INSTITUTIONAL ARRANGEMENTS AND SUPPORT SERVICES REQUIRED FOR SUSTAINABLE COMMUNITY WATER SUPPLY

A van Schalkwyk

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INSTITUTIONAL ARRANGEMENTS AND SUPPORT SERVICES REQUIRED FOR SUSTAINABLE COMMUNITY WATER SUPPLY

Report to the Water Research Commission

by

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EXECUTIVE SUMMARY

1. INTRODUCTION

Many of the existing water supply schemes in South Africa are not operating properly despite large capital investments being made on refurbishment and expenditure of nearly R600 million/annum on operation and maintenance with a staff compliment of some 10 000.

One of the main reasons for poor water service delivery is considered to be the lack of proper maintenance, repair, operation and administration of water supply schemes brought about by inadequate management and regulation of water service delivery.

The problem is aggravated by dissatisfied water users who have resorted to making unauthorized connections, vandalism and non payment of the water service received.

The aim of this study is therefore to:

- Assess institutional arrangements currently in place.
- Suggest improved institutional arrangements.
- Consider training and capacity building needs.
- Identify support facilities required.
- Assist technology transfer by initiating the process of sustainable water service delivery in a selected TLC.

2. METHODOLOGY

Various documents describe case studies and examples of water schemes which are achieving sustainable water service delivery. Such schemes :

- provide an uninterrupted water service
- have a level of service which is acceptable to the consumer
- ensure that repairs are undertaken promptly
- achieve cost recovery better than 80%
- build up a fund for emergency and major repairs

Information from the literature and case studies was assessed and synthesized to identify best practice which would ensure sustainable water service delivery.

Case study schemes are located throughout South Africa, but mainly in the Northern Province and include rural and urban environments.

The information collected and assessed included :

- the water service provided in terms of level of service and customer/user satisfaction with the service

- institutional arrangements and include water service provider, water service authority, power struggles at community level and organizational structure;

- revenue collection in terms of billing system, tariff, emergency fund, connection fee, advance payment and level of cost recovery;

- operation and maintenance procedures and response time to breakdown.

The raw data is available from files held by WSM

3. FINDINGS OF THE STUDY

3.1 Institutional arrangements

Before 1994, no national institution was responsible for ensuring equitable and sustainable access to water supply service and no structured national legislation existed which regulated the provision of this service.

The enactment of the constitution and the election of democratic local government together with policies outlined in various white papers and acts, made it possible to provide a legal framework within which the water supply service could be provided and regulated.

Water service delivery, according to the Water Services Act, comprises two levels of responsibility viz :

- water service authority (WSA), which has the responsibility to ensure that water services are provided.
- water service provider (WSP), which is the organization that actually provides the water service.

The WSA in the rural areas is usually the district council. The link between the district councils and the communities is weak and there is insufficient capacity to effectively, address all the required functions.

TLC councilors, in rural areas, provide an important link between the communities in their constituencies and higher levels of government, particularly in terms of promoting and initiating water supply schemes.

Tribal authorities, who are ex-officio members of the TLC, have considerable influence in many areas and have assisted to enforce payment for water service and can also assist communication with higher levels of authority

In the urban areas, the WSA and WSP are usually the transitional local councils (TLC), especially in the more developed areas.

The WSP function in rural areas can most cost effectively be undertaken by community based organizations, or by private contractors. To ensure cost effectiveness and efficiency it is necessary for the WSP to

- employ local people from the settlement
- employ staff on a part time basis where possible
- pay salaries appropriate to the area
- phase in DWAF staff to the above mentioned conditions
- ensure that training is provided as required
- contract out specialized tasks

Water vendors sell water in many villages throughout South Africa and world wide. The vendors manage to supply water under difficult conditions without external aid. However, in many cases, the vendors charge extortionist tariffs for the service. By using vendors as WSPs, the consumer would benefit from the entrepreneurial spirit of the vendors, but necessary control measures need to be put in place to ensure an equitable service.

Bulk water supply schemes are usually more sophisticated and require a higher level of expertise to properly operate, maintain and manage the scheme. Such schemes are currently mostly operated by DWAF, water boards or developed TLCs. DWAF will withdraw from this function and water boards have the expertise to assume this responsibility.

Support services agents (SSA) may be used to support and assist the WSP particularly in the rural areas. Support services include a variety of activities including mentoring, major repairs and purchasing of certain materials. It is not cost effective for community based WSP to have this expertise inhouse. SSA are currently not formally used on the rural case study schemes, except in the case of Vulindlela regional scheme, which is under the control of Umgeni Water.

3.2 SUPPORT FACILITIES

The WSP requires support facilities in order to cost effectively and efficiently deliver a water service and these include staff, organizational infrastructure, billing system, tools, equipment, spares, transport and communications.

The billing and revenue collection is dependent on the water distribution system, tariff and payment method.

The water distribution systems include communal street tap systems and metered yard connections. The tariff may be a flat rate, which is generally used for communal tap systems, or a consumption rate, which is applicable to metered connections. The latter usually occur on yard connections.

Payment systems can be based on the conventional post paid or the recently introduced pre-payment systems. Post paid systems have been in use for decades worldwide and the equipment is effective and relatively inexpensive. A significant number of field and office personnel are however required. Personalized accounts also need to be prepared and distributed in the case of metered yard connections.

Pre-paid meters require fewer field staff and, if no tampering occurs, only water paid for is used. These systems are however expensive and the development is in its infancy with the occurrence of considerable operational problems.

Other support facilities include communication, transport, office, stores and spares. Communication includes telephones and two-way radios, whilst transport could be in the form of light delivery vehicles and trucks. Where possible, particularly on rural schemes, vehicles should be hired as and when required. Bicycles may be used for transport on local village water supply schemes.

Billing and the cost recovery process requires, especially where prepaid or metered yard connections are used, computer billing systems, stationery, office space, pay points, safes for keeping cash, and related equipment.

Commonly used spares, tools, workshop and other related equipment is required to assist operation and maintenance.

It is normally too expensive for rural village WSP to have specialist tools and equipment available inhouse. These are best hired and contracted when necessary.

Staff and Training. Staff are required for the day-to-day functioning of the various components and aspects of the water service. The number of staff required and the level of skills required is related to the type of equipment used, level of service provided and extent of the water supply system.

In order to reduce costs, it is necessary, particularly in the case of smaller villages, to employ operators, maintenance staff, revenue collectors and managers on a part time basis. The income earned by individuals on this basis would however need to be such that staff will be retained on a permanent basis thus avoiding the need for frequent replacement of personnel.

DWAF have a large complement of personnel who currently provide water service delivery on existing schemes. Care needs to be taken that the inclusion of DWAF staff in local structures does not make the service unaffordable.

Training is necessary, particularly in the rural areas, to fully equip staff to undertake tasks effectively and efficiently. The need for follow-up training and to train replacement staff has also been identified.

4. TECHNOLOGY TRANSFER

The Bakenberg TLC located near Potgietersrus in the Northern Province, was selected, with the involvement of DWAF and the Bushveld District Council, to apply the experience gained from this research project.

Two workshops attended by TLC councillors, DWAF and DFID were held to discuss various issues related to effective water service delivery, including cost recovery.

A detailed implementation plan was developed and funds have been sourced. Implementation is scheduled to commence in January 2001.

5. CAPACITY BUILDING

A social consultant, Mrs M Maenetja , was assisted to establish her own practice, and was subsequently appointed as a sub-consultant on this project. Mrs Maenetja was responsible for data collection on the case studies, and processing of data.

6. RECOMMENDATIONS

The following recommendations result from this research project :

- Access to higher levels of service by the consumer is essential in certain villages to ensure sustainable water service delivery. DWAF, major NGO's and other funders should be encouraged to accommodate higher levels of service.

- Vendors, or private contractors, have provided a valuable, although expensive, water service in many communities for many years without assistance. Methods should be developed to ensure that residents are not charged an extortionist fee for this service.

- Training should be seen as a long term commitment. Training is necessary for replacement staff and refresher courses are also required. Links should be established so that trainees may refer to their mentors for on the job support.

- Water committees and their associated tap committees have shown to be cost effective water service providers. This approach to decentralization of water service provision in rural areas should be encouraged.

- Tribal Authorities have assisted to ensure water service delivery, particularly in terms of enforcing payment for services. This partnership with the water service provider should be recognized.

- Technology transfer should be achieved by applying the findings of this study in the Bakenberg TLC near Potgietersrus.

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Annexure B: Information from the checklist
Annexure C: Details of training offered
Annexure D: Job descriptions

1. INTRODUCTION

1.1 Background to the research

Poor maintenance, operation and management of existing water supply infrastructure has been identified (Dreyer, 1999; Mvula, 1996) as one of the main reasons why several million people in South Africa do not have access to adequate water supply. The ambitious and capital intensive water supply development programme initiated by the Department of Water Affairs and Forestry (DWAF), to ensure sustainable water service delivery, will be seriously compromised by this situation.

Numerous organizations are currently involved with water service delivery. These include DWAF, other government departments and village water committees (based on Mvula and Water Board initiatives).

Water service delivery in the rural areas was previously mainly the responsibility of the former homeland governments, and in the urban areas various administration boards and municipalities generally provided water services.

After 1994, water supply assets and staff of the former homeland governments were incorporated into Department of Water Affairs and Forestry (DWAF) and the water service delivery function of the administration boards were incorporated into local government structures. This is an interim arrangement until water service delivery functions are fully undertaken by local government as stipulated by the Water Services Act.

Several Acts, regulations and policies have been drafted to ensure water service delivery to all.

1.2 The business of water service delivery

In order to achieve sustainable water service delivery, it is necessary to apply business principles. A proper water service therefore needs to be provided and this is one which offers the water user access to an essentially uninterrupted supply of water. The degree of access and the volume of water available should be in relation to what the user is prepared to pay.

This level of service excellence can only be achieved on a sustainable basis by a motivated organization which has the appropriate physical and organizational infrastructure and the necessary capacity. Adequate income is necessary to allow the organization to function properly to operate the system, effect repairs, undertake maintenance or to refurbish or extend the water supply works when required.

The process of proper and sustainable water service delivery is comparable to any properly run business which comprises:

- A product or service, i.e. water delivery.
- Staff to operate and maintain the scheme and to provide the necessary support.
- Support facilities such as office accommodation, tools, equipment and spares.
- Budget and credit control.
- Tariff and levies to provide income which will be used to meet operating costs and extraordinary expenses such as for major repairs or equipment replacement.
- Adherence to regulations and policies.

Crucial to the success of any business is its management, i.e. the skills and capacity of the water service provider which delivers the water service. In the water business, the organization finds itself operating in an environment governed by political and cultural influences and monitored and regulated by higher authorities (water service authority) as required by various Acts and bills (DWAF, 1997; Government Gazette, 1997). The institutional structures appropriate to the conditions which occur in the various communities is therefore crucial to sustainable water service delivery.

A wide range of support facilities are required by the water service organizations in order to provide proper and sustainable water services and these include communications, transport, organizational infrastructure, staff and revenue collection systems.

Training is essential to equip the various operators, maintainers, managers and guardians of water supply schemes.

1.3 Aim of the study

The aim of this research project is to initiate the establishment of effective and efficient institutional structures for the operation, maintenance and management of rural water supply schemes.

This may be achieved by:

- Assessing institutional arrangements currently in place on selected rural water supply schemes.
- Suggesting improved institutional arrangements.
- Considering training needs.
- Considering support facilities required.
- Initiating the process of transition in a Transitional Local Council area.

2. LITERATURE SURVEY

2.1 Literature search

A literature survey was undertaken to establish:

- Research already undertaken in terms of institutional arrangements required to ensure water service delivery, organizations which effect water service delivery, support facilities required and governing factors which control, regulate and influence water service delivery.
- Practical experience in terms of sustainable water service delivery.
- Legal issues and regulations.
- Policies as developed and adopted by various government departments and other organizations.
- Guidelines developed by various government departments and NGO's.

A search on the internet yielded some 70 references and these were scanned to select references for review. (See list of references). Interaction with various government departments, NGO's and other organizations yielded further information particularly with regard to legal issues, policies, regulations and guidelines related to water service delivery.

The literature highlights the great difficulty experienced world wide to effect sustainable water service delivery. This is emphasized by isolated reports of water service delivery success (Dreyer, 1999; DWAF, 1997; Mvula, 1996) and numerous reports which describe problems relating to water service delivery (Dreyer, 1999; DWAF, 1997; Mvula, 1996).

The references provided information with regard to:

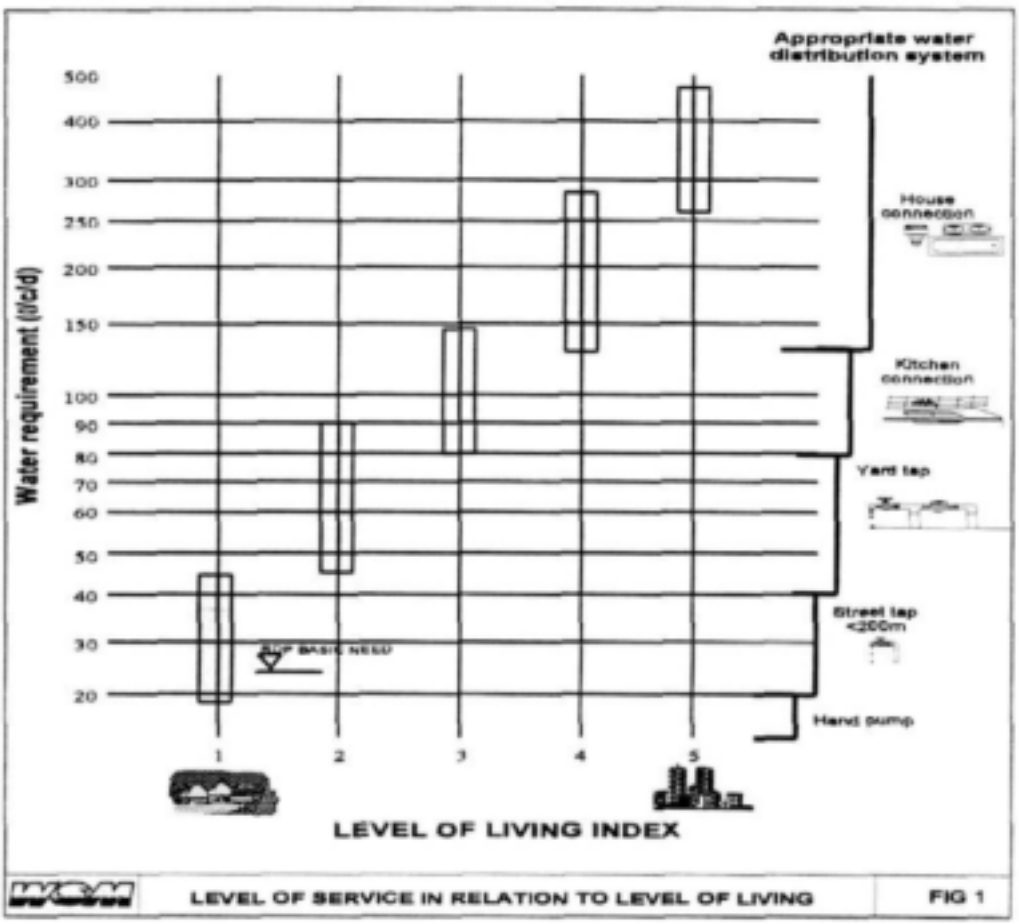
- Village water supply descriptions (water supply situation assessment).
- Institutional aspects.
- Policies.
- Community participation and scheme ownership.
- Training and capacity building.

- Cost recovery and tariffs.
- Water supply system management and information technology.
- Maintenance and operational issues.
- Guidelines.
- Water supply development process.

2.2 Community profile and level of service required

The water service required by the water user and for which the user is willing to pay, is described in terms of volume of water, reliability, quality and ease of access. Previous research (van Schalkwyk, 1996) (refer to Figure 1) revealed a relationship between level of service and level of living of the water user.

Level of living describes the economic status and value orientation of the community as a whole, or of individual households.



LEVEL OF SERVICE IN RELATION TO LEVEL OF LIVING — FIG 1

The least developed communities, which are usually located in remote areas, have a low level of living index, and are generally satisfied with rudimentary levels of service such as communal street taps.

The upper end of the level of living scale is characterised by communities which enjoy modern housing facilities, often with reticulated water supply systems which include water borne sewage. Such communities strongly object to drawing water from communal street taps.

The ability to pay for the water service is also a function of the economic status of the community or individual household.

In assessing the appropriateness of the water supply schemes and the water service which is offered, it is therefore necessary to determine the level of living of the community.

2.3 Review of published water service delivery experience

Before 1994, the former homeland governments were responsible for water supply in rural areas and also acted as policy making and resource allocation bodies. The governments developed the water supply schemes and then operated, maintained and managed the schemes. Some of these "governments" performed their tasks better than others, but mostly failed to deliver water to all. Although substantial funds were made available to them, these funds were not used effectively and large numbers of people had no access to water. Participation by the communities in decision making was not considered and little was done towards cost recovery and management responsibility. This resulted in many water supply projects implemented before 1994 failing and indeed this situation is still prevailing now (Dreyer, 1999; DWAF, 1997; Mvula, 1996). The main reasons for failure being the lack of proper maintenance and operation of the schemes and little to no cost recovery.

This section outlines the experience gained on several water supply schemes world wide and reported in various publications.

