of rural-to-urban population movement (Box 2). While migration to mega-cities receives much of the international attention, the mutation of villages or roadside ‘business centres’ into larger settlements and then into genuine towns is largely ignored. As part of this growth, existing ‘rural’ water supplies become inadequate due both to increasing numbers and heightened expectations.

Water supplies in small towns need to be designed to cope with rapid, often unplanned growth. The capacity must exist to take a flexible approach that will not be reliant on a single technical or managerial model, but that will make use of a dynamic and flexible mix where there will be different water supply options and systems for the different sectors and stages of development. A small town will typically contain a mixture of some of the following supplies:

- individual household and business connections;
- standpipes and tapstands;
- private or communal wells and boreholes equipped with hand-pumps;
- tapped and protected springs;
- water carried from distant sources;
- water bought from a neighbour connected to the piped distribution system;
- water bought from vendors or kiosks;
- water illegally tapped from a leaking distribution pipe.

Steps to strengthen the water supply and sanitation service in small towns must bear in mind their constant expansion: therefore the structure of the service must be expandable, both technically and institutionally, to meet the expected size of small towns over a 10-20 year horizon. This calls for an ability to undertake realistic scenario planning which in turn implies access to reasonable data on which to base plans.

A more holistic view will need to be taken of water’s role in small town livelihoods. Small towns will need an increased level of service for their domestic uses but also for their productive and industrial uses of water. Small towns are different from rural areas in that their waters have a wider range of potential uses and are also much more affected by the behaviour of people due to the greater population density.

In small communities formal private sector participation will generally be limited to initial capital works, rehabilitation of old systems and bulk water supplies. In addition there is a growing realisation that the ‘NGO and community’ model of rural areas cannot, on its own, provide the massive increase in coverage needed to meet the requirements of Vision 21 (Moriarty et al, 2001). Frequently NGOs concern themselves with individual small towns, or even sections of small towns. They often score notable successes at this scale by improving the lives of those with whom they work. However, they also frequently lack the strategic overview necessary to ‘scale up’ their efforts to serve larger populations or regions. NGOs and CBOs need to be encouraged to position themselves within, or at least to collaborate with, larger structures (often governmental) with the mandate and capacity to coordinate their interventions, and to ensure the continuation of their work once the NGO moves on to the next project.

Therefore small towns are faced with the problem of falling somewhere between the two dominant management paradigms of the WATSAN sector; too small (at least in isolation) to interest the large private utilities increasingly taking over the running of large town and city water services but too large and lacking the cohesion for pure community management approaches as practised in rural areas to be appropriate. Small towns are transitional entities and distribution of water within them will require a mix of approaches that lie somewhere between the two models. Whether that mix tends towards the pure community management, or pure utility management will rest on a complex mix of factors that will be discussed and examined further in the rest of the document. In addition, the mix of models used will in many cases need to act as an efficient ‘bridge’ between largely ‘formal’ bulk water suppliers and the often highly informal communities who are the end recipients.

## Background to WATSAN sector development and reform:

Despite massive investment over the last two decades huge needs remain, both in terms of the unmet needs of billions of people and the growing sense of crisis surrounding fresh water availability. The sector faces huge challenges if it is to meet the ambitious targets it set itself in Vision 21. 1.2 billion people remain without access to an adequate drinking water supply, while 3 billion people lack access to the most basic of sanitation services. This is clearly unacceptable, and has been acknowledged as such at numerous international meetings over the years, most recently at the 2nd World Water Forum (World Water Council, 2000; WSSCC, 2000). This section deals briefly with a number of important cross-cutting issues and external ‘drivers’ to sector reform.

An important point, often overlooked is that the sector does not exist in isolation and is seen increasingly as a conduit for affecting a number of important cross cutting issues such as poverty alleviation and gender mainstreaming. It is equally subject to larger global trends affecting government’s role in the provision of services to the public and the economic basis for the provision of public goods.

### *Cross cutting issues*

The water and sanitation sector is seen as having an important role to play within a number of cross cutting areas including water resource management, livelihoods, gender and equity, poverty reduction and health.

### *Managing water resources*

The second major challenge that faces the WATSAN sector is more recent, and has to do with the growing sense of crisis regarding the world’s available water resources – domestic, productive, and environmental. Water resources are coming under increasing strain, both in quality and quantity while the ‘water sector’ as a whole responds to this through IWRM. The WATSAN sub-sector is looking with increased interest at allocation and demand management, conflict resolution, and the use of alternative sources such as rainwater harvesting and wastewater reuse. In particular the inclusion of the poorest in water allocation decision making, and the protection of their right to a minimum quantity for domestic and small scale productive use is essential (Visscher et al, 1999; Lee and Bastemeijer, 1991).

### *Domestic water supply in livelihoods based approaches*

Access to clean water and good sanitation are an essential element of primary health care and the link between improved access to water and sanitation and poverty reduction is undisputed, and is the traditional ‘driver’ for the WATSAN sector. However, water plays a much wider role in people’s livelihoods than health alone. It is a key productive resource, particularly in arid and semi-arid areas, with particular importance in the livelihoods of women and the poor. It has been suggested that economically productive uses of water may in fact be more important in terms of overall impact on livelihoods than health based aspects alone (Nicol, 2000; Moriarty, 2001) and that the possibility to

derive cash flows from water supply will have a crucial role to play in DRA and cost recovery. In particular, urban agriculture is an important new area that is covered neither by traditional irrigation nor WATSAN sectoral approaches.

The challenge to the WATSAN sector is to widen its remit beyond 'domestic' water supply alone to address the issue of small scale production, through the use of traditional drinking water supplies as well as innovative sources such as rainwater and waste water reuse (Moriarty, 2001).

#### *Domestic water supply as an entry point for gender and equity*

Water is seen as an ideal entry point for working on issues of gender and equity because of its cross cutting role in people's lives - in addition proper attention to these leads to improved efficiency and effectiveness of service provision. This is particularly so with a view to the participation of stakeholders and communities in planning and managing water supply situations.

#### *Domestic water supply for poverty reduction*

Traditionally the main focus on domestic water supply for poverty reduction has tended to focus on the hardship to women of having to collect water from far away, and the time wasted doing so. The argument being that an improved water supply was in itself enriching, and also that women could use the time saved beneficially in other income generating activities. This understanding is taken a step further in 'livelihoods' based approaches which, in addition to identifying the time savings, also see the water itself as a key economic resource which is particularly appropriate for use by the poorest and most marginalised.

#### *Domestic water supply for improved health*

Improved health traditionally lies at the centre of domestic water supply and sanitation. The list of water borne and water washed diseases and their toll on people without access to adequate supplies is well known. Reducing the 2 million people who are estimated to die every year, or the half billion who are incapacitated by such diseases, continues to be the main focus of the WATSAN sector.

### ***External drivers***

#### *Changing role of government*

Perhaps the most important 'external' change for the sector is that of the role of government in service provision; not just water, but power, transport, health and education. The role of national government is changing from service provider to facilitator and regulator with service provision being undertaken by communities themselves backed by NGOs and CBOs, or by the private sector, or by local government or by various combinations of the three.

To support this trend, institutional and legal frameworks are changing, particularly to enable decentralisation and private sector participation, with the result that an increasing number of different organisations and institutions are seen as 'stakeholders' within WATSAN. Against this background there is a need to protect the role of the 'community' with user associations or co-operatives emerging as legal entities representing organised communities.

#### *Private sector participation*

The World Bank argues strongly (World Bank, 1994) that endemic organisational failures and poor performance are compelling reasons for abandoning efforts to reform the public sector and rely instead on private sector participation (PSP) for the provision of infrastructure services. However, for a number of reasons the public sector is likely to remain closely involved in the provision of water services in small towns for the foreseeable future. These include the unavoidable political reality that ensuring the provision of fundamental services (particularly ) to the poor is seen as a central role of government (especially local government), and that effective PSP will require a huge investment in capacity building among both public and private stakeholders.

In urban areas the changing role of government is reflected in the break up of traditional monopolies of public water authorities managed and owned by the municipality. In large urban areas government

provision is starting to be replaced by a variety of new arrangements based on sector reform and including increasingly either the private sector or some form of public-private partnership. The private sector is frequently represented by large (often multi-national) organisations, who are interested in urban areas where the consumer base offers economies of scale and allows poor households to be supplied through government or cross subsidies. Nonetheless even in large towns such private sector led approaches are based on business principles of minimising risk and maximising profit and there is often a conflict between 'financial' considerations and social, or developmental criteria such as effectiveness, sustainability, gender and poverty focus and capacity building. More importantly, in small towns few if any of the factors that attract multi-national companies exist, and the social and poverty problems are even greater, with the result that to date private sector participation in small towns has remained limited to small scale or informal actors.

A number of options exist for maintaining the role of government within the provision of water services while increasing the inclusion of the private sector. These include:

- *Corporatisation*, establishing the quasi-independence of public infrastructure utilities and insulating them from non-commercial pressures and constraints;
- *Explicit contracts between government and managers* (public or private), increasing autonomy and accountability by specifying performance objectives that embody government-defined goals;
- A pricing strategy designed to ensure sustainable financing through *cost recovery*.

#### *Decentralisation*

Decentralisation of decision making authority; is another important driver to sector development. Increasingly the lower levels of government (typically the municipality or district) are seen as the appropriate level for managing a range of development activities – including water supply.

Often frequently experiences with decentralisation and empowerment have been disappointing. Rather than truly devolving decision-making and financial autonomy to the local level the only the responsibility for decision making has been passed on, without the financial or regulatory means of implementation.

Equally decentralisation (the ability of local government to plan and implement projects with financial autonomy) has often given way to deconcentration (the ability of local branches of line ministries to act more autonomously within existing structures).

While there has frequently been a genuine desire to make the necessary institutional changes, efforts have been stalled by lack of institutional capacity.

#### *Cost recovery and payment for water*

Recent years have seen a growth in emphasis on cost recovery issues. Again, this is not limited to the WATSAN sector, but affects all the service sectors. In the water sector this shift is intellectually supported by IWRM principles which say that in the interests of efficient allocation and use water should be treated as an economic (though also a social) good. This change in perceptions has been reflected in the WATSAN sector by an effort to change the perceptions of users from seeing water as a public good, to be provided for free by the government, to one where it is seen as a service whose provision must either be paid for or undertaken by the community itself, a change that has met with decidedly mixed reactions, and that is far from being universally accepted.

#### *SWAPs*

Increasingly donors are recognising that the piecemeal, 'project based' approaches of the last couple of decades have largely failed to meet their objectives and that bypassing government, while perhaps attractive in the name of 'getting things done' at the level of their own pet projects, is not helpful in reaching large proportions of a population. As a result they are advocating 'sector wide approaches' (SWAPs) under which governments are supported in developing a single coherent plan and budget for a whole sector, into which donors then put funds. In theory money is then spent entirely through government structures. In practice, the reality is that few donors have the confidence in governments'



ability to adopt pure SWAPs however there is a clear tendency to try to carry out interventions in a more logical and holistic manner (Moriarty et al, 2001).

# Experiences in small towns – the challenge of providing sustainable services

## Introduction

This section brings together experiences from a number of case studies reporting experiences from different parts of Africa – they include: Estienne (1999) Senegal, Livingstone (1994) Sudan and Ghana, Le Jalle (2000) covering a number of French speaking African countries, Taisne and Cissé (2000) Benin, Smet (2000) Tanzania, and Vezina (2000) Mali. Brief overviews of the case studies from Senegal, Sudan, Ghana, Benin, and Tanzania are attached in the appendixes.

One overriding message from the case studies is the importance of context. System designs, both technical and institutional are entirely dependent on the environment (physical, human, institutional, and economic) in which they are to be implemented. Population size and density will effect technology choice by providing potential economies of scale. However, they will also have an impact on the cohesion and organisation of the users, therefore affecting their behaviour towards the water supply service. Equally, the institutional framework within the small town will not only affect the involvement of local government but also the management arrangement chosen (principally the split between ownership and operation), which will be related to the chosen technology, which in turn depends on access to adequate financial resources, qualified and committed human resources and so on.

## Small town population: size, growth and behaviour

The size of small towns in the review varies but is in the order of 10,000 inhabitants. As important as total size is the general dynamism of population growth, and the effects this growth has on water resources, different water uses, and on the capacity of the distribution network. Rural urban migration and urbanisation are cited as two important determinants of the high population growth expected in urban areas of less developed countries over the next thirty years (UNFPA, 2001). Migration is also a key parameter affecting the cohesion of small towns in the sense that inhabitants with different background, culture, wealth status and belief are less likely to form community organisations to manage their ends of the supply.

Estienne (1999) provides the example of small towns in Senegal where systems are rapidly overcome by uncontrolled illegal connections to the networks. People migrating to the towns need sufficient water for themselves and their businesses, but jeopardise the existing service by tapping into it. This growth causes resource management and allocation problems, leading to disputes and conflicts and a general reduction in service level.

## Technical aspects of water supply systems

The case studies show small towns in Africa as being typified by having several different water supply systems coexisting and sometimes competing with each other. Some towns have mechanised supplies and others a combination of both mechanised and non-mechanised. Mechanised supplies generally revolve around boreholes with motorised pumps (diesel, solar or mains-electricity) powered supplying water to elevated storage tanks attached to a limited distribution system of public tapstands, sometimes coupled with cattle troughs and individual house connections.

Technology is most important in terms of the demands and costs it will place on its operators. A huge range of options exist and it is beyond the scope of this paper to go into the different options in detail, however appropriate technologies and the capacity to implement them properly are crucial to effective management and particularly to DRA. Issues that need to be addressed include costs both capital and O&M, technical skills (construction and O&M), availability and costs of spares, operational costs (fuel etc.) and so on.

Estienne (2000) shows that prior to adapting supplies (i.e. construction or rehabilitation) to the growing needs of a population, systems must be evaluated in a feasibility study, which takes into account not just the required additional capacity but also elements such as the behaviour of future customers, and their willingness and ability to pay and organise themselves so that they can maintain their system

Quality of design, construction, and maintenance is a crucial aspect and one that is often overlooked, particularly in community management based approaches. It is not sufficient that a system is built or maintained, it must be built and maintained well.

## Management arrangements

The case studies show a range of different aspects of water supply and sanitation management in small towns. Due to the variety of water supply systems and institutional arrangements both existing and strengthened, they provide a good overview of the different strategies used by various extension and development workers. The common denominator for all these experiences is the issue of adequate managerial and regulatory capacity at the local government level.

The greatest variety in management arrangements is generally found in the “larger” small towns where it appears that municipal water authorities can seldom cope with making the service both sustainable and widely available. This is often partly due to the availability of alternative (often traditional) sources of water that are free, and sometimes are seen as providing a better ‘service’, especially in terms of continuity (Le Jalle, 2000; Estienne, 2000).

Clearly there are a wide range of possible management models for small town water services, however this section limits itself to those illustrated by experience from case studies. As such it is not an exhaustive list of options – merely a catalogue of practical experiences. In addition, management models (particularly in small towns) are frequently hybrids of several conceptual approaches, for instance with the growth in popularity of water user associations, mixes between community and municipal or delegated management, are becoming common.

This section covers three main types of management option identified in the case studies:

- various types of community management;
  - municipal management (direct and autonomous);
  - delegated management involving the local or regional private sector companies or individuals
- An overview of the main aspects of the different management options is given at the end of the section (Table 1, p.14)

### ***Community management:***

Community management at its most fundamental implies that users of the water resource are themselves responsible for the management, upkeep and maintenance of their system. To be truly effective community management relies on a number of external factors to be in place, which include:

- communities (or their representative organisations) should have the legal right to assume ownership and responsibility for their water supply;
- there should be an appropriate policy framework;
- there should be adequate ‘backstopping’ for the community, in particular with assistance in organisation and training and mediation with other actors;
- affordable and appropriate technologies should be available.

Aspects of community management can, and in small towns often do, form the building blocks for other ‘non-community’ management models, these aspects include:

- tap or neighbourhood committees;
- water user association representing the users in front of the municipality or a private company;
- small town associations (health, town development, water and sanitation);
- water committee, co-ordinating many tap-stands or group connections;

- a water committee contracting a private company.