2.3.1 International schemes reported on in the literature

At a conference on community water and sanitation hosted by the world bank, countries from across the world presented their experiences in terms of a demand responsive approach to rural water and sanitation provision. Relevant experience is summarized below:

Key characteristics of the demand responsive approach:

- Community members make informed choices about:
  - whether to participate in the project
  - technology and service level options based on willingness to pay - based on the principle that higher service level systems cost more
  - when and how their services are delivered
  - how funds are managed and accounted for
  - how their services are operated and maintained

- Government play a facilitative role, sets clear national policies and strategies, encourages broad stakeholder consultation and facilitates capacity building and learning.

- An enabling environment is created for the participation of a wide range of providers of goods, services and technical assistance to communities, including the private sector, and NGO's.

- An adequate flow of information is provided to the community, and procedures are adopted for facilitating collective action within the community and between the community and other actors (Social intermediation)

India

A demand driven approach was followed in a pilot project funded by the World Bank in Uttar Pradesh in India in 1991 (Swajal project). A non governmental organization (NGO) was selected at the preplanning stage to act as a support organization for the project as it provided an integrated package of assistance to the community. The NGO was responsible for informing the community of the project rules and to keep them informed for the duration of the project. The NGO also helped the community elect a Village Water and Sanitation Committee (VWSC). On average 42% of the VWSC members are women and 55% of the VWSC treasurers are women. The NGO assisted the VWSC in the choice of technology and level of service. The NGO also facilitated capacity building throughout the project.

This was the first rural water supply project in India to introduce capital cost recovery and full community responsibility for operation and maintenance. The community made all important decisions themselves, with the view of ensuring a sense of ownership. At the time of publishing, the project was still in the implementation stage, but the NGO was confident that the project target would be achieved.

Ghana

A Community Water and Sanitation Division (CWSD) was established in 1994 to

improve the delivery of water and sanitation services in rural communities, ensure sustainability of services, and empower communities to manage the schemes themselves.

The community chooses the type of services based on cost and accepts responsibility for all operation and maintenance costs. The community contributes 5% of the capital cost and has control over the management of funds. The community manages the scheme and is responsible for the sustainability of the scheme. The CWSD lend on-going support and training to the communities. The initial project under this strategy has been implemented and targets have been met.

Bolivia

The PROSABAR project was started in Bolivia to improve the coverage and quality of safe water and sanitation services in rural areas. Municipalities request funding from government who supply a ceiling contribution. The Municipalities are responsible for a 10% cash contribution of the construction cost and the community at least 5%. The total contribution of 20% required from the community is made up by providing labour and materials. The community participates in the planning, selection of the service option and ultimately contributes to the operating and maintenance cost. Community training on environmental and health issues form part of the project. A high percentage of women is incorporated into the project process and are actively involved in the operation and maintenance of the systems. Experience has shown that project targets are generally met where a high level of participation in the process occurs.

Some problems were identified in relation to the institutional structure and these include:

- High administrative cost
- slow project evaluation and approval process
- Inadequate coordination of operations between the department level and implementing agencies

Indonesia

Communities from rural villages apply for grants through the Bank Rakyat Indonesia. The villagers, with the help of a field engineer, select the infrastructure they wish to invest in, and prepare a budget and plan to be approved by the bank. Upon approval, the money is made available to the village implementation team. The village is expected to contribute at least 4% in cash and 16% in kind, of the capital cost. Labourers from the village are paid below the minimum wage to ensure that it is only attractive to the unemployed and poor. It is a requirement that women be actively involved in all phases of the project, from hygiene and sanitation education through to

training in operation and maintenance of the system. Some 31 schemes in rural villages that were completed in 1995/6 were still in working order in 1998. A high level of women involvement occurs in the schemes that are delivering water service with the least interruptions.

2.3.2 South African Schemes

The Department of Water Affairs and Forestry identified and reported on 12 successful cost recovery schemes in 1998. All 12 these schemes form part of this study but two are discussed here for comparison. The schemes comprise one new scheme, Vhutalu, and one existing scheme, Douglas.

Vhutalu

The residents of Vhutalu had to collect untreated water from a river, necessitating long walking distance over uneven terrain. A water committee was formed, which under the leadership of the chairlady, a teacher, applied for assistance from Mvula Trust. The project included a borehole fitted with a pump driven by a diesel engine and stand pipes. Each household was asked to contribute R160 to initiate the project. The community was fully involved, particularly with decision making. The community decided on a flat rate tariff of R10 to be paid monthly by the 10th to the Water Committee Treasurer and R30 for late payers. Substantial training was provided on financial, administration, technical, maintenance, construction and health aspects. The people who received training were identified by the community. Cost recovery in Vhutale stands at 100%.

Douglas

Because of the culture of non-payment, Douglas was R1.8 million in the red in 1996. An Interim Council was elected for 1 year but was ineffective due to the short term in office. An Interim Council was then elected for a 3 year term of office. After the councillors were informed that they could be held liable for losses incurred (Local Government Transition Act Second Amendment of 1996), firm action was taken to resolve the problem.

Douglas Municipality strives to provide every household with its own metered connection. Households who reside in the informal settlement are provided with standpipes as an interim measure. All consumers were registered, and accounts are posted or delivered by hand once a month. Accounts can be paid at the Municipal offices or three other pay points within the area. Pensioners can also pay where they receive their pensions. Households who did not pay their accounts were restricted to 15kl per month and their electricity was cut off. The flow restriction was only removed after the arrears were paid in full together with R20 for the removal of the restrictor. As an additional incentive to pay, the Council will only employ registered paying people. Cost recovery rates of 95% are now being achieved.

Scheme	Cost Recovery	Population	Authority responsible for managing the scheme	Water consumption	Payments required	Action against non-payers
Vhutalu (NP)	Excellent	500	WC	30 l/c/d	R10/hh/m	Late payment of R30/hh/m
Gundani (NP)	85%	1195	WC	30 l/c/d	R1.40/hh/m	It is expected of everybody to pay - The headman decide on action to be taken against non-payers
Crossroads (EC)	Good > 80%	1584	WC 40% female	25 l/c/d	R5/hh/m	Social ostracism, social events boycotted
Motlhabe/Ntswa na-Le-Metsing villages (NW)	Excellent	4600	Project steering committee 70% female	25 l/c/d	R15/hh/m	Visit and talk to non-payers Illegal connections are fined R300 by Tribal Authority
Nggele (EC)	Good 65-75%	4000	Village Development Forum 43% female	<25 l/c/d	R5/hh/m	Disciplinary Committee Social sanctions Community peer pressure
Tsita (EC)	Good	13000	WC 50% female		R2/adult/m Adult: over 18 years excl scholars	Names are read out at community meetings headman decide on action to be taken
George Moshesh (group of villages) (EC)	Good Smaller villages have better cost recovery	14500 (12 villages)	Project steering committee consisting of members of village WC	10 - 15 l/c/d	R2/hh/m	Peer pressure
Bisho (EC)	> 80%	8000	King William's Town TLC	20 - 30 kl/m house & yard connections	R2.66/kl	Flow restrictors are installed - R67 to have removed Electricity is cut off on a Friday
Douglas	95%	15000	Douglas Municipality (Interim Council)	10 - 100 kl/m Average 23 kl/m	House & yard connections: 1-10 kl/ R27.13 > 10 kl/ R0.91 kl/ Standpipes of R4.94/m	Flow restrictors are installed - R20 to have removed Electricity is cut off

Scheme	Cost Recovery	Population	Authority responsible for managing the scheme	Water consumption	Payments required	Action against non-payers
Pietersburg / Seshego	82%	80000	Pietersburg / Polokwane TLC		Step tariff 1-10k/ R0.98/k/ 10-15k/ R2.72/k/ 15-30k/ R3.04/k/ 30-50k/ R3.30/k/ 50-100k/ R3.68/k/ >100k/ R4.43/k/	Flow restrictors are installed and if payment are still not made water is cut off
Klerksdorp (NW)	94%	194000	Klerksdorp City Council	Developing part of town 12-22 kl/m other 25-50 kl/m	Step tariff 1-10k/ R1.30/k/ 10-20k/ R3.51/k/ 20-30k/ R3.61/k/ 30-50k/ R3.66/k/ 50-100k/ R3.70/k/ 100-500k/ R4.43/k/ >500k/ R4.31k/ Min levy R13 Standpipe R4.56/hh/m	Flow restricted to 3kl/m - still no payment - cut off Illegal connections - Fine of R300 1st offence and R2000 2nd offence
Durban (KN)	99%	1400000	Durban Metro		Full pressure system: <6k/ - R1.33k/ 6-30k/ - R2.43/k/ >30k/ - R3.64/k/ Semi-pressure system: <6k/ - R1.33k/ 6-30k/ - R1.74/k/ >30k/ - R3.64/k/ Water tank R9.30/hh/m	A lower level of service is provided - still no payment - cut off

2.4 Summary of key issues which contribute sustainable water services delivery

From the literature studied, it is evident that adequate and sustainable water service delivery depends on numerous factors. Some of these factors can be addressed by sound planning and by introducing preventative measures. Issues and measures include:

- The project should be demand driven.
- The community's needs and the level of service that is affordable, and for which the community is willing to pay, should be established during the planning and design stage of a project.
- The community should be involved with the decision making during the planning and design stages.

- Support should be provided in establishing a community elected committee that can represent the community through the different stages of the project. This committee can also become the body responsible for the scheme after implementation.
- High involvement of women in this committee.
- The community's willingness to invest in the project, ie financially or by providing labour, should be established during the planning stage. This will ensure a sense of ownership.
- Member(s) of the community, who will operate and maintain the scheme, should be identified during the project implementation stage.
- Any political issues that could affect the proper functioning of the project needs to be resolved during the planning stage as this could lead to the failure of the project.
- A high standard of service must be delivered and maintained.
- Accounts must be delivered on time and accessible pay points should be available. Facilities for complaints and queries must also be provided.
- Punitive measures accepted by all should be strictly enforced.
- Support after commissioning of a project should be available.

3. STUDY METHODOLOGY

3.1 Basic study concept

This research project aims to evaluate existing water supply schemes with the view of identifying the strengths and weaknesses of institutional arrangements, support facilities, training procedures and capacity building initiatives on these schemes.

This information would be evaluated in terms of its applicability to the various water supply situations and environmental variances which are found in rural villages. From this information, key considerations for the practical establishment of institutional structures and the appropriate support services in other areas may be produced.

Details of successful and sustainable water service delivery have been documented and presented in various scientific publications, conferences, reports and the media (Dreyer, 1999; DWAF, 1997; Macleod, 1997; The Star, 1998). These include water supply schemes in several rural areas and water service delivery in peri-urban and urban areas. Issues reported on include institutional arrangements, management approach, revenue collection processes and policy. Lessons can also be learned from reports of water service delivery problems as reported in the literature and identified in the field through interviews (DWAF, 1997; Mvula, 1997).

Aspects of concern include:

- Institutional arrangements and management of water supply schemes at

village level and regional level.

- Operation, particularly in terms of maintenance and revenue collection.
- Support facilities required, including staff, communications, offices, stores, billing systems and special tools.
- Support services including specialist assistance and major repairs.
- Applicability of training provided.

3.2 Identification of case study schemes

The schemes selected for research and evaluation should ideally be those which are managing to provide a sustainable proper service. It was considered by the research team that schemes which offer a sustainable proper service are ones which meet the following water service criteria.

- Water delivery occurs with infrequent interruptions.
- Repairs are generally effected and interruptions to water delivery restored within 2 days as stipulated by the National Water Supply Regulations.
- Tariff, which is adequate to cover operations, maintenance and management costs as well as a surplus for major repairs.
- Better than say 80% cost recovery. This arbitrary target is considered by the research team to be acceptable since levels of cost recovery are particularly low in villages and settlements.

The selection of case study schemes should be representative of various conditions and factors which influence water service delivery in terms of operation, maintenance and management.

Available information from the literature and personal experience was used to draft a list of these factors which include water user, water supply infrastructure and institutions. The schemes selected should ideally provide a representative sample containing the various variables and parameters given below.

- ***Village size* range and socio-economic status**
  - remote rural villages, low level of development. Population <1000
  - rural village with moderate level of development. Population 1 000 - 3 000
  - Semi-urban settlement. Population 3 000 - 10 000
  - Settlement having high population growth and residents insist on a high level of service. Population > 10 000

- ***Reticulation* (level of service types with different revenue collection methods)**
  - house connections (metered) including water borne sewage facilities
  - yard connections: (metered, flat rate, tickle feed, pre-paid)
  - street taps or communal standpipe: (kiosk, flat rate, pre-paid at tap,

pre-paid at reservoir)

- ***Energy source***
  - diesel
  - electric
  - gravity

- ***Institution responsible for water service delivery***
  - DWAF
  - Water Board
  - NGO (eg Mvula Trust)
  - Municipality
  - District Council
  - Transitional Local Council (TLC)
  - Water Committee or other community based organisations
  - Tribal Authority
  - Vendors

- ***Scheme type***
  - local scheme
  - regional scheme

From the above list of variables it is noted that more than 200 schemes would need to be identified and evaluated in order to cover the full spectrum of conditions and characteristics of communities served, water supply infrastructure and institutional arrangements.

Numerous rural water supply schemes are available for review and assessment as case studies and these include schemes developed by Mvula Trust and schemes under the control of DWAF and water boards. Experience gained by numerous individuals and groups involved in the water industry would also provide valuable additional information.

A search, particularly in the Northern Province, however found fewer than 20 rural domestic water supply schemes which met the criteria outlined above. Low levels of cost recovery and the usually associated inadequate operation, maintenance and management of the schemes, were the main negating factors.

Several successful domestic water supply schemes in urban areas were also identified and included in the evaluation. This was necessary in view of the limited number of rural villages which experience a high level of cost recovery. Important lessons can be learned from the urban centres which have been able to achieve high levels of cost recovery.

3.3 Methodology used to evaluate the case study schemes and practical application of the results

The assessment of the identified water supply schemes was achieved by:

- Conducting interviews with the water service providers using a specially designed structured questionnaire. A copy of the questionnaire is attached in Annexure A.
- A site visit to assess the water supply infrastructure.

The information obtained from the assessments was synthesized and combined with other relevant information taken from the literature identified in this study to yield best practice which may be applied on other schemes.

A TLC was subsequently identified, in collaboration with DWAF, where the practical and cost effective institutional arrangements and associated support facilities, as identified from this research, can be applied. The TLC was workshopped and the transition process initiated.

4. ASSESSMENT OF WATER SUPPLY CASE STUDY SCHEMES

4.1 Schemes identified for assessment

The schemes were identified according to the procedures outlined in section 3 of this document and are located in 7 of the 9 provinces as follows:

	Rural villages	Urban centres	Total
Northern Province	16	1	17
Eastern Cape	4	1	5
Northwest Province	2	1	3
Gauteng	1	1	2
Mpumalanga	0	1	1
Northern Cape	0	1	1
KwaZulu-Natal	1	1	1

A list of the schemes assessed is given in Table B1 (refer to Appendix B). The majority of the schemes identified and selected for evaluation are located in the Northern Province as the study team is most familiar with this region. This selection also assisted logistical considerations.

4.2 Issues considered in the assessment of the schemes

The assessment of the case study schemes focussed on aspects related to:

- The service provided in terms of level of service, interruptions to the supply, extent of unauthorized connections, vandalism and customer relations desk.
- Institutional arrangements in terms of the identity and roles of the water service authority and water service provider, payment for work done by staff, training received and political harmony within the institutional structures.
- Revenue collection and includes tariff, payment percentage, existence of an emergency fund, connection fee charged for yard connections and up-front payments to demonstrate commitment to the scheme.
- Operation and maintenance procedures in place and training received.

The community profile was also determined and expressed as a level of living index (van Schalkwyk, 1996).

4.3 Water Service provided

As mentioned earlier, sustainability of the water supply service is greatly dependent on the degree of payment for the service. Payment for the service is to a large degree dependent on the level of service provided and the user satisfaction with the service.

Assessment of the water supply scheme therefore evaluated the service provided in terms of level of service, interruptions to supply and the customer relations desk (see Table B2: refer to Appendix B).

The existence of unauthorized connections was also considered as it points to dissatisfaction with the level of water supply service.

The water service provided mostly comprised street tap systems with distance to fetch water usually not exceeding 200m. Communal street tap systems occur in virtually all rural villages where water supply schemes have been developed.

Interviews undertaken at case study villages confirms personal experience that although much effort and money has been spent on giving the community the choice of the level of water service, virtually in all instances, the community "chose" the communal street tap system as provided for in the RDP programme. Communities are generally unable or unwilling to raise the capital required to develop a higher level of service as required by the RDP programme policy.

This situation is however different in urban areas and also in the service area of

Umgeni Water where yard connections are provided and costs are recovered by way of a connection fee and the balance (if any) is recovered through the normal tariff.

In the former homeland areas of Venda and Bophuthatswana, households were also previously offered yard connections. A connection fee was payable and as a consequence, many rural villages in these areas have legal yard connections.

Interviews with households in the case study villages confirmed experience recorded in the literature (DWAF, 1998; Mvula, 1996; van Schalkwyk, 1996) that many communities are dissatisfied with the inconvenience of fetching water from communal street tap systems.

4.4 Institutional arrangements

4.4.1 Institutions involved with water service delivery on the case studies

The existing institutional arrangements on the case studies is summarised in Table B3 (refer to Appendix B) and the institutional arrangements include Water Boards, TLC's and Water Committees. A description of the institutions generally involved with water service delivery is given below.

The water service provider is the organization which actually performs the task of water service delivery and includes maintenance, operation and management of the scheme. On the case studies (See Table B3: refer to Appendix B) this task was performed by :

- Water committees and other community based organizations (CBO) who are responsible for maintenance and management in virtually all the case study rural villages. This is mainly due to policy implemented through the RDP programme.