Community management models are popular in villages and rural settings throughout Africa, where they are fast becoming accepted as the norm. Where community management is met in small town type situations it is often as community management of small systems (a standpost or small reticulation system) that serves part of a larger urban unit. As such community management can be found in peri-urban and slum areas around large towns, and also in smaller towns.

Sometimes, as is the case in Tanzania (Box 3), community management can have different components of municipal and delegated management (see next sections). These generally involve devolution of ownership to the local government, and of management to the communities which in turn are often advised to delegate O&M to local private sector companies. The case study also illustrates the dynamic and evolutionary nature of some community based management approaches – here more successful communities are encouraged to become professional service providers to less successful ones.

**Water Supply Companies in Tanzania**

In the Morogoro region of Tanzania, Water Supply Companies (WSCs) were established at community level to manage, operate and maintain piped water supplies. The WSCs are typically small and management of O&M ad-hoc, and most of the time done voluntarily by the board members. Contracting out of services is risky and difficult because of the lack of adequate knowledge and human resources. Participation of the private sector (especially in short-term contracts) is limited by the size of the schemes and their solvency.

The Domestic Water Supply Program (DWSP) in Tanzania is encouraging the largest WSCs to appoint executives to manage the systems, thereby allowing a separation in function between elected board members, who concentrate on the task of monitoring, assessment and policy development; and a management team who oversee the day to day functioning of the schemes (see diagram). How this management model compares to others. (Tables 1 and 2, p.11). The DWSP is also encouraging the more succesful WSCs to become more commercialised by offering their services to less succesful towns on a contractual basis.

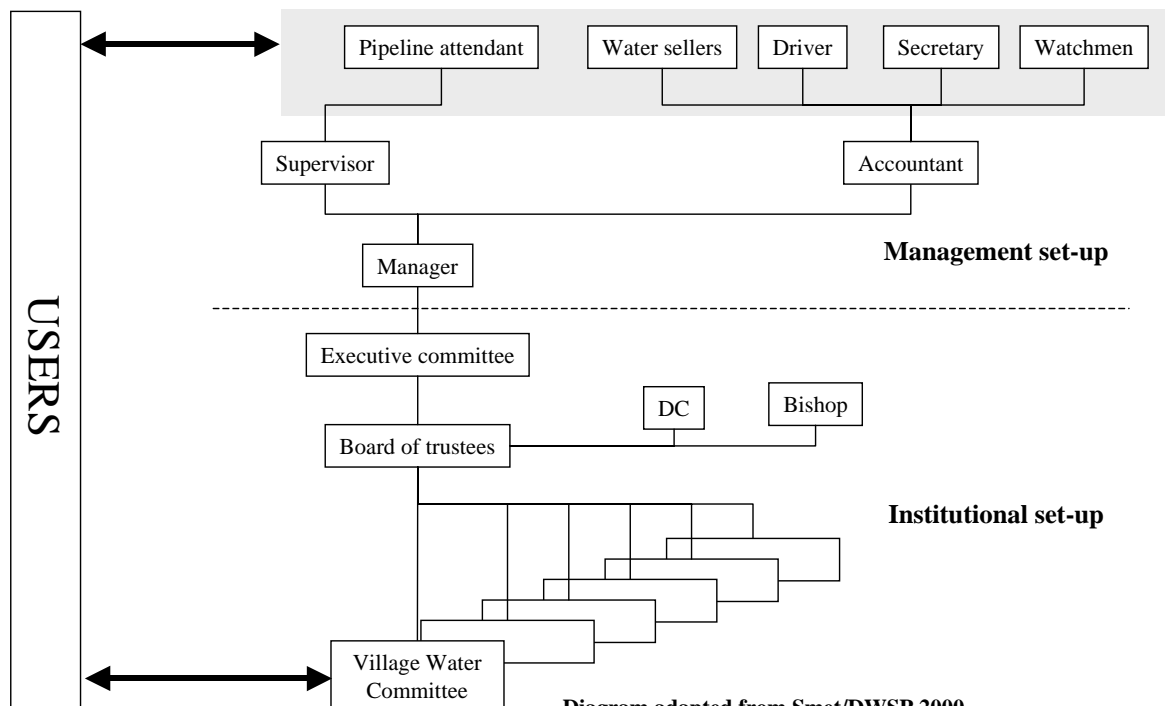


Diagram adapted from Smet/DWSP 2000  
 "Organisation structure of Uroki-Bamang'ombe water supply trust"

Smet/DWSP, 2000

In conclusion it can be said that for community based management options to be of interest in small towns there is a need to move towards more formalised systems than are found in rural settings. For this to be possible it is necessary for autonomous water boards (or water user associations) to have the necessary legal authority vested in them. Their current modus operandi, with lack of clear independence from local government, makes them unable to develop the necessary contractual arrangements with for example Small Scale Independent Providers (SSIPs), and also makes it difficult to implement unpopular decisions regarding the service level (such as volumetric price setting).

**Municipal management**

Municipal Management (MM) of water supply services occurs only in the larger small towns. It involves both ownership of the water supplies and sanitation infrastructure and day-to-day management of the system by the town. A separation is often made between ownership and day to day

maintenance, which is carried out by the town, and other aspects of regulation and monitoring. So, for example, price regulation may be provided by a water ministry or public utility commission while water quality monitoring, if any, may be carried out by the health ministry.

Municipal management has not been addressed in any of the case studies as it is typical of larger, more formal towns, with the necessary institutional capacity to undertake it. A brief overview of it is included here as it remains one potential management model towards which small towns can move as their capacities are increased.

- *Direct Municipal Management (DMM)*, where the municipal water department owns and operators the system. Different municipal bodies can be assigned different tasks as regards O&M, but there is no specific budget separated from the overall municipal budget (i.e. it is not financially autonomous). This option is often subjected to political interference (“government opportunism”), which is one of the main causes for the lack of sufficient capital and decision-making to sustainably run the systems.
- *Autonomous Municipal Management (AMM)*, where the water budget is separated from the overall municipal budget. The municipality owns the distribution system, but an independent water body manages its operation and maintenance. Since the water authority is autonomous, the chances are that there will be less political interference and opportunism.
- *Co-operative Management (CM)*, where ownership may be shared with local government or with a CBO (co-operative), which manages and operates the services. Co-operatives normally are made up of members of the community (elected). The co-operative is financially autonomous, but not always recognised as legal entity by government. The difference with DMM is that the operator is chosen by the community.
- *Mixed Economy Company*, where the initial capital investment is through both private and municipal sources. The municipal authority continues to manage the service, with contractual agreement to protect the private investment (this situation can be assimilated to donor or development bank funds).

Municipal management options present a number of variants related to external financing of capital investments or the contracting out of short-term services to local entrepreneurs. Such activities include the collection of water bills (where cost recovery mechanisms have been approved), the reading of meters, small maintenance work (such as locating and repairing leaks) or the management of some of the assets of the municipality (chemical storage facilities and vehicles).

### ***Delegated management***

Delegated management occurs when the municipality continues to own the distribution system (and therefore maintains responsibility for capital investments) but chooses to give the responsibility for O&M to a third party (public or private) that operates the system. Although this option is used widely in large urban areas its applicability to small towns remains largely unexplored. However, following sector reforms such as those in Senegal and Cameroon a few cases of this approach have emerged.

According to Estienne (2000) and Le Jalle (2000), the PAGE program focused on organising communities into drinking water point committees or other local water user associations to manage their end of the network. Therefore these small water companies could maintain the network in their area, in exchange for which water from the town supply could be distributed to them.

One possibility discussed in Tanzania related to strengthening small “companies” (generally not more than 10 people on the board and 5 employees) and allowing them to form associations of companies or even merge. The concept being to demonstrate how community based management arrangements could be strengthened and given more weight by amalgamating them and hence creating a larger water supply company, capable of taking on new commercial responsibilities. Possibilities would then include the complete divestiture of O&M to these companies, that have the added advantage of having the communities full backing (Smet, 2000).

Another possibility is that of delegation, by the operator and/or owner, of the management of part of the distribution network (Vezina, 2000). Examples include selling the right to produce additional water (typically through boreholes) and, later on, to feed it into the main distribution network. This approach is often used to expand services to low-income urban areas, but the principle can also be used for small towns. Indeed small towns with their mix of water supply and sanitation systems each managed differently by its own water (or tap-stand) committee (and frequently existing on the outskirts of a serviced town) offer a tempting target for the approach.

Currently, with communities becoming owners of their individual systems, and with the aim of encouraging the municipality to delegate part of the system to a community based organisation (employed as a private company), both must be prepared to change their roles and responsibilities. The newly formed WSCs in Tanzania, for instance, could probably have been given (or sold, or leased) the right to use the town supply, extended the municipal service to their area and organised their operation and maintenance of it. However, as Smet (2000) points out these CBOs turned into WSCs currently lack most of the necessary skills to do this.

Finally, delegated management contracts can be supported by the private sector by providing professional support to community operators. This option has the advantage of being relatively cheap as regards training, while maintaining centralised authority. Given that the service must be paid for, the problem is not so much of public or private forms of partnerships or business, but how to integrate them amongst small town systems managed at the local/neighbourhood level.

A good example of professional support is mentioned by Vezina in Mali. Management Advice Units (MAUs) are in constant radio contact with various community operators. These MAUs are mandated by the state to assist the water user associations who in return pay a fixed price (US\$ 0.03/m<sup>3</sup> produced) for queries and problems encountered (technical and managerial support, training programs and financial auditing). This is similar in concept to the proposed structure of water supply trusts' in Tanzania discussed earlier.

Table 1 Main aspects of different management options

	<b>Community Management (see p.9)</b>	<b>Municipal Management (see p.11)</b>	<b>Delegated Management (see p.12)</b>
<b>Ownership of the system</b>	Can be either with the community or remain with (local) government. Ideally with the community	Remains with (local) government. normally the municipal water department	Remains with (local) government
<b>Management of the system</b>	By the community. For larger systems a community can employ professional management staff	Mainly by government (DMM, AMM, MEC), although sometimes by a private sector or other partner (CM)	By a private sector or other operator on the basis of a contract
<b>Monitoring</b>	If done at all, normally by the community, but may be some element of external monitoring – for example of water quality	Various branches of government. For the system, by local government or water department. If quality monitored then normally by another branch of government	Remains with (local) government
<b>Regulation</b>	Normally, de-facto, left to the community. Ideally an independent regulator within the framework of a national strategy.	By local government or an independent regulator within the framework of a national strategy	By local government or an independent regulator within the framework of a national strategy
<b>Operation and maintenance</b>	Either entirely by the community, or with some external support (for example by pump mechanics)	By local government –except under CM. Sometimes with the external support of technical contractors	By the operator who holds the management contract. Operator may do it themselves, or with sub-contractors, or with community bodies
<b>Capital works and financing</b>	Normally by an external agency – donor or government	Local government. Funded either through government budgets, or in MEC through private sector	Normally remain the responsibility of government
<b>Cost recovery</b>	Frequently ad-hoc. Can successfully cover small repairs, but seldom larger repairs, and almost never capital works. Depends on system size and number of users.	Through tariffs, water kiosk payments etc. Under DMM no separation of water from other parts of municipal budget, under AMM water is run as an autonomous unit	Normally the responsibility of the operator, who is expected to maintain the system and sometimes take a profit from revenues collected. However often contains an element of government subsidy, and can remain wholly with government
<b>Most suited to</b>	Rural areas, simple systems, areas where government is weak	Larger towns with strong capacity, large and complex systems, 'wealthy' user base	A range of (urban) situations where operational capacity exists in the private sector and regulatory capacity exists in the public sector
<b>Least suited to</b>	Urban areas, complex systems, areas of resource constraint	Small towns, rural areas, ad-hoc settlements where management capacity is weak or non-existent	Rural areas, areas where local government is weak and unable to enforce regulations/contracts



**Table 2      Hybrid management models - community based water user associations**

	<b>Community based Water User Associations (see Tanzanian example, p.11)</b>
<b>Ownership of the system</b>	Can be either with the community or remain with (local) government. Ideally with the community
<b>Management of the system</b>	Professional management body including manager, accountant, technicians etc. Can be full time, or part time shared with another WUA. Accountable to community based water board possibly with government members
<b>Monitoring</b>	By community based water board, or with support from an external body – perhaps related to a federation of water boards. Water quality by government
<b>Regulation</b>	By local government or independent regulator within the framework of a national strategy
<b>Operation and maintenance</b>	By the management body with ad-hoc external technical support
<b>Capital works and financing</b>	External agency, with potential for contribution from own funds
<b>Cost recovery</b>	Through tariffs, waters kiosk payment etc. May be a role for government subsidy to achieve social objectives. All cash flow remains under the control of the WUA board
<b>Most suited to</b>	More complex rural schemes (large piped networks), small towns, areas of weak local government and low private sector involvement
<b>Least suited to</b>	Rural areas with simple point sources (the model is too ‘heavy’) and large towns

## Private sector participation – institutional development

All of the above management models can be adapted to make greater or lesser use of the private sector, with the division between CBO and small scale informal private sector often becoming blurred. However PSP only works if there are clear objectives, incentives and disincentives. The change of the role of government, both at the local level in terms of ownership, and at the regional or national level in terms of regulation of the water supply market must be strengthened and facilitated. A particularly problematic task is to devise policies for the national level and it is generally a long term process, and should not be seen as an activity that must perforce be carried out *before* PSP can be initiated. A number of activities can be undertaken early on to facilitate the entrance of the private sector into water supply management of O&M.

A good account of these informal and intermediary stages are discussed in Vezina (2000) and include small scale private entrepreneurs creating incentives for private managers. PSP builds on public sector capacity, and therefore all models assume a key role for the municipality. Due to the increased risk to the financier and operator PSP requires both a prolonged contract period, and clear performance targets.

Examples of local private sector participation also exist in Lesotho (Netwas International, 1999), where the government trained labour contractors, who then operated in the private market. Using material from district hardware dealers managed by the government, they are helped to establish themselves as contracting companies. Communities are gradually being empowered to take decisions about their supplies, although the payment of private construction and management of operation and maintenance lacks momentum and the public sector is finding it difficult to manage quality and cost. Again, this underlines the important of all actors having the necessary capacity to undertake their roles. Government cannot simply abdicate responsibility to the private sector without causing problems of quality and equity.

## Hygiene education and sanitation planning

Small towns exist at a threshold where total domestic water use begins to have a serious impact on the availability of the water resource, and equally where individual hygiene and sanitation begins to have serious implications for community health and drinking water quality. Most of the time sanitation programmes lag behind water supply ones, be it for financial reasons, perceived lack of prestige, or increased training needs. Even when attached to a water supply programme, sanitation is the smallest component in terms of finance, planning and training requirements.

The case studies in Sudan and Ghana both had a sanitation component, however the approaches were different, and help to underline two important points about integrating sanitation with water supply projects:

- when combined with infrastructure development projects, sanitation needs to be institutionalised and integrated in an overall planning framework. The Sudanese government recognising their inexperience, encouraged the communities to plan and implement measures themselves (female sub-committees especially).
- sanitation needs to be integrated in education campaigns, and therefore also requires reasonable funding. In Ghana where the project had a water supply focus, the lack of funding prevented any progress in education and awareness raising campaigns. The Water Supply Distribution Boards (WSDBs) however did not contribute to encouraging cross subsidies from water revenues.

## Summary: key parameters affecting the implementation of sustainable management options in small towns

Small town management models typically consist of mixes and hybridisation of management models. There is no blueprint for supply systems in small towns, any more than there is for rural communities or large well established urban centres. In an earlier section we adopted a definition of small towns that moved beyond mere size of settlement (or type of service) to reflect their uniquely dynamic nature. What we do in this section is try to identify the key factors that need to be considered when approaching small town water supply.