- Umgeni Water is delivering water service to a large number of villages in the Vulindlela area and the responsibilities include operation, maintenance and management of the schemes. A water board is also responsible for water service delivery in a case study village in the North West Province.

- Tribal authorities have significant influence in rural villages and assist water service delivery in several cases. The Tribal authorities are not directly responsible for water service delivery but generally assist with credit control, policy and management issues.

- DWAF, in view of its major involvement with community water supply, assists on most of the case study schemes, particularly in terms of purchase of diesel, operation and major repairs.

- Transitional Local Councils provide water service in all of the urban case studies.

From the case studies, it was found that in rural areas, the links with higher levels of authority (ie the link between the water service authority and water service provider) are weak or non existent. In urban areas, the TLC is usually both the water service provider and the water service authority, which makes the links automatic.

4.4.2 Overview of institutions generally involved with rural water service delivery

DWAF: District Office is responsible for the operation and maintenance of the large number of water supply schemes developed by the former homeland governments. DWAF structures include satellite offices developed by the former homeland governments in the various sub-districts to assist this task. A survey has revealed that the response time of the maintenance and repair teams is poor and repairs take months, and even years in some instances to complete. Revenue collection is at a low level, with frequent interruptions to water supply being offered as the main reason for non-payment.

Water service delivery is not one of the functions of DWAF, and the department has therefore initiated the process to transfer staff and water supply assets to local authorities.

District Councils. As the Water Services Authority, a district council has the statutory obligation to ensure that water services are provided to those within its area of jurisdiction. The area of jurisdiction of the district councils is extensive, for example, the Northern District Council has more than 92% of the villages of the Northern Province in its area. In order to provide services in such vast areas, the district council has to, for the sake of cost efficiency, establish relationships with locally based organizations who will provide water services. Certain district councils have limited capacity and facilities and have experienced difficulties to meet its obligations.

Tribal Authorities under the leadership of a chief command considerable influence in their chieftaincies and have considerable infrastructure in terms of offices, transport, communication and other facilities. The rural villages are located in the chieftaincies. The tribal authorities are maintained through a practice of hereditary leadership and have been the ruling authority of the inhabitants for many decades.

Tribal authorities are legal entities representing communities at the local and central government levels. These leaders play the most important role of running all community affairs, co-ordinating development activities and settling disputes among community members. Traditional leaders should be involved in needs identification and planning for all developments taking place in the community. In situations where the tribal authority does not actively get involved in the project, it is nevertheless

necessary to include the tribal authority as a stake holder. The Municipal Structures Act of 1998, makes provision for traditional leaders to attend and participate in any meeting of the council.

Transitional local or rural councils (TLC) and regional councils in Kwa-Zulu Natal consist of elected councillors. Many of such councillors have been found to have limited influence in many chieftaincies (DWAF, 1997). The TLC, during the first number of years after their establishment, had no or little infrastructure and received practically no income. Councillors are elected from their respective constituencies, who serve for the term of office, when they must either stand again for re-election or step down. Councillors are political representatives and have little capacity to undertake management, maintenance and operation of water supply schemes. Councillors are however offered various courses including courses related to water supply. This has created the perception with numerous councils that their involvement includes development, operation and maintenance of water supply schemes.

Councilors are elected from community members and therefore have direct communication links with their constituencies and also have links to higher levels of authority, ie with district councils for example. Councilors are therefore an important communication link to promote and initiate the development of water supply schemes.

Civic and development organizations. Virtually every village has one or more civic organizations which were established by interest and concerned groups, desirous of improving services within the community. Two of these, water committees and development forums, are especially aimed at improving water supply delivery. These organizations generally enthusiastically campaign for the funding and development of water supply schemes.

Water Committees were established in virtually all villages in the Northern Province during the past decade, mainly with own initiative and with very little government or other involvement. Links with higher levels of authority (WSA) are weak or non-existent. Water committee members are generally democratically elected and provide their services voluntarily. In many instances, water committees were responsible for initiating water supply developments and are then ultimately involved with the management of these schemes. Water Committees are locally based and are an important vehicle to facilitate cost effective operation and maintenance of water supply schemes. The case studies have shown that these organizations can effectively provide water services and therefore offer an important option to be considered by local government in its endeavors to ensure water service delivery.

Water Committees are also recognized in the Water Services Act, 1997 and can be delegated the responsibility of WSP. Water Service Committees is a body corporate body and has the powers of a natural person of full capacity.

The case studies showed that since Water Committees are at grass roots level, the committee will be aware of any problems and grievances within the community. The case studies confirm information from the literature that a strong committee leader and a high percentage of woman contribute greatly to the success of the committee (DWAF, 1997; Mvula, 1996). The committee members must receive training in the operation, maintenance and management of the scheme. Part of the management task must be to motivate the community to pay for the water they consume.

Residents associations/organizations. These structures, which are mainly constituted by the younger generation, have spearheaded several initiatives and urged the involvement of the government in addressing community development. Links with higher levels of authority (WSA) are weak or on-existent. In some cases residents organizations have been accused of overstepping the authority of traditional leaders. However, experience has shown that through proper consultation and negotiations, all leaders manage to cooperate in order to achieve proper implementation of the development projects.

Street or tap committees have been established in numerous villages where street tap water distribution systems have been developed and the flat rate tariff system applied. These committees are usually an extension of the Water Committees. The constituency of a street tap committee usually comprises the households which obtain their water supply from a particular tap. These constituencies are usually small (less than 30 households). Committee members are elected and have direct contact with each household in its constituency. The tap committee has as its main function to mind the tap in terms of maintenance and revenue collection. The street tap committee members usually perform their tasks voluntarily and report to the village Water Committee or other similar community based organization.

Water Board's main activity is the supply of bulk treated water to mostly urban communities, but in recent years also includes the distribution of water to individual households in rural communities. The boundaries of a water board are set by the Minister of Water Affairs and Forestry in terms of the National Water Act. Water Boards are non-profit organizations and are accountable to the Minister of Water Affairs and Forestry as defined in the National Water Act.

4.5 Cost recovery on the case study schemes

DWAF, Mvula Trust and others have the policy (DWAF, 1999; Mvula, 1997) that the user pays at least for the operation and maintenance of the water supply scheme when the water service is at RDP standard. The user is expected to pay the full cost, including capital costs, if the service is better than RDP level of service. Without cost recovery, it is not possible to provide the water service on a sustainable basis unless subsidized by government, which is contrary to the policy.

The case studies and other experience has shown that successful cost recovery can

be achieved, provided a combination of the following conditions and considerations are properly addressed:

- the level of service in terms of access, quantity, quality and reliability must meet the requirements of the user
- the service must be affordable and the user must be willing to pay for the service
- accessible pay points must be provided
- a credit control policy must be strictly enforced

On rural schemes, communal street tap systems are commonly found, but research (van Schalkwyk, 1996) has shown that communities having a moderate to high level of living, strongly object to communal tap systems and are thus likely to install unauthorized yard connections and avoid payment for services.

The flat rate tariff is generally acceptable and applicable where the communal street tap level of service is accepted by the community. This tariff system is easy to apply and involves rudimentary and low cost administrative and bookkeeping systems. The flat rate does however encourage wastage of water, particularly where higher levels of service, ie yard connections, are provided.

Payments are usually made monthly at the Water Committee or Tribal Authority office.

In a limited number of cases, the monthly tariff is collected from each household by a member of the water committee (see Table B4 : Appendix B).

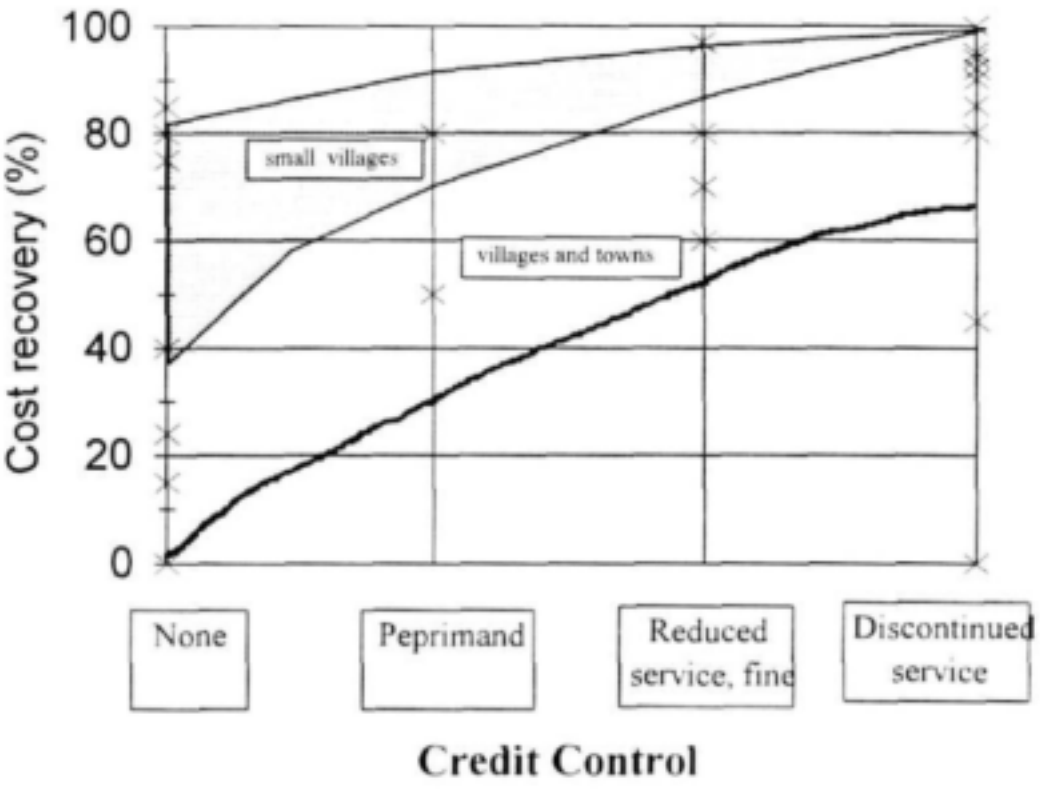
In the urban areas, accounts are usually posted or hand delivered and payments can be made at several conveniently located pay-points in the urban area.

Pre-payment systems are used on a limited number of cases. These systems are in their early development stage and require several improvements. A detailed discussion is presented in Section 5 of this document.

A strictly enforced credit control policy is required to ensure payment for the service offered. The case studies show that the firmer the disciplinary action, the more effective the cost recovery (see Figure 2).

The disciplinary action ranges from a reprimand, to fines and discontinuation of the water service (see Table B4 : Appendix B).

The case studies suggest that a reprimand is only effective in small, remote villages which has a high degree of community cohesion. In general, the credit control action should be firmer than imposing a fine or reduced service. The strictest actions involve denial of access to the water service.



WCM	IMPACT OF DISCIPLINARY ACTION ON LEVEL OF COST RECOVERY	FIG 2

5. DISCUSSION OF INSTITUTIONAL ARRANGEMENTS

5.1 Water Service Structures

5.1.1 Introduction

- Water Service Authority.
- Water Service Provider.

A water service authority is the local government structure that has the duty to ensure access to water services in a specific area and therefore has mainly a regulatory and monitoring function. The Local Government Transition Act, 1993, stipulates that the local government structure may be a district/regional council, a regional services council, a rural council, a local council or a metropolitan council. In the rural areas, as occurs on the case studies, it will generally be a district council (known as a regional council in KwaZulu-Natal).

A water services provider is the structure that actually provides the water services to the consumer or other water services institutions. The water services provider may be the water services authority itself or it may be another water services authority, water board, a water committee or a private company. In the case studies in the rural areas, water committees are generally the water service providers. Umgeni Water Board has taken on this function in parts of KwaZulu Natal, however using local people to undertake water service delivery at village level.

5.1.2 Water Service Authority (WSA)

The range of responsibilities of the Water Service Authority (WSA) includes:

- Communicating with the community and representing the interests of the consumer. Where a district council is the WSA, TLC councilors have the vital role of assisting communications between the community based WSP and the district council, especially to initiate new water projects.

- Preparation of a water services development plan, which sets out the way in which water services will be provided. Consultants or support service agents are usually required to assist with this task.

- Contracting Water Services Providers (WSP) in terms of bulk water and retail water distribution, if the WSA is a separate organization to the WSP.

- Contracting Support Services Agents (SSA).

- Regulatory responsibilities in terms of preparation of bylaws, regulating WSP through supportive actions as well as punitive action where necessary.

The role of district councils in terms of actual water service delivery in the case studies, has in general been minimal particularly in the rural areas. Limited interaction is reported in the literature (Dreyer, 1999; Mvula, 1996). Several of the district councils have however been especially active in terms of implementing new schemes.

Links between the WSA (generally district councils) and the WSP (generally a water committee) on rural schemes are weak and not visible. The WSP have nevertheless in several cases (refer to case studies) without involvement of supportive or regulating organizations provided a sustainable water service. The active involvement of the WSA is therefore not considered to be a determining factor for sustainable water service delivery.

In the urban areas, the WSA and WSP are generally the same organization.

5.1.3 Water Service Provider (WSP)

A water service provider is the structure that actually provides the water services to a consumer or other water services institution. A WSP could be responsible to deliver bulk water service and/or retail water service.

The activities of the water service provider includes:

- Governance
- Administration
- Finance
- Planning
- Project development
- Customer relations
- Operations

These activities may be performed by an organization or even a single person depending on the scale of the supply area.

The selection of the WSP, especially in the rural areas, for each village or settlement, is a key decision. There are a number of options ranging from the appointment of separate community based services providers for each settlement or groups of settlements to the appointment of a large organization to provide services for a whole area.

Issues which need to be considered in selecting the most appropriate option include:

- Cost efficiency and effective execution of responsibilities.

- The WSP should preferably be close to the customers to ensure cost effectiveness and to promote demand driven bottom up approach to water service provision. This points to the use of a community based WSP as indeed occurs in practically all the case studies.

- Bulk water service delivery requires a high level of expertise. Many communities lack the capacity to undertake such specialist tasks. The expertise is available in a water board. Water boards are however likely to be reluctant to take on the full WSP role including retail water service as it may expose the water board to substantial risk. The Umgeni Water is however currently successfully fulfilling the WSP role in the Vulindlela area of KwaZulu-Natal which serves 200 000 residents scattered in an area of 260 km^2. The cost of water service delivery to this group is however < 1% of its total operating cost.

- Private companies have proved to be cost effective particularly where certain

tasks have been contracted. Vendors indeed operate as private concerns in a large percentage of villages throughout South Africa, many of which however charge extortionist rates for the service.

- The case studies and literature reveal that for rural local schemes, community based organizations are the most often selected. Specialist input and services are obtained, when required, from contractors, suppliers, consultants and NGO's. Umgeni Water, as mentioned above, provides water service to rural communities, but utilize locals in branch offices in the various settlements. Umgeni Water's experience showed that utilizing intermediary WSPs, such as a regional council, was not successful.

  Community based organizations who act as WSP in most instances do not have strong links with higher levels of authority, ie with the WSA. The Water Services Act, 1998, envisages this link to be with the district council, if it is the WSA. In the case studies, this link is not direct and weak.

5.2 Requirements of Acts, Bills and Regulations

Before 1994, no national institution was responsible for ensuring equitable and sustainable access to water supply service and no structured national legislation existed which regulated the provision of this service. The enactment of the constitution, the election of democratic local government together with policies outlined in the White Paper on Water Supply and Sanitation (DWAF, 1994; DWAF, 1997) and in the Framework for Water Services (1997), made it possible to provide a constitutional and legal framework within which the water supply service could be provided and regulated.

The building and establishment of institutional structures is therefore governed by several Acts, bills and regulations and include the Local Government Act, the Water services Act, the Municipal Structures Bill (1998), the National Water Act.

5.2.1 The constitution states that:

- The three spheres of government must take reasonable legislative and other measures, within its resources, to achieve the progressive realization of the right to an environment not harmful to health or well-being as guaranteed to everyone by the constitution.

- One of the objectives of local government is to ensure the provision of services, including water services, to communities in a sustainable manner.

- The different spheres of government must support each other in a spirit of co-operative government.

- National and Provincial Government must, by legislative and other measures, support and strengthen the capacity of local government to manage their own affairs, to exercise their powers and to perform their functions.

5.2.2 Local Government Act

The Local Government Act provides for the establishment of local government structures throughout South Africa. The Act makes provision for two levels of local government in rural areas: district and rural or representative councils.

District councils currently have executive responsibility for service provision and these powers have in general not been delegated to rural or representative councils.

The Local Government Act requires that all local authorities prepare an integrated development plan. These plans amongst other things, outline the provision of services to all residents in the areas of concern.

5.2.3 The Water Services Act

The Water Services Act was promulgated at the end of 1997. The Act regulates the way in which water services are to be provided. Some main issues of the Act are:

- The identification of a Water Services Authority (WSA) which has the statutory responsibility to ensure that water services are provided. In the rural areas, the district councils are usually the WSA.

- The identification of a Water Service Provider (WSP) which is responsible for providing the service. In the case studies, water committees are acting as WSP but generally have no formal agreement with the WSA.

- The Act provides for the establishment of Water Boards and statutory water services committees. Water Boards generally provide bulk water services, but the Umgeni Water Board in KwaZulu Natal in particular also distributes water to rural villages.

Some of the objects of the Act are to:

- Set out the rights and duties of those who provide services, and those of consumers.

- Allow the Minister of Water Affairs and Forestry to set national standards to ensure enough continuous, affordable and equitable water services.

- Promote, support and strengthen the capacity and authority of local government, while creating mechanisms that will allow the provincial and

national government as well as consumers to monitor its performance.

- Regulate contracts for the provision of services to promote the fair and transparent provision thereof.

5.2.4 Municipal Structures Act, 1998

The Municipal Structures Act, 1998, defines the institutional and political systems of municipalities. The act also regulates the powers and functions of municipalities.

At present the transitional local councils in general comprise of elected councilors only, with little or no support facilities such as staff, income and offices. Councilors in the Northern Province have however received introductory courses to water supply and certain individual councilors have proved to be champions for the initiation of water supply schemes.

5.2.5 Municipal Systems Bill, 1999

The Municipal Systems Bill focuses on internal administrative functions of municipalities including human resources, labour relations, financial reporting and development planning. The Bill establishes a simple and enabling framework for the core process of planning, performance management, resource mobilization and organizational change.
A municipality has a separate legal personality consisting of governing structures and administrative functionaries. A municipality needs to promote public participation which leads to appropriate affordable service provision. Bylaws are introduced by council members and defines the rules according to which services are provided.

Each municipality needs to develop an integrated development plan and it must contain the water services plan as required by the Water Services Act, 1997.

5.2.6 The National Water Act, 1998

The National Water Act aims to regulate water use to ensure equitable and sustainable use of available resources.

In terms of water service delivery, the act is particularly applicable to the use of water, the protection of water resources, water use charges and reporting.

From the case studies, it is evident that the National Water Act at present in general has little impact on water service delivery in rural areas.

5.2.7 Policies and guidelines

Several policy documents and guidelines have been drafted by DWAF and NGO's

which regulate and guide water service delivery in terms of institutional structures, procedures and standards. Documents of particular interest include:

- White paper on water supply policy, DWAF, November 1994.
- White paper on a national water policy for South Africa, DWAF, April 1997.
- Guidelines for community managed water and sanitation services, Mvula Trust, November 1997.

Several other guidelines are listed in the references.

The principles on which the policies are based are as follows:

- Development should be demand driven and community based.
- Basic services are a human right.
- Some for all, rather than all for some.
- Equitable regional allocation of development resources.
- Water has an economic value.
- The user pays.
- Integrated development.
- Environmental integrity.

Compliance with the policies and guidelines are usually enforced in the implementation of water supply schemes.

6. TRAINING AND CAPACITY BUILDING

6.1 Review of training offered

Training is offered by a large number of institutions including the National Community Water and Sanitation Training Institute (NCWSTI) and other educational institutions, water boards, metropolitan councils, technical training institutions, NGOs and consultants.

An extensive suite of training modules have been developed to meet the training needs and those include:

- Financial management
- Health and hygiene
- Project management
- Technical training - construction
- Operation and maintenance
- Administration

Numerous other modules are also offered by the organizations mentioned. Details of

the training offered is given in appendix C. Several of the organizations have specially constructed training centres or mobile units with examples of specific components of water supply works which are used as teaching aids.

It is however recognized that successful training programmes need to be flexible services which address the unique circumstances and needs of the target group or community (Mvula, 1997). The development of this type of programme can only be achieved if it is based upon a sound needs assessment. Many rural communities already have people with technical skills on which further training can build. General human resources information such as literacy levels among community members will prove essential in the design of the training programme.

Training modules have also been developed to train trainers and to assist the large number of councilors who have been elected in political positions and who amongst other things need to address their constituency's water service needs.

Training should not be seen as a once off exercise but a long term commitment. The case studies revealed that certain community members who have received training have found jobs in major centres and thus need to be replaced by another member who will need training again. Members who remain in the community need "refresher" courses. It was found that this applies particularly to the less developed villages with limited capacity.

It is generally members of the water committees or PSC who receive training. Construction workers are also given relevant training however its use is of limited value as employment is usually only available until construction is complete.

Staff are required to operate pumps, particularly diesel engines on borehole schemes, for maintenance, revenue collection, administration in terms of procurement of spares and fuel, and cash handling, and to manage the scheme in terms of staff appointments, customer relations and enforcing discipline.

Operation and maintenance training was provided to selected team members who would be responsible for the long term operation and maintenance of mechanical and electrical equipment.

The case studies revealed that generally no permanent staff are employed where community based organizations deliver the water service (see Table B5 : Appendix B). Voluntary members, usually from the water committees, deliver the water service. In several cases, pump operators are seconded from, and paid by DWAF.

Committee members provide their services free of charge as this limits costs and reduces the tariff. This burden is becoming unacceptable to members who are increasingly demanding payment for work done.

6.2 Training needs on the case study schemes

The following was found on the case study schemes with regards to their training needs:

- Nine of the schemes indicated that a need exists for follow-up training in particularly three areas i.e. health, technical and administration.
- Five of the schemes indicated the need for follow-up training in the technical and administrative categories.
- Thirteen schemes (about 40%) did not indicate a need for follow-up training. Of these 13 schemes, 5 are managed by TLC's.

6.3 Principles underpinning training and capacity building

- ***Health promotion***

  Hygiene awareness promotion focuses on creating the enabling and supportive environment that people need to make critical choices for health. These include health resources such as clinics, medical personnel and medicines as well as socio-economic resources such as education, water and food supply. In essence, water and sanitation form part of a primary health care agenda. For this reason issues related to water and sanitation (including health promotion through improved access to health resources) should not be dealt with in isolation of this principle.

- ***Client-centered***

  Capacity building and training programmes need to be client-centred. The participants of the training need to be involved in determining critical skill areas, contributing to the design of the training programme, setting out the roles and responsibilities of the different parties and in deciding on evaluation criteria.

- ***Local skills and resources***

  Learning should be problem-centred and build on the experience, skills and local resources of participants. Cognisance must also be taken of existing projects and programmes (e.g. the Rural Administration Infrastructural Development programme [RAID]) within the area.

- ***Sustainable***

  Local capacity is required to manage, maintain and pay for services, without depending on continuing external support. The capacity building programme must be targeted at empowering participants to manage their affairs, solve problems and be involved in decisions to ensure water schemes will be sustained and will secure an enabling environment for health. In addition, it will be necessary to emphasise payment for use and cost recovery aspects and formalise agreement/acceptance of cost scenarios at individual household level.

- ***Participatory***

  Project implementation should be rooted in the realities of each community and include the promotion of the need for community participation during all phases of the project cycle. This will require that community groups and committees should not be seen as the ultimate target, but should be viewed as the vehicle to promote supportive attitudes and informed decision-making at individual household level. For this reason, it is required that needs are determined at an early stage in the project and should be used as the basis for decisions during the planning, design and implementation stages of project implementation.

- ***Cost-effective***

  Capacity building and training activities shall be undertaken in such a way that they are cost effective and provide best value for money. The value of training may be measured by the increase in skills, knowledge and understanding of the participants.

- ***Goal specific***

  The capacity building and training programme needs to be directly linked to immediate application, and need not be undertaken in isolation from capital development or rehabilitation of water and sanitation infrastructure. Specific local training objectives need to be determined appropriate to the needs of the community and also to the requirements of particular water and sanitation schemes. This will include an evaluation of what is being undertaken within the broader geographic area (e.g. district) and linking local training into this broader context.

- ***Income generating***

  Water infrastructure projects and programmes should maximise opportunities for local benefit through employment creation and income generation as part of the project itself, as well as leaving behind a skills base that will promote income generating activities in the medium to long term.

The potential for further involvement at the village is also limited and the trainee needs to leave the village for continued employment and further development. A process of involving selected trainees on several projects in an area needs to be considered to assist increased exposure and capacity building.

From the above, it is evident that training should not be seen as a once off exercise, but a long term commitment. Community members that have received training find jobs in major centres and have to be replaced by another member who will need training again. Members who remain in the community need "refresher" courses. It was also found that this applies particularly to the less developed villages with limited capacity.

Organisations need to be identified which would provide on-going support on especially the technical and administrative level. These organisations must be known to the managers of the schemes so as to eliminate communication gaps.

After training has been completed, the trainees must be able to refer to their mentors for help with any problem they experience.

A trouble shooting manual could be made available on all schemes. Problems, the possible cause of a problem and the relevant solution to the problem, could be included in the manual.

7. DISCUSSION OF SUPPORT FACILITIES REQUIRED

Support facilities are required by the WSP to effectively and efficiently provide the water service. Support facilities include revenue collection systems, staff, communication hardware, transport, office space, stores, tools and equipment.

7.1 Assessment of revenue collection

7.1.1 Introduction

Funds are required to cover costs associated with the operation and maintenance of the scheme, to effect major repairs and pay staff salaries.

Where the community is involved in the process of setting the tariff, a high level of revenue collection can be achieved. The tariff must be seen as fair in relation to the service offered and affordable by the community.

A summary of issues related to revenue collection as found on the case study schemes, is given in Table B4 (see appendix B).

Revenue collection is dependant on the level and type of water service that is provided. In rural villages a flat rate collected monthly by a water committee was the most commonly used method of revenue collection. In urban areas with metered connections, monthly accounts are send out and payment is then received within a specified time. The pre-paid meter is available in the form of a standpipe or a house connection.

Pre-payment for water services was introduced in about 1997.

7.1.2 Water service tariffs

The Water Services Act, 1997, provides for the development of norms and standards for the determination of tariffs for water services. Tariffs aim to generate revenue for the WSP, allocate costs for providing that service and limit the wasteful use of scarce resources.

Tariffs are important tools of ensuring social equity, financial viability and

environmental sustainability.

A water service authority, when determining the appropriate tariff for the water service, needs to take into account:

- Recovery of overhead, operational and maintenance costs.
- Recovery of the cost of capital, other than the capital required to provide basic water needs.
- Reasonable provision for deprecation of assets.

The tariff should be structured in a manner to assist access to at least 25ℓ/c/d. The concept of rising block tariffs has therefore been promoted as the norm for the country. With rising block tariffs, the per-unit price of water increases with consumption.

A flat rate charge for water used is generally applied in rural communities, which only have rudimentary street tap water distribution systems. Such communities are limited by the infrastructure to use less than 10kℓ/month/household, ie less than about 35ℓ/c/d.

Certain households located furthest from the communal taps consider the flat rate system to be unreasonable, since households located closest to the taps are viewed to have improved access and thus use more water.

Pre-paid and controlled volume systems may address this problem and is discussed below.

7.1.3 Payment for water service

Numerous cost recovery systems and methods to achieve cost recovery are in use and include combinations of four main groupings, viz. pre-paid or post-paid and flat rate or use rate. The options are summarized in Table 1 below and include :

- **Flat rate recovery from unattended metered or un-metered public stand pipes** usually open 24 hours a day.
- **Attended water kiosks and metered public stand pipes** usually scheduled to be open for limited times during the day.
- **Individual household metered connections.**
- **Privately operated (dedicated) metered shared stand pipes.**
- **Household distributed storage regulating units (CSIR) prepaid flat rate cost recovery.**

- **Community coupon operated water dispensers (CSIR).**

TABLE 1 : SUMMARY OF COST RECOVERY OPTIONS

Payment system	Cost recovery option
Post payment	

- Flat rate	• Communal street tap
	  • uncontrolled volume
	  • controlled (metered) volume
	• Storage regulating unit (CSIR)

- Use rate (Metered water use)	• Communal street tap (attended kiosk) • Privately operated metered shared yard connection • Metered yard connections
Pre-payment	
- Use rate (metered water use)	• Coupon operated water dispensers (CSIR) • Manually filled household storage tanks • Mechanical bulk water dispensers • Mechanical shared stand pipe water dispenser • Electronic shared stand pipe water dispenser • Electronic yard tap water dispensers

Pre-paid water meters

In 1997 the CSIR undertook a survey for DWAF on implementing prepayment water metering systems. A summary of the findings of this survey is given below.

The following types of systems were investigated:

- Hand-held meter reading route planner, recorder, data processor with field billing option.
- Manually filled household distributed storage tanks.
- Automatically filled regulated household distributed storage tanks.
- Mechanically operated coupon activated vending units.
- Electronically operated prepayment systems.
- PC based water utility management systems.

Practical experience on pre-paid systems

Two systems are generally being used in South Africa, viz. Aquanova (standpipe) and Bambamanzi (standpipe and yard connection). These systems have been installed extensively throughout South Africa. The development of these systems is however still in its infancy and is experiencing teething problems. The project team found after close liaison with the suppliers, that considerable research and development is

required to improve the situation.

Key issues which need to be considered and addressed when pre-paid systems are suggested for installation include :

- The community must accept the system and the service which is being offered. This is independent of the type of system to be installed.
- A competent person to do maintenance on the system is essential.
- If another water source is available to the water user, then the participation in the pre-paid system is not 100%. This can have a severe effect on the cost recovery, as fewer consumers will contribute to the maintenance of the prepaid system.
- After sales support, which at this stage requires considerable improvement.
- The capital cost of installing prepaid meters is high (R700/meter excl installation) and it must be questioned whether the capital cost can be recovered taking into account the low volumes of water consumed.
- The computer systems of the different suppliers vary and some improvements could be made.
- One TLC noted that they would in future expect the supplier to install and commission new installations.
- Points where tokens can be re-loaded with credit must be easily accessible.

Two case studies where prepaid meters were installed are described below to provide an insight to current experience.

- ***Brits TLC - Bambamanzi***. Both the pre-paid standpipe and pre-paid household connections from Bambamanzi were installed in the Brits TLC area during the last few years. At the time of the site visit (1998) none of the standpipes were working due to vandalism. A township with household connections was visited and the meters inspected were in working order and the consumers were satisfied.

  Bambamanzi prepaid system consist of a computer program for managing the system, a mostly plastic token for loading credits to be used with the meters and a token reader to link the token to the management system.

  The system is managed and maintained by the TLC. The computer system is seen as very sophisticated but user "unfriendly".

Every meter has to be "married" with a token before installation and it causes delays of up to 3 months.

Consumers can currently only pay for credits at the TLC offices and this is not convenient for al the consumers.

Extensive community participation meetings were held before the installation of the prepaid meters. In general the consumers supplied with the household connections are satisfied with the system.

The capital investment of the pre-paid household connection is high, ±R700/meter excluding installation cost and the TLC is therefore reconsidering conventional household connections.

- ***Mothipistad - Aquanova***. This system consist of the prepaid standpipes activated by using a metal token.

  The prepaid system was installed as part of a RDP project as the only means of delivering water to the community. Although no consultation took place, the system has been accepted. Bulk water is drawn from a borehole equipped with an electrically driven pump.

  A water committee, now consisting of only two members (one male and one female), is responsible for the system. The female committee member (treasurer) is responsible for selling the tokens and the male member for the maintenance of the system. Specialized maintenance is however required which is provided by a contractor at R10/meter.

  Although the computer system is relatively simple to use, the consultants who were responsible for upgrading the system are still managing the software side of the system as nobody in the community is able to do so. They will continue to do so on an ad hoc basis.

  Some residents have private boreholes and thus only some 200 of the 400 households in the village, have bought tokens. The cost per kl to ensure full cost recovery is therefore high.

  The Committee has been working voluntarily but members are now insisting on payment of R200/month. This payment was approved by the Tribal Authority but this is not feasible as the income from water sales per month is only about R400/month.

7.1.4 Conditions which promote improved cost recovery

Successful cost recovery depends greatly on the willingness of consumers to pay for the water they use. Communities will pay for the water service when it is perceived that:

- The price of the water delivered is **equitable.** Equitable pricing means paying the same price per kilolitre of water consumed as do other consumers with the same level of service, but paying less per kilolitre as the level of service drops. (DWAF, 1999)

- The level of service is **adequate** and **reliable.** Adequate does not have an absolute definition but its meaning is influenced by the consumers expectation in terms of ease of access and convenience. Reliable means that the operation and maintenance of the scheme must be effective, and therefore interruptions to the water service are minimized.

Few communities are satisfied with communal street tap level of service and desire yard connections (DWAF, 1998; van Schalkwyk, 1996). Although essentially all schemes developed in recent years occurred with intensive community participation, the level of service selected by the communities in virtually all cases was communal street tap systems. Communities are unable or unwilling to raise the capital required for the higher level of service. Once the schemes were commissioned, the communities expressed their dissatisfaction through non payment, unauthorized connections and vandalism.

Umgeni Water have through experience and in view of the above decided that the minimum level of service provided should be a metered yard connection (Sirenya, 1998).

Creative and innovative billing. The account must show the amount of water used and the charge and should preferably be in the appropriate official language (DWAF, 1997; Macleod, 1997). The National Water supply Regulations state that water meters should be read at least 12 times per year (Government Gazette, 1998).

Payment of accounts. Pay points should be conveniently located and consideration can be given to utilizing post offices and pension pay-out offices (DWAF, 1997). In rural areas, particularly on regional schemes, the pay point should be within easy walking distance. Consideration can be given to making the due date for payment of accounts coincide with pension payout dates.

Interruptions to the water service. The National Water Supply Regulations stipulates that leaks and breakdowns in the water service should be dealt with within 48 hours. The case studies show that repairs of equipment usually takes weeks and in some cases months. The long interruption to the service is unacceptable to the

water user and results in non payment.

7.1.5 Credit Control

A large percentage of the population has developed what is generally known as a culture of non payment for services. This needs to be reversed if water service delivery is to be sustainable. Payment for water service is also required by various acts, regulations and policies.

Naturally however, a customer is only likely to pay for a water service if it is perceived to offer value for money (DWAF, 1997). Every effort should therefore be made to eliminate reasons not to pay for water delivered. Issues of particular concern include adequate and affordable water service. Community participation is particularly important in the selection of the level of service and the tariff.

Where consumers have persisted to avoid payment for the water service received, disciplinary action must be taken (DWAF, 1997).