The mix of factors to be taken into account is complex. Clearly the size of the town will be important, for instance by directly favouring a piped water distribution system managed by a centralised ‘utility’ or water supply company. But other characteristics may call for a deeper analysis of benefits versus costs. How to divide or choose between various supply options, various abilities to pay by different classes of customers, and how to choose the system that is most adapted to the present needs and capacity of the stakeholders, while also offering enough flexibility and sustainability to cater for future needs?

The key to the solution lies in an ability to manage adaptively; to plan for, learn from and deal with change. This in turn calls for a high level of flexibility and technical and institutional competence in all stakeholders, but particularly management (whoever that may be). Strengthening management is therefore baseline for developing sustainable small town water supply management. The process of strengthening management must take into account the dynamic situation of population growth, resource use and the changing roles and responsibilities of owners, managers and users. It must also take into account the reality of who the ‘managers’ are: in government middle managers, in community structures teachers, business men, etc. What can be realistically expected from these people, many of whom at the community side are volunteers? What are the requirements for support and backstopping, and from where should they be satisfied?

Finally, any approach to improved management of water supplies must also take into account the limitations of the resource base itself – how much water is available – and will have to manage both supply and demand to ensure that all users receive an adequate and equitable share.

In the rest of this section we briefly identify the key factors that need to be assessed and explicitly addressed in small town water supply. We have grouped them under three main headings, although there are many different possible combinations, and all the factors interact with each other in a complex manner.

- **Supportive environment** – policy, regulatory, financial and political;
- **Effective management** – decision making autonomy, management stability and management capacity;
- **Demand responsive system design and cost recovery** – population size, dynamics, income and service requirements,– service quality, flexible and cost effective design and operation, private sector participation.

### *Supportive environment*

The aim of water sector reform should focus around user satisfaction as the centre of all policy and decision making activities. Where users include all community members – rich and poor, men and women. Regardless of differences in service levels and institutional arrangements the only criteria of success is to satisfy their requirements in a sustainable manner (from a resource point of view). The aim of wider policy and legislative environment must be to enable this aim in as effective a manner as possible and the necessary frameworks to do so should enable three objectives:

- They should clearly distribute roles and responsibilities in service provision;
- They should guarantee decision-making and financial autonomy to the lowest most appropriate levels;

- They should underpin this by supporting management stability, by providing the necessary regulatory, enforcement and conflict resolution frameworks.

The means used include regulations, effective organisational and institutional arrangements and user empowerment.

#### Organisational and institutional arrangements

Perhaps the most important point when looking at organisational and institutional arrangements is that they will be sustainable and effective only if accepted and supported by customers and communities. In addition, when choosing the most suitable arrangements, due care must be given to identifying the existing and probable future problems of the service and supporting a flexible and adaptive approach to dealing with them.

There is no blueprint for achieving sustainable water supply. Some situations will require better financing, others better management, and others more appropriate technologies. Many will require a mix of all three. This being said, different management models all have preferred baseline conditions that depend on a complex mixture of capacity (of the local government/municipality, local private sector, and local communities), economics (relative wealth or poverty), political will, and an effective enabling environment (laws, policies, regulations) and enforcement mechanisms. So for example community management models are often used where government capacity is weak or non-existent – however they bring with them limitations in terms of technology used and complexity and level of service achievable. Some options can be used to by-pass local government, while some such as co-operative management, delegated management or community management are used when municipal capacity is weak.

#### Political support and conflict

Political support plays a crucial role in the transformation process. It legitimises the shift from central to decentralised arrangements, and is the key factor in changing laws and setting incentives and regulation. Where changes such as the involvement of the private sector or increased cost recovery are being implemented it is essential to have broad based political support for the change.

At the same time it is important to be aware of the potential for undue political involvement in decision-making at the local levels, especially on financial issues such as cost-recovery, expansion of services to illegal settlements, flexibility in municipal management and accountability/transparency procedures. Rent seeking and corruption are classic and sometimes seemingly insurmountable problems, which can be particularly severe at a local level – away from the spotlight of public opinion – and in countries with poorly developed democratic institutions.

Political support is essential for both advocacy and the development of an enabling environment, however it is increasingly clear that within a framework of decentralisation and involvement of the private sector, political oversight and the work of regulation should be separated. Only by this clear separation of duties can rent seeking and corruption be expected to be minimised.

#### Regulation

Regulation must be designed to protect all stakeholders, and clearly define the roles and responsibilities assigned to them. Whatever the management option chosen it should be backed by regulation that specifies who owns, who operates, and who benefits from the services. Regulations (acts of law and contracts) should protect all parties against the inefficiencies of the others. For example private sector contractors need assurance of reasonable tariff levels but should also be prevented from transferring inefficiencies to the users. Regulations on their own are useless without a strong and widely accepted enforcement mechanism. As mentioned in the section on politics, this should ideally be supplied by an independent regulator – someone who is not directly attached to local (or national) government, and who has a clear mandate to represent the interests of the consumer.

In countries with weak legislative environments, a potentially important alternative to waiting for legally binding regulatory framework to be developed, is to take a contract based approach. Rules can be specified in contracts, such as terms between the owner and the operator, and also between the

users and the operator. These so-called 'performance objectives', provide a 'softer' form of regulation that has immediate potential for strengthening small towns management of water and sanitation service. However, even contracts require the capacity to monitor and enforce compliance, a functioning and respected legal system and reasonably low barriers to participation within the legal system.

#### Financing

With the weak potential of developing country government (national and local) to provide long term grants, and with the declining amount of long-term donor subsidies, the financing for new facilities and major rehabilitation or expansion of existing facilities is the biggest limiting factor to improving small town water supplies. In addition, it is generally accepted that for the foreseeable future access to private financing will be limited, therefore imaginative solutions are required.

Raising money through the community itself (revolving funds etc.) is one option, establishing water supply and sanitation trust funds (as is being explored for rural areas in Namibia, South Africa and Tanzania among others) another, seeking access to credit at favourable rates through donors or national government a third. Support from donors can open possibilities of accessing credit, and in this context advocacy of the needs of small towns is important. Donors and governments need to be convinced that small towns require help in attaining sustainable water supplies, and their special financing needs must be recognised.

#### Existing institutional arrangements.

Nothing is created from nothing, and one of the main starting points for developing a new or improved institutional environment will be the existing one. What are the existing responsibilities of stakeholders in the sector and how can they be changed? What works and what doesn't? What can reasonably be expected to be improved by increased finance or training for example, and what cannot? What are the best options for reform: in terms of ease and effectiveness of implementation? What are the ongoing changes in institutional and legal approaches outside the water sector? Answering these questions implies taking into consideration the side effects of reform, not only in terms of sustainability and intended benefits, but also in terms of social integration, employment, future use of the reform elsewhere in the region and in other sectors. A change of institutional framework implies a change in decision making processes, responsibilities and duties: it must reasonably foresee immediate short term objectives and anticipate future long-term trends in development.

#### *Management issues*

##### Capacity of the different stakeholders

Both short-term and long-term requirements must be addressed in monitoring the reform of the sector. For example, the problem of lack of administrative capacity in public institutions in developing countries is a heavy constraint to effective reforms, in addition to the lack of management expertise and access to private capital flows in local entrepreneurs. This is especially true for small towns.

##### Decision-making autonomy

Autonomy of municipal managers is reflected in the ability to price water so that it recovers both recurrent and capital costs. This is often threatened by political interference at both the local and national levels. Decentralised countries, where in principle more power is given to the lower levels of government, are often constrained by political, cultural, historical and sociological factors. But decision making is not only related to political freedom or autonomy: its effectiveness is also dependent on adequate human resources for management expertise, task division and responsibility sharing, organisational structuring and autonomy.

The effectiveness and efficiency of small town water supply services are often jeopardised because of the weakness of the local government. This weakness, although largely dependent on other factors such as administrative and technical lack of capacity, is also often due to lack of financial autonomy. Water boards, water user associations and water committees in small towns need to be able to retain their own revenues to remain viable (they may also need a considerable external injection of funds).

With management models that clearly separate ownership from management such as AMM, public-private partnerships and various delegated management options, there are fewer external political and non-commercial pressures to use savings and revenues inappropriately, thus affecting the day-to-day management and the financing of service expansion.