In all the case studies where a high level of cost recovery is achieved, credit control is strictly enforced and disciplinary action taken when necessary. Disciplinary action applied in rural areas is often based on peer pressure or reprimand by the tribal authorities. Water supply is also in some instances discontinued (Macleod, 1997)(see also Table B4, Appendix B). In urban areas, the water service is in general restricted or discontinued. The necessary warning before action is taken is necessary as required by the Water Services Act, 1997.

It is recognized that there are impoverished households who do not have the means to afford even the basic level of water supply. In many rural villages, these special cases are accommodated by the tribal authorities or other local structures. The equity fund has also been established to ensure access to adequate water service to all South Africans.

7.2 General support facilities

Support facilities such as communication hardware, transport, billing system, office space, stores and spares are required to ensure proper functioning of the Water Service Provider.

Without proper support facilities, it is not possible to properly operate, maintain and manage water service delivery systems. Without these facilities, it will thus not be possible to provide a proper water service and achieve cost recovery.

The support facilities include communication such as telephones and two-way radios, transport in the form of light delivery vehicles, billing system including computer software and hardware, office space, stores, workshops and a range of commonly

used spares and other equipment.

7.3 Maintenance and repairs

A proper maintenance and repair programme needs to be put in place to ensure that a proper water service is provided at all times.

The maintenance and repair on most rural water supply schemes is currently being undertaken by DWAF personnel located at satellite maintenance camps. Shortcomings of the maintenance and repair programme occur and the service offered is in most cases poor as is reflected by the unacceptably long time required to effect repairs on the case study schemes.

The maintenance and repair programme should also include the replacement of equipment which has a limited life span.

8. SUPPORT SERVICES

Support services include a variety of activities which are required to assist small WSPs to undertake their responsibilities properly. This includes amongst other things mentoring, major maintenance and repairs, and purchasing of materials.

These activities are part of the normal range of water services provider activities but may be contracted out to others under service contracts. The organization contracted to undertake support services is known as the support services agent.

These services could be contracted out as a package for the whole district council area, either to a water board or to a private company.

Alternatively the support services work could be divided into separate packages of work, based on a geographic or activity split. For example, the mentoring activities which are more suited to consultants or NGOs, could be contracted separately, possibly on a zone by zone basis. Major maintenance activities, which are better suited to engineering contractors, could be contracted out separately, possibly with the best arrangement being to do this for the whole district.

Bulk purchasing is a difficult activity to contract out separately and may need to be maintained as an 'in house' activity.

The form of the contract will depend on the work package. For example, a mentoring contract could be written on the basis of a time commitment to each WSP. However, it is important for incentives to be built into the contracts, and a time based component could be combined with a percentage based component, which may be related to the extent to which the WSP is performing well.

Major maintenance contracts could be structured on the basis of a schedule of items. For example, an item could be the overhaul of a specified diesel engine. Incentives would also need to be incorporated, particularly to reward contractors for quick responses.

On small water supply schemes in villages which have small populations, only basic operation and maintenance is done by members of the community. Specialist repair services are required to assist these communities with repairs as these occur. Even on large schemes, where TLC staff is responsible for maintenance of the system, specialist repair services are sometimes required due to a lack of capacity with in the TLC. It is also more cost effective for the TLC to call out a specialist as and when required, rather than employing such a specialist full time.

The support services agent, in view of his though knowledge of an area, and continued involvement with WSP and the communities, could also most effectively undertake certain of the tasks of the WSA viz :

- preparation of the water services development plan
- reporting

9. TOWARDS ACHIEVING SUSTAINABLE WATER SERVICE DELIVERY

9.1 Focus on the needs of the customer

9.1.1 Overview of the water user

The primary consideration is to **focus on meeting the needs of the water user**, particular since payment for the water service is expected, and indeed necessary, to ensure sustainability.

It is for this reason that **community involvement and participation** is essential through all stages of the project cycle to ensure that misunderstandings do not occur.

A thorough awareness programme needs to be undertaken to ensure that households, fully understand and appreciate the cost implications of the choice of the water service made.

In order to properly address the needs of the water user and to establish effective and efficient water service institutions together with its support facilities and support services, it is necessary to **understand the rural environment**.

Rural communities vary in their level of development and this influences level of water service required, ability and willingness to pay for the service and capacity to operate, maintain and manage their water supply scheme.

Categorization of villages and communities is therefore necessary particularly during the planning stage of the project to establish the level of development, value

orientation, approximate water need, and therefore also the level of service required.

Rural communities are classified as follows and have the following characteristics:

- **Rural (level of living index 1)**
  - **Population** <2 500.
  - **Dwellings** mainly constructed of cement blocks with flat roofs. Traditional materials used in some cases.
  - Large stands.
  - Significant **agricultural activity** with extensive cattle ownership.
  - Travel time to urban centre exceeds 2½ hours.
  - **Street tap** level of service acceptable
  - Water needs about 25l/c/d.

- **Advanced Rural (level of living index 2)**

  - **Population** 2 500 to 6 000.
  - **Dwellings** mostly constructed of painted cement blocks with flat roofs.
  - Moderate to limited **agricultural activity**.
  - Travel time to urban centre about 1½ hours.
  - **Yard connections** required.
  - Water needs about 65l/c/d.

The level of service required by the water user, which needs to be confirmed with the water user during the early planning stage of the project, is related to the development level (level of living) of the household or community (Van Schalkwyk, 1995) as shown in figure 1 (see chapter 2 of this document).

Community involvement and participation is necessary to establish the level of service required by the community and for which it is able and willing to pay. DWAF's current policy of providing capital to develop communal street tap level of service, and the requirement for the community to in advance provide the capital for higher levels of service, has resulted in virtually all communities "selecting" communal street tap level of service. From Figure 1 (see chapter 2), it is evident that a significant percentage of communities would require a level of service of at least yard connection.

To avoid vandalism, unauthorized connections and non payment of services, it is therefore necessary to offer individual households the choice of a yard connection, with the payment of a connection fee.

Reticulation in the village therefore needs to be designed to accommodate a mixed level of service.

Handpumps and other rudimentary water distribution systems are only appropriate to remote small villages having a low level of development. Where these systems are used in higher developed communities, they can only be considered to be a temporary measure in an emergency situation.

The reverse to the above situation also holds true. It will be a waste of limited funds to provide a sophisticated water distribution system to communities having a low level of development. Capital costs for higher levels of service are considerably higher and a considerably higher level of expertise and increased tariffs are required to operate, maintain and manage such schemes.

9.2 Appropriate Institutional Arrangements

9.2.1 Selection of the WSA

It is government's intention that water service provision be a local government function. This responsibility is delegated to the second tier of local government by the provincial government. The responsibility to ensure that water services are provided therefore usually lies with district councils or regional councils in KwaZulu-Natal. These responsibilities comprise mainly regulatory and controlling functions. Funding for water supply schemes has also partly been channeled through district councils.

Communication between the water user and higher levels of authority, such as district councils, can best be undertaken by TLC councilors. The councilors are close to the communities, but also have direct links with higher levels of authority.

Certain tasks of the WSA, such as preparation of water services development plans and reporting, may be more cost effectively and efficiently undertaken by consultants (or the SSAs) who have an intimate knowledge of the area and are in continuous contact with the communities.

In instances where the third tier of local government, i.e. transitional local councils or transitional rural councils (representative councils in KwaZulu-Natal), have the necessary capacity, the responsibility to ensure water service provision may be delegated to these structures. This situation is occurring in numerous urban centres.

9.2.2 Factors to consider in the selection of the Water Service Provider

In order to adequately meet the community's water supply needs, the water service provided must be sustainable.

Sustainability in the context of water supply service delivery implies that the water is available to the consumer for the period for which it was designed in the same

quantity and at the some quality as it was designed (DWAF, 1998).

A well managed, motivated team having appropriate skills is required to operate and maintain the water supply infrastructure and to administer water service delivery.

The choice of organizational options suitable for the efficient, effective and sustainable management, operation, administration and maintenance of water supply schemes is influenced by:

- Need for cost effectiveness.
- Financial and credit control arrangements.
- Human resources.
- Performance efficiency .
- Practical grouping of schemes.
- Political considerations.

These factors are a function of the physical characteristics of the area, type and extent of the water supply scheme, number of people serviced and the level of service, remoteness of the water user group, land tenure and other political and institutional demarcations.

Type and extent of water supply scheme. Water supply schemes may be characterised as local schemes or large scale bulk services schemes. Local schemes usually comprise simple arrangements of water source, bulk water pipeline, reservoir and reticulation and in most cases services only one village. Large scale bulk water service schemes may cover vast areas serving numerous villages and include sophisticated bulk water supply infrastructure.

Cost effectiveness is essential to ensure the appropriate water service at least cost. Studies and research have shown that in order to achieve cost effective provision of a water service, it is necessary to:

- Undertake operation, maintenance, administration of village water supply service at village level.
- Use village based organizations.
- Employ local people.
- Where possible, use part time personnel with commensurate salaries.
- Contract specialist services or tasks as required.

Grouping of schemes may be necessary to achieve sustainable service where there is a lack of capacity, or where there are legal or other jurisdictional factors. Umgeni Water for example has grouped a large number of settlements and villages numbering some 200 000 people and is the WSP to this area. Many rural areas are likely to be included in the area of jurisdiction of urban TLCs with the new demarcation. This situation already occurs, for example, Kutama/Sinthumule rural

area in the Northern Province is included in the Louis Trichardt TLC. In such cases, the WSP responsibility for the area as a whole may be assumed by the urban TLC. The research has however shown that it will be necessary for the WSP to establish branch offices at village level.

Political considerations are essential to fully utilize the strengths, but to also find solutions to the constraining influences, of the various political, cultural and social structures. The involvement of these structures in the WSP - consumer link needs to be recognized and accommodated.

Tribal authorities evolved over decades and have a large support base and influence in may areas. Tribal authorities are mainly involved with cultural and social issues, but have been effectively used in certain areas to enforce disciplinary action against non payment for service. In such cases, tribal authorities assist and support water committees or other community based water service provider organizations.

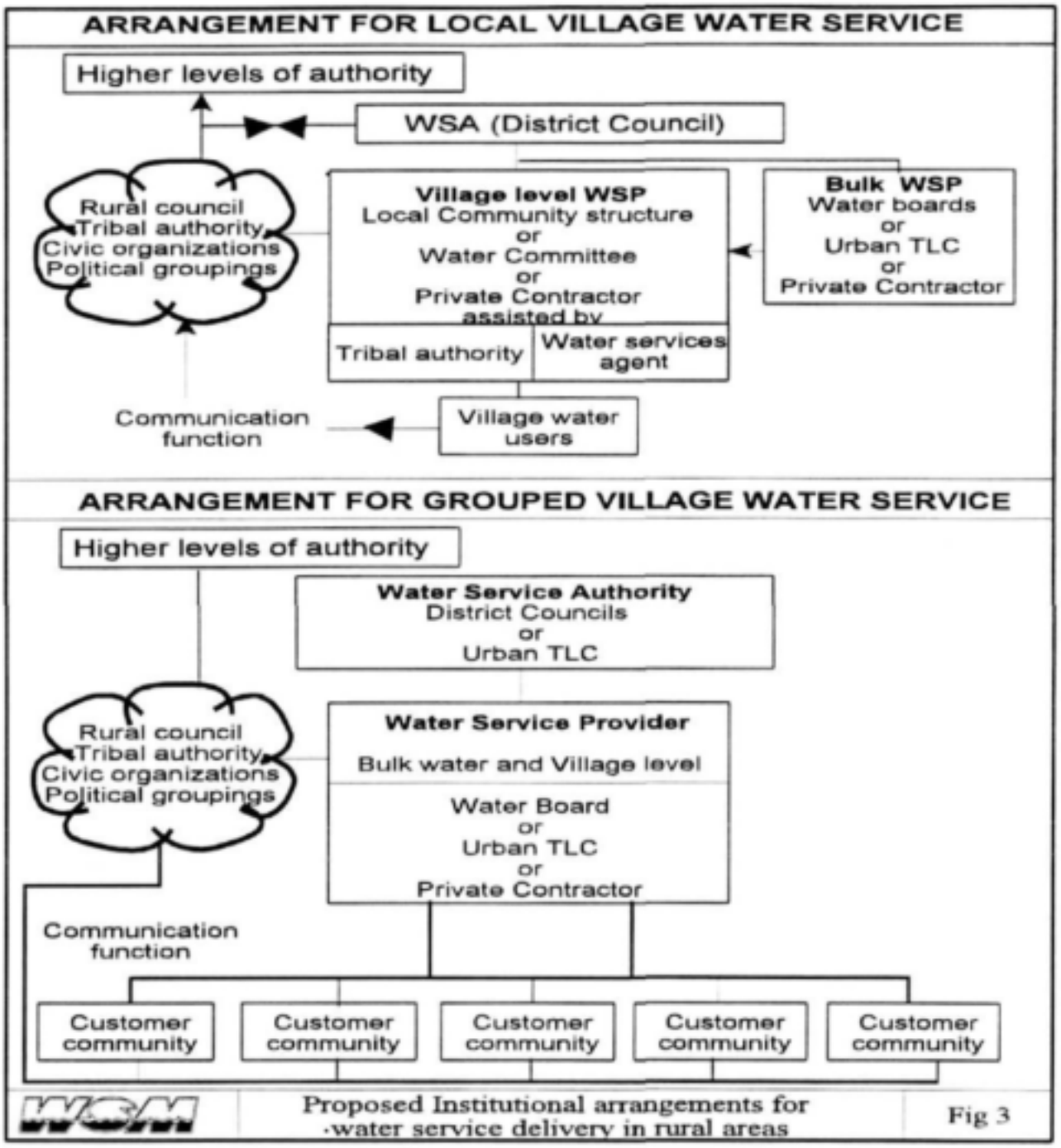
Civic and other community organizations have in numerous cases used the communities need for services to promote their political standing. This power struggle has derailed numerous water service projects. It is therefore necessary to recognize such potential problems during the early stages of the project and to depolitize the situation.

9.2.3 WSP options for rural local water service

The proposed institutional arrangement to provide a water service at local village level is shown in Figure 3. This arrangement utilizes local resources to achieve cost effective and sustainable water service delivery.

The WSP would be a local community structure such as a water committee or development forum. It is essential that a motivated and enthusiastic individual champions and leads this organization.

The tasks which need to be performed by the WSP could in part or all be delegated to appropriate effective groups or individual contractors including block or street tap committees or tap minders. Tribal authorities may assist the WSP with credit control in terms of taking disciplinary action when necessary.



Proposed Institutional arrangements for water service delivery in rural areas — Fig 3

A water services agent, who may be a professional, contractor, water board, urban TLC or NGO, may be contracted to provide specialist services.

Rural councils, tribal authorities and civic organizations provide on important link between the water customers and the WSA, or other higher levels of authority and funders. Experience has shown that these groups and individuals have been effective to lobby for funds and to initiate the development of schemes.

In numerous instances, villages obtain bulk water supply from a regional scheme. Possible bulk water provider options include water boards, urban TLCs or private contractors. The latter includes individuals or organizations who have developed a private water resource and trade water.

9.2.4 WSP options for grouped village water service.

Villages may be grouped and the water service provided by a regional WSP. Water service provision may include bulk water as well as village level water distribution.

Organizations with well established organizational structures and appropriate expertise such as water boards, urban TLCs and private contractors provide suitable WSP options. The suggested institutional structure for water service provision is given in Figure 3.

Grouped regional schemes usually serve populations of between 20 000 and more than 100 000. The appropriate organizations generally have adequate resources available including technical operators, administrative clerks and labourers. Specialised services, which may include an engineer, may be contracted as required. The composition of the organizational structure, comprises individual village groups which share the benefits of motivated specialist services.

9.3 Support facilities, support services and related issues

9.3.1 Billing and revenue collection

Billing systems may be either pre-paid or post-paid arrangements, based on a flat rate or a rate related to volume of water used.

Pre-paid water distribution systems are expensive and still in their early stages of development. A high level of expertise is required to operate and maintain pre-paid systems. The advantage is however that operational costs are considerably lower, especially for yard connections, since meters do not need to be read and accounts prepared and processed.

Post-paid systems, especially metered yard connections have been in use for decades world wide. The systems are reliable and the infrastructure relatively inexpensive. Operational costs are however considerably higher than pre-paid systems. Water meters in household yards need to be read on a monthly basis, accounts need to be prepared, distributed and processed.

The bill should clearly show the amount of water used, tariff and amount due. The bill should preferably be in the appropriate official language.

Accounts need to be hand delivered in many areas especially in rural areas, in view of

the poor postal service and due to the fact that it is not uncommon for several households to share one post box. Post reportedly gets lost in such situations.

Pay points should be within walking distance. In large villages and urban areas, several pay-points should be established.

Two tariff systems are in general use viz flat rate and use rate.

The flat rate is usually applicable where communal street tap level of service is provided. The flat rate bears no relation to the volume of water used by the household. This is perceived to be unfair by some communities.

The flat rate should cover the cost of operation, maintenance and repairs of the water service. The flat rate usually ranges between about R5/household/month for gravity schemes to R15/household/month for diesel driven borehole schemes.

The use tariff is related to the actual volume of water used by the household. The tariff needs to be sensitive to the poor, but should also be so structured to limit water wastage.

A block tariff structure is now widely accepted as the norm where the water charge increases with increased volume of water used.

The lowest tariff called the lifeline tariff, is usually < R2/kl and the poor would have a monthly water account of <R10/household/month. The upper end of the tariff scale may exceed R15/kl for water use > 60 kl/month.