#### Management stability

Management stability is particularly important in small towns, where so much else is highly unstable. Moreover, instability in small town communities (due to migration for instance), poses serious challenges to the stability of user based management structures such as water user groups. Some types of municipal management options, such as co-operative arrangements, are more likely to be affected by internal community conflicts, than say AMM. Management stability is supported by clear roles and responsibilities backed by mechanisms to ensure accountability and transparency. Stakeholders must be legally recognised in order to prevent frequent changes in management behaviour; instability in a town government often results in changes in water management. Equally, more user involvement gives rise to increased legitimacy and ownership.

When trying to facilitate new forms of management options, it is of prime importance to consider the gradual changes required in local capacity to meet the new roles and responsibilities. According to the e-conference report, MM arrangements may be easier to introduce than more participatory (and therefore time consuming) or democratic options such as co-operative management, in that they conform better with existing legal frameworks and local political balances.

#### *Demand responsive system design and cost recovery*

Any approach that seeks to enhance the autonomy of small town managers will need to pay close attention to the issue of cost recovery. Cost recovery does not necessarily imply full coverage of capital and O&M costs by users, however on some level the books do have to balance. Regardless of ideological considerations, the hard reality is that, particularly in poor parts of the world, if communities do not raise at least some of the money to cover the maintenance of their schemes they will be left with no service. The discussion therefore becomes one of matching available finances – external (donors, governments and financial markets) with internal (municipal taxes and user tariffs) – with levels of service. Brikké has proposed seven key principles for cost recovery.

#### Seven key factors for cost-recovery

1. Assessing the impact of projects characteristics and environment on cost recovery;
2. Maximizing willingness to pay;
3. Clarifying financial responsibilities;
4. Optimizing operating and maintenance costs;
5. Setting appropriate and equitable tariff structure;
6. Developing an effective financial management system;
7. Organizing access to alternative financial sources.

*Brikké et al, 2000*

This section deals with some of these issues in more detail. While it does not deal explicitly with the issue of external finance (which is treated in the enabling environment section), this is a crucial part of the overall cost recovery package.

The acceptance of cost recovery, or at least a volumetric price structure, depends both on the transparency and accountability of the operator (association, WSC or public authority) and on the level of service. In order to implement a volumetric price for water, other alternative sources of water must be evaluated: the price of water will determine the competitiveness of the higher quality service over traditional and unprotected sources. For example, the PAGE program in Senegal (Estienne, 1999) focused on convincing the public water suppliers that the alternative uses of water were also legitimate, and not in competition with theirs, and therefore that it was in their interest to help develop or protect them.

In general, cost recovery is more easily implemented in new supplies than ones that need rehabilitation, especially when the communities have already paid part of the construction costs. This raises the question of how to evaluate customers' willingness to pay for services (WTP). According to a CERGRENE/LABAM study (1999), WTP was found to be strongly correlated to the users' knowledge of what was or had been planned (i.e. participation of communities in planning stages is still a must at the small town level): they stress the importance of analysing the change in demand over a prolonged period, with seasonal water availability changes, and therefore assessing the competitiveness of the new supply.

#### Population income or customer ability and willingness to pay for services

This factor must be reflected in the tariff structure (immediate and future), and must reflect the wider economic situation in the region. Willingness to pay is closely related to demand – the higher the demand the higher the willingness to pay, however it must not be assessed in isolation of ability to pay, which is far less elastic. While willingness to pay can be enhanced by demand creation tools such as hygiene education, ability to pay can only be affected by increasing wealth. One way to do this is to designing explicitly for productive uses of water supplies (Moriarty, 2001). In the absence of such approaches ability to pay will remain largely inflexible – driven by external economic factors. An assessment of ability to pay is therefore essential and, in combination with a realistic assessment of 'external' financing, should determine the overall envelope of service level.

#### Service requirements

Service levels are essentially driven by a mixture of demand and cost recovery considerations. Increasingly it is popular to design a basic (and often highly subsidised) service that meets some sort of nationally agreed minimum, to which additional levels may then be added on a full cost recovery (or even cross-subsidisation) basis. In South Africa for example systems are designed to provide a stand-post within 200m of every house, but with the possibility to upgrade to a house connection. Different service levels must be reflected in incentives created in institutional arrangements to deal with service expansion and upgrading for low income households.

The condition of capital assets, especially sunk assets like distribution systems, is of great importance in sharing the risk between say private and public sector organisations. Service requirements are not only the outputs, but also the necessary inputs in achieving contractual conditions such as increased service coverage, lower prices and quality, continuity and quantity. All these factors have to be negotiated between the various stakeholders (not just the public regulator and private operator): water-user associations (gender and equity aspects; productive uses; conservation and leisure); local, national or international financing organisations; regional resource protection authorities and market competitors).

#### Service quality

Service quality is not only a matter of water quality, but a matter of convenience and availability, versus cost. Successful management options will therefore offer a choice to different types of customers. According to the World Bank and an increasing body of others, this demand responsive approach is a key to guaranteeing not only the immediate use of the service, but also the future sustainability of the service (which can always increase in terms of coverage)

Service quality can be measured in terms of coverage, quantity, continuity, quality and cost. In new supplies (or in rehabilitating old ones that are not used because the communities have found alternative sources), the competitiveness of services must be increased. Sustainability is dependent on the anticipated use of the service, against competing sources. The problem of small towns is often one of non-cost recovery that leads to pronounced depreciation, and therefore only those who do not want to use other sources (often the most wealthy ones), use the town distribution system.

#### Cost effective operation and private sector participation:

In municipal management arrangements technical operations are almost always given priority over financial. The case studies in Sudan and Ghana showed that initially the water supply systems were all in need of a major rehabilitation and even re-construction, due to ineffective cost recovery. This is

also related to the lesser incentives MM options have in being financially viable, especially, once again, if ownership and management of O&M are not separated.

Cost recovery is affected by the cost of production of water: price setting must not cause a reduction in the anticipated individual consumption or else the cost of production will rise driven by a decline in the number of paying customers, therefore affecting the sustainability of the network. One option in trying to increase the financial viability of water supply management models is to increase user sense of ownership, through for example legalising WBs, WUAs or other CBOs and sometimes also by using future beneficiaries of the systems as free labour force (thus reducing the investment cost).

Despite the absence of large scale private financial flows, private sector participation (mainly through the strengthening of small, local entrepreneurs) seems the most promising option in small towns, given the previously discussed limitations of size, poor regulatory frameworks and weak municipal capacity. The main drawback is the common reluctance of public authorities to award seemingly long-term contracts, for fear of excessive profit making by the private companies. Community based options such as co-operative management, WUAs and CBOs may lack access to financing due to their lack of assured permanence and lack of cash flow and savings.



## Conclusions and recommendations:

### Small towns

- The term small towns represents a wide range of entities, with strict definitions differing between countries and regions. A number of generalisations may be made about them, although even these are largely region specific.
- In Africa small towns are typically transitional entities, typified by dynamics of rapid population growth. They lack the social cohesion of rural areas, but have on the other hand no effective 'urban' institutions. They may be wealthier than rural areas, but generally lack a sufficiently large 'wealthy class' to allow cross subsidization of supply schemes.
- In all parts of the world, small towns exist at the threshold where domestic water use begins to have a serious impact on total available water resources, and equally where individual sanitation begins to have serious implications for both community health and the potable water resource.
- Small towns present a wide variety of water supply systems and associated management options. They are often sufficiently large and dense to support a piped water supply scheme for at least some of their area

### Ways forward

- Because small towns do not represent a clear 'type', recommendations for development of sustainable supplies cannot be in the form of a technological or institutional 'blueprint'. Instead, the most pressing need is for recognition of their needs within existing water sector planning. In particular there is a need to recognise the need for:
  - Appropriate financing mechanisms – that can be used to carry out necessary capital upgrading, and that are suited to the needs of small, often poor entities
  - Appropriate cost-recovery policies that allow the re-investment in systems of revenues from sale of services
  - Appropriate training and capacity building. This needs to cover all 'stakeholders' at the appropriate levels. Who the stakeholders are will differ according to the management model being used, but will include some or all of local politicians and local government, small scale and informal private operators and community groups (water user associations)
  - Appropriate legislation and regulation; a good enabling environment. Legislation must clearly separate roles and responsibilities of all stakeholders. It must enable raising of necessary finance, and cost recovery mechanisms by clarifying issues of ownership. It must allow for the relative weakness of regulatory and management capacity likely to be found at the small town level, and avoid confusion between the roles of owner, supplier and regulator.
- Particular attention must be given to the ability to manage adaptively. Small towns are characterised by dynamism; rapidly changing customer bases and demands. The ability to plan for and deal with the varying levels of service provision must be internalized in all relevant stakeholders.