9.3.2 *Human Resources*

Staff are required for the hands on day-to-day functioning of the various components and activities related to the water supply system and water service delivery. The main grouping of tasks includes :

- operations
- maintenance
- revenue collection

The extent and complexity of the tasks which need to be performed is related to the type of equipment used, level of service provided and the extent of the water supply system. A list of staff and their related tasks is given in Appendix D.

Operation/maintenance. Staff needs for operation and maintenance of a water supply systems are mainly dependent on the type of equipment utilized on the system and the extent thereof.

The skills vary from unskilled staff who act in support and assistance to the more skilled personnel, which varies from low level of skills to highly skilled in the case of sophisticated treatment and bulk water distribution facilities (see Appendix D).

Staff needed for revenue collection is related to the tariff system used which includes:

- Flat rate system.
- Pay in relation to use

The tariff system applied is partly dependent on choice, but is to a large extent dictated by the type of water distribution system utilized and includes :

- Communal systems which include hand pumps and street taps.
- Individual household supply systems.

The flat rate tariff system is usually applied on communal street tap water supply distribution systems. A simplified revenue collection system is applicable and thus a low level of bookkeeping and monitoring is needed. Revenue collection therefore only involves :

- Practical and user friendly pay points.
- Simplified accounting system.

The pay as you use system is mainly applicable to individual yard connections. This system is however also used in certain communities where kiosks or pay points have been established at street taps.

Pay as you use systems imply that the volume of water used is measured. Water meter readers are required to read the meters on a monthly basis. The water meter reading is subsequently accurately processed and accounts generated. This procedure can be undertaken manually for small communities but is more readily undertaken using computer-based software.

Accounts should be distributed monthly and this may need to be by hand in some areas in view of the poor postal service.

Door-to-door distribution of accounts and receipt of payment can be undertaken by Water Committee members or Street Committee members.

DWAF have a large compliment of personnel who currently provide water service delivery on existing schemes. DWAF have a policy of seconding and then transferring staff to local government or village based water service providers. Salaries of DWAF staff are high. Care needs to be taken that the inclusion of DWAF staff in local structures does not make the service unaffordable or create discontent

amongst other staff.

9.3.3 Communications, transport, tools and equipment

Support facilities such as communications hardware, transport, billing system, tools, equipment, office space, stores and spares are required to ensure proper functioning of the water service provider. The appropriate support facilities required is mainly a function of the type and extent of the water supply scheme.

Without proper support facilities, it is not possible to properly operate, maintain and manage water service delivery systems and achieve cost recovery.

In order to save on transport, communication and other costs, it is necessary to employ staff locally in the village where the tasks need to be performed.

Communication includes telephones and two-way radios, whilst transport could be in the form of light delivery vehicles and trucks. Taxis, bicycles and horses may also be used where appropriate, for example in remote small villages.

Billing and the cost recovery process requires, especially where prepaid or metered yard connections are used, computer based billing systems, stationary, office space, pay points, safes for keeping cash, and related equipment.

Commonly used spares, tools, workshop and other related equipment is required to assist operation and maintenance. On small village schemes, the pumphouse may be used as a store.

It is normally too expensive for rural village WSP to have specialist tools and equipment available inhouse. These are best hired and contracted when necessary.

A list of support facilities required for local water supply schemes and regional water supply schemes is given in Table 2 below.

Table 2 : Support facilities required for rural water supply schemes

SUPPORT FACILITIES		LOCAL VILLAGE SCHEME	REGIONAL SCHEME
COMMUNICATIONS	Telephone	ad hoc	✓
	Cellular phone		✓
	Two-way radio		✓
	LDV		✓
	Taxi	ad hoc	
TRANSPORT	Bicycle	✓	✓
	LDV	ad hoc	✓
	Truck		✓
	Hire vehicle	✓	
ORGANIZATIONAL INFRASTRUCTURE	Office	✓	✓
	Stores		✓
	Store (pump house used)	✓	
	Workshop	rudimentary	✓
TOOLS AND EQUIPMENT	Toolkit	basic	✓
	Special tools		✓
	Block & tackle		✓
	Spares/filter/oil	✓	✓
	Water level recorder	✓	✓
	Diesel depot	as needed	✓
ADMINISTRATION AND BILLING	Water meter cards		✓
	Bookkeeping records	✓	✓
	Accounts list	✓	
	Accounts books		✓
	Computer based accounts		✓
	Billing software		✓
	Pay point	✓	✓
	Cash handling	✓	✓
	Banking facilities	✓	✓
	Credit control	✓	✓
	Emergency cash fund	✓	✓

9.3.4 *Specialist tasks and services*

Numerous specialist tasks and services need to be undertaken on an ad hoc basis on all water supply schemes.

It is not cost effective to have the necessary skills and equipment in each village, or even a group of villages. These services need to be contracted out as an when the need arises. Suggestions have also been made that an engineer or other suitably qualified personnel be appointed to provide a service of extension officer or circuit-rider. Such persons also now known as water service agents, will visit each village on a periodic basis and offer advice to community based Water Service Providers and to facilitate communication.

The tasks which require specialist expertise, skills and/or tools and include:

- Lifting and removing borehole pumps for repair
- Major repairs to diesel engines
- Major repairs to hand and wind pumps
- Electrical repairs
- Replacing or repairing major pipebreaks, valves and fittings
- Planning and developing extensions to water supply facilities

9.4 Other Important Considerations

9.4.1 Legal Aspects

Several legal requirements control and regulate water service provision and several contracts and agreements are required to ensure the proper functioning of the WSP.

The contracts and agreements include :

- between the WSA and WSP (bulk and retail)
- between the WSA and customer
- between the WSP and service agents
- bylaws to regulate and control water service delivery
- between DWAF and the WSP if staff and equipment is transferred

The water service provider is governed by various regulations to provide a water service of a certain standard, to protect the environment and to ensure social responsibility.

Various procedures and policies also need to be in place to assist and regulate procurement of spares, chemicals and other items required for water service delivery. Procurement of capital items also needs to be defined. Procedures for proper and transparent cash handling is essential.

9.4.2 Cultural, social and local government structures

Numerous local structures exist which have a major influence on the lives of residents, particularly in the rural areas. These structures include tribal authorities, rural TLC, political groups and community based organizations. These structures have considerable influence and their strengths may be utilized to assist water service delivery.
Certain structures may however in self interest be disruptive and care needs to be taken to guard against these constraining and limiting influences.

Tribal authorities have been successfully used in some areas to enforce payment for water service by applying social disciplinary action.

Councilors are political representatives and have no capacity to undertake management, maintenance and operation of water supply schemes, but have proved to be champions for the promotion of water service development.

Water committees are established in virtually all villages, mainly with own initiative with very little government or other involvement. Water committee members are generally democratically elected and provide their services voluntarily. In many instances, water committees were responsible for initiating water supply development and are involved with the management of the scheme. Water committees have proved to be cost effective water service providers.

10. INITIATION OF THE WATER SERVICE STRATEGY IN A RURAL TLC AREA

10.1 Introduction

The practical experience gained form the research would be applied in a selected TLC.

With the involvement of DWAF and the Bushveld District Council, it was decided to select the Bakenberg TLC to initiate the process towards sustainable water services delivery. Key considerations which led to the selection of the Bakenberg TLC area include:

- Councilors of the Bakenberg TLC are motivated and eager to provide water services on a sustainable basis.
- The study team has a thorough knowledge of the area and this obviates the need for costly situation assessments.

10.2 Overview of the Bakenberg TLC area

The Bakenberg TLC is located north west of Potgietersrus in the Northern Province.

Population

The population of about 195 000 of the Bakenberg TLC reside in some 71 villages. Two concentrations of population occur namely at Greater Mapela (4 villages) and at Bakenberg.

There is an indication that a spontaneous urbanisation process already occurs at Potgietersrus/ Mahwelereng, which has a present high growth rate of 4.5% p.a. This is due to the economic importance of Potgietersrus in terms of jobs and business.

Socio-economic aspects

Communities located in the western extremity of the Bakenberg TLC, i.e. downstream

of the confluence of the Mogalakwena and Sterk Rivers, have poor access roads and the general level of living is relatively low.

Education levels in general are relatively low with only 4% of the adult population having tertiary qualifications. Approximately 20% have no education at all.

A high percentage of unskilled labourers resides in this area. Labourers can work in any sector but they are restricted to jobs with low levels of income. Upward mobility in terms of the employment situation does not exist. Low levels of education coupled with low levels of income, results in low affordability levels for services.
Gardening is enthusiastically pursued by a significant percentage of households in many of the villages in the Bakenberg TLC. In order to maintain a garden, it is essential to have water supplied to the property. This has not been DWAF policy in the past and as a consequence, a large number of unauthorized water connections were made.

Present water supply situation

The villages in the Bakenberg TLC area obtain water mainly from groundwater sources and from wellpoints in the Mogalakwena River. Water is abstracted by diesel driven pumps, hand pumps, windmills and in limited cases, electrically driven pumps.

Available water supply facilities are inadequate and critical water shortages occur frequently. In certain villages, water shortages are worsened due to the construction of illegal water connections.

The per capita water use ranges from less than 10l/c/d to about 80l/c/d and is usually determined by water availability rather than representing the actual requirements. In several villages, particularly where groundwater potential is poor, additional water supplies are drawn from wells dug in the sandy river beds or bought at high rates from water vendors.

Residents in general do not pay for water. Operation and maintenance is usually undertaken by DWAF. Diesel is provided free of charge, but must be collected from the depot by the community. This situation is however gradually changing.

The Bakenberg TLC, through the Bushveld District Council, and water committees established in most villages, are accepting the responsibility of providing their own water service. It is now the intention of the funding agencies that the communities be responsible for the operation and maintenance of the water supply schemes. This situation is in a state of flux due to the ownership of most of the schemes still being vested in the state.

ANNEXURE D

JOB DESCRIPTIONS

10.3 Institutional arrangements in the Bakenberg TLC

The Bakenberg TLC area lies within the area of jurisdiction of the Bushveld District Council. During the 1995 local elections, councilors were elected for a term of five years. This council has, for most of its time in office, practically had no staff, equipment and support facilities to perform its duties.

The Bushveld District Council has however been most supportive and assisted the TLC to initiate and develop water supply infrastructure.

Councilors of the Bakenberg TLC have attended several training courses and workshops (some provided by the NCWSTI at the University of the North) for capacity building in terms of water supply infrastructure development and water service delivery.

Several of the councilors enthusiastically motivate water service delivery. Without this support it would not be possible to initiate the process of sustainable water service delivery in the Bakenberg TLC area.

The Bakenberg TLC area lies within the area of influence of eight separate tribal authorities. **The tribal chiefs** have considerable influence and it has now become common practice to include the tribal authorities in the process of water service development.

The tribal authorities were established many decades ago and are firmly entrenched. These authorities have properly established infrastructure in therms of office space and other support facilities. The tribal authorities have an income base which is derived from the community and government.

Water committees and other community based organizations have been established in practically all villages. These committees are actively involved with water supply planing and development and to a lesser extent, operations and maintenance of schemes.

DWAF are at present responsible for operation and maintenance of practically all the water supply schemes in the Bakenberg TLC area. Operators generally reside in the relevant villages, while maintenance staff are located at a central district office.

10.4 Workshop with the Bakenberg TLC

Workshops were held on 22 September 1999 and 25 January 2000 to discuss and debate various issues related to effective water services delivery including cost recovery.

The workshops, which were held near Potgietersrus, were attended by representatives from:

- Bakenberg TLC council
- Department of Water Affairs and Forestry.
- Water Services and Sanitation Unit DFID - (Pretoria).
- Bushveld District Council

Aspects of particular concern which were discussed included:

- Lessons learned from case studies.
- Institutional structure suitable for Bakenberg TLC area.
- Support facilities required.
- Programme of implementation.
- Budget and funding.

The TLC councilors actively participated in the discussions and are eager to ensure sustainable water service delivery.

10.5 Towards implementation of the Water Service delivery plan

A check list of issues which need to be addressed to assist and facilitate proper implementation of the water service delivery plan was drafted with input from the delegates of the workshop.

The issues include:

- Legal aspects
  - Regulations and by-laws
- Support facilities and services
  - Staff (technical, administrative)
  - Equipment and tools
  - Office accommodation and workshop
  - Communication and transport
  - Transfer of DWAF personnel and assets
- Operation and maintenance
  - Routine maintenance
  - Major repairs
  - Specialist services
- Institutional arrangements
  - Water services authority
  - Water services provider
  - Water committees at village level
  - Support service agents
- Finance

- Banking facilities
- Bridging finance
- Operation and maintenance fund
- Cost recovery process
- Funds for further development

These issues are currently being addressed in detail by the project team and key stake holders.

10.6 Implementation of the water service delivery programme

The Bakenberg town, Marulaneng and Sepharane villages were identified to form the node where implementation of the water service development plan would commence. This area comprises approximately 3 500 households and adequate water is available to provide a proper service.

Proper water service delivery in the remaining villages in the Bakenberg TLC will be established after the process has been successfully implemented in the pilot 3 village area.

DFID have agreed to fund the project and implementation will commence in January 2001.

11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Focus on the customer

The water service provided must meet the needs of the water user in terms of level of service, volume of water, quality and reliability of supply. The water user must also be wiling and able to pay for this service.

There is a relationship between level of living or development status of the water user, and the appropriate level of service. Only the less developed communities will be satisfied with communal street tap systems. Numerous communities insist on access to higher levels of service.

11.2 Institutional arrangements

Two bodies are required, as stipulated by various acts, to provide a water service, viz water service authority (WSA) and water service provider (WSP).

The WSP has the responsibility of actually undertaking the tasks of providing the water service.

In order to provide a sustainable water service, the WSP must undertake its tasks cost effectively and efficiently. This is best achieved by :

- employing local people from the settlement
- employing staff on a part time basis where possible
- paying salaries appropriate to the area
- phasing in DWAF staff to the above mentioned conditions
- providing training as required
- contracting out specialist tasks as and when required
- Limiting transport needs to a minimum

Every effort must be made to depolitisize the WSP. Power struggles between the various structures invariably lead to poor service delivery.

Tribal authorities have considerable influence in many areas and can beneficially assist the WSP, particularly in terms of enforcing payment for services.

In rural areas, where street tap water service is provided, the WSP function is best undertaken by community based organizations such as water committees.

In urban areas, especially where full services are provided, the WSP function could be undertaken by TLCs with part of all the tasks contracted out.

On regional schemes, especially the bulk water service, is best undertaken by water boards or contractors. This task may also be performed by a TLC, where the necessary capacity already exists.

The water service authority has the responsibility to ensure that a proper water service is provided. This function includes, regulating planning, monitoring and reporting. The regulatory and monitoring function should be undertaken by local government, although none of the case studies showed these functions to be key factors to ensuring sustainable water service delivery.

The planning and reporting functions are generally undertaken by consultants in view of their capacity and knowledge of local conditions. Support service agents will also effectively undertake these tasks

TLC councillors provide an important link between the community at grassroots level and higher levels of authority especially in terms of promoting and initiating water supply schemes.

In urban areas, the WSA function can be undertaken by TLCs or district councils.

11.3 Support facilities

The WSP requires various support facilities to effectively and efficiently undertake its functions and these include :

- Staff for operation, maintenance, administration and management of the water supply service. Training is necessary to build capacity where required. A reactive unit is also required for emergency repairs, especially on larger schemes.

- Organizational infrastructure including offices, furniture, computers and other related equipment.

- Billing systems, cost recovery procedures and facilities and record keeping tools. The facilities required are related to the payment system used, be it pre-paid or post-paid, as well as the level of service provided. The traditional metered yard connection post-paid systems require the capture of meter readings and the generation and delivery of water user accounts based on volume of water used.

- The accounts, which should preferably be in the appropriate official language, should reflect, amongst other things, the volume of water used, tariff and amount due. Accounts will not be necessary where the flat rate is applicable.

- Pay points should be within walking distance with facilities to receive and attend to complaints, water leak information and other suggestions.

- Tools and equipment required for routine maintenance and general repairs. A workshop is also necessary on larger schemes.

- Spares and materials with appropriate storage facilities.

- Transport and communications. For village based organizations this is normally of a rudimentary nature. It would be cost effective to hire larger vehicles when required.

12. RECOMMENDATIONS

The following recommendations result from this research project :

- Access to higher levels of service by the consumer is essential in certain villages to ensure sustainable water service delivery. DWAF, major NGO's and other funders should be encouraged to accommodate higher levels of service.

- Vendors, or private contractors, have provided a valuable, although expensive, water service in many communities for many years without assistance. Methods should be developed to ensure that residents are not charged an extortionist fee for this service.

- Training should be seen as a long term commitment. Training is necessary for replacement staff and refresher courses are also required. Links should be established so that trainers may refer to their mentors for on the job support.

- Water committees and their associated tap committees have shown to be cost effective water service providers. This approach to decentralization of water service provision in rural areas should be encouraged.

- Tribal Authorities have assisted to ensure water service delivery, particularly in terms of enforcing payment for services. This partnership with the water service provider should be recognized.

- Technology transfer should be achieved by applying the findings of this study in the Bakenberg TLC near Potlgietersrus.