### Next steps

- Advocacy of the needs of small towns is probably the single most important step. This should in turn lead to the necessary funds to further distil experience, produce better training materials and management tools and identify more appropriate institutional and technological options.
- Because of the lack of attention to this sector, experiences are few and far between and often of dubious quality. There is a need for a rigorous assessment of claimed success stories, to identify the true level of their 'success' and where appropriate to use them as case studies for knowledge dissemination. Advocacy and training materials based on such success stories need to be developed and used at all levels from national level politicians to municipal level managers and communities. Water sector resource centres should take a lead role in this work.
- On a practical level perhaps the most pressing need is to make available adequate financial resources to underpin the necessary research training, and implementation of small town water supplies. Where they exist small towns should be explicitly acknowledged in sector wide

approaches for the water supply sector. Specific funding lines should be identified for them, acknowledging that they are unlikely to find funding on international financial markets.

- Finally, the problem of water resources management at the small town level is difficult: when addressing sustainable management options for small town water supply and sanitation services, light IWRM principles are to be incorporated in the training given, and in parallel integrated in the institutional framework, as it develops, as hard IWRM principles.

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# Appendices

## Case 1 - Tanzania

*This case study is based on a report on the Morogoro Region Domestic Water Supply Programme (Smet, 2000)*

### **General and Technical Information**

Under the Domestic Water Supply Programme in Morogoro Region of Tanzania, 22 piped water supply schemes have been constructed or rehabilitated since 1993. The program is supported by the Dutch and Tanzanian governments, together with DHV Consultants. 14 of the schemes have more than 5,000 users, with the largest serving 28,000. The majority of people use public standposts, but in larger centres there are a substantial number of house and business connections.

### **Institutional arrangements and ingredients for success (barriers to success)**

Each scheme is managed by a Water Supply Company (WSC). The WSC is made up of four groups: users; a Water User Group Committee (WUGC); Members of the Company; and a Board of Directors. Roles and responsibilities for each group and election procedures are set out in the Articles of Association. Every year the users elect the WUGC, the WUGC elects up to 30 members and the members elect the board. The Board appoints a Chairperson, a Secretary and a Treasurer and is responsible for managing the company. Larger WSCs may have full or part-time personnel (e.g. a manager, an accountant and technical support). Only the larger WSCs have their accounts audited by an external body. Tariffs are set by the Board and collected by the WUGC. In general, users appreciate the improved service and there is a willingness to pay. However, financial performance of nearly all WSCs is poor. Collection rates are less than 50% for public standposts, and average 69% for house connections and 87% for business connections.

The WSC is registered as a legal entity, with the Members of the company taking over from the District as owners of the assets. However, very few schemes have been officially handed over. In the long run, the success of WSCs will probably depend on establishing autonomous community ownership and responsibility, with traditional authorities at village and district level accepting a new role in conflict solving and counselling. This approach is supported by the latest draft of the new Rural Water Policy (July 1999) which also advocates full cost recovery in operations and maintenance, replacement and system expansion. At present the policy is over ambitious, since most Boards lack capacity and experience to manage their company successfully as a business. As a result of poor collection rates, WSC reserves are typically less than 1% of the total asset value and only cover operations and basic maintenance. Lack of confidence may result in authoritarian rule, and poor communication with users result in a lack of accountability and transparency. The situation is not helped by the short terms of office.

At present, district authorities lack the capacity and resources to provide support to WSCs, and the private sector is weak. It is suggested that a Federation of WSCs be established to provide much needed management and technical support. The Federation could also facilitate the involvement of the private sector, while regulating the quality of service and the cost to the user.

## Case 2 - Sudan and Ghana

*This case study is based on a paper by A. J. Livingstone, (1994). The paper examined water supply projects to small towns in Ghana and Sudan that had been supported financially and technically by the Canadian International Development Agency (CIDA). The Northern Darfur Water, Sanitation and Hygiene Project was implemented through the NCDRWR by a Canadian NGO. The Ghana Water and Sewerage Corporation Assistance Project was implemented through the GWSC by a Canadian consulting engineering company, Wardrop Engineering Inc. Both projects were implemented based on a community management approach, in which the communities themselves were seen as key actors in managing their own water supply systems. The projects concentrated on community organisation, planning for rehabilitation, financial arrangements, training activities, institutionalization and government commitment.*

### **Sudan**

In Sudan, the activity was undertaken by the Northern Darfur Water, Sanitation and Hygiene Education Project (1987 to 1990). 25 towns in two districts of Northern Darfur were involved. Towns ranged in size from 3,000 to 10,000 people with 15 having existing mechanised water supplies that were to be rehabilitated while the remaining 10 were given new water supplies. In all cases, the technology utilised was the same and consisted of deep boreholes, equipped with diesel-powered pumps supplying water to elevated storage tanks. A limited distribution system of standpipes, troughs for watering livestock and a tank filling outlet were provided in each town.

Some 3,000 wateryards are in existence in Sudan, most constructed by the National Corporation for the Development of Rural Water Resources (NCDRWR) in the 1960s and early 1970s. More than 50 percent are inoperative, and most require major rehabilitation (McPherson and Livingstone, 1990). Towns with water yards usually had existing formal committees or informal interest groups, in the form of health committees or town development committees. These committees were to a certain extent supported by the relevant ministries. Towns without existing water yards normally had health and/or development committees already established. Where possible the project used these existing organisations to create new wateryard committees. The committees averaged eight people, but were separated into sub-committees for men and women. Usually five or six men, and two or three women. Men focussed on technical and financial matters, while women focussed on hygiene, sanitation and water use. However, they usually had major inputs in the financial management as well.

Communities had little input in technology choice for rehabilitation, water yard equipment and layout. The NCDRWR insisted upon water yards conforming to national standards, seeing themselves as the operator and owner of rehabilitated systems when community management had failed. Capital costs ranged from US\$30 to US\$100 per capita, depending upon the population of a town. All services were the same, being deliberately standardized, regardless of town size. Communities were not expected to contribute financially towards the capital costs for rehabilitation and construction: instead, in some towns wateryard committees organised community labour.

### **Ghana**

In Ghana, the activity is focused upon the Ghana Water and Sewerage Corporation (GWSC) Assistance Project (1990 to 1997). In this project, towns and cities in the three regions of northern Ghana are involved. In the initial phase of the project, 12 towns and cities are involved. Towns and cities range in size from 6,000 to 50,000 people. All have existing mechanised water supplies that are to be rehabilitated. Also, each town and city has a variety of non-mechanised water supplies that are in use; predominantly boreholes with handpumps and shallow hand-dug wells. The technology utilised is blended, to incorporate rehabilitation of both the mechanised and non-mechanised water supplies within each town and city.

Some 50 mechanised water supplies, 3,000 boreholes with handpumps, and innumerable shallow hand-dug wells exist in northern Ghana. They have been constructed primarily by GWSC, but also by non-government organisations and religious agencies. Most mechanised water supplies are inoperative or operating far below original capacity, and all require major rehabilitation. While more than 80

percent of boreholes with handpumps are claimed to be operational, most shallow hand-dug wells run out of water in the dry season each year (GWSC, 1992a).

The towns all had existing mechanised water supplies, but no effective community water supply committees. In some towns the low-tech. systems (boreholes and hand-pumps) were managed by committees, concentrating on raising funds and keeping the pump sites clean. A consultation process between town leaders and government created the Water and Sanitation Development Board (WSDB) for each town: these were linked to government, and had a high degree of autonomy in decision making encompassing all supplies. Each WSDB had 12 members of which 4-6 were women, and women were also chairing water supply management.

In Ghana, there was considerable community input into planning rehabilitation. The WSDB evaluated suitability and acceptability of a wide variety of options, and included many non-mechanical supplies. Service levels were fitted to consumers' willingness and ability to pay for choices, and where possible alternative energy options were chosen to reduce O&M costs.

Capital costs ranged from \$60 to 160\$ US per capita, depending upon the technology utilised and the equipment installed. Community residents who had opted for private house connections were expected to contribute cash towards the installation of this increased level of service.

## Case 3 - Senegal

*This summary is based on a contribution by Cedric Estienne, Hydroconseil, to the Electronic Conference on Small Towns, in March 2000, and relates to the Water Management Support Program (PAGE).*

### **General and Technical Information**

PAGE<sup>1</sup> has been carried out by ISF<sup>2</sup> and AFVP<sup>3</sup> since 1996, in the Matam Department of North-East Senegal. The programme is funded by French Cooperation, French Regional Water Distribution Operator, private funds and (if accepted) the EEC. The program currently reaches 47 small towns with between 2,000 and 15,000 inhabitants. The typical distribution network has a borehole with motorised pump, and a piped network with between 5 and 20 standposts and one or two cattle troughs. For larger settlements the number of private connections becomes significant (e.g. up to 200 connections in towns of 10,000).

In towns of 5,000 or more, uncontrolled expansion of the original network causes water pressure imbalances and physical leakage. Since users normally pay a fixed price for water, taps are often left open to fill basins and barrels. Others have to wait until these connections are closed before the network can deliver water to their area and they may have to find alternative sources. In general, users take advantage of the fixed price and daily production can reach 70 liters a day per capita with a lot of waste. However, in smaller settlements with fewer house connections people use public standposts, and a different type of user behaviour is apparent. The service is regarded as a collective good, and production stays at around 30 liters a day per capita with little waste.

### **Institutional Arrangements and Ingredients for Success (Barriers to Success)**

At present facilities are owned by the State, which delegates day to day management (e.g. operation and maintenance, collecting revenues and keeping accounts) to the users who are represented by a voluntary water board. Only the borehole and water tower are maintained by the State. The board is usually selected by the heads of families and this lack of independence from the community makes it difficult to have contractual arrangements, audits of performance and to enforce unpopular decisions (e.g. refusing to authorise a new connection). Under current reforms the State intends to stop financing the water sector, boards will have access only to their collected revenues, and it is hoped that day to day management will be delegated to the private sector. However, community fears of price rises and loss of management control are barriers to reform.

The waste of potable water is encouraged by the fixed price system (in which households with private connections pay more than those who use public standposts). Selling water by volume, such as by bucket at standposts or by installing meters on house connections, seems to be the best solution.

If the water supply service is to be made financially viable water boards must manage their facility in a professional manner, establish the confidence of users and implement rational and acceptable water rates. Investment may also be required to improve sections of the network currently in disrepair and from which no revenues are being collected. These have been the objectives of the PAGE management support programme, which legitimises the role and authority of the water boards. The mechanism of this progression is not known, and the Water Directorate of Senegal has extended the programme to two neighbouring departments increasing the number of boards under the programme to 100 during 2000-2002.

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<sup>1</sup> Programme d'Appui a la Gestion de L'Eau – Water management support programme.

<sup>2</sup> Ingenieurs Sans Frontieres – Engineers without frontiers

<sup>3</sup> French association of the volunteers for progress



## Case 4 - Benin

*This case study is based on a study conducted in nine small towns in Benin by Régis Taisne (Hydroconseil, France) and Mahamane Wanki Cissé (AGECO, Mali). The aim of the study was to identify the major advantages and constraints to the improvement of piped water supply management in small towns in rural areas of Benin. This study also falls under the wider initiative of an overall research conducted by the Water and Sanitation Programme in all developing countries. The original works were published in April 2000.*

### **Institutional framework of drinking water supply in small towns**

The ministry of Mines, Energy and Water is responsible for water supplies to rural areas and small towns through: SBEE, the public corporation responsible for water supply to major towns in prefectures and sub-prefectures; and through the Water Directorate (DH) in rural areas and some small towns.

Policy for the management of water supplies in small towns provides for the establishment of Water User Associations (AUEs), with legal status, statutes, and an executive body, the Management Committee. Ownership of all or part of the installations and equipment is given to the AUEs, representing an important indicator of the state's commitment to decentralisation of the water supply. The AUE's mandate is to ensure adequate public drinking water supply, by developing new water supply systems, operating, maintaining and renewing existing systems, and making extensions to these where necessary. In addition to the AUE, day to day technical and commercial operation is carried out by an 'operator-in-charge'. These operators, often AUE employees, are *not* directly involved in the management of the service. In particular, they are completely cut off from decisions about expenditure or cost recovery - issues that are handled entirely by the AUEs.

Benin is one of the few countries in Africa to have made this kind of transfer official. Under this approach the renewal of equipment and accessories with a short or medium life-span (under 10 years or so) should be funded from water sales.

### **Status of small towns' water supply**

An increasing number of principal towns are supplied by the SBEE through construction of individual household connections. These towns no longer have standpipes, leaving the poor families (about 80% of the families) with no other options than to buy water from their neighbours who do have individual connections. Because of a stepped tariff system based on levels of consumption, these buyers pay a much higher rate than the owners of the individual connections.

For other small towns, the national policy is to provide water supply through small networks – rural piped systems (AEVs). These were first initiated in the early 90s and have been highly successful. In theory each AEV is designed to supply 1,500 inhabitants, in practice however, the population supplied is often as high as 5,000, due principally to the fact that nearly half of the AEVs are shared among several villages. Currently management (and ownership) of the AEVs is delegated to the AUEs by the DH. However, with planned decentralisation which would see the current role of the DH taken on by district authorities, it is far from clear how this will be managed in the future, especially in terms of handling the savings already made for renewals and extensions. This issue is already causing serious friction.

### **Financial management**

Financial and cash management is handled entirely by the Management Committee of the AUE. Many cases of embezzlement, especially through over-charging for spare parts, transport costs etc. have been observed. Controls and audits are almost non-existent and where carried out largely inadequate. In addition to routine embezzlement the Management Committee's pricing policies are often directed to favour preferred customers - those with individual connections. Consumers lack the necessary will and/or means to control their representatives. The whole concept of a Management Committee, which concurrently serves as representative of users and manager of the system, is ambiguous. The volunteer status of its members compounds this ambiguity.

- Some AUEs have opted to encourage individual connections, and the volumetric tariff for these connections is as much as 30% lower than that for the standpipes.
- No AUE has established a monthly lump-sum payment, nor a minimum invoice for individual connections to 'compensate' this advantage.
- 'Connection fees' are rare, as subscribers finance their own connections. The meter system is not efficient as meters are usually the property of the subscriber, making control by the operator and the obligation to renew the meters difficult.
- Monthly volumes supplied for individual connections are relatively high, and account for about 50% of volumes sold. A major portion of the population have access to water supply through resale by neighbours (with tariffs identical to that of standpipes). Consequently, monthly volumes distributed to standpipes are low (lower than 100 m<sup>3</sup>/month/standpipe), and therefore below the break-even point required to be profitable for a full-time professional pipe operator (generally estimated at 200 to 300 m<sup>3</sup>/month).

Readjustment and analysis of the operating costs of the eight systems studied show that:

1. The cost price, including theoretical renewal costs, are higher than the rates charged by SBEE
2. Cost prices are covered in nearly all cases by actual proceeds earned and additional profits are even made in 7 out of 8 cases, which could then be used for extensions or other projects, or even to help reduce the selling price of water
3. The account balance depends very much on the pumping system.
4. In a context where it is difficult to make long-term savings (low density banking system, embezzlements, great need for cash flow in villages and districts), it is clear that connection to the electrical power system is the most reliable
5. In practice, the AUEs do not have a savings plan, because they do not have a clear idea of the amounts and due dates of these renewals.

The case study concludes with the statement that management must be sought which shares responsibilities and promotes more transparent forms of remuneration that cater for the interest of operators, the authorities and the populations. The current arrangements, based on volunteers who get no official remuneration are untenable in the longer term.