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ANNEXURE A

VILLAGE WATER SUPPLY INTERVIEW CHECKLIST

VILLAGE WATER SUPPLY INTERVIEW CHECKLIST

LOCALITY

Village Name:.....	Farm Name:	Farm No.: .....
District:..... ..	Province:.....	
Nearest Major Centre:.....		
Public transport travel time to nearest major centre..... (Hrs)		

SOCIO-ECONOMIC SITUATION

Population:			Year:	
Number of stands or households				
Settlement Type :	Urban ☐	Formal ☐	Informal☐	Scattered ☐
Dwelling construction	☐ Limited traditional, untreated cement block, clustered ☐ Untreated cement block ☐ Limited painted cement block ☐ Painted cement block/informal housing ☐ Painted block/limited western/improved informal ☐ Moderate western, small stands ☐ Western large stands			
Gardening activity :	None ☐ Limited ☐ Moderate☐ Moderate to extensive ☐ Extensive☐			
Electricity connections	0 ☐	10 ☐	35 ☐	50 ☐ 80 ☐
Pirate connections :	0 ☐	20 ☐	50 ☐	70 ☐ 90 ☐
Business activity :	Extensive ☐ Moderate☐ Limited ☐			

WATER USER GROUP

Stock watering:	always from system ☐, only from springs and streams ☐, partly system partly springs and streams ☐
Schools:	taps in yard ☐, hand pump near/at school ☐, None ☐
Clinics:	taps on property ☐, fully reticulated ☐, own water supply system ☐
Communal gardens:	hand watered from system ☐, separate irrigation system scheme ☐

WATER SOURCE

Source	Type	Delivery l/s	Treatment (yes/no)	Energy	Storage	Shared source
Source 1						
Source 2						
Source 3						
Source 4						

- Type: borehole (BH), dam, bulk pipe (BP), spring or stream (S)
- Energy: electric (E), diesel (D)
- Storage, reservoir (R), trickle tanks (TT), elevated tank (ET)
- Shared source by more than one village Yes / no

RETICULATION

Infrastructure	Pre-Paid	Metered	Not Metered	Kiosk or Seller	Private
Reservoir					
Limited supply points					
Street taps >200m					
Street taps <200m					
Yard taps					
Yard tanks					
Fully reticulated					
Security against vandalism					
Pirate connections					

REVENUE COLLECTION

	post paid	pre-paid	ad hoc paid	payment interval
Use rate (metered)				
Flat rate				
Major repairs				
Private sellers				
Tariff payment	collected at house ☐, monthly account ☐, paid at office ☐, or shop ☐, or tap ☐			
Payment rate	..... %			
How is tariff collected	....			
Reasons for non payment	....			
Punitive Measures				
Distance to pay-point:	How is it reached:			

OPERATION AND MAINTENANCE

Water supply problems: *almost never* ☐ *often* ☐ *very often* ☐

How are faults reported: ..... and monitored: .....

How quickly are repairs made: within days ☐ weeks ☐ months ☐

Availability of: stores ☐, offices ☐, drawings, manuals ☐, special tools ☐

Duties of pump operator: start/stop ☐ oil service ☐ order diesel ☐

report pump breakdowns ☐ report other breakdowns ☐

Number of staff: part time ☐ full time ☐ voluntary ☐

Availability of specialized: tools ☐ none ☐

INSTITUTIONAL STRUCTURES

Who authorizes	DWAF	District Council	Tribal	TLC	Water Com	Street Com	Other	Water Board	None
repairs									
purchase of spares etc									
pays, hires, fires staff									
major repairs									
collects diesel, spares									
pump operator									
manages the schemes									
sets the tariff									
safe keeps money									
level of influence									
pays for diesel									
development									
pays for major repairs									
pays for small repairs									
how were members elected									

TRAINING

Who gave training: Consultant ☐ Water Board ☐ Government ☐

How were trainees selected: .....

Follow-up training: Health ☐ Technical ☐ Administration ☐

Replacement training: Health ☐ Technical ☐ Administration ☐

What training material provided: .....

Effectiveness of the; *Manager*: good ☐, fair ☐, poor ☐ *Pump operator*: good ☐, fair ☐, poor ☐

Storesman: good ☐, fair ☐, poor ☐ *Bookkeeper*: good ☐, fair ☐, poor ☐

Maintenance: good ☐, fair ☐, poor ☐

ANNEXURE B

INFORMATION FROM THE CHECKLISTS

TABLE B1: LIST OF SCHEMES ASSESSED AND LEVEL OF LIVING (LOL)

Village name	Province	Population	Gardening activity	Electricity connections (%)	Pirate water connections (%)	LOL
Gudani	NP	1195	None	0	0	1
Boschkop	NP	1107	None	10	0	2
Vhutale	NP	500	Moderate	0	0	2
Ga-Phago	NP	300	Moderate - extensive	0	0	2
Masete	NP	1900	None	0	0	2
Ga-Mojapelo	NP	2000	None	0	?	2
Seokodibeng	NP	4000	Limited	0	0	3
Maboi	NP	4800	Limited	10	10	3
Seponapudi	NP	3923	Moderate - extensive	> 80	0	3
Mothlabe	NW	5000	Limited	10	0	3
Laaste hoop	NP	16000	Moderate		20	3
Ngqele	EC	4000	Limited	> 80	0	3
Leokaneng	NP	2325	Limited	0	?	3
Ga-Kurate	NP	3310	Moderate	> 80	0	3
Crossroads	EC	1584	Limited	> 80	0	3
Umvunyane	KN	2700	?	>80	?	3
Morapalala	NP	2309	?			3
George Moshesh	EC	25000	Limited	50	0	4
Soetfontein	NP	12500	Limited	> 80	20	4
Tsita	EC	13000	Limited	0	0	4
Ga-Tisane	NP	4615	None	> 80	0	4
Vulindlela	KN	18500	Limited	50	0	4
Modderspruit	NW	25000	Limited	> 80	0	4
Turkey	NP	7500	Limited		50	4
Vosloorus	G	158000	Moderate	> 80	0	5
Bisho	EC	8000	Limited	> 80	20	5
Douglas	NC	15000	Moderate	> 80	20	5
Mhluzi	M	72000	Extensive	> 80	0	5
Seshego	NP	143000	Moderate - extensive	> 80	0.05	5
Poortjie	G	6000	Limited	> 80	?	5
Klerksdorp	NW	94000	Moderate	> 80	20	5
Qoqodala	EC	multi village		0		

TABLE B2: ASSESSMENT OF WATER SERVICE PROVIDED

Village name	Level of living	Scheme type	Level of service	Pirate connections	Water supply problems - time to repair	Tariff	Cost recovery (%)
Boschkop	2	Borehole	Street tap < 200m	0	Almost never - months	No payments	0
Soetfontein	4	Borehole	Street tap < 200m	20	Almost never - months	Flat rate	0
Seokodibeng	3	Borehole	Street tap < 200m	0	Almost never - weeks	Flat rate	0
Poortjie	5	Bulk pipeline	Full reticulation (metered)	?	Almost never - days/weeks	Use rate	0
Masete	2	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	15
Turkey	4	Borehole	Street tap < 200m	50	Often - months	Flat rate	24
Mapoi	3	Borehole	Pre-paid at reservoir	10	Almost never - days	Flat rate	40
Mothlabe	3	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	40
Vosloorus	5	Bulk pipeline	Full reticulation (metered)	0	Almost never - days	Use rate	45
Ga-Mojapelo	2	Bulk pipeline	Limited supply points	?	Almost never - days	Flat rate	50
Laaste hoop	3	Bulk pipeline	Street tap < 200m	20	Almost never - days	Flat rate	60
Ngqele	3	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	70
Leokaneng	3	Borehole	Street tap < 200m		Almost never - days	Flat rate	75
George Moshesh	4	Weir	Street tap < 200m	0	Almost never - days	Flat rate	Good
Gudani	1	Borehole	Street tap < 200m	0	Almost never - weeks	Flat rate	80
Seponapudi	3	Borehole	Yard tap	0	Almost never - weeks/days	Flat rate	80
Bisho	5	Dam	Yard tap metered	20	Almost never - days	Use rate	80
Tsita	4	Weir	Street tap < 200m	0	Almost never - days	Flat rate	80
Crossroads	3	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	80
Ga-Kurate	3	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	85
Ga-Tisane	4	Borehole	Street tap = 200m	0	Almost never - days	Flat rate	85
Vulindlela	4	Dam/Borehole	Street tap < 200m	0	Almost never - days	Use rate	90
Mhluzi	5	Bulk pipeline	Yard tap metered	0	Almost never - days	Use/flat rate	92
Klerksdorp	5	River (Bulk)	Yard tap	20	Often - days	Use rate	94
Douglas	5	Canal	Yard tap metered	20	Often - days	Use rate	95
Vhutale	2	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	97
Seshego	5	Borehole/Bulk pipeline	Yard tap metered street tap	0	Almost never - days	Use/flat rate	100
Ga-Phago	2	Borehole	Street tap = 200m	0	Almost never - days	Flat rate	100
Modderspruit	4	Bulk pipeline	Street tap < 200m	0	Often - days	Use rate	
Morapalala	2	Borehole	Street tap < 200m	0	Almost never - days	Flat rate	93
Qoqodala	3	Boreholes	Street tap			Use rate	good
Umvuhyane	3	Boreholes	Street tap			Flate	good

TABLE B3: INSTITUTIONS INVOLVED WITH THE PROVISION OF WATER SERVICE ON THE CASE STUDY SCHEMES

Village name	Population	Level of service	Scheme type	Responsible institution			
				Maintenance	Pump operator	Manage scheme	Major repairs
Boschkop	1107	Street tap < 200m	Borehole	WC & DWAF	DWAF	DWAF	DWAF
Soetfontein	12500	Street tap < 200m	Borehole	WC & DWAF	DWAF	DWAF	DWAF
Seakodibeng	4000	Street tap < 200m	Borehole	WC	WC	WC	WC
Poortjie	6000	Full reticulation (metered)	Bulk pipeline	TLC	TLC	TLC	TLC
Masete	1900	Street tap < 200m	Borehole	WC	DWAF	DWAF	DWAF
Turkey	7500	Street tap < 200m	Borehole	WC	WC	WC	WC
Maboi	4800	Pre-paid at reservoir	Borehole	WC & WB	WC & WB	WC & WB	WB
Mothlabe	5000	Street tap < 200m	Borehole	WC & WB	WC & WB	WC & WB	WB
Vosloorus	158000	Full reticulation (metered)	Bulk pipeline	TLC	TLC	TLC	TLC
Ga-Mojapelo	2000	Limited supply points		WC	WC	WC	DWAF
Laaste hoop	16000	Street tap < 200m	Bulk pipeline	WC & WB	WC & WB	WC & WB	WB
Ngqeie	4000	Street tap < 200m	Borehole	WC	WC	WC	WC
Leokaneng	2325	Street tap < 200m	Borehole	WC	WC	WC	WC
George Moshesh	25000	Street tap < 200m	Weir	TLC & TA	WC & TA	WC & TA	WC
Gudani	1195	Street tap < 200m	Borehole	WC	WC	WC	WC
Seponapudi	3923	Yard tap	Borehole	WC & WB	WC & WB	WC & WB	WB
Bisho	8000	Yard tap metered	Dam	TLC	TLC	TLC	TLC
Tsita	13000	Street tap < 200m	Weir	WC & TA	WC & TA	WC & TA	WC
Crossroads	1584	Street tap < 200m	Borehole	WC	WC	WC	WC
Ga-Kurate	3310	Street tap < 200m	Borehole	WC & DWAF	WC & DWAF	WC & DWAF	DWAF
Ga-Tisane	4615	Street tap = 200m	Borehole	WC	WC	WC	WC
Vulindlela	18500	Street tap < 200m	Dam/Borehole	WC & WB	WB	WB	WB
Mhluzi	72000	Yard tap metered	Bulk pipeline	TLC	TLC	TLC	TLC
Klerksdorp	94000	Yard tap	River (Bulk)	TLC	TLC	TLC	TLC
Douglas	15000	Yard tap metered	Canal	TLC	TLC	TLC	TLC
Vhutale	500	Street tap < 200m	Borehole	WC	WC	WC	WC
Seshego	143000	Yard tap metered Street tap	Borehole/Bulk pipeline	TLC	TLC	TLC	TLC
Ga-Phago	300	Street tap = 200m	Borehole	DF	DF	DF	DF
Moddersprult	25000	Street tap < 200m	Bulk pipeline	WB	DC & WB	DC & WB	DC
Morapalala	2309	Street tap	Borehole	WC	WC	WC	
Qoqodala		Street tap	Borehole	WC	WC	WC	
Umvuyane	2700	Street tap	Borehole	WC	WC	WC	

DWAF - *Department of Water Affairs and Forestry*
WC - *Water Committee*
WB - *Water Board*
DC - *District Council*
DF - *Development Forum*
Tribal - *Tribal Authority*

TABLE B4 : REVENUE COLLECTION ON THE CASE STUDY SCHEMES

Village name	Level of living	Level of service	Tariff	Payment		Pay-point		Major repair fund	Cost recovery (%)	Disciplinary act
				Pre-	Post-	House	Office			
Boschkop	2	Street tap < 200m	No payments						0	
Soetfontein	4	Street tap < 200m	Flat rate		x		x		0	None
Seokodibeng	3	Street tap < 200m	ad hoc Flat rate		x	x		none	0	Shutt off
Poortjie	5	Full reticulation (metered)	Use rate		x		x		0	Shutt off
Masete	2	Street tap < 200m	ad hoc Flat rate		x	x		none	15	None
Turkey	4	Street tap < 200m	Flat rate		x		x		24	None
Maboi	3	Pre-paid at reservoir	Flat rate	x			x	none	40	None
Mothlabe	3	Street tap < 200m	Flat rate		x		x		40	None
Vosloorus	5	Full reticulation (metered)	Use rate		x		x		45	Cut off
Ga-Mojapelo	2	Limited supply points	Flat rate	x			x		50	Read name
Laaste hoop	3	Street tap < 200m	Flat rate	x			x	none	60	Fines
Ngqeie	3	Street tap < 200m	Flat rate		x	x			70	Low pressure
Leokaneng	3	Street tap < 200m	Flat rate		x	x			75	None
George Moshesh	4	Street tap < 200m	Flat rate		x	x			Good	Low pressure
Gudani	1	Street tap < 200m	Flat rate		x		x		80	Fines
Seponapudi	3	Yard tap	ad hoc Flat rate		x		x		80	None
Bisho	5	Yard tap metered	Use rate		x		x		80	Trickle flow, elect cut
Tsita	4	Street tap < 200m	Flat rate		x	x	x		80	Headman
Crossroads	3	Street tap < 200m	Flat rate		x	x			80	Social & boycotts
Ga-Kurate	3	Street tap < 200m	Flat rate		x		x		85	None
Ga-Tisane	4	Street tap = 200m	Flat rate		x		x		85	No service
Vulindlela	4	Street tap < 200m	Use rate		x		x		90	Shutt off
Mhluzi	5	Yard tap metered	Use/flat rate		x		x		92	Cant buy elect
Klerksdorp	5	Yard tap	Use rate		x		x		94	Trickle flow, elect cut
Douglas	5	Yard tap metered	Use rate		x		x		95	Trickle flow, elect cut
Vhutale	2	Street tap < 200m	Flat rate		x		x		97	Fines
Seshego	5	Yard tap metered Street tap	Use/flat rate		x		x		100	Trickle flow, elect cut
Ga-Phago	2	Street tap = 200m	Flat rate		x		x		100	
Morapalala	2	Street tap < 200m	Flat rate		x		x	none	93	taps locked
Moddersprut	4	Street tap < 200m	Use rate	x			x			None
Morapalala	3	Street tap	Flat rate		x				85	Lock taps
Qoqodala		Street tap	Use rate	x					Good	none
Umvuhyane	3	Street tap	Flat rate	x					Good	Lock taps

TABLE B5 : STAFF APPOINTMENT AND TRAINING ON THE CASE STUDY SCHEMES

Village or Settlement	Full time staff	Special tools	Who Trained	Follow on training		
				Health	Technical	Admin
Boschkop	none	none	cons		x	x
Soetfontein	2	none	cons	x	x	x
Seokodibeng	none	none	cons		x	x
Poortjie	x	x				
Masete	none	none	cons		x	x
Turkey	none	none	cons			
Maboi	none	none	cons	x	x	x
Mothlabe	x	none	cons		x	x
Vosloorus	x	x				
Ga-Mojapelo	none	none				
Laaste hoop	x	x	cons			x
Ngqele	none	none	cons	x	x	x
Leokaneng	3	none	cons	x	x	x
George Moshesh	none	none	cons	x	x	x
Gudani	none	none	cons	x	x	x
Seponapudi	x	none				
Bisho	x	x				
Tsita	none	none	cons			
Crossroads	none	none	cons	x	x	x
Ga-Kurate	x	none	cons			
Ga-Tisane	none	x	cons	x		
Vulindlela	x	x	WB	x	x	x
Mhluzi	x	x				
Klerksdorp	x	x				
Douglas	x	x				
Vhutale	none	none	cons	x	x	x
Seshego	x	x				
Ga-Phago	x	none	cons	x	x	x
Morapalala	5. DWAF	none	cons	x	x	x
Modderspruit	x. DC	none	cons		x	x

TABLE B6 : DETAILED INFORMATION FROM THE QUESTIONNAIRE

Scheme name	Province	Distance from major centre	Population [year]	No stands	Settlement type	Garden activity	Electricity [%]	Business activity
Boschkop	NP	1.5	1107 [96]	191	Informal	None	10	Limited
Soetfontein	NP	1	12500 [96]	1377	Formal & Scattered	Limited	80	Moderate
Seokodibeng	NP		4000 [96]	572	Informal	Limited	0	Limited
Poortjie	G		6000		Informal	Limited	80	Limited
Masete	NP		1900 [96]	320	Informal & Scattered	None	0	Limited
Turkey	NP	1.5	7500 [97]	1168	Informal & Scattered	Limited		Limited
Maboi	NP	0.75	4800	865	Formal	Limited	10	Limited
Mothlabe	NW	2	5000 [98]	774	Informal	Limited	10	Moderate
Vosloorus	G	0.25	158000 [98]	30000	Urban & informal	Moderate	80	Moderate
Ga-Mojapelo	NP		2000 [98]	1043	Informal	None	0	
Laaste hoop	NP	1	16000 [98]	2500	Formal	Moderate		
Ngqele	EC	0.5	4000 [95]	504	Informal & scattered	Limited	80	Limited
Leokaneng	NP	1	2325 [97]	332	Informal & scattered	Limited	0	Limited

Scheme name	Province	Distance from major centre	Population [year]	No stands	Settlement type	Garden activity	Electricity [%]	Business activity
George Moshesh	EC		25000 [95]	4000	Informal	Limited	50	Moderate
Gudani	NP	2	1195 [94]	216	Formal & scattered	None	0	Limited
Seponapudi	NP	1.5	3923 [95]	617	Formal	Moderate to	80	Moderate
Bisho	EC	1	8000 [95]	1400	Urban & formal	Limited	80	Moderate
Tsita	EC	2	13000 [95]	2000	Informal & Scattered	Limited	0	Limited
Crossroads	EC	0.5	1584 [95]	300	informal	Limited	80	Limited
Ga-Kurate	NP	1	3310 [97]	370	Formal	Moderate	80	Limited
Ga-Tisane	NP	.5-1.5	4615 [97]	380	Scattered	None	80	Moderate
Vulindlela	KN	1	18500 [94]	22500	Formal & informal	Limited	50	Moderate
Mhluzi	M	0.25	72000 [95]	6618	Urban & informal	Extensive	80	Moderate
Klerksdorp	NW	0.5	94000 [95]	28000	Urban & Formal	Moderate	80	Extensive
Douglas	NC	2	15000 [94]	4000	Urban & formal	Moderate	80	Moderate
Vhutale	NP	1.5	500 [95]	80	Informal	Moderate	0	Limited
Seshego	NP	0.25	143000 [97]	10000	Urban & informal	Moderate to	80	Moderate
Ga-Phago	NP	1.5	300 [97]	500	Formal	Moderate to Extensive	0	Moderate
Modderspruit	NW	0.5	25000 [98]	2007	Formal & informal	Limited	80	Moderate

Name	School water	Settlement water connection	Type of bulk	Shared bulk	Breakage - Repairs done within	Availability of special
Boschkop	Hand	Street tap >	Bore hole	No	Almost never - months	None
Soetfontein	Hand pump	Street tap > 200m	Bore hole	Yes	Almost never - months	None
Seokodibeng	Yard tap	Street tap > 200m	Bore hole	No	Almost never - weeks	None
Poortjie	Yard tap	Full reticulation with metered connections	Bulk pipeline	Yes	Almost never - days / weeks	Yes
Masete	None	Street tap > 200m	Bore hole	No	Almost never - days	None
Turkey	None	Street tap > 200m	Bore hole	No	Often - months	None
Maboi	None	Pre-paid at reservoir	Borehole	No	Almost never - days	
Mothlabe	Yard tap	Street tap > 200m	Borehole	No	Almost never - days	None
Vosloorus	Yard tap	Full reticulation with metered connections &	Bulk pipeline	No	Almost never - days	Yes
Ga-Mojapelo		Limited supply points				None
Laaste hoop	Yard tap	Street tap > 200m	Bulk pipeline	Yes	Almost never - days	Yes
Ngqele	None	Street tap > 200m	Borehole	No	Almost never - days	None
Leokaneng	Yard tap	Street tap > 200m	Borehole	No	Almost never - days	None

Name	School water	Settlement water	Type of bulk supply	Shared bulk	Breakage - Repairs done within	Availability of special
George Moshesh	Yard tap	Street tap > 200m	Weir	Yes	Almost never - days	None
Gudani	Yard tap	Street tap > 200m	Borehole	No	Almost never - weeks	None
Seponapudi	Yard tap	Yard tap	Borehole	No	Almost never- weeks /months	None
Bisho	Yard tap	Yard tap metered	Dam	Yes	Almost never - days	Yes
Tsita	None	Street tap > 200m	Weir	Yes	Almost never - days	None
Crossroads	None	Street tap > 200m	Borehole	No	Almost never - days	None
Ga-Kurate	Yard tap	Street tap > 200m	Borehole	No	Almost never - days	None
Ga-Tisane	Yard tap	Street tap = 200m	Borehole	No	Almost never - days	None
Vulindlela	Yard tap	Street tap > 200m	Dam / Borehole	Yes	Almost never - days	Yes
Mhluzi	Yard tap	Yard tap metered	Bulk pipeline	No	Almost never - days	Yes
Klerksdorp	Yard tap	Yard tap	River (bulk)	Yes	Often - days	None
Douglas	Yard tap	Yard tap metered	Canal	Yes	Often - days	Yes
Vhutale	None	Street tap > 200m	Borehole	No	Almost never - days	None
Seshego	Yard tap	Yard tap metered &	Borehole / Bulk	No	Almost never - days	Yes
Ga-Phago	Hand pump	Street tap = 200m	Borehole	No	Almost never - days	None
Modderspruit	Yard tap	Street tap > 200m &	Bulk pipeline	Yes	Often - days	None

Name	Staff	Pay method	Where pay	Pay %	Collection method	Use rate (metered)
Boschkop	Voluntary	No		No		
Soetfontein	Full time	Flat rate	Office	0	Pay at WC office	
Seokodibeng	Voluntary	Flat rate		0	Supervisor collect	
Poortjie	Full time	Use rate	Office	0	Pay at office	R kl/ post-paid monthly
Masete	None	Flat rate		15	Collect when required	
Turkey	Voluntary	Flat rate		24	Paid to WC	
Maboi		Flat rate	Headman / Chief office	40	Pay at office	
Mothlabe	Full time	Flat rate	Office	40	Special collectors	
Vosloorus	Full time	Use rate	TLC office	45	Pay at TLC office	R kl/ post-paid monthly
Ga-Mojapelo	Full time &	Flat rate	Office	50		
Laaste hoop	Full time &	Flat rate	Office	60	Pay at office	
Ngqele	Voluntary	Flat rate	House	70	At houses	
Leokaneng	Full time	Flat rate	Office/Tap	75	Community meetings	

Name	Staff	Pay method	Where pay	Pay %	Collection method	Use rate (metered)
George Moshesh	None	Flat rate	House	Good	At houses	
Gudani	Voluntary	Flat rate	Office	80	Community meetings	
Seponapudi	Full time	Flat rate	Office	80	WC collect	
Bisho	Full time	Use rate	TLC Office	80	Pay at TLC office	R /kl post-paid monthly
Tsita		Flat rate	Office/House	80	At houses	
Crossroads		Flat rate	House	80	At houses	
Ga-Kurate	Part & full time & Voluntary	Flat rate		85	Mass meetings	
Ga-Tisane	Voluntary	Flat rate	Tribal office	85	Mass meetings	
Vulindlela	Full time	Use rate	Office	90	Pay points	R /kl post-paid monthly
Mhluzi	Full time	Use rate & Flat	Pay point	92	4 Pay points	R /kl post paid monthly
Klerksdorp	Full time	Use rate	Office	94	Pay points	Post-paid monthly
Douglas	Full time	Use rate	Office	95	TLC office	R /kl post-paid monthly
Vhutale	Voluntary	Flat rate	Office	97	WC treasurer	
Seshego	Part & full time	Flat rate & user	TLC	100	Pay at TLC	R/kl Post-paid monthly
Ga-Phago	Part & full time & Voluntary	Flat rate	Office/Tap	100	Street committee	
Modderspruit	Full time	Use rate	Office	100	Pre-paid	R4/kl pre-paid as required

Name	Flat rate	Punitive measures	Responsible for	Manage scheme	Set tariff	Who gave training
Boschkop			WC &	WC &	WC &	Consultant & WB
Soetfontein	R3.6/hh post-paid	None	WC & DWAF	WC & DWAF	WC & DWAF	Consultant & WB
Seokodibeng	R2/hh pre-	Shut off	WC & Prov	WC & Prov	WC & Prov	Consultant
Poortjie		Shut off	TLC	TLC	TLC	
Masete	R10/hh	None	WC & Prov	WC & Prov	WC & Prov	Consultant
Turkey	R10/hh	None	WC	WC	WC & MT	Consultant & WB
Maboi	R5/stand		WC	WC	WC	
Mothlabe	R15/stand	None	WC & WB	WC & WB	WC & WB	Consultant
Vosloorus		Cut off	TLC	TLC	TLC	
Ga-Mojapelo	pre-paid	Read name				WB
Laaste hoop	R8/stand	Fines	WC	WC & WB	WB	Consultant/WB
Ngqele	R5/hh pre-paid	Poor pressure,	WC & Developme	WC & Developm	WC & Developmen	Consultant
Leokaneng	R5/hh pos-paid as	None	WC	WC	WC	Consultant & WB

Name	Flat rate	Punitive measures	Responsible for	Manage scheme	Set tariff	Who gave training
George	R2/hh pre-paid	Poor pressure	TLC & PSC &	TLC & PSC &	TLC & PSC &	Consultant
Moshesh Gudani	R10/hh pre-paid	Fines : R10 - R15	WC	WC	WC	Consultant & WB
Seponapudi	R50 pre-paid	None	DWAF & WC	DWAF & WC	WC	
Bisho		Trickle flow, electricity	TLC & WB	TLC & WB	TLC & WB	
Tsita	R2/adult	Headman	Tribal &	Tribal &	Tribal &	Consultant & WB
Crossroads	R5/hh pre-paid	Social & boycotts	WC	WC	WC	Consultant
Ga-Kurate	R10/hh pre-paid	None	WC	WC	Community	Consultant
Ga-Tisane	R14/hh	No pay no	WC	WC	Communit	Consultant
Vulindlela		Shut off	WC, WB	WC, WB	WC, WB	WB
Mhluzi	R25/stand post paid	Can't buy electricity	TLC	TLC	TLC	
Klerksdorp		Trickle flow,	TLC	TLC	TLC	
Douglas		Trickle flow, electricity	TLC	TLC	TLC	
Vhutale	R10/stand pre-paid	Fines : R20 - R30	WC	WC	WC	Consultant
Seshego	Post-paid monthly	Trickle flow	TLC	TLC	TLC	
Ga-Phago	R10/stand post-paid		PDF	PDF	PDF	Consultant
Modderspruit		None	District Council &	District Council &	District Council	Consultant

Name	Follow up training	Manager	Pump operator	Storesman	Bookkeeper	Maintenance
Boschkop	Technical	Fair	Fair	Fair	Fair	Fair
Soetfontein	Health & Technical	Good	Good	Fair	Good	
Seokodibeng	Technical	Fair	Good			Good
Poortjie						
Masete	Technical	Fair	Fair	Fair		Fair
Turkey						
Maboi						
Mothlabe	Technical	Good	Good	Good	Good	Fair
Vosloorus						
Ga-Mojapelo						
Laaste hoop	Admin					
Ngqele	Health & Technical	Good	Good	Good	Good	Good
Leokaneng	Health & Technical	Good	Good	Good	Good	Good

Name	Follow up training	Manager	Pump operator	Storesman	Bookkeeper	Maintenance
George	Health &	Fair		Fair	Fair	Fair
Moshesh	Technical &					
Gudani	Health &	Good	Fair		Good	Good
	Technical &					
Seponapudi						
Bisho						
Tsita						
Crossroads	Health &	Good	Good	Good	Good	Good
	Technical &					
Ga-Kurate		Good	Good	Good	Good	Good
Ga-Tisane	Health	Good	Good	Good	Good	Good
Vulindlela	Health &					
	Technical &					
Mhluzi						
Klerksdorp						
Douglas						
Vhutale	Health &	Good	Good		Good	Good
	Technical &					
Seshego						
Ga-Phago	Health &	Good	Good		Good	Good
	Technical &					
Modderspruit	Technical &				Poor	Poor
	Admin					

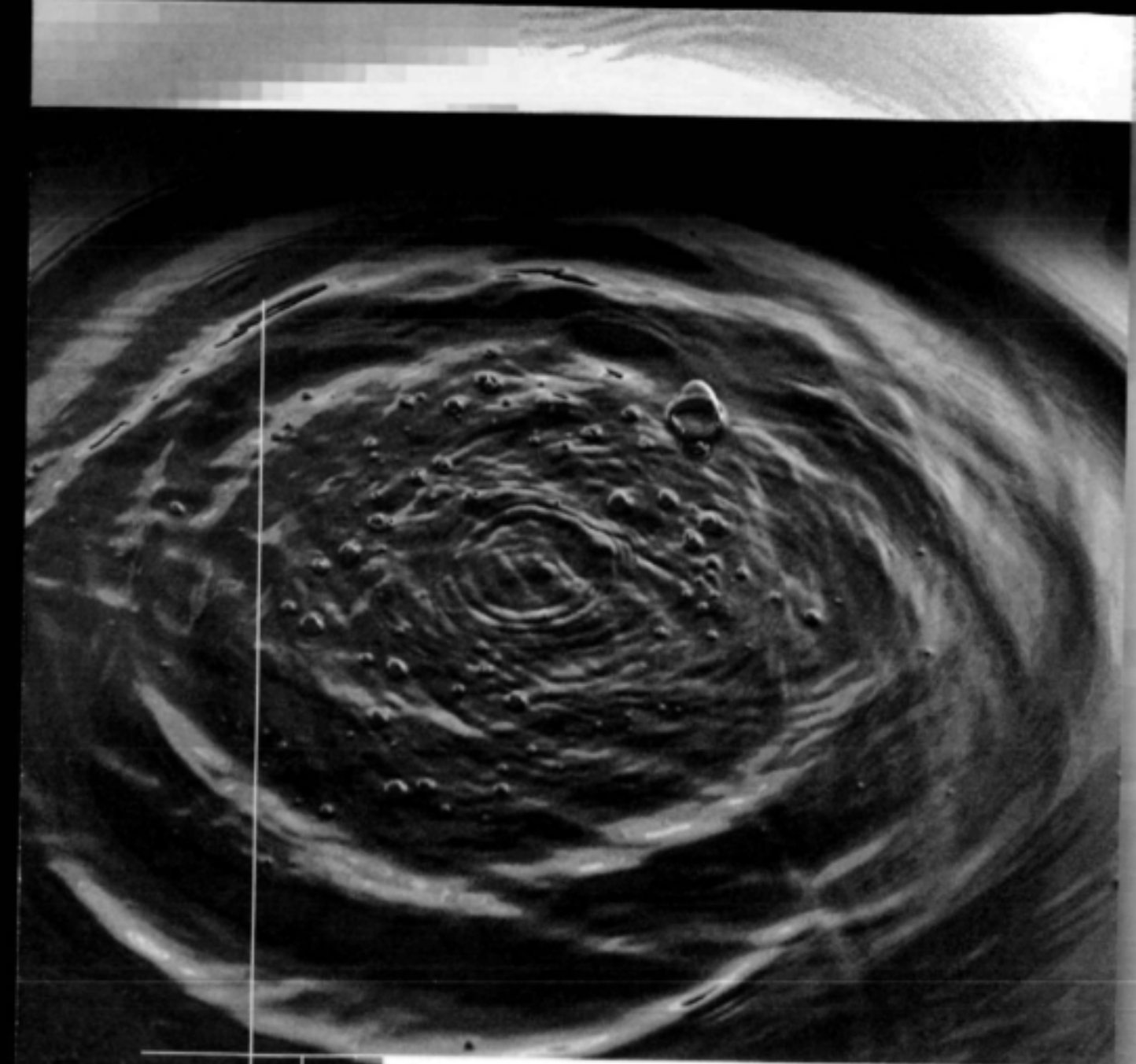
ANNEXURE C

DETAILS OF TRAINING OFFERED

JOB DESCRIPTIONS

STAFF	TASKS
PUMP OPERATOR (diesel)	Start/stop engine Daily service Diesel supply management Routine service (oil change, filters) Routine spares management Check gate, air, pressure release valves Take bulk water meter readings Measure borehole water level Check bulk pipeline Check reservoir
STREET TAP MINDER	Maintain taps Identify water wastage Identify water loss Participate in village zone meetings Check monies received Follow up on non-payers Repair street reticulation
YARD TAP MINDER	Read yard meters Replace broken meters Dispatch broken meters for repair
ADMINISTRATOR	Process meter readings Compile accounts Deliver accounts to pay point Reconcile money received Identify broken meters Identify extraordinary water use Bank monies Dispatch bulk water meter readings Pay electricity account Purchase pre-paid water meter dongles Order and collect diesel
MECHANICAL SPECIALIST	Diesel engine repairs Borehole pump removal Hand pump repairs Wind pump repairs Pump dispatch for repair Electric motor dispatch for repair Diesel engine dispatch for rep
PIPEWORK SPECIALIST	Remove large valves and fittings Order and replace large valves and fittings Repair bulk water pipelines

STAFF	TASKS
TREATMENT WORKS OPERATOR	Check and service chlorinator Order and replace chlorine gas Check chemical dosing Order and replenish chemicals Filter maintenance Check water quality Take bulk water meter readings Undertake routine maintenance
VILLAGE STREET COMMITTEE	Promote water awareness Deal with non-payers Collect payments Read meters Deliver metered accounts
VILLAGE WATER COMMITTEE	Water supply needs assessments Fund application Project development Operation and maintenance management Bank monies Order and collect diesel Pay electricity account Manage emergency cash fund Manage major repairs Tariff setting Draft budgets Initiate new development Wage control Crisis management (droughts)
SECURITY	Guards infrastructure 24 Hour guards Looks after pre-paid reservoir meter Looks after street pre-paid meter Looks after pumpstation Looks after treatment works



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